



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

June 26, 2017

MEMORANDUM FOR: Captain Donn Pratt, NOAA
Master, NOAA Ship *Nancy Foster*

FROM: Captain Scott M. Sirois, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for NF-17-06
Habitat Mapping Southeast US

Attached is the final Project Instruction for NF-17-06, Habitat Mapping Southeast US, which is scheduled aboard NOAA Ship *Nancy Foster* during the period of July 3 to July 16, 2017. Of the 14 DAS scheduled for this project, 14 days are funded by a Line Office Allocation. This project is estimated to exhibit a High Operational Tempo. Acknowledge receipt of these instructions via e-mail to OpsMgr.MOA@noaa.gov at Marine Operations Center-Atlantic.




Project Instructions

Date Submitted: June 6, 2017

Platform: NOAA Ship *Nancy Foster*

Project Number: NF-17-06 (National Centers for Coastal Ocean Science).

Project Title: Habitat Mapping Southeast US

Project Dates: July 3 to July ¹⁶ ~~17~~, 2017 

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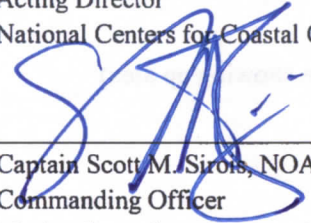
J. Christopher Taylor
Ecologist and Chief Scientist
National Centers for Coastal Ocean Science – Beaufort Laboratory

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Steven Thur
Acting Director
National Centers for Coastal Ocean Science

Approved by:  **Dated:** 6/29/17

Captain Scott M. Siros, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

The National Centers for Coastal Ocean Sciences (NCCOS) will continue its mission to conduct ecological characterizations of shipwrecks and hardbottom, rocky reef seafloor habitats in the Southeast US Atlantic waters to guide ecosystem management and ocean planning. This year, NCCOS will collaborate with Monitor National Marine Sanctuary (MNMS) to collect high-resolution photogrammetric images couple with high-frequency multibeam and fishery echosounder data to construct high-detail three-dimensional models of shipwrecks and rock reef habitats. The team will then conduct diver visual observations to describe benthic biological and fish communities associated with historically significant shipwrecks and adjacent rocky reefs in proposed sanctuary expansion areas in Onslow Bay and Raleigh Bay, North Carolina. The coupling of remote sensing using sonars and high-definition photogrammetry will produce new models providing unprecedented detail for the study of the condition and habitat value of ship wrecks and rocky reefs. The digital models will be developed into online virtual tours for sanctuary advisory members, usergroups, and the public to increase awareness of the historical and ecological significance of the maritime resources offshore North Carolina.

B. Days at Sea (DAS)

Of the 14 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 14 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a High Overtime Operational Tempo.

C. Operating Area (include optional map/figure showing op area)

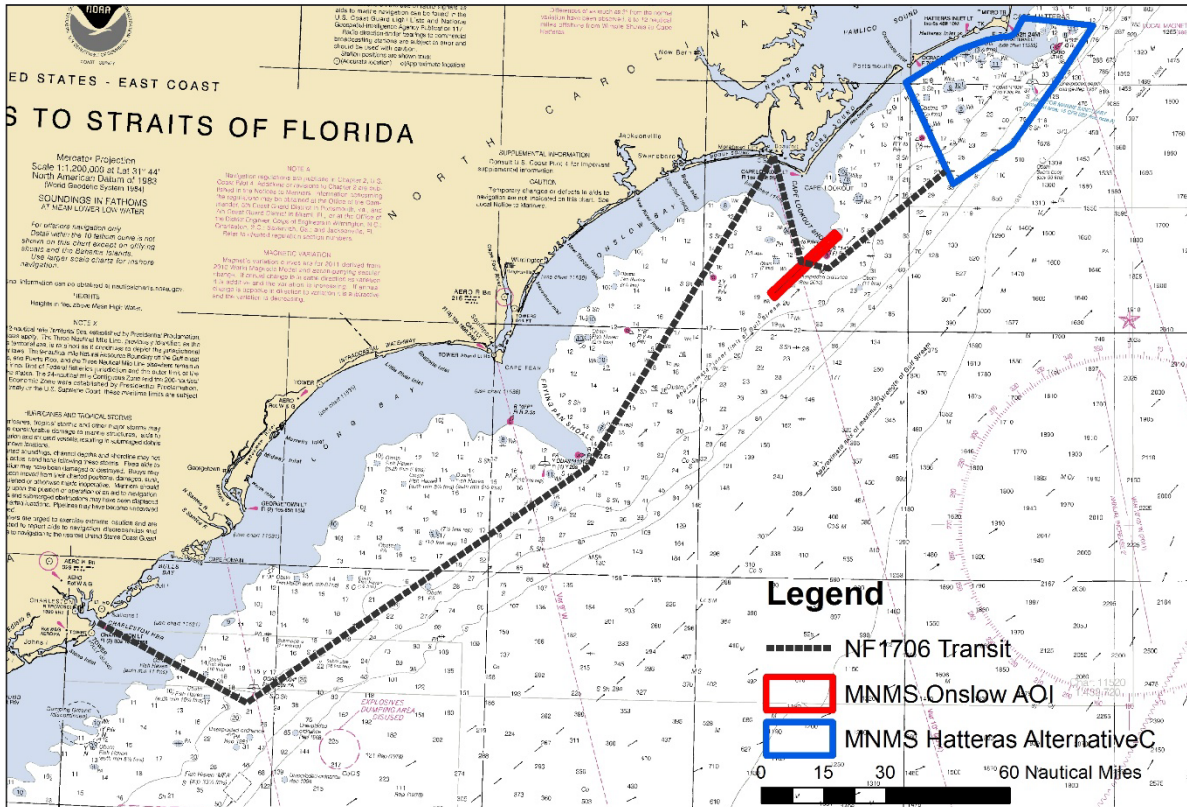


Figure 1 NF-17-06 Transit and operating areas near Cape Lookout and Cape Hatteras

The vast majority of the operations for NF-17-06 will be focused in the Cape Lookout Survey Area above. If time permits, operations will move to the southwestern portion of Cape Hatteras Survey Area

D. Summary of Objectives

The objectives of this project are to 1) conduct detailed archaeological photogrammetric and ecological characterizations of historically significant shipwrecks offshore North Carolina, and 2) conduct high-resolution multibeam and fisheries acoustic surveys over shipwrecks and adjacent hardbottom rocky reefs to characterize the topography and complexity of the wrecks and seafloor habitats and associate acoustic fish biomass with shipwrecks and other benthic structures/features.

E. Participating Institutions

NOAA (NCCOS, NMFS, ONMS), University of North Carolina Institute of Marine Sciences, University of North Carolina Wilmington, Florida International University

F. Personnel/Science Party: name, title, gender, affiliation, and nationality

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Taylor, Chris	Chief Scientist	4 July	15 July	M	NOAA	US
Casserley, Tane	Co-Chief Scientist	4 July	15 July	M	NOAA	US
Ebert, Erik	Dive Master	4 July	15 July	M	NOAA	US
Sassorosse, William	Diver/Archaeologist	4 July	15 July		NOAA	US
Avery Paxton	Scientist/Acoustics	4 July	15 July	F	UNC	US
Groves, Sarah	Diver/Habitat	4 July	15 July	F	NOAA	US
Bullock, W Landis	Diver/Habitat	4 July	15 July	M	UNCW	US
Freshwater, F. Wilson	Diver/Habitat	4 July	10 July	M	UNCW	US
LaCroce, Melissa	Diver/Habitat	10 July	15 July	F	UNCW	US
Burton, Michael	Diver/Fish	4 July	10 July	M	NOAA	US
Contillo, Joseph	Diver/Fish	10 July	15 July	M	NOAA	US
Ball, David	Diver/Archaeologist	4 July	15 July	M	BOEM	US

G. Administrative

1. Points of Contacts:

Chief Scientist: Chris Taylor, NOAA/NOS/NCCOS, 101 Pivers Island Road, Beaufort, NC 28516, 252-838-0833, Chris.Taylor@noaa.gov

Co-Investigator: Tane Casserley, NOAA/NOS/MNMS, 100 Museum Drive, Newport News, VA 23606, 757-284-1115, Tane.Casserley@noaa.gov

Dive Master: Erik Ebert, NOAA/NOS/NCCOS, 101 Pivers Island Road, Beaufort, NC 28516, 252-728-8751, Erik.Ebert@noaa.gov

NOAA Ship *Nancy Foster* Operations Officer: LT Keith Hanson, 1050 Register St., North Charleston, SC 29405, 843-991-6326, ops.nancy.foster@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

None Required.

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:

3 July: NOAA Ship *Nancy Foster* transit from Charleston, SC to Morehead City, NC

4 July: Staging in Morehead City Port and preparing for departure

0900 NOAA Ship arrives Morehead City Port, NOAA Staff load equipment

ETD Ship departs for operating area in Onslow Bay.

ETA Ship arrives in operating area, deploys NF4, conducts first check dive and simulated dive emergency. Begins multibeam surveys

5-15 July: Operations in Onslow (**Note:** At sea Transfer on 10 July)

0000 Continue multibeam survey of target areas

0700 Ship completes night multibeam survey. Scientist will direct ship to conduct fishery acoustic surveys at select dive stations prior to day dive operations. Divers load gear on small boats (NF2/3 4 divers and 1 tank each; NF4 4-6 divers 1 tank each)

0745 Daily safety meeting

0800 Deploy small boats for dive operations

0830 NF Stand by to support dive operations.

1100 Small boats return to NF, boats recovered

1130 Lunch. When feasible, conduct fishery acoustic surveys over dive stations.

1230 Divers reload small boats as in morning evolution

1245 Small boats deployed for dive operations. Divers deploy stationary cameras at conclusion of dives.

1300 NF Stand by to support dive operations.

1630 Small boats return to ship.

1645 Recover small boats, immediately follow with targeted fishery acoustic survey over select site(s)

1700 Secure from dive operations, refill tanks

1730 Commence night operations: Scientist enter next day's dive coordinates in small boat GPS. Night fishery acoustic and hydrographic survey: multibeam with fishery sonar to complete seafloor habitat mapping of operating area.

10 July: At sea transfer for science party, about 15 miles south of Beaufort Inlet (Tentatively: 2 embark, 2 disembark)

15 July: **ETA/ETD** Ship return to Morehead City Port, Touch-n-go unload. NOAA Ship depart for transit to Charleston

16 July: **ETA** Ship returns to Charleston

B. Staging and Destaging:

Staging will occur in the **Port of Morehead City on July 4, 2017**. Destaging will occur at the

Port of Morehead City on 15 July, 2017.

C. Operations to be Conducted:

Seafloor mapping: Multibeam sonar and fishery acoustic surveys

Seafloor mapping will be conducted during night operations, during the daytime small boat operations where safety permits and when sea conditions do not permit safe small boat operations on all legs. Survey locations will be determined by the Chief Scientist and provided to the Ship's Survey Department prior to departure and refined during each daily plan. Ship's Survey Department will lead hydrographic multibeam surveys. All surveys will use the ship's multibeam sonar (Reson 7125 or Kongsberg EM710) will be used to log bathymetry and backscatter and will be operated by the survey department with assistance from science party. Multibeam will be used to develop specific habitat locations and possible for diving. Survey lines will be developed to ensure greater than 110% bottom coverage and cross lines. Multibeam data will be processed as collected to produce preliminary bathymetry products to select habitat validation stations the following day. Survey lines will be transmitted to survey department and bridge using Hypack. A CTD cast will be used at beginning of each night or the Underway CTD system will be used for sound velocity profiles every 4 hours throughout MBES survey operations. Fishery acoustics will be acquired using EK60 simultaneous to multibeam sonar.

Dive Operations: Archaeology and fish/benthic community survey

Divers will conduct archaeological or biological assessments of selected shipwrecks and hardbottom habitats identified from previous studies. Dive teams will vary between 2 and 4 divers depending on the objective. Two (or three) small boats will be used to survey different wreck location and may be as much as 5 nmi from the ship.

Photographs and videos will accompany the data records. In some cases, organisms will be brought to the surface for identification and verification. No chemicals will be needed, but freezers may be used. Archaeological surveys will be coordinated with biological assessments of the biological and benthic cover on these sites. Stations will be located using GPS and confirming expected depths on small boats. Upon arrival, lead diver will deploy weighted line with polyball float. This line will be used as a reference mark for divers to descend to station. Divers will deploy from and be retrieved by small boats; Nancy Foster will stand by near dive operations area to support as needed. The anticipated bottom time will be 25-40 minutes. Divers will use the following methods while maintaining buddy contact:

- 1) Fish community: Diver will trail a field tape along prescribed heading and document large fishes along a 50 m transect. Returning to station, for the first 25m of the return trip, the same diver will record presence of small fish species.
- 2) Habitat point diver: Diver will record benthic organism occurrence at points distributed every 30 cm for 20 m of the fish transect tape. Returning to the start point, diver will record physical height of relief or ledges.

3) Archaeological divers: Diver will survey the shipwreck's features along the site's longitudinal axis using still and video photography. Diver will start surveying at either the wreck's bow or stern and current dependent, circumnavigate the wreck site recording its features on slates and by video.

4) Deploy/recover time-lapse cameras: During the final dive of the day, divers will deploy a time-lapse go-pro camera in a custom housing. The camera will be anchored to the seafloor using a 0.5m tall metal cage approximately 25 lbs. The cage will be deployed with a down line and surface float, similar to an anchor. Divers will use a <100 lb lift bag to move the cage into position and then install the camera housing onto the cage. The camera will be left on the seafloor overnight and be recovered on the following day. Recovery will begin with removing the cameras and use of a lift bag to provide assistance for the small boat to recover using the down line.

Buddy pairs can call dive if visibility hinders ability to collect scientific data OR is perceived by any diver to be a safety issue. Divers will always be "connected" to one another by transect tape but will be required to maintain visual contact with buddy.

At the conclusion of the dive, divers will attach a lift bag to the anchor allowing it to be retrieved by topside personnel in the small boats using a controlled ascent. Each buddy team will have at least one NOAA diver that is trained in deploying small Carter lift bags (<100lbs). Divers are trained to inflate lift bag with back gas. Back gas is also used to inflate SMB (Surface Marker Buoys) that each diver will have on person in cases of free ascent after anchor is deployed to surface or in cases of buddy separation/emergencies. Divers will free drift off the bottom releasing a surface marker buoy (lift bag or other highly visible marker) that can be seen from the surface. Small boats will follow divers and upon surfacing retrieve all divers and equipment into the small boats. Where multiple dives are occurring at the same site, divers will descend and ascend the marker buoy line until the last dive team, which will conduct a free ascent. This approach minimizes diver fatigue and ensures anchor retrieval.

If at any time divers breathe their cylinders down to 2/3's of the starting volume the data collection will be terminated and safety ascent procedures will be initiated. This is also known as the rule of thirds, where the first 1/3 of the cylinder is allotted for use by the diver during the bottom phase of the dive, 1/3 of the cylinder is allotted for use by the diver during ascent, and 1/3 of the cylinder is reserved for his/her dive partner in cases of an out of air situation or other emergency contingency. All divers will surface with a minimum of 500 PSI.

Dives will be planned using nitrox computers or appropriate nitrox tables to allow for pre-dive planning and gas management. Maximum depth and bottom time will be planned according to the buddy with the most conservative profile. All divers will dive with computers set to atm 1.4 mode.

D. 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.

The Dive Plans for NF-17-06 are presented in Appendix B.

E. Applicable Restrictions

Conditions which preclude normal operations:

Equipment failure (sonars): Mitigation – at sea repair.

Poor weather: Mitigation – switch from small boats (suspend diving and drop camera) to ship based operations (conduct multibeam operations).

Safety concerns: Mitigation – Chief Scientist, deck departments and Command discuss and review daily operations during safety briefings each day and as needed. Mitigation measures to manage risk will be provided by all participating, Command will make final determination.

III. Equipment

A. Equipment and Capabilities provided by the ship (itemized)

- 1) Hand held radios for communication between bridge, deck and small boats.
- 2) CTD's 1000m depth rating.
- 3) Underway CTD system
- 4) Kongsberg EM 710 and Reson Seabat 7125 multibeam sonars, and Simrad split-beam EK-60 sonars.
- 5) Simrad EK60 splitbeam calibration downriggers and calibration sphere (calibration of EK60 will be determined during cruise based on weather and operations)
- 6) Applanix Pos/MV v.5
- 7) 2-3 cubic foot freezer space (<32 F)
- 8) Internet connection and connection to ship's data server for MBES and EK60 processing computers
- 9) Oxygen kits and recall systems for small boats.
- 10) Dynamic Positioning System
- 11) 15 80 cf and 8 AL 100 cf NITROX scuba tanks and compressor system, initially filled with 36%
- 12) Tank fill whip array
- 13) Two small boats: 1 small boats for 2-4 divers (NF2 OR NF3), 1 small boat capable of carrying 2-6 divers and tanks (NF4) with GPS and depth sounder to locate stations and confirm depth at station.

B. Equipment and Capabilities provided by the scientists (itemized)

- 1) Three high end laptops / workstations and 4 flat screen monitors, internet connection required
- 2) 16 120 cf NITROX scuba tanks, 10 100 cf NITROX scuba tanks with tank racks
- 3) Nitrox gas analyzers
- 4) Emergency Oxygen kits for small boats
- 5) RASS bottles and regulators for all dives greater than 100 FSW

- 6) Dive benches or racks to store 120 cf nitrox tanks for refill.
- 7) Dive tapes, weights, clipboards, data sheets, dive gear (SEP or alternative serviced within 12 months)
- 8) Laptops for data entry and data management
- 9) High-definition video cameras for photogrammetry

IV. Hazardous Materials

A. Policy and Compliance

No Hazardous Materials are being brought aboard the ship for this project.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

No Supplementary Projects are planned.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA’s Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

A. Data Classifications: *Under Development*

a. OMAO Data

b. Program Data

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

- A. 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.

- B. 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.
- C. 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.

D. 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 <https://sites.google.com/a/noaa.gov/omao-intranet-dev/operations/marine/customer-satisfaction-survey> and provides a "Submit" button at the end of the form. It is also located at https://docs.google.com/a/noaa.gov/forms/d/1a5hCCkgIwaSII4DmrHPudAehQ9HqhRqY3J_FXqbJp9g/viewform. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding 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 Chief Scientist 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 Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist 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 17, 2000, which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website <http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf>.

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

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

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

The only secure email process approved by NOAA is [Accellion Secure File Transfer](#) which

requires the sender to setup an account. [Accellion's Web Users Guide](#) is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The 'Send Tab' function will be accessible for 30 days.

Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
Email MOA.Health.Services@noaa.gov

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

C. Shipboard Safety

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

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations Officer should be consulted by the Chief Scientist to ensure members of the scientific party report aboard with the proper attire.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via email 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 and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy* 1.1 (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

- (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 the above 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

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

G. Best Management Practices

Refer to Appendix B. Environmental Review Memorandum for determination of human and environmental impact as required by the National Environmental Policy Act (NEPA).

General vessel operations support many of the sanctuary's field projects. The small boats are operated according to the NOAA Small Boat Program guidelines (<http://www.sbp.noaa.gov/policy/manual.html>). In addition, sanctuary vessels, follows additional standing orders imposed by ONMS management to minimize impacts on sanctuary resources. These self-imposed standing orders are modeled after USCG regulations that apply to the safe operation on USCG vessels. The standing orders include:

· **Look Out** -- Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

· **Safe Speed** - Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions. Consistent with Rule 6 (Safe Speed) of the U.S. Coast Guard's International/Inland Navigation Rules (COMDTINST M 166672.2c), in determining a safe speed the following factors shall be among those taken into account:

By all vessels:

§ state of visibility;

§ traffic density including concentrations of fishing vessels or any other vessels;

§ maneuverability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;

§ at night, the presence of background light such as from shore lights or from back scatter of her own lights;

§ state of wind, sea and current, and the proximity of navigational hazards; and

§ draft in relation to the available depth of water.

Additionally, by vessels with operational radar:

§ characteristics, efficiency and limitations of the radar equipment;

§ constraints imposed by the radar range scale in use;

§ effect on radar detection of the sea state, weather and other sources of interference;

§ possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range;

§ number, location and movement of vessels detected by radar;

§ more exact assessment of the visibility that may be possible; and

§ when radar is used to determine the range of vessels or other objects in the vicinity.

Finally, MNMS operators are advised that additional reductions in speed should be considered when a whale is sighted or known to be within 5 nm of the vessel. In these situations, vessels would navigate prudently at the best “safe” speed at the Captain’s discretion according to Coast Guard regulations to avoid a collision with a whale, clear the area and, if necessary, reduce speed to the minimum at which the vessel can be kept on course or come to all stop. Sanctuary vessel operators receive information on the location of whales by communicating with other marine users on the radio. There are no minimum distances other than those required by NMFS (e.g., staying 500 yards away from a northern right whale). If there is a sighting, the vessel must maintain maximum distance and make every attempt to avoid striking a large whale. If the vessel becomes too close to the whale the vessel must come to a complete stop.

Protective Measures and Best Management Practices Incorporated into the Action

In the event of unauthorized incidental take, NCCOS would suspend all activities causing such take and immediately contact NMFS Office of Protected Resources. NCCOS would request reinitiation in the event of unauthorized take, systematic noncompliance, unanticipated adverse effects, or modification of the action.

Points of Contact:

Reporting Logs - Colette Cairns, colette.cairns@noaa.gov, 301-427-8414, NMFS OPR ESA-ICD

Southeast Marine Mammal Stranding Coordinator - (305) 361-4586

NC Turtle Stranding Coordinator – Mathew Godfrey - (252) 241-7367,
matt.godfrey@ncwildlife.org

The following protective measures would be incorporated into the cruise plan and are listed below as described in Section 2.9 of the OCS Biological Opinion. However, there are additional measures set forth by DUSO VADM Michael Devany's memo of August 22, 2014, concerning entanglement measures and habitat impact precautions that would also be incorporated and are included here:

1. Minimize vessel disturbance and ship strike potential
 - a. Slow speeds (4-8 knots), when mapping;
 - b. Reduced speeds (<13 knots) when ESA-listed cetaceans are sighted (unless otherwise required, e.g., NOAA Sanctuaries);
 - c. Reduced speeds (<13 knots) while transiting through designated critical habitat (unless slower speeds are required, e.g., < 10 knots in right whale critical habitat and management areas);
 - d. Trained observers aboard all vessels; 100% observer coverage; and
 - e. Species identification keys (for marine mammals, sea turtles, corals, abalone, and seagrasses) available on all vessels.
2. Upon Sighting Protected Species
 - a. Multibeam echosounder transmissions will be suspended when ESA-listed whales are within range.
 - b. For large whales, attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the animal has left the area.
 - c. Reduce vessel speed to 10 knots or less as safety permits when whales are observed near an underway vessel. Always proceed with caution when a whale is sighted at the surface, as there may be additional submerged animals in the vicinity.
 - d. When whales are sighted directly in the vessel's path or in close proximity to a moving vessel, reduce speed and shift the engine to neutral, as safety allows. Do not engage the engines until the animals are clear of the area.
 - e. Maintain a distance of 200 yards (600 ft) or greater from large whales. Maintain a distance of 50 yards or greater from sea turtles or small marine mammals when possible.
 - f. Vessels are prohibited from coming within 100 yards of humpback whales.
3. Minimize noise
 - a. Reduced speed (see above);
 - b. Multibeam surveys using ≥ 50 kHz frequencies, lowest possible power and ping-rate;
 - c. Single beam surveys using ≥ 30 kHz frequencies, lowest possible power and ping-rate, and $<12^\circ$ beam angle; and

- d. Reduce use of active acoustics as much as possible.
 - e. Active acoustic sources should be used only when required for navigation or data collection and should be used at the lowest source level and highest frequency available that is suitable for the purpose.
 - f. Multibeam echosounder transmissions will be suspended when ESA-listed whales are within range.
4. Minimize anchor impact to corals, seagrass or other EFH
 - a. Use designated anchorage area when available;
 - b. Use mapping data to anchor in mud or sand, to avoid anchoring on corals;
 - c. Avoid anchoring in seagrass critical habitat; and
 - d. Minimize anchor drag.
 5. Avoid collecting bottom samples in seagrass critical habitat
 - a. There would be no sample collections of any kind conducted during this cruise.
 6. Cetaceans
 - a. Avoid approaching within 200 yards (182.9 m), 500 yards for right whales;
 - b. Avoid critical habitat, when possible;
 - c. Avoid using sonar frequencies of less than 180 kHz, when possible;
 - d. Suspend multibeam sonar transmissions of less than 125 kHz, when susceptible ESA-listed species (i.e., Southern Resident killer whale and Cook Inlet beluga whale [not in USVI/PR area) are within hearing range; and
 - e. Suspend single beam sonar transmissions of 30 kHz when ESA-listed species are within hearing range.
 7. Sea Turtles and Manatees
 - a. Avoid approaching within 50 yards.
 8. Entanglement Protective Measures (towed Conductivity Temperature and Depth recorder and ROV)
 - a. Use stiffer line materials for towing and keep taut during operations to reduce potential for entanglement;
 - b. Reduce knots in the line as much as possible; and
 - c. Clearly mark lines in the event an animal does become entangled so that NMFS experts can identify the gear.
 9. Habitat Protection
 - a. Avoid contact of gear, towed or lowered, with the sensitive bottom habitat (e.g. submerged aquatic vegetation (SAV) and hard bottom); and
 - b. Report deep sea coral bycatch and collect a sample of each species for species identification.

VIII. Appendices

Appendix A. Station/Waypoint List (coordinates in degree-decimal minutes and decimal degrees).
Additional natural rocky reefs will be selected from multibeam maps during mission.

Site	Latitude	Longitude
W.E Hutton	34 8.62 N (34.14369,)	076 39.14 W (-76.652352)
Schurz	34 11.23 N (34.187191)	076 36.13 W (-76.602143)
U-352	34 13.68 N (34.228052)	076 33.89 W (-76.56489719)
HMS Bedfordshire	34 18.85 N (34.314151)	076 27.15 W (-76.452538)
Ashkabad	34 22.9 N (34.3814)	076 21.9 W (-76.36500)

Appendix B. Dive Plan (Following Pages)

DIVE OPERATIONS PLAN

DIVE OPERATIONS

DATE(S) of DIVE OPERATIONS		DIVE OPS START TIME		DIVE OPS STOP TIME	
LOCATION of DIVE OPERATIONS		DISTANCE FROM SHORE		EVAC TIME to CHAMBER	
PLATFORM or FACILITY		DEPTH RANGE		NUMBER of DIVERS	
PLANNED NUMBER of DIVE EVOLUTIONS PER DAY		MAXIMUM NUMBER of DIVES to be LOGGED PER DAY		NUMBER of CONSECUTIVE DIVE DAYS	
SAFE SHIP CHECKLIST REQUIRED	YES <input type="checkbox"/> NO <input type="checkbox"/>	DIVE MODE	OPEN CIRCUIT SCUBA <input type="checkbox"/> REBREATHER <input type="checkbox"/>	DIVE PURPOSE	SCIENTIFIC DIVE <input type="checkbox"/> WORKING DIVE <input type="checkbox"/>
FLOAT PLAN REQUIRED	YES <input type="checkbox"/> NO <input type="checkbox"/>	DECOMPRESSION CALCULATION	DIVE COMPUTER <input type="checkbox"/> DECOMPRESSION TABLES <input type="checkbox"/>	DIVE DUTY	ON-DUTY DIVE <input type="checkbox"/> OFF-DUTY DIVE w/SEP GEAR <input type="checkbox"/>

DIVERS (Attach additional sheets if more than 12 divers participate in the dive)

DIVEMASTER / LEAD DIVER	DIVER	DIVER
DIVER	DIVER	DIVER
DIVER	DIVER	DIVER
DIVER	DIVER	DIVER

DESCRIPTION

PURPOSE of DIVES and TASKS to be PERFORMED
PRINCIPAL DIVER WORN EQUIPMENT and BREATHING MEDIA
TOOLS and SPECIALIZED EQUIPMENT to be USED Tethered comms dive? YES <input type="checkbox"/> NO <input type="checkbox"/>
POTENTIAL HAZARDS and MITIGATIONS (Certain hazards are present on all dives (AGE, DCS, drowning, etc.). The hazards listed below are unique to this operation.)
PRIMARY MEANS of EVACUATION for EMERGENCIES

AUTHORIZATION

SUBMITTED BY (DIVEMASTER/LEAD DIVER)	SIGNATURE	DATE
APPROVED BY (UNIT DIVING SUPERVISOR/DESIGNEE)	SIGNATURE	DATE