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: Lieutenant Commander Holly Jablonski, NOAA
Commanding Officer, NOAA Ship *Nancy Foster*

FROM: Captain Anita Lopez, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for NF-12-05 with NF-12-08
Underwater Behavior of Endangered Whales with USGS Endeavor

Attached is the final Project Instruction for NF-12-05 and NF-12-08, Behavior of Endangered Whales and Submarine Canyon Development (USGS), which is scheduled aboard NOAA Ship *Nancy Foster* during the period of 11 June – 08 July 2012. Acknowledge receipt of these instructions via e-mail to **OpsMgr.MOA@noaa.gov** at Marine Operations Center-Atlantic.

Attachment

cc:
MOA1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of National Marine Sanctuaries
Stellwagen Bank National Marine Sanctuary
175 Edward Foster Road
Scituate, Massachusetts 02066
Tel 781 545.8026 Fax 781 545.8036

FINAL Project Instructions

Date Submitted: May 1, 2012

Platform: NOAA Ship *Nancy Foster*

Project Number: NF-12-05 SBNMS

Project Title: Underwater Behavior of Endangered Whales

Project Dates: **06/11/2012 to 07/08/2012. This includes a USGS project. NF-12-08 (See Appendix 1) 29 June-03 July and depart from Woods Hole, MA**

Prepared by: David Wiley, PhD, SBNMS
Chief Scientist
Dated: 1 May 2012

Approved by: _____
Craig MacDonald
Superintendent
Stellwagen Bank National Marine Sanctuary
Dated: _____

Approved by: _____
Captain Dave Score, NOAA
Commanding Officer
Marine Operations Center - Atlantic
Dated: 8 JUN 12

I. Overview

A. Brief Summary and Project Period

The project will place synchronous motion, acoustic recording tags on humpback and fin whales, while concurrently measuring prey field size, shape and composition. The goal is to understand water column use by endangered whales and how prey patch characteristics influence whale behavior as a way to recommend mitigation measures related to collisions between endangered whales and commercial ships and/or fishing gear. Additionally, whale acoustic data collected will allow us to evaluate the efficacy of passive acoustic monitoring for these species by age and reproductive class. Tags will be placed on whales using RHIBs that will be provided by the science team, but berthed on and launched from, NOAA Ship *Nancy Foster*. We do not have our own cradles for the RHIBS and will have to use or modify *Nancy Foster's* existing cradles. We will be working in consort with NOAA's R/V Auk, which will engage in fine scale prey mapping in close proximity to tagged whales, while *Nancy Foster* provides mid-range prey mapping. We will also work with the M/V Song of the Whale, which will engage in the night time tracking of a tagged animal additional to the one being tracked from *Nancy Foster*. On nights that a tagged whale is not available to be tracked we will multi-beam select areas for maritime heritage and/or fine scale bathymetry and sediment determination. We will also place National Geographic "Crittercam" camera technology on whales to record underwater behavior and visualize the water column from the whale perspective.

The project period is 17 – 29 June 2012.

B. Service Level Agreements

Of the 13DAS scheduled for this project, 13 DAS are funded by OMAO. This project is estimated to exhibit a High Operational Tempo. Four additional DAS are funded by OMAO on behalf of OAR.

C. Operating Area (see figure 1)

All specific sampling locations will be provided to the Operations Officer prior to the cruise, but all operations will be conducted within and surrounding the Stellwagen Bank National Marine Sanctuary (SBNMS), generally delimited by an area between latitude 42° 5' N and 42° 48' N, and longitude 70° 2' W and 70° 39' W. We will also work in Jeffreys Ledge and possibly the Great South Channel area east of Cape Cod and Nantucket (see figure 1 below).

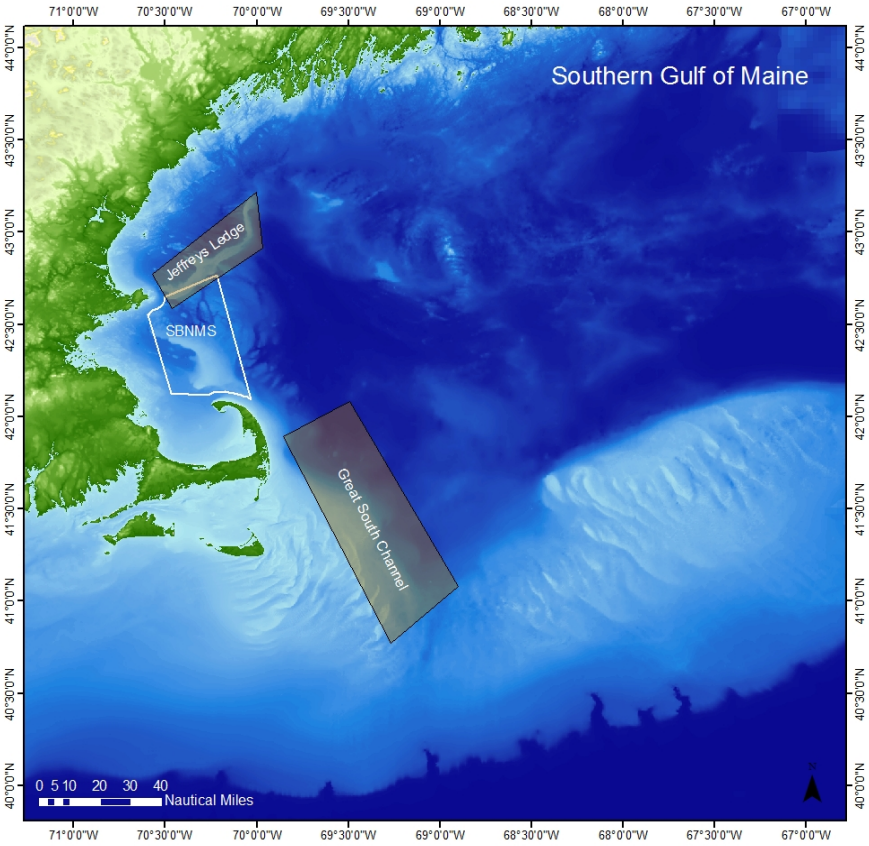


Figure 1.

D. Summary of Objectives

1. Tag 20 – 30 humpback and fin whales.

2. Use RHIBS to conduct focal follow and behavioral sequencing of tagged animals.

3. Map water column (24/7) using EK-60 to delineate prey fields.

4. Follow tagged animals at night with *Nancy Foster* using VHF tracking technology.

5. Create 3D and 4D visualizations of whale behavior.

6. Place National Geographic crittercam technology on ~10 whales to record underwater behavior and visualize the water column from the whale perspective.

7. Use multi-beam technology to map maritime potential heritage sites and/or sites of interest for fine scale bathymetry and sediment analysis.

E. Participating Institutions

Stellwagen Bank National Marine Sanctuary, Duke University, University of New Hampshire, Syracuse University, National Marine Fisheries Service, International Fund for Animal Welfare, Provincetown Center for Coastal Studies, National Geographic Society

F. Personnel/Science Party:

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Wiley, David	PhD; Chief Scientist Operations alt.	17 June	29 June	M (1)	SBNMS	USA
Friedlaender, Ari	PhD; Chief Scientist (alternate)	17 June	29 June	M (2)	DUKE	USA
Thompson, Mike	Operations	17 June	29 June	M (3)	SBNMS	USA
Allison Stimpert	Scientist; PhD	17 June	29 June	F (1)	NRC Research Associate; Ocean Acoustics Laboratory; Naval Postgraduate School	USA
Colin Ware	Scientist; PhD	17 June	29 June	M (4)	Univ. of New Hampshire	CANADA; Green Card
Jennifer Tackaberry	scientist	17 June	23 June	F (2)	Provincetown Center for Coastal Studies	USA
Cara Pekarcik	Scientist	17 June	29 June	F (3)	SBNMS	USA
Johnston, David	Scientist; PhD	17 June	29 June	M (5)	Duke	Canada; Green Card
Hazen, Elliott	Scientist; PhD	17 June	29 June	M (6)	NOAA SWFSC	USA
Kirchner, Theresa	Scientist	17 June	29 June	F (4)	SBNMS	Germany
Abernathy, Kyler	Scientist	17 June	29 June	M (7)	National Geographic	USA
Casey, Caroline	Scientist	17 June	29 June	F (5)	Duke Univ.	USA
Greg Marshall	Film	17 June	21 June	M (8)	National Geographic	USA
6a. Laura Ganley	Scientist	24 June	29 June	F(2)	Provincetown Center for Coastal Studies	USA

G. Administrative

1. Points of Contacts:

Chief Scientist:

Dr. David Wiley; david.wiley@noaa.gov (508-243-1586)
(alternate) Dr. Ari Freidlaender; asf7@duke.edu

Operations:

Michael Thompson; Michael.A.Thompson@noaa.gov
(Alternate); Dr. David Wiley; david.wiley@noaa.gov

Ops Officer: LT Josh Slater
Cell: 843-991-6326
Iridium: 808-434-5653
Email: ops.nancy.foster@noaa.gov

2. Diplomatic Clearances: Not applicable.

3. Licenses and Permits

Research will be conducted under Permit No. 775-1875 dated January 16, 2008 issued to the Northeast Fisheries Science Center with Dr. David Wiley as a co-investigator under that permit. A copy of the permit and letter of authorization are in Appendix A.

II. Operations

A. Project Itinerary

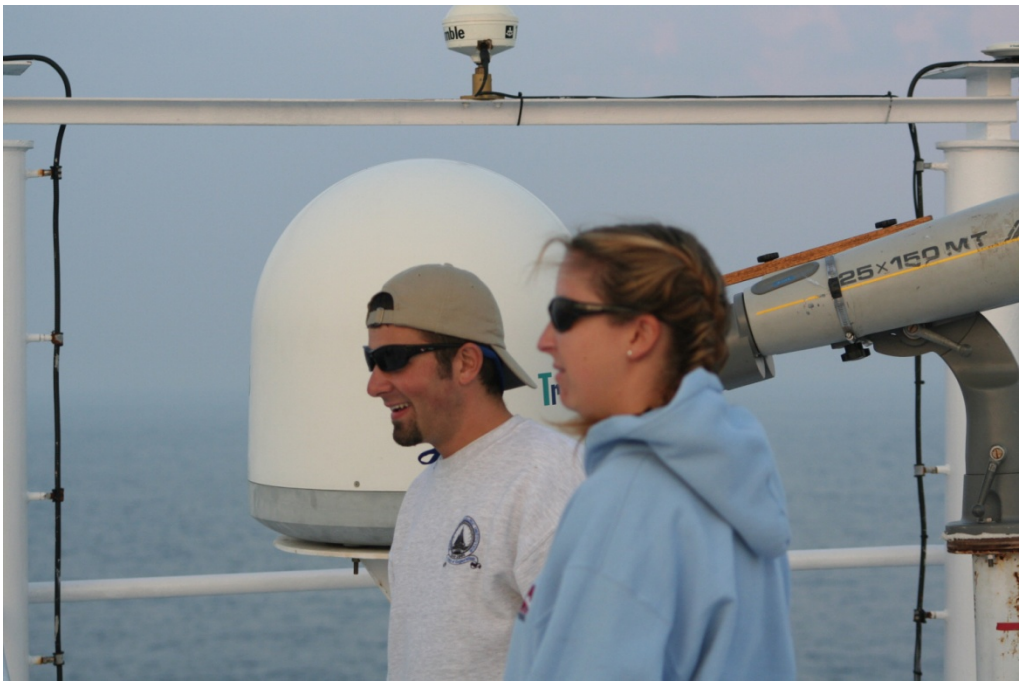
(See Section D. Work Plan)

B. Staging and Destaging

Staging will occur on 16 June in Woods Hole, MA. Anticipated arrival time of science party is 0900 hrs. At that time, the following activities will take place:

1. 1. 16 June: The RHIB tagging vessel (*Novurania)* will be placed aboard *Nancy Foster* and secured in *Nancy Foster's* existing port side small boat cradle. Boat dimensions are: Length; 22 ft, Width; 7 ft. Weight; ~2000 lbs. The RHIB will already be in the water for lift-up. This will occur on Sat 16 June. See photo below of *Nancy Foster* and tag RHIB. A standard lifting harness made for the *Novurania and used on many NOAA vessels will be used (I am not sure what a shift bridle is).*

2. 16 June - Place Big Eyes on *Nancy Foster*'s flying bridge. A mount on the flying bridge has previously been configured to receive this equipment. We have used big eyes at this location in the past and have been told that the location does not interfere with radar operation or pose a danger to those on the flying bridge. See photo below:



3. 16 June – A second RHIB tagging vessel (*AB Boat Al RHIB* length 16' ft; Width 6'9", weight ~1,000 lbs; Honda 40 hp 4-stroke outboard) will be brought aboard *Nancy Foster*. We will work with *Nancy Foster* to determine the best way to secure this vessel. We do not have our own cradle for this vessel.

4. 16 June - Computer equipment will be brought aboard and set up in the *Nancy Foster's* laboratory space (wet and dry labs). All NOAA employees will have prescanned and up-to-date packages. We will work with the ship to make secure all non-NOAA computers.

5. 16 June - Tracking equipment will be installed. ADF array will be installed on the top portion of the *Nancy Foster's* mast and cables run to the tracking station on the bridge. We will work with *Nancy Fosters* Chief Boatswain to hoist the array using a hand line.

Departure time on 17 June is: 1000. Arrival time on 29 June is: 0900 in Woods Hole, MA. De-staging will take place on 29 June in Woods Hole, MA**.** The majority of the equipment will be broken down during the transit to port. It is anticipated that all equipment will be removed from *Nancy Foster* within 3 hours of docking. On 29 June the SBNMS project will terminate and a new project will begin with the USGS.

C. Operations to be Conducted

Data to be collected include:

1. Position of the tagged whale at each surfacing. During day time, this will occur from RHIBs. In poor weather or when RHIBs have returned to *Nancy Foster*, this activity will take place from *Nancy Foster*,
2. The DTAG attached to the whale(s) will record the pitch, roll, heading, dive depth, and fluke strokes of the animal relative to sounds being recorded in a tag,
3. CTD casts (1 morning, 1 afternoon, 1 evening) in the vicinity of the tagged whale (from *Nancy Foster*) data needed are temperature, depth and salinity. No water samples are required.

4. EK-60 data for use in delineating prey fields (from *Nancy Foster* and *Auk*),
5. Position of other non-focal whales (from *Nancy Foster* and *Auk*),
6. Video footage from cameras placed on the whales,
7. Multibeam data of the seabed (night time activity if no tagged whale is available to be tracked (from *Nancy Foster*). A hard drive for data storage will be provided by the scientific party.

D. Work Plan

On Day 1 (17 June), we will attempt to locate an aggregation of whales through visual observation and contact with the sanctuary's R/V *Auk* [1]. Observers will be stationed on the bow of *Nancy Foster* and at the top viewing area (above the wheel house). Upon sighting, *Nancy Foster* will approach whale location and, with the permission of the OOD, prepare for launch of *Novurania* (RHIB tagging vessel) and *AB* (RHIB tagging vessel). While on *Nancy Foster, Novurania* will be located on the ship's deck in the *Nancy Foster's* port cradle. We will work with *Nancy Foster* to determine the best way to secure and launch the *AB*. During approaches to the target whale, visual observers or the Chief Scientist will request course changes, approaches, changes in speed, etc., to the OOD. No changes in course or speed will be made that might endanger the ship, small boats, or impede the practice of safe navigation**.** During the approach, the tag will be prepped for deployment, which should take 15-30 minutes. Handheld computer(s) should be synchronized with the laptop interfaced with the GPS.

When it is determined that *Auk* must depart the area or RHIBs must return to *Nancy Foster* at the end of the day (~12 hours after RHIB launch), a RHIB will be used to shuttle members of the scientific party between the two vessels[2]. This transfer will occur at the discretion of and with the permission of the CO and OOD. Transfer will be accomplished by bringing *Auk* to *Nancy Foster* or other method as determined by the OOD and Captain of *R/V Auk*. Final transfer will occur via the RHIBs.

On subsequent days, *Nancy Foster* will search for whales starting at 0500. Upon finding a suitable aggregation of animals, and with the permission of the OOD, we will launch tag RHIBs. *Nancy Foster* will communicate its position to *Auk* and *Auk* will rendezvous with *Nancy Foster* as soon as possible. When *Auk* arrives, with the permission of the OOD, members of the scientific party will be exchanged between the vessels using one of the SCI's RHIBs.

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[1] *R/V Auk* will be working in consort with *Foster* during the cruise. Whereas *Foster* will be used as a base of tagging operations and large scale prey mapping, *Auk* will be used to map prey densities closer to the whales. This will require the transfer of some members of the scientific party between the two vessels via RHIB.

[2] The research being conducted is extremely complex and multi-faceted. Each team member brings a specific area of expertise to the project. While some members are required to be on board *Auk* for data collection purposes, they are also required on *Foster* at night for data analysis and integration with concurrently collected data. Because of this, in the morning and evening, at the discretion of and with the permission of the CO and OOD, 3 members of the scientific party will be transferred from *Foster* to *Auk* and then from *Auk* to *Foster*.

OBSERVER TASKS AND STATIONS:

Whale Observations –

Task - Conduct continuous scans to locate whales other than those tagged. Inform OOD of any animals likely to be within 800 m of *Nancy Foster*. These activities will occur while *Nancy Foster* is conducting large scale prey mapping with EK-60 (see prey sampling below).

Station - On *Nancy Foster* flying bridge. In case of inclement weather observers will work from the Bridge wings or inside the bridge. If observers are working from inside the bridge they will work in a manner that does not disrupt *Nancy Foster's* bridge team.

Number at Station - 2

Radio Tracking –

Task – Note direction to whale at each surfacing interval and communicate position to RHIBs if needed. Communicate whale position and direction of travel to the OOD and provide course for prey sampling. Communicate surfacing and position to behavioral sequencing team via hand-held VHF radio.

Station – the radio tracking station requires an LED display (dimensions 8"X12"X6") to be located in a protected area within easy communication of the OOD, preferably near the bridge. The LCD needs to be connected to the VHF antennae array (see below) via four 50 ft. coaxial cables. The LCD has minimal light and is red. The OOD's vision and work space will not be compromised by its operation. See below for a photo of past placement.

Number at Station - 1

Chief Scientist –

Task - The chief scientist or designee will be facilitating information between *Nancy Foster* and scientific personnel. The Chief Scientist will also rotate through the various data stations to provide relief to other scientists.

Station – Bridge

Number at Station - 1

The scientific party will use *Nancy Foster's* private channel radios provide VHF radios for the bow observation station, the tagging vessel, and the radio tracking station. *Nancy Foster* will determine communication channel.

Once a RHIB is launched, sightings information will be shared via VHF radio to help the tag boat approach the whale and to inform *Nancy Foster* about target whales. Tagging is accomplished using a pivoting pole mounted on the bow of *Novurania.* The pole is ~ 10m in length. The tagging vessel's complement consists of the coxswain (provided by the scientific party), tag pole operator, observer, and the photographer/videographer. No ship personnel are required. Also during this phase, from stations aboard *Nancy Foster*, the scan-observer will collect whale and possibly radar acquired vessel position data using hand-held computer. The radio-tracker should confirm that the RF signal from the tag is working normally. The focal data observer will choose a focal whale and begin observations as soon as possible.

After ≥ 30 minutes of data have been collected on the focal whale, a RHIB will begin tagging attempts. When a RHIB approaches a whale to tag, video footage will be taken of the tag attempt. If the tagging attempt is successful, a RHIB will approach the whale to inspect the tag placement and to take photo-identification and tag placement photographs. The *AB* RHIB will follow the tagged whale while the *Novurania* seeks to tag additional whales. The RHIB will then follow the whale and record behavioral data until sunlight,weather or time constraints forces curtailment of the focal follow. Once the RHIBs have returned to *Nancy Foster*, she will act as the focal follow vessel, following tagged whales until darkness begins the VHF tracking portion of the project.

Sampling Prey

Prey distribution will be monitored with acoustic surveys during tag deployments to continuously and instantaneously provide acoustic volume target strengths of observed prey patches using *Nancy Foster*'s EK-60. Vessel speed during EK-60 tows will be ~7 knots. As animals perceive and react to their environment at a range of scales, there is clearly no single scale correct for studying ecological relationships (Levin 1992). We will use *Nancy Foster* to sample at meso-scales (1-10km) primarily and at fine scales (100's of meters) when *Auk* is unavailable during this project. Meso-scale acoustic surveys were designed to adequately and synoptically cover the immediate area surrounding an aggregation of humpback whales in order to determine the relative number, location, and size of prey patches in the

study area. Each transect will be approximately 4 km in length (Figure 1). A CTD cast (1) will be taken in the vicinity and time of the first whale tagging, at ~noon-time and in the evening. Once the DTAG has been deployed on a whale, a more refined and focused small-scale survey will be conducted from *Auk* (Figure 1). Legs will be ~ 45 degrees from the path of the animal and ~ 4 km in length. At the end of the leg, *Nancy Foster* should turn ~45 degrees, run a 4 km leg and repeat the process. (See figure below).

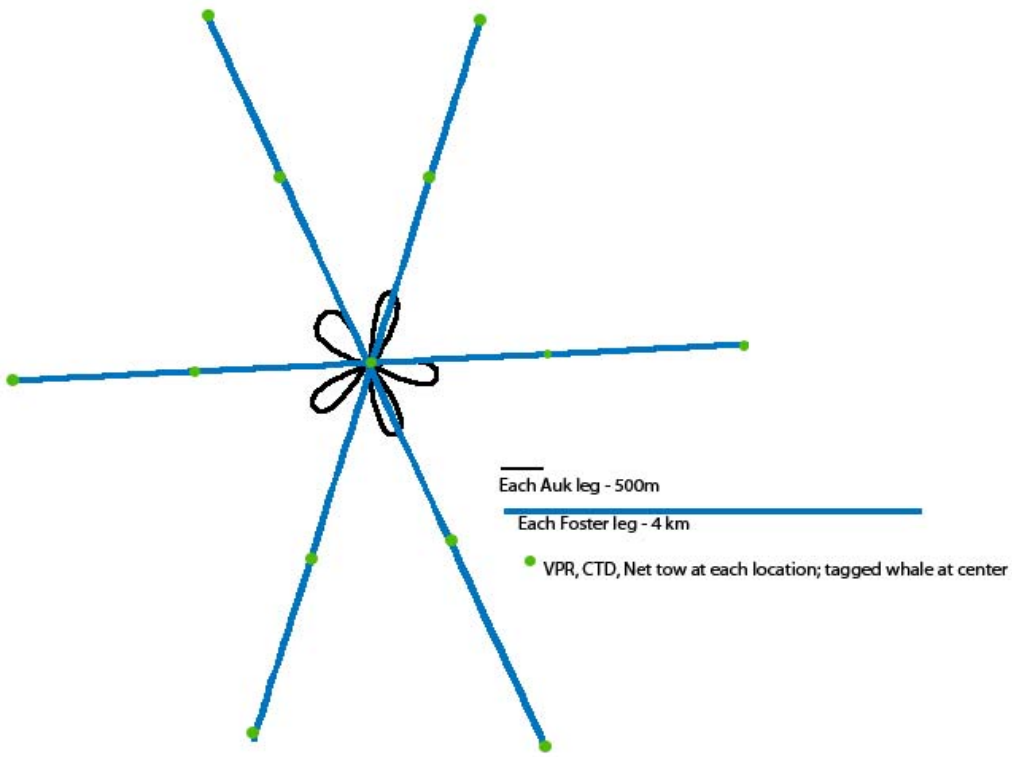


*Figure 2. a) Cartoon of hypothetical meso-scale and fine scale acoustic surveys around a tagged whale. Black tracklines represent the fine scale track of *Auk* with blue tracklines representing the path of *Nancy Foster* with the whale at the center point

Acoustic data from the EK-60 will be used as the primary measure of fish and euphausiid biomass and distribution with high spatial and temporal resolution. EK-60 data will allow us to synoptically measure prey fields before tagging, around the tagged whale, and surrounding where the whale has just passed. This unit is permanently mounted on the ship's hull and will be used to investigate the properties (shape, density, depth) of prey fields that the whales appear to be foraging on, as well as once the whale has left a certain patch. Survey lines will be constructed to achieve the highest possible resolution of prey swarm size, area, and density and will be adjusted to avoid interfering with whale behavior as necessary. The radius perpendicular to the whale's track to be covered will likely be on the order of 100's of meters. Target strength-length equations can be used to convert acoustic backscatter to numeric abundance estimates using echo-integration and sampled prey sizes (Midttun 1984; MacLennan and Simmonds 1992).

In order to test our research hypothesis, we will integrate the behavioral data from tagged whales with observations of prey patch distribution and density collected during the synoptic acoustic surveys. We will use GIS based interpolation functions to reconstruct the three-dimensional volume measured from each synoptic prey survey. This method uses the local spatial structure of each data point (measurement of acoustic backscattering throughout the water column) to predict local nearby values obtaining a measurable prey field.

VHF tracking Equipment -

Tracking from *Nancy Foster* will be accomplished using a direction-finding VHF antenna system. The system consists of a four Yagi array. Each Yagi is oriented in a cardinal direction. The array is premounted on an 8' long, 2" diameter pole. The array can be attached to the ship by being clamped to a strut or other stable part of the vessel. Depending on the mount, guide wires might be required to maintain stability. The Yagis are fixed, but ideally should have an unobstructed view. *Nancy Foster's* antennas, radars etc, should not pose a problem. However, the mast could cause a substantial blind spot and limit tracking efficiency. The most favorable mount would elevate the array above the mast. The array is connected to the LCD unit via four 50 ft. coaxial cables. The VHF system does not need external power. Direction to the focal animal will be provided via an LCD located in the wheelhouse or other protected location convenient to the bridge.

Tagging Vessels -

Tagging will be accomplished from a rigid hull inflatable boat RHIB built by *Novurania* and a RHIB built by *Zodia*c. Boat dimensions are: *Novurania* - Length; 22 ft, Width; 7 ft. Weight; ~2000 lbs and AB (length 16'; Width 6'9", weight 1000 lbs; 40 hp 4-stroke outboard). The 50 gallons of gasoline carried by *Nancy Foster* should fill gasoline requirements. If more gas is needed, *Auk* will supply gasoline. Both RHIBs will be stored on deck of *Nancy Foster* and deployed and retrieved by *Nancy Foster*. The scientific party will provide coxswains for the tagging vessels, as stipulated by the research permit from the NMFS. The coxswains will have NOAA Small Boat Safety certification.

Acoustic Survey for prey –

SIMRAD EK-60 echo sounder

The Commanding Officer and the Chief Scientist will lay out the boundaries within which *Nancy Foster* will operate in advance**.** At all times, *Nancy Foster* will follow whale watch guidelines. These will be provided to *Nancy Foster* at least two weeks prior to the cruise date. In general, these require vessels to not approach within 100 feet of a whale and to limit the number of boats within 300 feet of a whale to a single vessel. Guidelines also suggest speed limitations around whales. The distance between *Nancy Foster* and whales will vary depending on the activities and observations being conducted. *Nancy Foster* will use VHF tracking equipment to follow the focal (tagged) animal. Visual observers or the Chief Scientist will request course changes, approaches, changes in speed, etc., to the OOD. No changes in course or speed will be made that might endanger the ship, small boats, or impede the practice of safe navigation.

If the tag comes off during daylight, focal observations on the whale will be continued for 15-30 minutes before tag recovery. If necessary we will use RHIBs for tag recovery. The radio-tracker will work with the visual observers to spot the tag – RHIB or *Nancy Foster* will recover the tag. If the tag is still attached at dark, the radio-tracker will keep *Nancy Foster* in proximity (e.g., 600 m) to the whale. *Nancy Foster* will maintain close proximity, within safe limits of navigation, until daylight or until the released tag is spotted and recovery can be accomplished safely. The boundaries in which *Nancy Foster* will navigate during nighttime operations will be laid out by the Commanding Officer and the Chief Scientist in advance.

We will use Logger to enter/record all data so that we will have an Access database at the end of the field season. GPS data will be automatically logged into the program, and we will attempt to automate the collection of environmental data (e.g., wind speed and direction) directly from the ship's instruments. Specific pages within Logger will be created to accommodate our various data (e.g., permit data). We will preferably have a laptop in an area with unrestricted view for behavioral data entry; Logger running on this laptop will be essentially an event recorder marking the time of every behavior called and having optional fields to fill in with whale range, bearing, and heading, which will be taken at least twice during a surfacing.

Tag Calibration –

To calibrate the sensors on the tag the following procedures should be conducted at least every 2-3 days and more often if the tag is exposed to strong magnetic fields. Degauss the tag with the degaussing coil, then take a series of 4 measurements: 1) straight and level; 2) heading 180^0; 3) roll 180^0; 4) pitch 180^0, then offset the tag to a new position approximately 90^0 from the original heading, then repeat the 4 measurements. Add all 8 measurements; divide by 8, and this gives the residual field levels on the tag.

E. Applicable Restrictions

Conditions which preclude normal operations:

Weather conditions which preclude the launching of RHIBs from *Nancy Foster* will restrict operations. Malfunction of a RHIB will curtail some operations. Mitigation is for RHIBs to be

serviced prior to deployment and for *Auk* to return RHIB to Scituate base for repair. *Auk* will be returning to its Scituate base each night.

III. **Equipment** CTD

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

1. ADCP
2. Crane and operator to deploy and retrieve RHIBs
3. Lab space
4. Assistance in mounting VHF tracking antennae array
5. Assistance in storing RHIBs on deck
6. Gasoline for RHIBS
7. Hand held (3) radios to communicate only with *Nancy Foster. Radios will be for each RHIB and Auk*

B. Equipment and capabilities provided by the Scientists (itemized)

1. RHIB (2. The smaller RHIB will be brought on a trailer approximately noon
2. VHF Whale Tracking Equipment
3. Whale Tagging Equipment (dtag and crittercam)
4. Leica Viper II Laser range and Bearing Binoculars
5. Computers
6. Big Eyes (1) for port-side mounting

IV. **Hazardous Materials**

No Hazardous materials will be brought aboard *Nancy Foster*

V. **Additional Projects**

A. Supplementary (“Piggyback”) Projects

1. **Investigating the impact of large storms on sediment transport relative to grain size**
2. **Nighttime from 17 – 28 June**

(USGS)

The multibeam survey areas are located on the southern part of Stellwagen Bank, and extend from the bank crest down the western flank. Water depths range from ~30 m to ~75 m. Bathymetric contours run North-South. The attached spreadsheet lists the boundary coordinates for the areas.

The objective of the survey is to map a part of the bank where large storms (nor-easters) move sediment from east to west, forming large sand sheets with distinctive grain size distributions. Coarser sand on the crest transitions abruptly to finer sand on the western flank, and then to mud in Stellwagen Basin.

There are 10 mapping areas, each measuring 3 nm in the north-south direction, which is the direction of the tracklines. The northern boundary for all areas is 42deg 15.5min N, and the southern boundary is 42deg 12.5min W.

The areas measure 1 km in the east-west direction, and the boundary coordinates are given in the spreadsheet. Each area will be surveyed along north-south tracklines and ideally from the eastern boundary to the western boundary.

The areas are contiguous, and each area has been assigned a priority (listed in the spreadsheet); the highest priority is number 1. The locations of known sediment features have the highest priority.

Personnel

Support from *Nancy Foster's* survey technicians is required to conduct the multibeam sonar surveys.

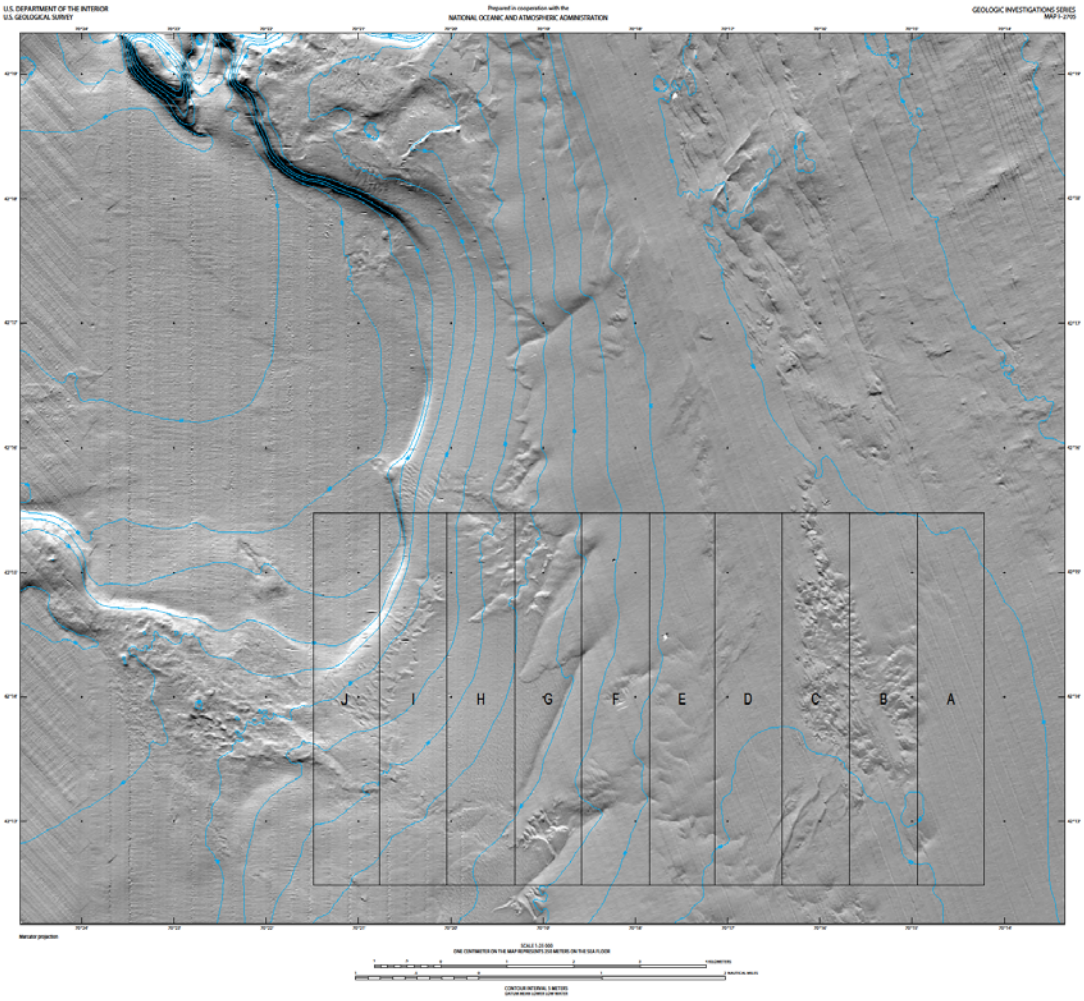
Equipment: Use *Nancy Foster's* Reson 7125 for all data collection.

Vessel Speed: *Nancy Foster* should transit survey lines at a speed of 6-8kts to achieve a high density of soundings per meter covered.

For more information contact:

Page Valentine, Research Geologist
U.S. Geological Survey, Woods Hole Science Center
384 Woods Hole Road, Woods Hole, MA 02543
tel: 508-457-2239 | fax: 508-457-2310 | email: pvalentine@usgs.gov

Area	Priority	Northern bdy Lat N deg min	Northern bdy Lat N dd	Southern bdy Lat N deg min	Southern bdy Lat N dd	Eastern bdy Lon W deg min	Eastern bdy Lon W dd	Western bdy Lon W deg min	Western bdy Lon W dd
A	10	42 15.5	42.2583	42 12.5	42.2083	70 14.15	-70.2358	70 14.87	-70.2478
B	9	42 15.5	42.2583	42 12.5	42.2083	70 14.87	-70.2478	70 15.61	-70.2602
C	8	42 15.5	42.2583	42 12.5	42.2083	70 15.61	-70.2602	70 16.35	-70.2725
D	1	42 15.5	42.2583	42 12.5	42.2083	70 16.35	-70.2725	70 17.08	-70.2847
E	2	42 15.5	42.2583	42 12.5	42.2083	70 17.08	-70.2847	70 17.79	-70.2965
F	6	42 15.5	42.2583	42 12.5	42.2083	70 17.79	-70.2965	70 18.53	-70.3088
G	7	42 15.5	42.2583	42 12.5	42.2083	70 18.53	-70.3088	70 19.26	-70.3210
H	3	42 15.5	42.2583	42 12.5	42.2083	70 19.26	-70.3210	70 19.98	-70.3333
I	4	42 15.5	42.2583	42 12.5	42.2083	70 19.98	-70.3333	70 20.73	-70.3455
J	5	42 15.5	42.2583	42 12.5	42.2083	70 20.73	-70.3455	70 21.45	-70.3575


U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
Prepared in cooperation with the
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
GEOLOGIC INVESTIGATIONS SERIES
MAP I–2705
J
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A

2. Multibeam Mapping Operations for Maritime Heritage

During nighttime hours when no whales are tagged and at the discretion of the Chief Scientist, multibeam mapping survey will be conducted at predetermined areas within the Stellwagen Bank National Marine Sanctuary. The purpose of the mapping operations is to develop high resolution bathymetric maps to characterize the seafloor habitat and locate maritime heritage resources. The mapping surveys will be directed by the SBNMS archaeologist, Matthew Lawrence. His contact information is: Matthew.Lawrence@noaa.gov , (work) 781-545-8026 x213, (mobile) 617-827-4368.

Survey Methodology

The goal of the survey is to generate bathymetric maps with the greatest amount of horizontal resolution possible. Past consultations with *Nancy Foster's* survey technicians have resulted in the following survey techniques to achieve this goal.

-Equipment: Use *Nancy Foster's* Reson 7125 for all data collection.

-Vessel Speed: *Nancy Foster* should transit survey lines at a speed of 6-8kts to achieve a high density of soundings per meter covered.

-Sonar Settings: The beam spread of the multibeam system should be narrowed to achieve the greatest horizontal resolution.

-Data Processing: Each survey area should be exported as a color-shaded GeoTIFF processed to as small a horizontal cell resolution as possible, such that the data does not have soundings gaps.

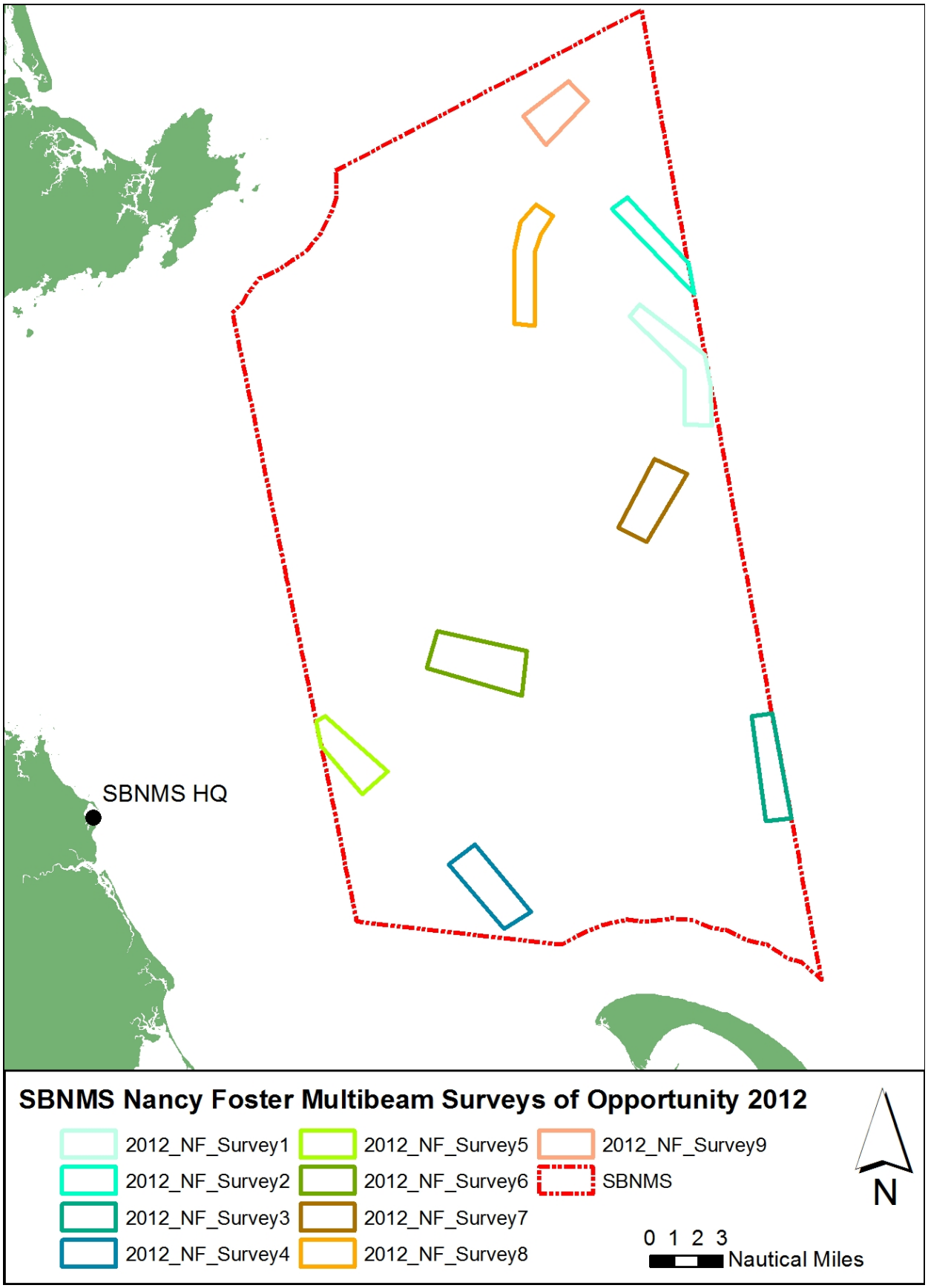
-Track lines: Track lines should be plotted to achieve soundings overlap based upon the swath width at the shallowest survey depth.

Survey Locations

Several survey locations were generated to anticipate the location of *Nancy Foster* at the end of daytime operations. Once daytime operations have been completed, *Nancy Foster* will transit to the closest survey area and begin multibeam sonar operations. Survey operations will conclude at a time appropriate for the ship to be on station for daytime operations. The following table contains geographic coordinates for the center of survey areas to be investigated during the cruise. See the following table for the survey's spatial arrangement.

Survey Area	Latitude N	Longitude W
Survey 1	42.520450	-70.167609
Survey 2	42.610383	-70.204786
Survey 3	42.238653	-70.083979
Survey 4	42.151440	-70.340921

Survey 5	42.240103	-70.476113
Survey 6	42.311465	-70.360015
Survey 7	42.423956	-70.201210
Survey 8	42.594514	-70.322778
Survey 9	42.693908	-70.293290


SBNMS HQ
SBNMS Nancy Foster Multibeam Surveys of Opportunity 2012
2012_NF_Survey1
2012_NF_Survey2
2012_NF_Survey3
2012_NF_Survey4
2012_NF_Survey5
2012_NF_Survey6
2012_NF_Survey7
2012_NF_Survey8
2012_NF_Survey9
SBNMS
N
0 1 2 3
Nautical Miles

Surveys are not prioritized by number. *Nancy Foster* should proceed to the closest survey to limit time wasted on transiting. Priority should be given to finishing survey areas as opposed to starting new areas. ArcGIS shapefiles delineating the survey area's boundaries will be supplied by the science party upon boarding the ship or via email to the survey technician at their request. Tracklines need to be established by the coordinator of Maritime Heritage Matthew Lawrence (matthew.lawrence@noaa.gov)

Personnel

Support from *Nancy Foster's* survey technicians is required to conduct the multibeam sonar surveys. Surveys will be conducted from 10pm – 5am.

Data Products

Matthew Lawrence will meet with *Nancy Foster's* survey technicians to pick up the data products and raw data at the end of the cruise when it returns to Woods Hole, MA or at a time/place mutually agreed upon by the technician and Mr. Lawrence. All data and data products are considered sensitive information and should not be distributed to any other NOAA researchers or non-NOAA personnel. A message should be included with the data to direct the NGDC archiving center that the data should not be made available on the NGDC website or to others without written permission from the Superintendent of the Stellwagen Bank National Marine Sanctuary.

B. NOAA Fleet Ancillary Projects: Not applicable.

VI. Disposition of Data and Reports

A. Data Responsibilities

The science party will be responsible for all data storage and archiving.

B. Pre and Post Project Meeting

Prior to departure, the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of cruise objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Project Meeting: Upon completion of the project, a meeting will normally be held at 0830 (unless prior alternate arrangements are made) and attended by the OPS officer, the Chief Scientist and the CO to review the project. Concerns regarding safety, efficiency, and suggestions for improvements for future projects should be discussed.

C. Ship Operation Evaluation Report

Within seven days of the completion of the project, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to omao.customer.satisfaction@noaa.gov. If email is not an option, a hard copy may be forwarded to:

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

VII. Miscellaneous

A. Meals and Berthing

Meals and berthing are required for up to 14 scientists. 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 survey.

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 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 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 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 the form into an email using the contact information below. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the cruise to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. 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 StreetNorfolk, VA 23510
Telephone 757.441.6320, Fax 757.441.3760

E-mail 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

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. 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.

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

E. IT Security

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

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (http://deemedexports.noaa.gov). National Marine Fisheries Service personnel will use the Foreign National Registration System (FRNS) to submit requests for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated NMFS Deemed Exports point of contact to assist with the process.

The following are basic requirements. Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

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

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

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.

2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist or the DSN of the FRNS e-mail granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the cruise, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

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

Appendix A

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Alaska Fisheries Science Center
National Marine Mammal Laboratory
7600 Sand Point Way NE, Bin C15700
Seattle, Washington 98115-0070

(206) 526-4037 FAX: 526-6615

e-mail: phillip.clapham@noaa.gov

May 4, 2012 F/AKC3: SAM

David N. Wiley
Research Coordinator
Stellwagen Bank National Marine Sanctuary
National Ocean Service
175 Edward Foster Road
Scituate, MA 02066

Dear David,

By this letter, you are hereby designated to act as a co-investigator (CI) under the National Marine Mammal Laboratory's Scientific Research Permit No. **14245** to conduct photo-identification, biopsy and dtagging studies on North Atlantic humpback whales in the regions covered in the permit through **May 1, 2013**. You may not assign or transfer this authorization to any other person. A copy of this letter and the permit must be in your possession during the proposed work.

No co-investigators shall kill or cause the death of an animal during the conduct of this research. In the unlikely event of a death or serious injury of an animal during conduct of this research, you must suspend the research operation and notify me (or Sally A. Mizroch (206) 526-4030) immediately.

This letter serves as a reminder of your responsibilities under this permit, and describes procedures for monitoring permitted research activities which have been implemented by NMML. As noted in the attached letter for your signature, failure to comply with any of the permit conditions, including the annual and final reporting requirements, may result in losing your authorization under NMML permits now or in the future.

As a CI working under a NMML permit, you are reminded that:

1) You are responsible for reading, understanding, and fully complying with all provisions of the research permit under which you are authorized;

2) If you anticipate any requests for non-research filming (e. g, a documentary film crew), you must contact NMML well in advance of the project's start date so we can apply for authorization from the Chief of the Permits Division (see Section B. 4, p. 3).

3) You are the on-site representative of NMML under this permit. You must directly supervise any takes of marine mammals that occur. Research assistants (e.g., graduate students, contractors, employees) may participate in the research without also being named under the NMML permit, but may not do so without your direct, in person, on-site supervision. No person who is not specifically named as a CI may conduct research in the field in the absence of the named CI to whom the permit is issued.

4) You must ensure that any images or video are approved by NMML for use before they are made public. They must include a credit acknowledging that the research was conducted under this permit issued by NMFS under the authority of the MMPA and/or the ESA.

5) As a condition of being authorized to conduct research under a NMML permit, you are required to provide NMML with both annual and final reports of your activities. Reporting requirements for Permit No. 14245 can be found in Appendix 4 of the permit.

~~I. Figures, maps, tables, images, etc.~~

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Appendix B:

FINAL Project Instructions

Date Submitted: June 01, 2012

Platform: NOAA Ship *Nancy Foster*

Project Number: NF-12-08 (USGS)

Project Title: Submarine canyon development along the Southern New England shelf-edge

Project Dates: June 29, 2012 to July 3, 2012

Prepared by: Dr. Uri ten Brink Dated: June 1, 2012 _____
Chief Scientist
U.S. Geological Survey, Woods Hole Science Center

Approved by: Alexandra Von Saunder 6/8/2012
Commander Alexandra Von Saunder, NOAA
OAR Platform Coordinator

Approved by: _____ Dated: 18 June 12
Captain Anita Lopez, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

As part of USGS, US-NRC, and BOEM efforts to characterize the shelf edge of the U.S. Atlantic margin, we plan to conduct a multibeam sonar survey of regions of the shelf edge south of New England. Our specific scientific goal is to understand the development of small submarine canyons and slope failures at the shelf edge. In order not to duplicate prior efforts, we have assembled and re-processed all prior multibeam bathymetry in the area and are in contact with *Okeanos Explorer*, which will be mapping in this area during the project dates.

B. Service Level Agreements

Of the 4 DAS scheduled for this project, 4 DAS are funded by the program.. This project is estimated to exhibit a Low Operational Tempo.

C. Operating Area

1. Shelf edge of southern New England from the Hydrographer Canyon to the Canadian EEZ at water depths of 200-800 m. See Figure 1.

2. On the transit south from Woods Hole, please collect multibeam bathymetry data along the shelf edge landward of the data collected by *Okeanos Explorer*. See Figure 2 for region of particular interest offshore Virginia. Any data collected will be greatly appreciated.

D. Summary of Objectives

We use various techniques to quantify the morphology of the seafloor to reveal characteristic scales and quantities. These scales and quantities are used to develop models for submarine canyons and debris flows.

E. Participating Institutions

U.S. Geological Survey

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Andrews, Brian	Mr.	06/29	07/03	M	USGS	USA
Brothers, Daniel	Dr.	06/29	07/03	M	USGS	USA
Charles, Jerry	Mr.	06/29	07/03	M	USGS	USA
Danforth, William	Mr.	06/29	07/03	M	USGS	USA

Ferreira, Racheal	Ms.	06/29	07/03	F	USGS	USA
Ten Brink, Uri	Dr.	06/29	07/03	M	USGS	USA

G. Administrative

1. Points of Contacts: *Chief Scientist – Uri ten Brink 508-457-2396; utenbrink@usgs.gov)*

Alternate – Daniel Brothers 508-457-2293; dbrothers@usgs.gov),

Project Operation Leads – William Danforth (508-457-2274; bdanforth@usgs.gov)

Operations Alternate – Brian Andrews 508-457-2348, bandrews@usgs.gov).

Address for all: U.S. Geological Survey; 384 Woods Hole Rd., Woods Hole, MA 02543

Ops Officer, Nancy Foster – LT Josh Slater 843-991-6326; ops.nancy.foster@noaa.gov

2. Diplomatic Clearances

This project involves Marine Scientific Research in waters under the jurisdiction of the USA. Diplomatic clearance is not needed.

3. Licenses and Permits - N/A

II. Operations

A. Project Itinerary –

06/29 - Depart Woods Hole to the shelf edge near Hydrographer Canyon. (If NF-12-05-SBNMS is offloaded by 1500, then departure will be at 1600. Otherwise departure will be at 0900 on June 30, 2012.)

07/03 – Depart shelf edge near Hydrographer Canyon and arrive in Wood's Hole, MA at 1400 on July 3rd, 2012.

B. Staging and Destaging

6/29 Load passengers in Wood's Hole, MA; minimal loading including luggage and laptops.

7/03 Offload passengers, luggage, laptops in Wood's Hole, MA.

C. Operations to be Conducted – Multibeam sonar survey continuously (24/day); SeaBird CTD once a day for sound speed.

D. Dive Plan – N/A

E. Applicable Restrictions –

Conditions which preclude normal operations: poor weather conditions, equipment failure (failure of EM1002 multibeam survey system would make the ship unable to complete the project), safety concerns, unforeseen circumstances.

III. Equipment

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

Simrad EM-1002 acquisition system; SeaBird CTD; Navigation

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

Laptop computers with Caris; Fledermaus, and ArcGIS for processing and interpretation, and HyPack for navigation

IV. Hazardous Materials

A. Policy and Compliance

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

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

- A list of hazardous materials by name and anticipated quantity
- A list of neutralizing agents, buffers, and/or absorbents required for these hazardous materials, if they are spilled
- A chemical hygiene plan.

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

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard

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

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

B. Radioactive Isotopes

N/A.

C. Inventory (itemized)

Common Name	**Concentration**	**Amount**	**Notes**
None			

V. Additional Projects

A. Supplementary ("Piggyback") Projects

On the transit south from Woods Hole after the end of this project, please collect multibeam bathymetry data along the shelf edge landward of the data collected by *Okeanos Explorer*. See Figure 2 for region of particular interest offshore Virginia. Any data collected will be greatly appreciated.

B. NOAA Fleet Ancillary Projects

VI. Disposition of Data and Reports

A. Data and metadata Responsibilities – Mr. Brian Andrews, USGS Woods Hole. A copy will be logged with NOAA-NGDC

B. Pre and Post Project Meeting

Prior to departure, the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of project objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Project Meeting: Upon completion of the project, a meeting will normally be held at 0830 (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist and members of the scientific party to review the project. Concerns regarding safety, efficiency, and suggestions for improvements for future projects should be discussed. Minutes of the post-project meeting will be distributed to all participants by email, and to the Commanding Officer and Chief of Operations, Marine Operations Center.

C. Ship Operation Evaluation Report

Within seven days of the completion of the project, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to omao.customer.satisfaction@noaa.gov. If email is not an option, a hard copy may be forwarded to:

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NOAA Office of Marine and Aviation Operations
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Silver Spring, MD 20910

VII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the 6 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 survey.

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Marine Operations Center – Atlantic
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Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
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the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

E. IT Security

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F. Foreign National Guests Access to OMAO Facilities and Platforms

4. N/A

Appendices

Figure 1: Proposed Survey Area