



**UNITED STATES DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration  
NOAA Marine and Aviation Operations  
Marine Operations Center  
439 W. York Street  
Norfolk, VA 23510-1114

MEMORANDUM FOR: Commander Nathan Hancock, NOAA  
Commanding Officer, NOAA Ship *Gordon Gunter*

FROM: Captain Anne K. Lynch, NOAA *Anne K. Lynch CAPT NOAA*  
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for GU-14-03  
Northern Right Whale Survey & Biology

Attached is the final Project Instruction for GU-14-03, Northern Right Whale Survey & Biology, which is scheduled aboard NOAA Ship *Gordon Gunter* during the period of 5 May to 26 May 2014. Of the 21 DAS scheduled for this project, 21 DAS are funded by an OMAO allocation. This project is estimated to exhibit a Medium Operational Tempo. Acknowledge receipt of these instructions via e-mail to [OpsMgr.MOA@noaa.gov](mailto:OpsMgr.MOA@noaa.gov) at Marine Operations Center-Atlantic.

Attachment

cc:  
MOA1





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Northeast Fisheries Science Center  
166 Water Street  
Woods Hole, MA 02543-1026

### Final Project Instructions

Date Submitted: 8 April, 2014  
Platform: NOAA Ship *Gordon Gunter*  
Project Number: GU14-03  
Project Title: N. Right Whale Survey & Biology  
Project Dates: May 5 - May 22, 2014

Approved by: Russell W. Bunn Dated: 4-8-2014  
William A. Karp, Ph.D.  
Science and Research Director  
Northeast Fisheries Science Center

Approved by: Anne K. Lynch Dated: 4/23/2014  
Captain Anne K. Lynch, NOAA  
Commanding Officer  
Marine Operations Center - Atlantic

## I. Overview

### A. Brief Summary and Project Period

### B. Days at Sea (DAS)

Of the 24 DAS scheduled for this project, 24 DAS are funded by an OMAO allocation, 0 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a \_\_\_\_\_ Operational Tempo

### C. Area of Operation

Shelf and shelf-edge waters from Massachusetts eastward into Canadian waters out to Georges Basin and northeastward as far as Roseway Basin. The primary survey area will be the Great South Channel and Georges Bank (Figure 1).

### D. Objectives

The primary objectives in order of priority are to: (1) Collect photo ID and biopsy samples of baleen whales. Primary target species is North Atlantic right whales. (2) Apply dermal tags to right and sei whales. (3) Conduct oceanographic sampling in proximity to tagged whales. (4) Conduct zooplankton sampling to examine prey sources. (5) Collect right whale fecal samples for hormone analysis. (6) Deploy 1 autonomous acoustic recording mooring for the Ocean Noise Reference Station Network (ONRSN). (7) Deploy 2 acoustic buoy moorings at Roseway Basin.

### E. Participating Institutions:

Woods Hole Oceanographic Institution (WHOI), Woods Hole, MA

Integrated Statistics, Woods Hole, MA

Northeast Fisheries Science Center (NEFSC), Protected Species Branch, Woods Hole, MA

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

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Duley, Peter	Chief Scientist	05/05/14	05/22/14	M	NMFS, NEFSC, Woods Hole, MA	U.S.A

Henry, Allison	Marine Mammal specialist	05/05/14	05/22/14	F	NMFS, NEFSC, Woods Hole, MA	U.S.A
Gatzke, Jennifer	Marine Mammal specialist	05/05/14	05/22/14	F	Integrated Statistics, Woods Hole, MA	U.S.A
Davis, Genevieve	Marine Mammal specialist	05/05/14	05/22/14	F	Integrated Statistics, Woods Hole, MA	U.S.A
Conger, Lisa	Marine Mammal specialist	05/05/14	05/22/14	F	NMFS, NEFSC, Woods Hole, MA	U.S.A
Risch, Denise*	Marine Mammal specialist	05/05/14	05/22/14	F	Integrated Statistics, Woods Hole, MA	German citizen
Baumgartner, Mark	Marine Mammal specialist	05/05/14	05/22/14	M	WHOI, Woods Hole, MA	U.S.A
Tremblay, Chris	Marine Mammal specialist	05/05/14	05/22/14	M	WHOI, Woods Hole, MA	U.S.A
Yin, Suzanne	Marine Mammal specialist	05/05/14	05/22/14	F	WHOI, Woods Hole, MA	U.S.A
Fortune, Sarah*	Marine Mammal specialist	05/05/14	05/22/14	F	WHOI, Woods Hole, MA	Canadian citizen
Bebrowski, Barbara	Marine Mammal specialist	05/05/14	05/22/14	F	WHOI, Woods Hole, MA	U.S.A
Panicker, Divya*	Marine Mammal specialist	05/05/14	05/22/14	F	WHOI, Woods Hole, MA	Indian citizen

- \* Peter Duley will act as Foreign National Sponsor Denise Risch, Sarah Fortune, and Divya Panicker.

#### G. Administrative

1. Points of Contacts: The following should be included as recipients of the daily e-mail message:

<a href="mailto:Peter.Corkeron@noaa.gov">Peter.Corkeron@noaa.gov</a>	{ Large Whale program leader }
<a href="mailto:Michael.Simpkins@noaa.gov">Michael.Simpkins@noaa.gov</a>	{ Protected Species Branch Chief }
<a href="mailto:Fred.Serchuk@noaa.gov">Fred.Serchuk@noaa.gov</a>	{ Acting READ Chief }
<a href="mailto:Bill.Karp@noaa.gov">Bill.Karp@noaa.gov</a>	{ Science and Research Director }
<a href="mailto:Russell.Brown@noaa.gov">Russell.Brown@noaa.gov</a>	{ Deputy Science and Research Director }
<a href="mailto:Nathan.Keith@noaa.gov">Nathan.Keith@noaa.gov</a>	{ NEFSC Vessel Coordinator }
<a href="mailto:Ops.Gordon.Gunter@noaa.gov">Ops.Gordon.Gunter@noaa.gov</a>	{ Operations Officer – <i>Gunter</i> }
<a href="mailto:CO.Gordon.Gunter@noaa.gov">CO.Gordon.Gunter@noaa.gov</a>	{ Commanding Officer – <i>Gunter</i> }
<a href="mailto:Michael.S.Abbott@noaa.gov">Michael.S.Abbott@noaa.gov</a>	{ NEFSC Port Captain }

2. Diplomatic Clearances

This project involves Marine Scientific Research in waters under the jurisdiction of Canada. Diplomatic clearance has been requested by the NEFSC.

3. Licenses and Permits

This project will be conducted under the Marine Mammal Protected Species Permit: #1058-1733-01 (U.S.) AND Foreign Fishing Vessel License: xxx (Canada) {applied for} AND Species at Risk Act permit: #330996 (Canada) issued by The Ministry of Fisheries and Oceans (Canada) on 13 Feb 2014 to Peter A Duley.

## 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. Planned Itinerary: The cruise will take 1 18 day leg with no port calls

- B. Staging and de staging

2 May: Load scientific gear.

5 May: Load any remaining scientific gear, embark scientific personnel and depart Woods Hole, MA.

- 5 May - 22 May: Survey line transects between Great South Channel/Georges Bank/Gulf of Maine, and across the EEZ as appropriate.
- 22 May: Return to Woods Hole, MA. Disembark scientific personnel, and offload scientific equipment and samples.

C. Operations to be conducted:

Primary cruise activities are described below and include: (1) Collecting biopsies and photographs of large whales from a RHIB on all good weather days that whales are present. (2) Apply dermal tags to right and sei whales from a RHIB on all good weather days that whales are present. (3) Deploy vertical profiling package from *Gunter* in the trailing path of tagged whales for the duration of the tagging period (24-72 hr). (4) Conduct zooplankton tows near whales from the ship and the RHIB. (5) Collect sei and right whale fecal samples for hormone analysis. (6) Deployment of 1 autonomous acoustic recording hydrophone mooring. (7) Deployment of 2 acoustic buoy moorings at Roseway Basin.

Prior to departure from Woods Hole (and for the duration of the cruise), the chief scientist will consult with the NEFSC aerial survey team to determine locations of concentrations of North Atlantic right whales to be targeted. WHOI will have deployed an ocean glider prior to departure which will also assist us in the location of target species. If no right whale sightings are available from the aerial survey team or the ocean glider, *Gunter* will run a series of transect lines in order to locate concentrations of North Atlantic right whales.

In general, small boat operations will be conducted on all good weather days when sea state allows. Conditions permitting, the vessel will conduct small boat operations when sightings of North Atlantic right whales occur. At the request of the chief scientist and at the Commanding Officer's discretion, the RHIBs will be deployed in order to maximize efforts in good conditions. One RHIB (18'-90hp provided by NEFSC) will focus on photographic identification and biopsy sampling. The other RHIB (15'-70hp provided by WHOI) will focus on dermal tagging.

Cruise activities may change from hour-to-hour or day-to-day depending on the sea state, weather, availability of whales, and previous accomplishments. The Chief Scientist and Commanding Officer will discuss the upcoming day's anticipated activities and the conditions under which the day's science plans will change. For example, survey operations may be conducted during the first part of the day, but if the wind and seas calm down and whales have been encountered, the Chief Scientist may request to cease survey operations and deploy the RHIBs to conduct photo-identification, biopsy and tagging operations.

Right whale photo-identification and biopsy: The 18' NEFSC RHIB will be deployed on all fair weather days when right whales are encountered. The NEFSC RHIB will focus on photo-identification and biopsy sampling of previously un-sampled right whales and possibly other baleen whales. The NEFSC RHIB will carry a coxswain, photographer, darter and data recorder. Biopsy sampling will be done with a crossbow which has a 150lbs draw weight. The bolts have a modified tip for extracting a skin and blubber sample. All samples will be processed once scientists are back aboard *Gunter*. Skin samples will be fixed in dimethylsulfoxide (DMSO) and blubber samples will be frozen. The NEFSC RHIB will work within a distance of *Gunter*, previously agreed upon by the chief scientist and the Commanding Officer. The biopsy effort

will be conducted under ESA/MMPA permit #1058-1733-01. Established biopsy safety protocols will be followed: <http://www.nefsc.noaa.gov/publications/crd/crd1011/crd1011.pdf>

Right whale dermal tagging: The 15' WHOI RHIB will be deployed on all fair weather days when right whales or sei whales are encountered and when there is no tag currently on a whale. The WHOI RHIB will focus on applying a dermal tag to right or sei whales. The WHOI RHIB will carry a coxswain and a tagger (Baumgartner). The tag will be applied on the back of the whale between 1.5 m posterior to the blowholes and 1 m anterior to the peduncle from a distance of 5-10 m using a compressed air launcher. Once the tag is secured to a whale, the WHOI RHIB will be retrieved and *Gunter* will commence oceanographic sampling. The tag is designed to report its GPS location every 10-20 minutes to *Gunter* via an ARGOS satellite-receiving antenna mounted high on the ship's mast. A computer will be set up on or near the bridge that will allow bridge personnel to monitor the location of the tagged whale in real time. Oceanographic sampling will be conducted at stations along the whale's track. The tagging effort will be conducted under ESA/MMPA permit #1058-1733-01. Tagging safety protocols: The air launcher is only pressurized during approaches to whales from the tagging boat. Once pressurized, the launcher remains in the hands of the tagger and is always pointed forward – away from the vessel and its personnel. When not in tagging mode while on the RHIB, the chamber is de-pressurized via a valve to eliminate the possibility of unintentional discharge. At all other times (i.e., when aboard *Gunter* or during launching of the RHIB), the launcher is disconnected from the compressed air tank so that it cannot be pressurized to fire. Only the tagger will handle the launcher.

Oceanographic sampling: A vertical profiling instrument package fitted with equipment to examine prey source and water conditions will be deployed from *Gunter* every 15-20 minutes at locations provided by the dermal tag. These operations will continue round-the-clock for the duration that the tag is on the whale: 24-72 hours. Twice during the cruise a light sensor will be hand deployed from the deck while the ship is at idle to measure light levels at depth. Established safety protocols regarding deployment and retrieval of gear from the deck of *Gunter* will be followed.

Zooplankton sampling: Zooplankton samples will be collected at times when a tag is not attached to a whale using double or single ring nets outfitted with 150 micron mesh nets. During photo-identification and biopsy effort, the RHIB will opportunistically collect zooplankton samples in the vicinity of surface feeding sei whales. The RHIB will deploy a small cone net approximately 10 feet off the stern and tow just below the surface for approximately 5 minutes. Samples will be transferred to jars while on the RHIB. All samples will be preserved in a 5% formaldehyde-seawater solution. Formaldehyde will be stored in the fume hood in the chemistry lab of *Gunter*.

Fecal sampling: During photo-identification and biopsy effort, right and sei whale fecal samples will be opportunistically collected from the NEFSC RHIB using a dip net. Sample jars will be stored in the scientific freezer aboard *Gunter*.

Deployment of the autonomous acoustic hydrophone mooring: Exact Maps and GPS position for deployment will be provided (see Figure 2 for general locations). Deployment will take place on days when small boats cannot be launched for large whale work. The autonomous acoustic hydrophone mooring will need to be deployed using the ship's crane and net reel (see figure 3 for the configuration of the autonomous acoustic mooring). Attached in the appendices are

specific details on the deployment procedures provided by the principle investigators of the Ocean Noise Reference Station Network (ONRSN) Holger Klink and Robert P. Dziak. Depending on how many moorings are to be deployed, the principle investigators may provide a technician to help with the deployment. Acoustic signal checks will be carried out before the deployment of the mooring. Established safety protocols regarding deployment and retrieval of gear from the deck of *Gunter* will be followed.

Roseway Basin Acoustic Buoy Deployment: Location and deployment details will be made available once final decisions are made regarding the fiscal budget (see Figure 4 for general location for the Roseway buoy deployment). A more specific latitude longitude position and deployment details will be made available as soon as possible.

Vessel Sensor and Logging Requirements: *Gunter's* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. Date and time for data collections from computers, instrumentation, and log sheet recordings will be synchronized using the vessel's GPS master clock. The NEFSC is responsible for setting up hardware and software, and the NEFSC and *Gunter's* Survey and Electronics Technicians are responsible for ensuring data collection and storage.

The ship's Scientific Computer System (SCS) will be required for logging data on a routine basis and data requirements will be coordinated with the Commanding Officer and Survey Technician at the beginning of the cruise.

D. Dive Plan – N/A

Dives are not planned for this project

E. Conditions which preclude normal operations

Poor weather could limit small boat operations; however flying bridge observations and photo id work would still be carried out.

F. Protected Resources

North Atlantic right whale protection: The vessel is requested to adhere to right whale protection regulations. Information on Seasonal Management Area (SMA) and Dynamic Management Area (DMA) regulations and information for protecting right whales from collisions with vessels are provided through the NOAA Protected Resources website (<http://www.nmfs.noaa.gov/pr/shipstrike/>), Right Whale Sighting Advisory System (SAS) website (<http://www.nefsc.noaa.gov/psb/surveys/>), the U.S. Coast Guard's "Notices To Mariners" and NOAA weather radio.

Mariners are urged to use caution and proceed at safe speeds in areas where right whales occur. U.S. Law (50 CFR 224.105) prohibits operating vessels 65 feet (19.8 meters) or greater in excess of 10 knots in Seasonal Management Areas (SMAs) along the U.S. east coast. Mariners are also requested to route around voluntary speed restriction zones, Dynamic Management Areas (DMAs) or transit through them at 10 knots or less.



Approaching within 500 yards of right whales is prohibited, unless the Chief Scientist is in possession of an ESA/MMPA permit allowing such approaches.

Whale sightings: Sightings of right whales, or dead or entangled whales of any species, are extremely valuable and reports are urgently requested. Please report all right whale sightings north of the Virginia-North Carolina border to 866-755-NOAA; right whale sightings south of that border should be reported to 877-WHALE-HELP. Right whale sightings in any location may be reported to the U.S. Coast Guard via VHF channel 16. Protocols for reporting sightings are described in the Guide to Reporting Whale Sightings placard. The placard is available online ([www.nefsc.noaa.gov/psb/surveys/documents/20120919\\_Report\\_a\\_Right\\_Whale.pdf](http://www.nefsc.noaa.gov/psb/surveys/documents/20120919_Report_a_Right_Whale.pdf) and [http://www.nefsc.noaa.gov/psb/surveys/documents/20120919\\_Report\\_a\\_Dead\\_Whale.pdf](http://www.nefsc.noaa.gov/psb/surveys/documents/20120919_Report_a_Dead_Whale.pdf)) and laminated copies will be provided by the Protected Species Branch upon request. It is requested that this placard be kept on the bridge for quick reference and to facilitate rapid reporting (via satellite phone if necessary). Opportunistic sightings of other marine mammal species that are alive and well may be reported using the Platforms of Opportunity (POP) forms and protocols

Endangered Species Act and Marine Mammal Protection Act reporting requirements: This reporting is required and is in addition to the reports in the above two sections. If the ship has an interaction with any protected species such as a sturgeon, whale, dolphin, porpoise, marine turtle or seal (e.g., collision with a whale or bycatch of a sturgeon or sea turtle), then the NMFS Greater Atlantic Regional Fisheries Office must be notified via e-mail within 24 hours of the interaction. All e-mail correspondences should be made to the following e-mail address: [incidental.take@noaa.gov](mailto:incidental.take@noaa.gov). Please indicate in the subject line which protected species was encountered. If the take involves a marine mammal or sea turtle that is alive, injured and in need of assistance or monitoring, please call the NOAA Northeast Region marine animal hotline at: [866-755-NOAA](tel:866-755-NOAA). The chief scientist will be notified before reports are made.

Marine turtle bycatch: All marine turtles taken incidental to fishing activities must 1) be handled and resuscitated according to established procedures, 2) be clearly photographed (multiple views if possible, including at least one photograph of the head scutes), 3) be identified to the species level, 4) have width and length (carapace notch to notch, and notch to tip) measured in centimeters, 5) have supporting data recorded including GPS or Loran coordinates recorded describing the location of the interaction; time of interaction; date of interaction; condition of the animal upon retrieval (alive uninjured, alive injured, fresh dead, decomposed, comatose or unresponsive); the condition of the animal upon return to the water; GPS or Loran coordinates of the location at which it was released; and a description of the care or handling provided. Live animals shall then be returned to the sea. Dead animals shall, if feasible, be frozen and returned to the Woods Hole Laboratory.

Marine mammal bycatch: All marine mammals taken incidental to fishing activities must 1) be clearly photographed (multiple views if possible, including at least one photograph of the head), 2) be identified to the species level, 3) have body length (snout to tail (seals), beak

to the notch in the fluke/tail (whales, dolphins and porpoises)), measured in centimeters, 4) have supporting data recorded including GPS or Loran coordinates recorded describing the location of the interaction; time of interaction; date of interaction; condition of the animal upon retrieval (alive uninjured, alive injured, fresh dead, decomposed, comatose or unresponsive). Live animals shall then be returned to the sea. Dead animals shall, if feasible, be frozen and returned to the Woods Hole Laboratory.

### III. Equipment

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

ITEM	QUANTITY	PROVIDED BY:
Rigid hull inflatable boat-18' -90hp- gasoline, cradle, lifting harness, other associated gear & safety equipment	1	NMFS, NEFSC, Woods Hole, MA
Biopsy systems (3 crossbows, bolts, modified tips)	3	NMFS, NEFSC, Woods Hole, MA
Biopsy sampling supplies	ample	NMFS, NEFSC, Woods Hole, MA
Deep water acoustic mooring (Roseway Basin)	2	NMFS, NEFSC, Woods Hole, MA
ONRSN acoustic mooring and deployment materials	1	NOAA/PMEL/CI MRS Newport, OR
Photographic equipment	Ample	NMFS, NEFSC, Woods Hole, MA
Big eye binoculars w/ stand	2	NMFS, NEFSC, Woods Hole, MA
Observer platform for flying bridge	1	NMFS, NEFSC, Woods Hole, MA
Observer deck for flying bridge	1	NMFS, NEFSC, Woods Hole, MA
Observer chair with stand	1	NMFS, NEFSC, Woods Hole, MA
Life vests and exposure suits	Ample	NMFS, NEFSC, Woods Hole, MA
Laptop computers/data recorders	2	NMFS, NEFSC, Woods Hole, MA
Sighting and biopsy logs	ample	NMFS, NEFSC, Woods Hole, MA

Handheld binoculars	3	NMFS, NEFSC, Woods Hole, MA
Dip net & bucket for fecal sampling	1	NMFS, NEFSC, Woods Hole, MA
Fecal sampling jars and data sheets	Ample	NMFS, NEFSC, Woods Hole, MA
Zooplankton sampling net	1	PCCS, Provincetown, MA
Zooplankton sampling jars	20	PCCS, Provincetown, MA
Rigid hull inflatable boat-15' -70hp- gasoline, cradle, lifting harness, other associated gear & safety equipment	1	WHOI, Woods Hole, MA
Vertical profiling instrument package with CTD, optical plankton counter, and video plankton recorder (weight =	1	WHOI, Woods Hole, MA
Dermal attachment tags	2	WHOI, Woods Hole, MA
Modified compressed-air line thrower, modified for launching Dermal attachment tag	1	WHOI, Woods Hole, MA
Scuba air tank	2	WHOI, Woods Hole, MA
Single and Double 75 cm diameter ring net	1 each	WHOI, Woods Hole, MA
Plankton sampling gear: sieves, 1-quart jars	Ample	WHOI, Woods Hole, MA
Microscope with light source	1	WHOI, Woods Hole, MA
Digital camera	1	WHOI, Woods Hole, MA
Laptop computers	4	WHOI, Woods Hole, MA
GPS antennae and ARGOS tracking antennae	1 each	WHOI, Woods Hole, MA
SBE 37 temperature/depth instrument for use on ring nets (~1ft long)	1	WHOI, Woods Hole, MA

#### 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 quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a

size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

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 sufficient to contain and cleanup all of the hazardous material brought aboard by the program
- Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were 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 hazardous materials is not permitted aboard NOAA ships.

#### B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control

Common Name of Material	Qty	Notes	Trained Individual	Spill control
DMSO-dimethyl sulfoxide	30/ 2oz. tubes	Tubes will be kept sealed in a box under the fume hood	Peter Duley	F
Formaldehyde solution (37%)	1 4 liter container	Alkalinity, Stored in ship chem. lkr	Mark Baumgartner	F
Clorox bleach	1 gallon	Stored under the fume hood	Peter Duley	A
Fuel	100 gal	For small boat	Peter Duley	

### C. Chemical safety and spill response procedures

#### A: ACID

- Wear appropriate protective equipment and clothing during clean-up. Keep upwind. Keep out of low areas.
- Ventilate closed spaces before entering them.
- Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
- Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.
- Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
- Never return spills in original containers for re-use.
- Neutralize spill area and washings with soda ash or lime. Collect in a non-combustible container for prompt disposal.
- J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

#### M: Mercury

- Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate dust. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Use Mercury Spill Kit if need be.

F: Formalin/Formaldehyde

- Ventilate area of leak or spill. Remove all sources of ignition.
- Wear appropriate personal protective equipment.
- Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.
- Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container.
- Do not use combustible materials, such as saw dust.

Inventory of Spill Kit supplies

Product Name	Amount	Chemicals it is useful against	Amount it can clean up
Spill-X-FP	1.68 kg	Formaldehyde	10 gallons

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

E. Inventory (itemized) of Radioactive Materials – N/A

**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 <http://www.oma.noaa.gov/fleeteval.html> and provides a "Submit" button at the end.

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

Following the quarterly briefings the data are briefed to the Deputy Director of OMAO.

## **VIII. Miscellaneous**

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

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, Revised: 02 JAN 2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website

<http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf>. The completed form should be sent to the Regional Director of Health Services at Marine



Operations Center. The participant can mail, fax, or scan and send via secure e-mail the form using the contact information below; participants should take precautions to protect their Personally Identifiable Information (PII) and medical information. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

Contact information:

Regional Director of Health Services  
Marine Operations Center – Atlantic  
439 W. York Street  
Norfolk, VA 23510  
Telephone 757-441-6320  
Fax 757-441-3760  
E-mail [MOA.Health.Services@noaa.gov](mailto:MOA.Health.Services@noaa.gov)

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.

**Certified Boat Operators:** Under NAO217-103 MANAGEMENT OF NOAA SMALL BOATS, certified small boat operators must have current CPR and First Aid certification as well as a Small Boat Safety course and Fast Rescue Boat certification which includes classroom and on water components. Photocopies of the small boat operators required documentation must be provided to the Master of the vessel prior to any cruise which conducts small boat operations. Boat Operators included on this cruise are: Duley,

Baumgartner, Conger, Henry, and Yin. Coxswains will not work beyond the 12 hours per day as permitted under the STCW guidelines.

#### 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 and 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 *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.

Data Management: All whale sightings and survey effort will be recorded electronically. Data logging computers will be linked to ship's computer system for real-time locations. All effort and sightings data will be submitted to NEFSC DMS for incorporation into Oracle database system. Samples and data collected for specific individuals, agencies or organizations will be processed the same.

#### 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 (FNRS) 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 Line Office Deemed Export point of contact to assist with the process.

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 Servicing Security Office granting approval for the foreign national guest's visit. (For NMFS-sponsored guests, this e-mail will be transmitted by FNRS.) 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 Security Office.
4. Export Control - Ensure that approved controls are in place for any 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 approval from the Director of the Office of Marine and Aviation Operations 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 FNRS or Servicing Security Office 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 project, 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 Security Office.

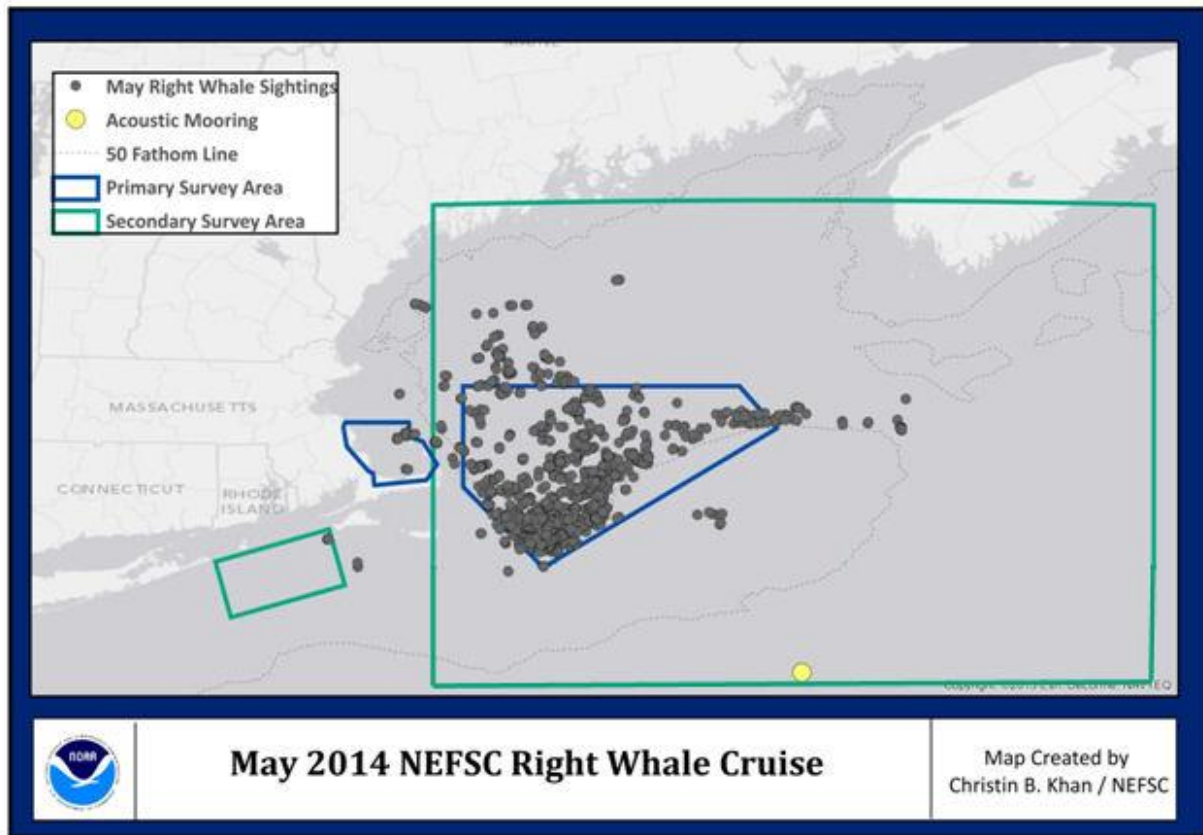
**Responsibilities of the Foreign National Sponsor:**

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 and a 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

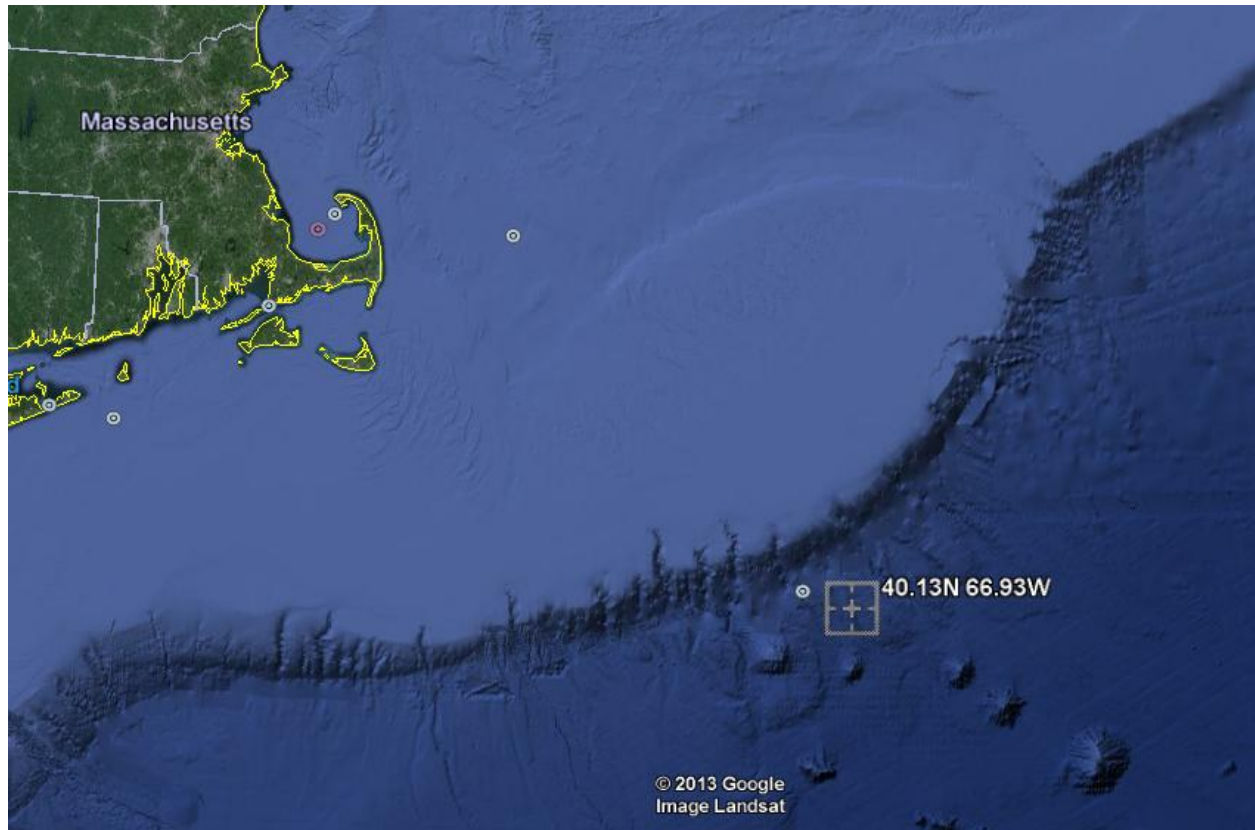
**VIII. Appendices :**

1. Figures, maps, tables, images, etc.
2. Station/Waypoint List (coordinates in Latitude, Longitude: degree-minutes)

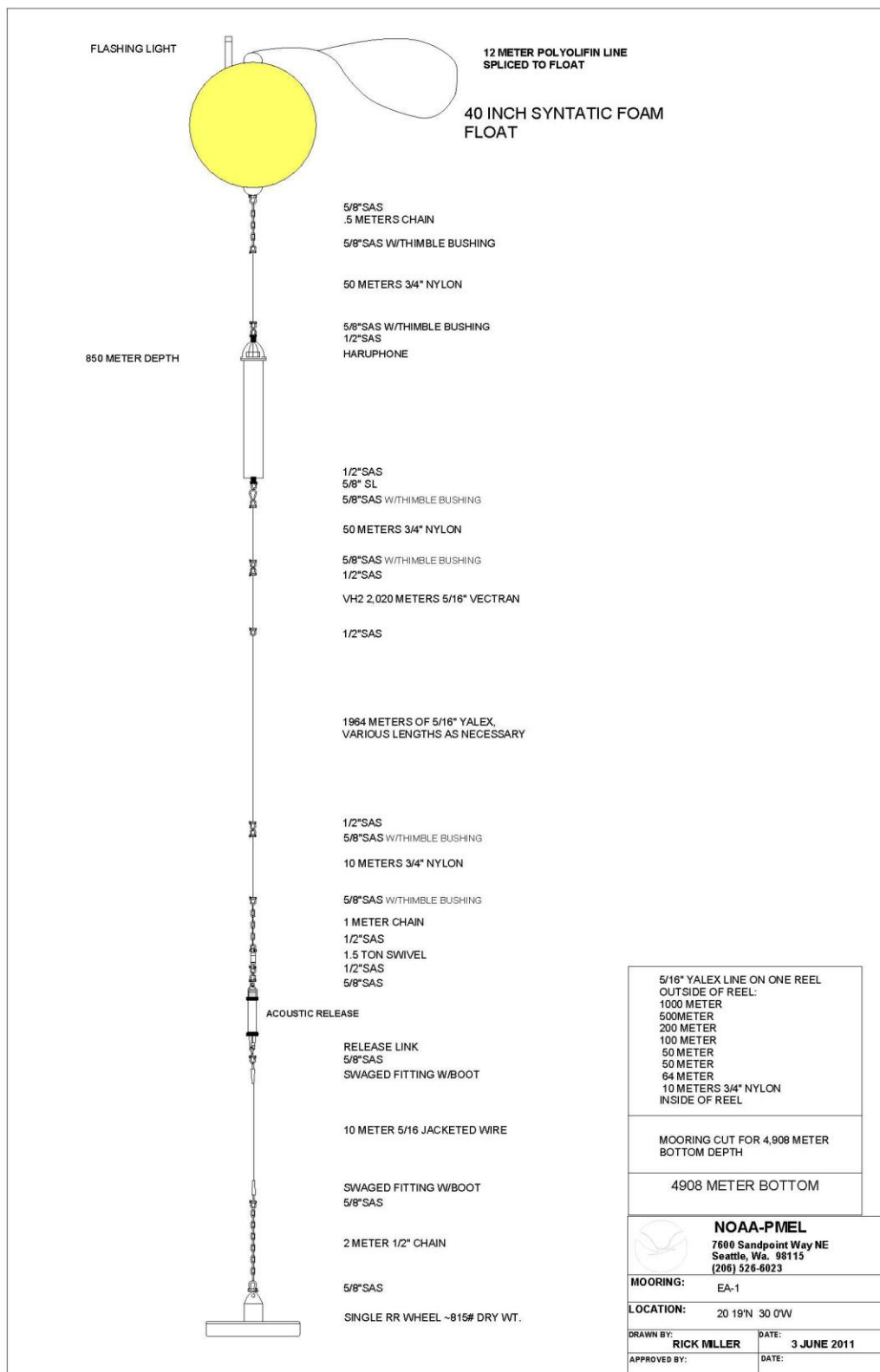
**Figure 1: Study area for Northern Right Whale Survey, cruise GU-14-03 with May right whale sightings across 2006 - 2013 shown**



**Figure 2: General location for Ocean Noise Reference Station Network (ONRSN) acoustic mooring.**

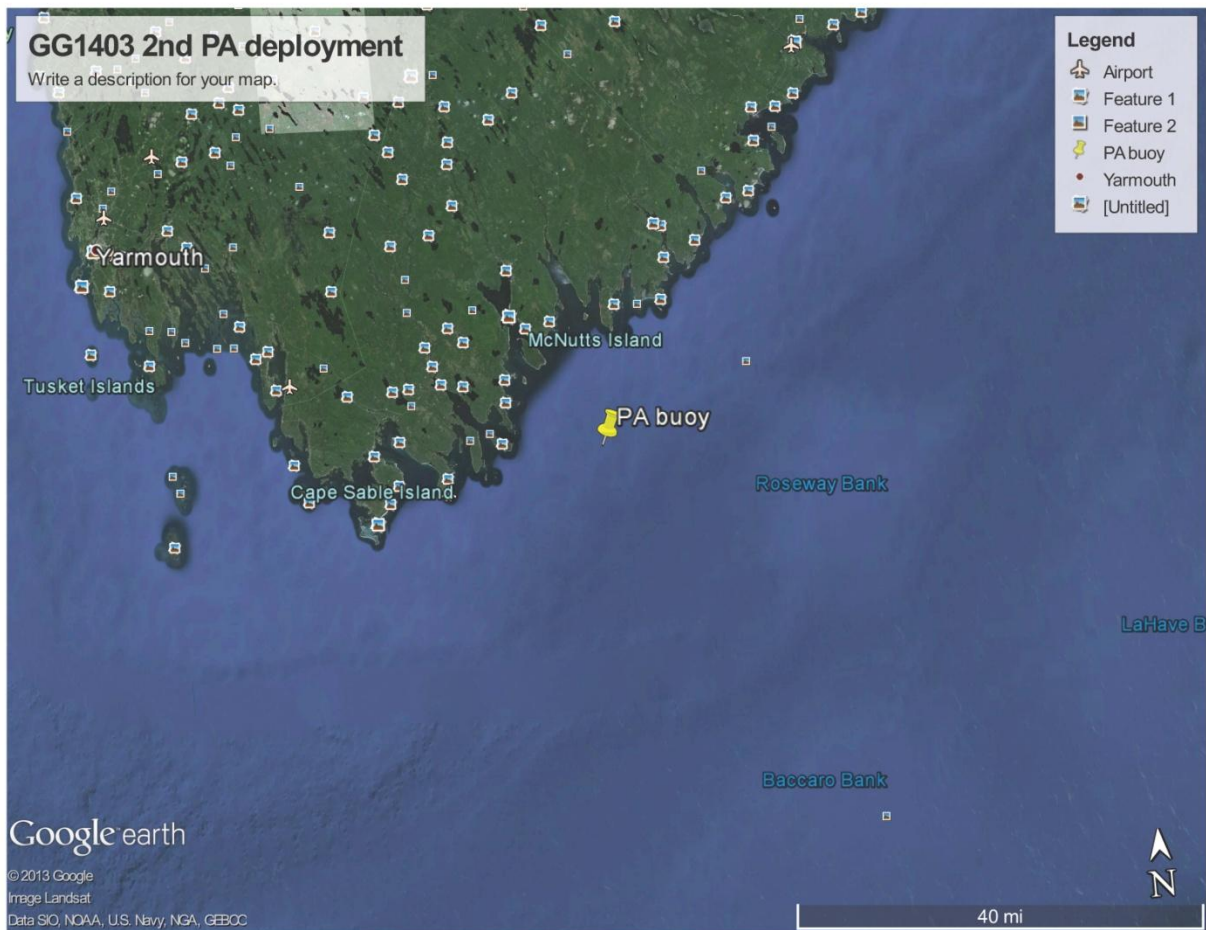


**Figure 3: Acoustic Mooring Diagram**





**Figure 4: General location for Roseway Basin acoustic buoy deployment**





## **Mooring Deployment Procedures**

**Ship position for deployment;**

**Deployment strategy**

### **Anchor Drop Point**

When deploying a hydrophone mooring, you must first determine the approximate location where you want the final anchor position to be. After determining where the target anchor location is, you must then determine the approximate anchor drop point. Due to the design of the mooring, we deploy the float first and stream the mooring out behind the ship. Since the floatation has more drag than the anchor has, when the anchor is dropped, it does not descend straight down to the bottom. Instead, the anchor swings back toward the float while the float is heading (at ~ 5kts) toward the anchor. This results in the anchor landing on the bottom quite a ways behind where it was dropped. This “fall back” of the anchor follows a predictable rate. The anchor will end up ~1/7 the mooring line length behind the drop point. So if you have a mooring with 4200m of line on it, you need to drop the anchor 600m PAST the target anchor position. The anchor will swing back to the target location. The amount of “fallback” is not purely a function of line length, line tension is a factor as well. If the ship is approaching the drop point slowly with the line slack or with little tension, the fallback will be less than if the line is under moderate tension. The amount of fallback is generally between 1/7<sup>th</sup> and 1/10<sup>th</sup> of the mooring line length.

### **Starting position of the ship**

With an experienced crew (one that has done at least one hydrophone mooring) it is safe to estimate 45-90 minutes deployment time for at 3000m to 4200m mooring. On the first deployment I like to estimate 90-120 minutes deployment time.

The speed the ship deploys at is subject to modification in the field, however, I like to start out at 2.5 to 3 kts after I’ve deployed the float. The speed of deployment is important for a couple of reasons, one it allows you to estimate how far down range to begin the deployment, since you know the duration of the deployment, speed of the ship, and the anchor drop point. Another important aspect of the deployment speed translates to the distance over ground covered during the deployment (crucial to avoid missing your drop point). Our mooring is designed to be low drag mooring to reduce strumming noise, the drawback to this design is that without some drag, the mooring line does not deploy swiftly and smoothly unless the ship is going fast enough. This is counter-intuitive, but the faster the ship deploys at (speed through water) the shorter the distance both through the water and over the ground covered during the deployment. The reason for this is simple though not necessarily obvious, since the mooring has little drag, at slow deployment speeds, the float simply follows along after the ship. The difference is dramatic, if you deploy a 4000m mooring at < 2kts it will take ~2 to 2.5 hours and the distance over ground

may be as much as 5 NM or more. If you deploy the same 4000m mooring at 4-5 kts, the deployment time will be ~ 45 minutes (or less) and the cover 3 to 4 NM (or less) over ground.

There are other considerations to mooring speed, however it is important the mooring be deployed under tension to eliminate potential tangling of the mooring line with itself. As a general rule of thumb, deploy as fast as can be done safely, with a maximum speed of 5 kts.

## **Mooring Set-up**

(refer to mooring diagram included)

## **Pre-deployment**

The mooring can be treated as two moorings, the top and the bottom, and can be built independently of each other. If possible get the anchor moved into position on the fantail, beneath the A-frame before operations begin. This eliminates having to use the crane during the deployment operation and allows the tech to begin building the bottom of the mooring while the 3000-4200m mooring line is being deployed.

## **Building the top of the mooring**

On the top loop of the float, splice the 10m polyolifin line and attach a 5/8" shackle to the top of the float (not the line), this will be used as the attachment point for the quick release used to deploy the float.

On the bottom loop of the float, attach a 1/2m section of chain using a 5/8" shackle (pin through the chain, not the float).

Attach 40m piece of 3/4" nylon with a thimble bushing, to the bottom of the 1/2m chain using another 5/8" shackle. The pin goes through the nylon not the chain.

Flake the 40m piece of line out on the deck so it can go overboard without tangling.

When the ship is within 20 minutes of beginning the deployment, bring the hydrophone out of the lab and attach the 40m 3/4" nylon to the top of the hydrophone. This attachment is done using a 5/8" shackle connected to the nylon, with a thimble bushing, hooked with a 1/2" shackle to the top of the hydrophone.

Inspect all nylon isolator bushings and shackles and verify they are in place.

Insert cotter pins to all shackles (use new cotter pins, never re-use the pins that come in the shackle, they are cheap galvanized and we use stainless steel pins).

## Preparing to deploy

When using an A-frame, capstan/winch configuration

**If the ship only has one method of lifting** the mooring, and or only one block in the A-frame, you will need to do a "double pick-up".

This involves feeding the ship's lifting line through the block and attaching it to the float via a quick release. While the ship is at all stop, lower the float into the water and release it. While the 40m  $\frac{3}{4}$ " nylon line is slowly going overboard, feed the jacketed vectron through the block and attach it to the bottom of the hydrophone using a  $\frac{1}{2}$ " shackle attached to a 5/8" sling link, or "pear-ring", and another  $\frac{1}{2}$ " shackle to the 'phone. The 5/8" sling link is critical for stopping off the mooring on the subsequent recovery operation.

Lift the hydrophone off the deck with the Vectron line through the block on the A-frame

Have the bridge bring the ship up to deployment speed, start at 2 kt, as the ship accelerates, the 40m nylon line will begin paying off the deck into the water as it is pulled off by the drag from the float. When the line is pulled tight, begin paying out the jacketed Vectron and the 'phone will go into the water as smoothly as possible.

**If the ship has two methods of lifting** and two blocks attached to the A-frame, set-up similar to previously described.

Run the Vectron line through one block and attach it to the bottom of the hydrophone and run the ship's "lifting line" through the other block to the quick release attached to the top of the float. This is the preferred method since the mooring is attached to the ship at all times during the deployment and there is no transfer of lines under strain to deal with.

Lift the float with the lifting line, then lift the hydrophone with the Vectron attached to the bottom of the hydrophone. Then lower the float into the water, release it, allow the 40m  $\frac{3}{4}$ " nylon to deploy and when the line comes under tension, lower the 'phone into the water.

**If the ship has a crane/snatchblock and a capstan** the mooring can easily be deployed over the side. After lifting the float over the side and booming out ~5-6m the mooring can be deployed through a snatch block on the crane. This method requires the capstan to provide the lifting while the crane is used similar to the a-frame or as a support for the block the line is going through. This method is preferred when working on the R/V Atlantis, since the A-frame is dedicated to Alvin no mooring work is allowed to use the A-frame.

If the capstan is unavailable, NOAA/PMEL has a portable 440v windlass we can mount so we can utilize the crane for over the side mooring deployments.

The mooring deployment procedure is the same as above except we use the crane/capstan rather than the A-frame/capstan combo.

While the mooring line is being deployed by the deck force/assistant build the bottom of the mooring.

## **Building the bottom of the mooring**

### **Preparing the Acoustic Release for deployment.**

EG&G/Edgetech 8242;      Attach the detachable link, cock the release using the cocking tool included with the release

Benthos 865a;              Attach the detachable link and ARM the release. If not armed it won't release next year...

Attach a 2m chain to the 800lb anchor using a 5/8" shackle.

Attach a 5/8" shackle to the middle of the 2m chain, this is where you will attach the quick release to for lifting the anchor into the water.

Attach the upper end of the 2m chain to the detachable link on the acoustic release using a 5/8" shackle.

Attach a 5/8" shackle to the top of the acoustic release looped through a 1/2" shackle attached to the 1 1/2 ton swivel, (writing on the side of the swivel should be upright after the mooring is deployed).

Lay another 1/2" shackle near the top of the swivel it will be used to make the final connection between the bottom of the mooring line and the top of the swivel.

When you are nearing the end of the last piece of Yalex mooring line, attach the 10m 3/4" nylon piece, with thimble bushings, to the bottom of the Yalex line using a 5/8" / 1/2" shackle combination.

Attach the 1m chain to the bottom of the 10m 3/4" nylon using a 5/8" shackle, attach the other end of the chain to the ship's "lifting line".

The lifting line must be strong enough to support all dynamic forces generated by the 800 lb anchor, 80 lb release and tension on the line.

At this point have the ship slow to 2 kts through the water.

Attach a drop line to the 1m chain. The drop line must be long enough to reach the deck from the A-frame block the mooring line is being deployed through with enough left over to grab onto and haul in on. 8-12m is probably sufficient.

As you deploy the last of the mooring line, the 10m 3/4" nylon, you will observe the drop line hanging free from the 1m chain. After the drop line has passed through the block on the A-frame, stop the deployment. Haul the line back in until you can grab the drop line while standing on the fantail. Use the drop line in conjunction with the release of a little additional line to get the 1m chain down to the deck and stop it off to the deck.

Attach the 1m chain to the swivel using a 1/2" shackle

Detach the lifting line from the 1m chain and transfer it to the quick release attached to the 5/8" shackle, mid way on the 2m chain between the anchor and the release. This is your pick-up point.

Take up the strain on the lifting line, check with the bridge and tow the mooring until you get to the anchor drop point.

When you are approaching 5 minutes from the drop point, lift the anchor off the deck, go out on the A-frame, lower the anchor to the water's edge and wait for the bridge to give the order to drop the anchor.