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
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for GU-14-02
AMAPPS Cetacean and Turtle Abundance Spring Survey

Attached is the final Project Instruction for GU-14-02, AMAPPS Cetacean and Turtle Abundance Spring Survey, which is scheduled aboard NOAA Ship *Gordon Gunter* during the period of 11 March to May 1, 2014. Of the 50 DAS scheduled for this project, 50 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** 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:	February 25, 2014
Platform:	NOAA Ship *Gordon Gunter*
Project Number:	GU-14-02 Parts I and II
Project Title:	AMAPPS – Cetacean and Turtle Abundance Survey Spring
Project Dates:	Part 1: March 11, 2014 to April 3, 2014 Part 2: April 7, 2014 to May 1, 2014

Approved by: Russell W. Brown for Dated: 3-3-2014
William A. Karp, Ph.D.
Science and Research Director
Northeast Fisheries Science Center

Approved by: Anne K. Lynch CAPT NOAA Dated: 3/7/14
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center – Atlantic

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

In the following table are the personnel that will participate in the Parts I and II. In addition to these personnel, three people will be conducting the EK60 calibration on April 3, 2014 (first day of Part II) so they will be on the ship for only April 3, they will be transported back to the dock when the calibration has been completed. They are (all have a CAC card):

Joseph Godlewski and Michael Jech (Males, NEFSC FTE, US nationality) and
Michael Ryan (Male, Integrated Statistics, Inc., US nationality)

Name (Last, First)	**Title**	**Date Aboard**	**Date Disembark**	**Gender**	**Affiliation[1,2]**	**Nationality**
Force, Michael	Bird team	10-Mar	01-May	Male	IS, Inc	Canada
Metheny, Nicolas	Bird/visual team	10-Mar	01-May	Male	IS, Inc	USA
Palka, Debra	Chief Sci,Leg 1	10-Mar	03 Apr	Female	NEFSC PSB[2]	USA
Pusser, Todd	Visual team	10-Mar	01-May	Male	IS, Inc	USA
Bascunan, Cristina	Oceanography	11 Mar	03 Apr	Female	NEFSC OC[2]	USA
Duley, Peter	Visual team	11 Mar	03 Apr	Male	NEFSC PSB[2]	USA
Gatzke, Jennifer	Chief Sci,Leg 2	11 Mar	01-May	Female	IS, Inc[2]	USA
Haver, Samara	Acoustic team	11 Mar	03 Apr	Female	IS, Inc[2]	USA
Lentell, Betty	Visual team	11 Mar	01-May	Female	IS, Inc	USA
Lowe, Michael	Oceanography	11 Mar	03 Apr	Male	IS, Inc	USA
Rosendale, John	Oceanography	11 Mar	03 Apr	Male	NEFSC SH[2]	USA
Tremblay, Chris	Acoustic team	11 Mar	01-May	Male	IS, Inc	USA
Vendatullia, Dan	Oceanography	11 Mar	03 Apr	Male	IS, Inc	USA
Walsh, Harvey	Oceanography	11 Mar	03 Apr	Male	NEFSC NA[2]	USA
White, Tim	Bird team	11 Mar	01-May	Male	IS, Inc	USA
?	Oceanography	7-Apr	01-May			USA
?	Oceanography	7-Apr	01-May			USA
Broughton, Elisabeth	Oceanography	7-Apr	01-May	Female	NEFSC OC[2]	USA
Davis, Genevieve	Acoustic team	7-Apr	01-May	Female	IS, Inc[2]	USA
Matzen, Eric	Visual team	7-Apr	01-May	Male	IS, Inc[2]	USA
Melissa Warden	Visual team	7-Apr	01-May	Female	IS, Inc[2]	USA
Plantamura, Peter	Oceanography	7-Apr	01-May	Male	NEFSC SH[2]	USA

Prezioso, Jerome	Oceanography	7-Apr	01-May	Male	NEFSC NA[2]	USA

[1] NEFSC PSB = Northeast Fisheries Science Center, Woods Hole, Protected Species Branch
NEFSC OC = Northeast Fisheries Science Center, Woods Hole, Oceanography Branch
NEFSC SH = Northeast Fisheries Science Center, Sandy Hook, Behavioral Ecology Branch
NEFSC NA = Northeast Fisheries Science Center, Narragansett, Oceanography Branch
IS, Inc = Integrated Statistics, Inc.

[2] Has a CAC card

G. **Administrative**

1. **Points of Contacts:**

Chief Scientist: Dr. Debra Palka; NEFSC, 166 Water St., Woods Hole, MA 02543; 508-495-2387; debra.palka@noaa.gov

Protected Species Branch Chief: Dr. Michael Simpkins; NEFSC, 166 Water St., Woods Hole, MA 02543; 508-495-2358; michael.simpkins@noaa.gov

Oceanography Branch Chief: Dr. Jon Hare; NEFSC, 28 Tarzwell Dr., Narragansett, RI 02882; 401-871-4705; jon.hare@noaa.gov

Marine Chemistry Branch Chief: Dr. Jennifer Samson; NEFSC, 74 Magruder Rd, Sandy Hook Highlands, NJ 07732; 732-872-3041; jennifer.samson@noaa.gov

Vessel Operations Coordinator: Nathan J. Keith; NEFSC, 166 Water St, Woods Hole, MA 02543; 508-495-2224; Nathan.Keith@noaa.gov

Ops Officer... LT MARC WEEKLEY OPS OFFICER NOAAS GORDON GUNTER 301-713-7784 (VOIP) OPS.GORDON.GUNTER@NOAA.GOV

2. **Diplomatic Clearances**

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

3. **Licenses and Permits**

This project will be conducted under the

Marine Mammal Protected Species Permit Number 17355 (U.S.);

Foreign Fishing Vessel License Number 000005 (Canada) {applied for};

Species at Risk Act permit (Canada) issued by _____ (Canada) on _____ (date) to Debra Palka {applied for}

II. Operations

The Chief Scientist is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives and priorities. The Commanding Officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. **Project Itinerary**: The cruise will consist of two parts, with a port call between the parts.

Part I: March 11 – 03 Apr, 2014:

10-11 March:	Load scientific gear, embark scientific personnel and depart Newport, RI
12 Mar – 02 Apr	Conduct the survey per Operational Plans
03 Apr	Return to Newport, RI disembark and/or exchange scientists.

Part II: April 7 – 01 May, 2014:

7 April:	Exchange scientists Conduct EK60 calibration off Newport, RI, and Depart Newport, RI
8 Apr-02 May :	Conduct the survey per Operational Plans
03 May:	Return to Woods Hole, MA, disembark and/or exchange scientists, and unload some scientific gear (some will stay on for next cruise focusing on right whales).

B. Staging and Destaging: Newport, RI; Woods Hole, MA. See Project Itinerary for details.

C. Operations to be Conducted:

Distance Training/Testing

Prior to beginning operations (or within the first couple of days of each Part, depending upon the weather) perform training and testing of observers' ability to estimate sighting distances. This could be accomplished by having NOAA ship *Gordon Gunter* stay in precisely the same position and point the bow towards a clear view of the horizon. Visual observers using binoculars and naked eye will estimate the distance to a black buoy that is deployed from a small boat which has been deployed from NOAA ship *Gordon Gunter*. The GPS location of the small boat will be compared to the GPS location of the two sighting platforms to determine the true distance between the sighting platform and the buoy which can then be compared to the estimated distances made by the observers. The buoy will be placed at various positions around NOAA ship *Gordon Gunter* from meters in front of the ship to 5 nautical miles in front of the ship. Training of observers will be done by having the true distance reported to the observers immediately after they make their estimate the distance. Testing will be done by withholding the true distance information until after a series of estimated distances have been made.

Calibrations and Ambient Noise Tests of the EK60

Calibrations are required for each survey to ensure data quality and verify that the instrumentation is operating properly. The EK60 is calibrated by suspending standard calibration spheres of known target strength under each transducer from three monofilament lines. The calibration sphere is centered in the far field of the transducer and moved throughout the acoustical beam beneath the vessel using remotely controlled downriggers. The calibrations should be done in a sheltered area (probably at the Newport Naval Anchorage across the channel from the Newport Naval Station). EK60 calibrations require at least 35 meters of depth. NEFSC scientist will provide all equipment necessary to perform the calibration. NEFSC scientist will need access to the EK60 processing computer.

Visual Marine Mammal-Sea Turtle Sighting Teams

These two teams will be responsible for data on cetaceans, seals, sea turtles and some large fish using the two independent team line-transect procedures.

A visual line-transect survey will be conducted during daylight hours (sunrise to sunset; approximately 0600-1800 local time with a 1 hour break at lunchtime) using the two independent team procedure. The flying bridge team will have 2 observers surveying with 25x150 powered binoculars; the bridge wing team will have 1 or 2 observers surveying with 25x150 powered binoculars. In addition, there will be 1 or 2 recorders. If there is one recorder that person will be stationed either inside the bridge or on the flying bridge recording data from both teams via hand held radios. If there are 2 recorders, then the recorders will be at each team recording data from only that team. In addition, there will be 1 person off effort, not located at either team.

Surveying will be conducted during good weather conditions (Beaufort sea state 4 and below) while traveling at about 10 – 11 knots as measured over the ground. If there is a lot of Beaufort sea state 5 weather conditions, then we will survey in it.

Survey activity will be conducted along transects whose starting point and direction may be a modification of pre-determined track lines depending on daily weather conditions, satellite imagery, and sea conditions. Thus, the exact track lines to be covered during a day will be determined no later than 19:30 the night before.

The data entry computers will be connected with the ship's SCS system to record latitude, longitude, depth and sea surface temperature into the scientist's data entry computers. Thus, power will be needed at the bridge station, on the flying bridge and on the bridge wings.

The visual teams, acoustic team, and bridge personnel will be in radio contact with each other. Data entered by the visual teams will be displayed on a computer that is located where the acoustic team's computers are set up. This computer will need to be connected to the ship's intranet system.

Bridge officers are requested to give a couple minutes notice before the ship will be starting and ending each transect line or if they need to make minor diversions from the track line to, for example, go around fishing boats.

At times when it is not possible to positively identify a species, surveying will go off-effort and the ship will head in a manner to intercept the animals in question. When the species identification is confirmed

and the group's vocalizations are recorded, the ship shall proceed back to the point the ship departed from the track line. When the ship is near the original departure point, the bridge will notify the observers and when the ship is back on the original track line and up to survey speed then the survey teams will go back on-effort.

Seabird Sighting Team

This team will be responsible for recording sea bird data using standard single team strip transect procedures.

When the visual marine mammal-sea turtle sighting teams are on-effort and whenever else feasible, the seabird team will be visually searching for seabirds. This team will be located on the flying bridge. The two people on this team will switch off every two hours so that at any time there is at least one seabird observer on-effort. This observer will search for seabirds using the naked eye, and use hand held binoculars to confirm the species identification and group size. The seabird team members will follow standard 300m strip-transect protocols for seabirds. Seabird sightings and effort data will be entered by the scientists using a hand held, at sea, data entry system. This computer needs to be hooked up to the ship's intranet via a serial port.

There will be times, particularly in Beaufort sea state 5 or worst conditions when the ship is transiting on a track line and the seabird team will be on-effort collecting data even though the visual marine mammal-turtle team will not be on-effort.

Cetacean Biopsy and Photograph Collection

At the discretion of the Chief Scientist, the ship will break effort from the track line and travel to investigate groups of cetaceans. At this time, and perhaps at other times, several scientists will be responsible to photograph the animals to confirm the species identification. Most photographs will be taken from the bow of the ship. Photographs will be collected using a 6.3 digital SLR camera (Canon EOS D10) equipped with a 100-300 mm zoom lens. A 500 mm 4.5 power lens will also be available for taking pictures. Time stamped JPEG images will be saved onto the cameras' compact flash cards and downloaded onto a computer at the end of each day. All images will be kept in the NEFSC Protected Species Branch digital archives. Copies of all humpback whale fluke and dorsal fin images will be sent to the North Atlantic Humpback Whale Catalogue at College of the Atlantic, Bar Harbor, ME, and to the Center for Coastal Studies in Provincetown, MA.

At the discretion of the Chief Scientist, when the ship breaks to investigate a group of cetaceans, biopsy samples may be collected from the bow of the NOAA ship *Gordon Gunter*. Biopsy samples will be collected using crossbows. The bolts have hollow stainless steel tips with tines inside to retain the samples. The tips themselves are 5mm in diameter and 25-40m in length. Molded foam near the bolts' tip is used to keep the tip floating so they can be retrieved after the shot made from the RHIB. A "Game Tracker" line dispensing system will be used to retrieve bolts when sampling from the bow of the NOAA ship *Gordon Gunter*.

Biopsy samples will be processed in the ship's wet lab at the end of each day. Each sample will be placed in a vial containing dimethyl sulfoxide (DMSO). The samples will be sent to Dr. Patricia Rosel of the Southeast Fisheries Science Center for genetic analysis or other authorized genetic laboratories.

Acoustic Detection Team

This team will be responsible for recording vocalizations of cetaceans using passive acoustics and deploying the marine autonomous recording units (MARUs).

DAYTIME OPERATIONS

The acoustic array will be deployed once the ship is on visual team's trackline, about 15 minutes prior to initiating the visual survey. The vessel will be asked to slow to a speed of 2-3 kts for all array deployments and retrievals. It takes about 5-10 minutes to deploy and retrieve the acoustic array. The array will be deployed to a length of 300m behind the vessel. When the visual marine mammal-sea turtle sighting team is on-effort, the acoustic detection team will also be on-effort. The acoustic team may also stay on-effort at times when the visual team is off-effort. When the ship is surveying in waters shallower than about 80 m, the array will be retrieved.

The array will also be deployed at nighttime as discussed in more detail below. The latter will depend on the focus of the passive acoustics and plankton teams. Nighttime data collection will focus on determining whether there are species-specific differences in encounter rates between day and night.

The acoustic team will be stationed inside the ship. From this location, the acoustic team will maintain contact with the visual team to be notified of each new cetacean group. This information will be transmitted via the visual team's data stream using the ship's intranet system and via radio that is held by a recorder.

Additionally, a protocol will be established between the acoustic and visual teams to facilitate data collection when the ship breaks survey track to investigate a group of animals (termed off-effort). This protocol will include the following: a) before the ship breaks from the track line, notify the acoustic team when the ship will break track (so that the recording equipment settings can be adjusted to compensate for the increase in noise experienced during maneuvering); b) and then while still off-effort once the visual team is satisfied with species identification and collection of photographs, etc., the ship may be asked to maintain a straight-line transit for up to five minutes to facilitate the collection of high quality acoustic recordings. Maneuvering of the ship to investigate animals may be restricted when operating in water depths of 100m or less while the array is deployed. In these situations, the visual team and the bridge should communicate with the acoustics team to determine whether the array should be retrieved before the ship breaks track.

Turning the ship while the array is deployed can cause strain on the cable, if maneuvers are not conducted appropriately. The acoustic team and bridge personnel will establish turning guidelines to ensure that the turn is not so tight as to damage the wires within the hydrophone cable. For example, in the past the guideline was the maximum turn was 60 degrees to either starboard or port. The guidelines will be dependent on the exact configuration of how the hydrophone is deployed.

Recordings of acoustic detections will be made onto several desk top computers, utilizing the ship's computers if possible. The acoustic team will require at least 3-4 serial GPS feeds from the ship.

The main passive acoustic hydrophone array consists of a 400m cable with two oil-filled sections containing 8 hydrophone elements. The array will be mounted onto the port side reel supplied by the

SWFSC, and will be deployed off the stern with the possible assistance of several members of the deck crew and the acoustic team. Ideally, the array could be suspended through a block mounted at the stern of the ship or suspended in such a way as to limit the side-to-side movement of the array so that it does not bend at a sharp angle and thus break the array. A removable deck cable will connect between the hydrophone array cable and the computers in the lab. A second towed array will be brought on board as a back-up.

NIGHTTIME OPERATIONS

In conjunction with the oceanography work, the passive acoustics team may also deploy the towed hydrophone array to collect nighttime acoustic data. When possible, the array will be deployed after the evening CTD cast, so that passive acoustic data may be collected both in transit to the oceanography site and on site. However, if the target site is sufficiently far that the vessel needs to transit at greater than 10 kts, the hydrophone array deployment will be delayed until the vessel arrives on site. The oceanography and passive acoustics team will consult nightly to make this decision.

MARU Deployment Plan

Ten Marine Autonomous Recording Units (MARUs) will be deployed off the NOAA ship *Gordon Gunter*, in areas concurrent with the tracklines (Figure 4; Table 1). Target depths at most sites are 300-400 m. Target sites were determined based on best available map data; if the bottom depths at the site are not appropriate, the vessel will be requested to adjust position slightly. The bridge should communicate with the acoustics team prior to arrival on site so that the acoustics team may prepare the equipment. Deployment procedures will be similar to those used during the MARU deployment off this vessel in May 2013, and are expected to take approximately 15 minutes once on site. These units will be recovered probably in August or September 2014.

The general deployment procedure at each site is as follows:

1. Prior to arriving at each site, an acoustician will test the acoustic communication response of the MARU on deck and attach 4 sandbags (approximately 120 lbs weight total). We will need at least 30 minutes notification prior to arriving on site.

2. When the vessel arrives on site, the deck crew will be required to help in the MARU deployment. The unit and sandbags will be lifted slowly over the side of the vessel with the assistance of a winch, or something like that. At this time, it is very important to visually confirm that the harness and burn cable are not entangled with the sandbag lines. If they are entangled, the unit will need to be brought back on deck so that the lines can be disentangled.

3. If conditions allow, lower the unit approximately 3 meters into the water and maintain position for an in-water surface communication test. For this test, a hydrophone and acoustic transducer will need to be deployed near the MARU. **It is important that the propellers be disengaged when the acoustic communication equipment is in the water; failure to do so resulted in loss of equipment during the deployment on the Gunter in 2013**. If the deck crew or captain determine that the sea conditions do not allow for this surface communication test, it can be aborted.

4. When the MARU is released, the vessel's exact location, water depth, and time of release must be noted.

5. After approximately 2 minutes, the acoustician will conduct an acoustic communication test to confirm that the MARU is responsive once it hits the bottom. After this, the vessel is free to move on.

Oceanography Team

This team will be responsible for physical and biological sampling of the water column and bottom using a combination of underway and station-based sampling.

Position, date, time, ship's speed and course, water depth, surface temperature, salinity, and chlorophyll, weather characteristics, along with other variables will be obtained from the ship's sensors and logged into the Science Computer System (SCS), as is normally done for all surveys. In addition, a subset of these data (Table 2) will be routinely collected and recorded every second during survey operations and will be logged into a specially created file that will be used by the cetacean scientists. At the end of the leg the data in the specially created file will be made available to the Chief Scientist. Note the survey techs on the NOAA ship *Henry B. Bigelow* have the script to do this.

There may also be special zooplankton or benthic collections for researchers from other institutions. Collections will be conducted with the appropriate gear and/or samples may taken as a subsample from scheduled operational tows. Samples will be dispersed to the Primary Investigator for further processing.

It is suggested that every evening, representatives from the bridge, deck crew, chief scientist, oceanography team and passive acoustic team meet to refine the oceanographic sampling strategies for that night and following day.

In general, limited oceanographic sampling will occur during the daytime with more extensive sampling at night, where the oceanographic sampling will be in the close vicinity of the track line used by the visual observers during the past or upcoming day. Sampling equipment includes:

- EK60 multi-frequency echosounder for plankton, micronekton, and fish distribution
- ADCP (Acoustic Doppler Current Profiler) for currents, synchronized to the EK60 to minimize interference
- CTDs for hydrography (max depth 3000 m)
- 61cm Bongo plankton net equipped with one 333 µm and one 505 µm mesh net with the CTD mounted on the wire 1m above the bongo nets. Max depth 200m
- 1 m MOCNESS (Multiple Opening Closing Net Environmental Sensing System) with color VPR (Video Plankton Recorder) and strobes attached to collect zooplankton and ground-truth EK60 acoustic data (max depth 1000 m)
- IKMT (Isaacs Kidd Midwater Trawl) to collect zooplankton and micronekton and ground-truth EK60 data (max depth 600 m)

- V-fin black and white VPR to collect images of zooplankton and ground-truth EK60 acoustic data (max depth 600 m)
- 2 m beam trawl to collect benthic fish and invertebrates (max depth 1000 m)
- 1/10 sq m Young-Modified Van Veen grab sampler to collect sediment and the benthic infauna that live in about the top 5 cm of the sediment. Max depth 200m.

DAYTIME SAMPLING

EK60 and ADCP data will be collected and recorded continuously during the day while the visual marine mammal, sea bird, and passive acoustic teams collect data.

The daytime plan includes oceanographic sampling at least three times per day: once before the day's visual surveying started (before sunrise), at lunch time (about 12:00 when the ship stopped visual surveying), and again after visual surveying is completed for the day at sunset or approximately 18:00, depending upon weather and the time of sunset. Additional stations may be added if there are interesting marine mammal sightings or physical/biological features or for more complete uniform coverage.

These daytime oceanographic sampling stations will comprise of at least deploying the Bongo net instrumented with the Seabird 19+ CTD. Depending on depth and what was seen on the EK60, other sampling instruments that may also be deployed include the VPR, IKMT, bottom grab, and beam trawl.

See the nighttime sampling section for more information about the sampling equipment.

NIGHTTIME SAMPLING

During night when the visual survey teams are off-effort, physical and biological sampling of the water column will be conducted employing a combination of underway (ADCP, EK60, XBTs, possibly towed VPR) and station-based sampling (CTD, MOCNESS, IKMT, bottom grab, and beam trawl). The amount of time available each night for sampling and the target site will be determined by the vessel's position at the end of each day's visual surveying and the desired start location the following day.

Which instruments are deployed, the order of operations, and exactly where the sampling station(s) will be will vary between nights depending on prevailing conditions, such as depth, what was seen on the EK60 during the day, available time, and current position. Typically though, at a sampling location either a Z-shaped or straight-line transect will be conducted for the collection of both ADCP and EK60 data. Then biological sampling instruments will be deployed on that same transect to ground-truth the acoustic features of high scattering and interesting frequency response (e.g., characteristic of krill, small zooplankton, and mesopelagic fishes). Both the VPR and IKMT and beam trawl operations can be conducted in less than 2 hours but would be largely dependent on the depth of the target layer identified in the acoustic survey. MOCNESS operations would take 1.5 – 3 hrs depending on water depth and the number of acoustically interesting layers. Bottom grab operations could be conducted in 0.5 – 1 hr depending on water depth.

In conjunction with the oceanography work, the passive acoustics team may also deploy the towed hydrophone array to collect nighttime acoustic data. When possible, the acoustic array will be deployed after the evening CTD cast so that vocalization data may be collected both in transit to the oceanography site and on site on the first transect which collects EK60 and ADCP data. The ship will be requested to slow to 2 – 3 kts for the deployment and recovery of the array, which takes approximately 5 – 10 minutes.

Survey speeds for passive acoustic and oceanography data collection will be 10 kts or less.

Bongo net description

The 61cm bongo plankton net equipped with one 333 μm and one 505 μm mesh net with the CTD mounted on the wire 1m above the bongo nets will be towed in a double oblique profile using standard ECOMON protocols. The ship's speed through the water will be approximately 1.5 knots. Wire out and wire in speed will be dependent on bottom depth. . Tows will be to within 5 m of the bottom or 200 m if the bottom depth exceeds 205 m. Upon retrieval, samples will be rinsed from the nets using seawater and preserved in 5% formaldehyde and seawater. Samples will be transported to the NMFS lab at Narragansett, RI for future processing.

MOCNESS description

The $1m^2$ MOCNESS will be used to target organisms in shelf-break waters (i.e., ≥ 150m depth) and be towed at 1-1.5 knots speed over ground (SOG). The MOCNESS will be equipped with 9, 333 μm mesh nets, conductivity and temperature sensors, a color VPR, and two banks of strobes. The $1m^2$ MOCNESS is designed to collect depth integrated samples of plankton under 1.5 cm in size and the strobes are included to increase capture efficiency of larger plankton by disorienting euphausiids and mesopelagic fishes. The self contained color VPR (Davpr 07) to be used will be on its largest camera setting representing a water volume of 395ml per frame. The VPR should be able to image gelatinous zooplankton and phytoplankton that may be destroyed by the nets as well as larger zooplankton such as euphausiids that were captured non-quantitaively by the nets.

Sampling locations, depth, and net open/close depths will be determined by observations made during the acoustic transects, ocean conditions, and weather.

Flow meter calibration will be conducted prior to any biological sampling with the MOCNESS. With the MOCNESS deployed at ~30m depth, the ship will transit 1 km, make a slow turn, and transit 1 km in the opposite direction. This will ensure accurate calculations for the volume of water filtered.

Upon retrieval, samples will be rinsed from the nets using seawater and preserved in 5% formaldehyde and seawater. Samples will be transported to the NMFS lab at Narragansett, RI for future processing.

VPR description

The self contained black and white V-fin VPR (Davpr 05) will be deployed when bottom depths are shallow or large volumes of zooplankton, are present. The V-fin will be equipped with a Seabird SBE49 Fastcat CTD and a Wet Labs combination fluorometer and turbidity sensor. The V-fin should be towed at speeds of 2 – 4 kts and can be towed for 1-2 hrs . The camera imaging area will be set based on location, previous VPR hauls, or the types of plankton collected with the net type sampling gear. Two types of tows can be conducted. The first type is a single depth tow targeting distinct layers in the 120 – 200kHz

range on the EK60 to provide temporally fine scale plankton data to assist in the ground truthing of the EK60 data and to examine plankton patchiness. The second type is a tow-yo haul which can be used to describe the water column structure and plankton depth distributions. Tow-yo hauls will be conducted if there are no distinct layers on the EK60 or the oceanography looked interesting. Tow-yo hauls will also be conducted to quantify plankton, before deciding whether to deploy the larger net samplers.

Due to the cruise dates the spring phytoplankton bloom may be in progress. The VPR S-2 and S-3 camera settings cannot be used in areas with high phytoplankton densities. The phytoplankton clouds the image and does not allow for quantitative sampling.

In focus regions of interest (ROIs) will be extracted at sea. As time allows data processing including oceanographic plotting or plankton quantification will be completed. All data will be transported to the Woods Hole NMFS lab for further processing and archiving.

Isaacs Kidd midwater trawl description

The IKMT will be deployed to target depth-specific layers that were observed at the lower frequencies of the EK60 and so are consistent with mesopelagic fish and euphausiids. The IKMT has a 1mm mesh cod end and will be mounted below a CTD. To maximize the sampling depth, the IKMT can be lowered to below its target depth with the ship maintaining minimal speed without sacrificing steerage. The ship then increased its speed to 2 – 3 kts (speed over the ground, SOG). As the IKMT rose through the water with the increased SOG, the IKMT trawl depth should be able to be maintained by adjusting the amount of wire out. Oftentimes, the wire angle becomes too steep, causing the wire to rub on the aft block. As a result, tow speed should be lowered.

Upon retrieval, samples will be rinsed from the nets using seawater and preserved in 5% formaldehyde and seawater. Samples will be transported to the NMFS lab at Narragansett, RI for future processing.

Beam trawl description

A single 2 m beam trawl will be conducted at each designated BOEM sampling site. The beam trawl requires a single tow wire and will be used to sample demersal fishes and megabenthic invertebrates. Beam trawls will be conducted for 15 minutes (set to haul back) at 2 kt. Beam trawls will be conducted day and night and follow depth contours to the extent feasible. Processing of catches will include separation to the lowest practicable taxa, enumeration and weighing by taxa, and recording of numbers and weights on waterproof paper recording forms provided. Subsampling of samples for enumeration may be necessary for taxa whose total numbers are deemed too numerous to count; all specimens are separated and weighed, but only a weighed subsample is counted. Subsampling of complex matrices may also be undertaken when a complex matrix (i.e., mud lumps, tube masses, etc.) are collected in quantities too large to easily break up and examine. In such cases, the entirety of the matrix catch is weighed, but separation of taxa, enumeration and weighing of specimens is only performed on a weighed matrix subsample. This technique can be combined with complete enumeration of large specimens of appropriate taxa (e.g., fish), when necessary. Jars, formalin, and waterproof paper labels will be provided for collection of unusual or unidentifiable specimens at the discretion of the collector.

Young-Modified Van Veen grab sampler description

Three replicate grabs for grain size and benthic infaunal analysis will be taken at each station. It is desirable to take the sample within ~35 m (= ~0.02 min. = ~0.0003 deg. Lat/Lon) of the selected sampling point if at all possible. If this proves too difficult or time-consuming, this requirement may be relaxed in consultation with the Chief Scientist. The grab sampler will be cocked and lowered over the side and sent down to the bottom at the fastest speed allowable by the winch until it hits the bottom, then will be brought back up and lowered onto its wooden stand. The lids on top of the Van Veen buckets will be opened and the sample will then be inspected for adequacy of the sample. *If the sample is adequate as judged by the scientist in charge*, this information needs to be passed to the bridge so that they can get to reposition to the same site or get underway for the next station as soon as possible. The grab will be recorded and a photo of its surface will be taken by a member of the scientific crew, then a 3 cm (1 3/16") diameter plastic core tube will be used to take a subsample of at least 5 cm (2") depth for grain size analysis. That tube will then be capped on top, carefully removed from the grab, capped on the bottom, recorded, labeled, and stored upright in a refrigerator. The rest of the sample should be dropped into a pan under the grab sampler stand by opening the grab jaws. The grab sampler jaws may be washed out with a small quantity of clean salt water (not to exceed the receiving pan's capacity) to wash any remaining sample from the inside of the jaws into the receiving pan if necessary. The sample in the pan with any wash water should then be removed for sieving. More thorough washing of the grab with water from a hose will be done if needed once the pan is removed. The grab can be re-cocked at this point. *If the sample is deemed inadequate upon inspection*, it should be dumped into a pan without subsampling for grain size and immediately discarded over the side so that another grab can be conducted immediately, before the ship drifts too far from the initial sampling point. Repositioning the ship will undoubtedly be necessary in order to take subsequent replicate grabs at the same station.

Grab samples in pans will receive initial processing on board NOAA ship *Gordon Gunter*. They will be washed through one or more 1 mm geological sieve(s) with salt water from garden hoses. Material passing the sieves (primarily silt and fine sand) will be washed over the side. Material retained in the sieves will be preserved in 10% borate-buffered formalin with rose Bengal dye in one or more plastic jars following hand removal of large stones and shells to reduce volume. A waterproof paper label will be put inside the jar(s) as well as marking the jars on the outside to identify the samples. These operations are best performed on the weather deck rather than in a wet lab if at all possible.

D. **Dive Plan**

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (http://www.ndc.noaa.gov/dr.html) and require the approval of the ship's Commanding Officer.

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations:

In most cases, the marine mammal visual observation teams will survey when the Beaufort sea state is under six (6). The seabird visual observation team, passive acoustic team, and oceanography team may continue surveying even when the Beaufort sea state is 6 and above.

The oceanographic sampling during the day or night may have to be altered if there are fixed gear and multiple vessels in the region of the sampling station.

III. Equipment

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

ITEM	QUANTITY	FURNISHED BY
1. Scientific Computer System	1	NOAA Ship *Gordon Gunter*
2. Flow-through and meteorology sensors	1	"
3. Deck equipment to deploy CTD and bongo	amp	"
4. Deck equipment to deploy VPR, MOCNESS, IKMT, beam trawl, grab	amp	"
5. Simard EK60 Scientific Sounder	1	"
6. ME70	1	"
7. Hydro winches to deploy the CTD, bongo, VPR, MOCNESS, IKMT, beam trawl, grab	2	"
8. Small boat for distance training	1	"
9. Salt water hose to wash down samples	1	"
10. Hood with a sink and running salt water to preserve samples	1	"
9. Big eye stands (white steel pedestals)	2	NOAA ship *Henry B. Bigelow*

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

The following sampling and scientific equipment will be placed aboard NOAA Ship *Gordon Gunter* prior to departure:

ITEM	QUANTITY	FURNISHED BY
1. Passive acoustic data collection equip	ample	NMFS, NEFSC, Woods Hole, MA
2. Portable computers	7	"
3. Desk top computer	3	"
4. Pelorus for measuring sighting angles (mounted at each sighting station)	4	"
5. Hand held binoculars	4	"
6. 25x150 binoculars and yokes	4	"
7. Data logs, computerized and paper	ample	"

8. Photographic equipment	ample	"	"	"	"	"
9. Buoy for distance training	1	"	"	"	"	"
10. Desks and chairs for sighting stations	3	"	"	"	"	"
11. Bongo frames, nets, weights	ample	"	"	"	"	"
12. Passive acoustic array	1-2	"	"	"	"	"
13. Seabird 911+ CTD	3	"	"	"	"	"
14. MOCNESS stand	2	"	"	"	"	"
14. Tool box with spare parts	1	"	"	"	"	"
15. Video Plankton Recorder (VPR)	1	"	"	"	"	"
16. 1 m^2 MOCNESS frame, nets, cod ends and sensors	ample	"	"	"	"	"
17. 32oz and 1 gallon sample jars	ample	"	"	"	"	"
18. Batteries and chargers (VPR, MOC)	ample	"	"	"	"	"
19. Isaacs Kidd trawl (IKMT)	1	"	"	"	"	"
20. EK60 calibration equipment	ample	"	"	"	"	"
21. Marel electronic scales						
small (countertop model w/calib wt)	2	"	"	"	"	"
large (deck model w/calib wt)	1	"	"	"	"	"
22. Fish measuring boards, manual	3	"	"	"	"	"
	NMFS, NEFSC, Sandy Hook, NJ					
	"	"	"	"	"	
23. Beam trawl (2m) frames w/nets	2	"	"	"	"	"
24. Spare 2m beam trawl nets	4	"	"	"	"	"
24. Young-Modified Van Veen grab sampler	1	"	"	"	"	"
25. Fish baskets, 1.5 bushel	ample	"	"	"	"	"
26. Plastic 5 gal buckets	ample	"	"	"	"	"
27. Sampling supplies for BT, grab	ample	"	"	"	"	"
28. Clerical supplies	ample	"	"	"	"	"
29. Formalin	5 gal.	"	"	"	"	"
30. Formalin neutralizer	ample	"	"	"	"	"
31. Formalin respirator	1	"	"	"	"	"
32. Cleaning supplies	ample	"	"	"	"	"
23. Passive acoustic hydraulic reel	1	NMFS, SEFSC, Norfolk, VA				
24. HPU for acoustic reel	1	"	"	"	"	
25. Cable guide ("horn"); mounts to port aft rail	1	"	"	"	"	
26. Bigeyes (25x binoculars in gray storage case	2	"	"	"	"	
27. Big eye stands (white steel pedestals)	3	"	"	"	"	
28. Big eye platform (wood platform)	2	"	"	"	"	
29. Flying bridge center seat pedestal	1	"	"	"	"	
30. Hardware bins (bolts, etc for bigeye Install)	2	"	"	"	"	
31. Tool bag	1	"	"	"	"	

(Contact Tony Martinez (NMFS Miami 305-323-4305) or Joe Clark (MOC-A) for more info about SEFSC gear that are currently in Norfolk, VA)

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
Ethanol	1 x 1 gal	Flammability	Elisabeth Broughton, Harvey Walsh	
Formaldehyde solution (2%)	1 x 5 gal	Alkalinity	Elisabeth Broughton, Harvey Walsh	F
Formaldehyde solution (37%)	2 x 20l + 1x5 gal	Alkalinity, Stored in ship chem. lkr	Elisabeth Broughton, Harvey Walsh, John Rosendale, Peter Plantamura	F
Dimethyl sulfoxide (DMSO)	0.5 gal		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 a formaldehyde neutralizer (sodium metabisulfate or Spill-X-FP) and follow the manufacturer's instructions for disposal.
- 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
Mercury Tamer	250 gm	Mercuric Chloride	2 Liters

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

E. Inventory (itemized) of Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary ("Piggyback") Projects

No Supplementary Projects are planned.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

A. Data Classifications: *Under Development*

a. OMAO Data

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.

b. Program Data

Program Data - At the end of each leg of the cruise the ship will provide the chief scientist with a copy of data from the EK60 transducer, the ADCP unit and the SCS system. A copy of the SCS data should also be provided to DMS personnel in Woods Hole.

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 978-585-8473; right whale sightings south of that border should be reported to 904-237-4220. 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 (http://www.nefsc.noaa.gov/read/protspp/mainpage/surveys/documents/Guide_to_Reporting_Whale_Sightings.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 live 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 a sturgeon, whale, dolphin, porpoise, marine turtle, or seal (e.g., collision with a whale or bycatch of a sea turtle), the NMFS Northeast Regional Office must be notified within 24 hours of the interaction. If an interaction with any of those species occurs or if the vessel's company notices an animal that is entangled, injured, in distress, or dead, they should contact the Northeast Regional Office's 24-hour hotline at 866-755-6622 to report the incident and receive further instructions.

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.

Stellwagen Bank: Any artifacts brought aboard the vessel due to fishing in the Stellwagen Bank National Marine Sanctuary must be immediately returned, as near as possible, to the location of interception. An artifact is defined as anything of man-made origin with the exception of modern fishing gear. Stations located within Stellwagen Bank will be identified prior to the cruise and reported to the chief scientist.

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.omao.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

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

C. Shipboard Safety

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

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

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel,

aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via 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.

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)

Table 1. Site information for each of the MARUs to be deployed during either Part I or II.

SITE	Recording Device	Lat	Long
1	MARU	40.6480	-69.5749
2	MARU	39.9836	-70.4391
3	MARU	39.9285	-69.3696
4	MARU	40.2249	-68.2191
5	MARU	40.5547	-67.0652
6	MARU	40.9768	-66.3755
7	MARU	41.4100	-65.9203
8	MARU	41.9674	-65.6991
9	MARU	39.9067	-71.3444
10	MARU	39.5611	-72.2724

Table 2. Scientific Computer Sensors, and logging rates of those sensors, required during *Gordon Gunter* cruise 14-02, AMAPPS Cetacean and Turtle Abundance Survey - Spring. Additional sensors may be requested.

Sensor Name	Units	Log Rate (secs)
ADCP-Depth	(Meters)	1
ADCP-F/A-GroundSpeed	(Knots)	1
ADCP-F/A-WaterSpeed	(Knots)	1
ADCP-P/S-GroundSpeed	(Knots)	1
ADCP-P/S-WaterSpeed	(Knots)	1
Air-Temp	(Degrees C)	1
Baro-Press	(Millibars)	1
CenterBoardPos-Value	(Position)	1
Date	(Date)	1
Doppler-Depth	(Meters)	1
Doppler-KeelOffset	(Meters)	1
Doppler-P/S-BottomSpeed	(Knots)	1
Doppler-P/S-WaterSpeed	(Knots)	1
EK60-18kHz-Depth	(Meters)	1
EK60-38kHz-Depth	(Meters)	1
ES60-200hz-Depth	(Meters)	1
ES60-50hz-Depth	(Meters)	1
GYRO	(Degrees)	1
ME70-Depth	(Meters)	1
Mid-SeaTemp-C	(Degrees C)	1
MX420-COG	(Degrees)	1
MX420-Lat	(DEGMIN)	1

Sensor Name	Units	Log Rate (secs)
POSMV-COG	(Degrees)	1
POSMV-Elevation	(Value)	1
POSMV-hdops	(Value)	1
POSMV-Heading	(Degrees)	1
POSMV-Lat	(DEGMIN)	1
POSMV-Lon	(DEGMIN)	1
POSMV-Quality	(Value)	1
POSMV-Sats	(Value)	1
POSMV-SOG	(Knots)	1
POSMV-Time	(Time)	1
SAMOS-AirTemp-Value	(Degrees C)	1
SAMOS-TRUE-WIND-DIR-Value	(Degrees)	1
SAMOS-TRUE-WIND-Spd-Value	(Knots)	1
YOUNG-TWIND-Speed	(Knots)	1
Fluorometer data		
MX420-Lon	(DEGMIN)	1
MX420-SOG	(Knots)	1
MX420-Time	(Time)	1

Figure 1. Proposed track lines within the shelfbreak stratum (blue lines), the MA BOEM wind energy area (green), and the VA BOEM wind energy area (red). The proposed locations of the marine autonomous recording units (MARU) are denoted as pink circles.

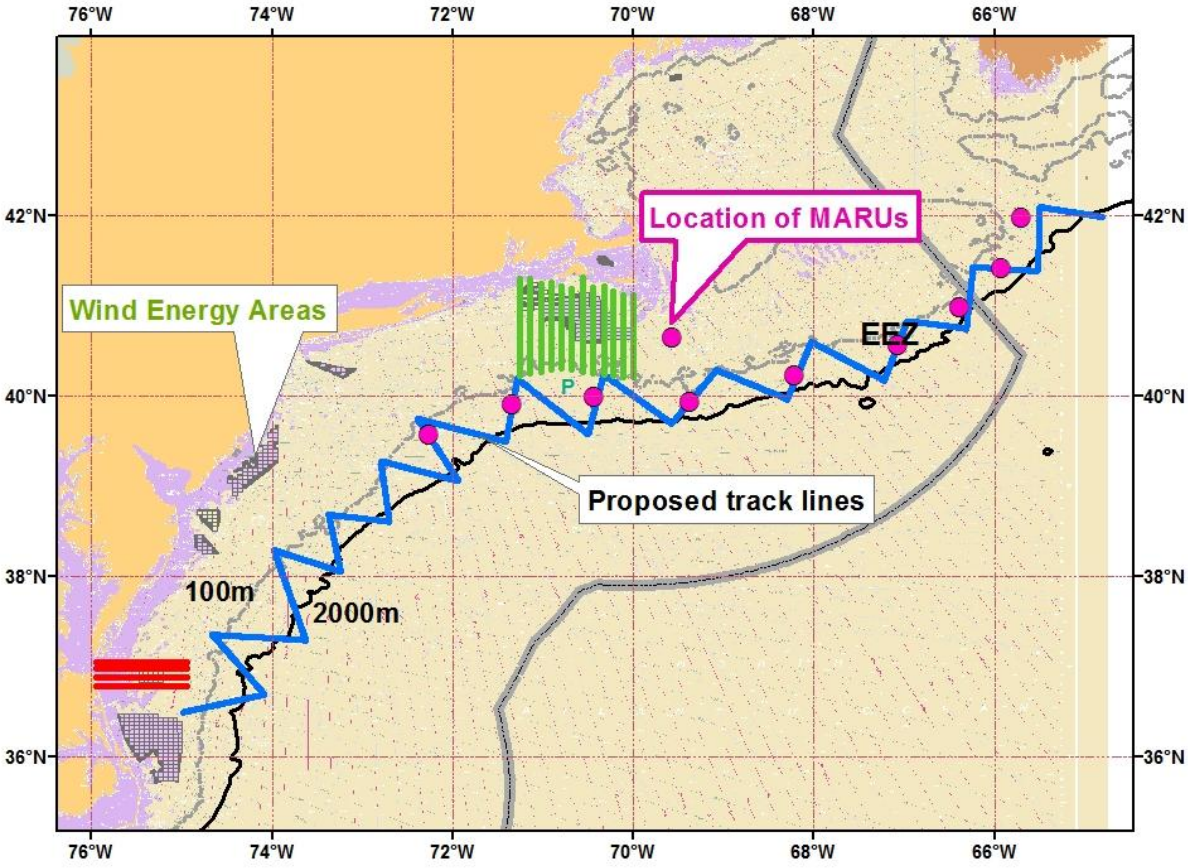

Figure 2. Closer view of the proposed track lines the MA BOEM wind energy area (green lines). Shelfbreak track lines are blue lines and the proposed locations of the marine autonomous recording units (MARU) are denoted as pink circles.

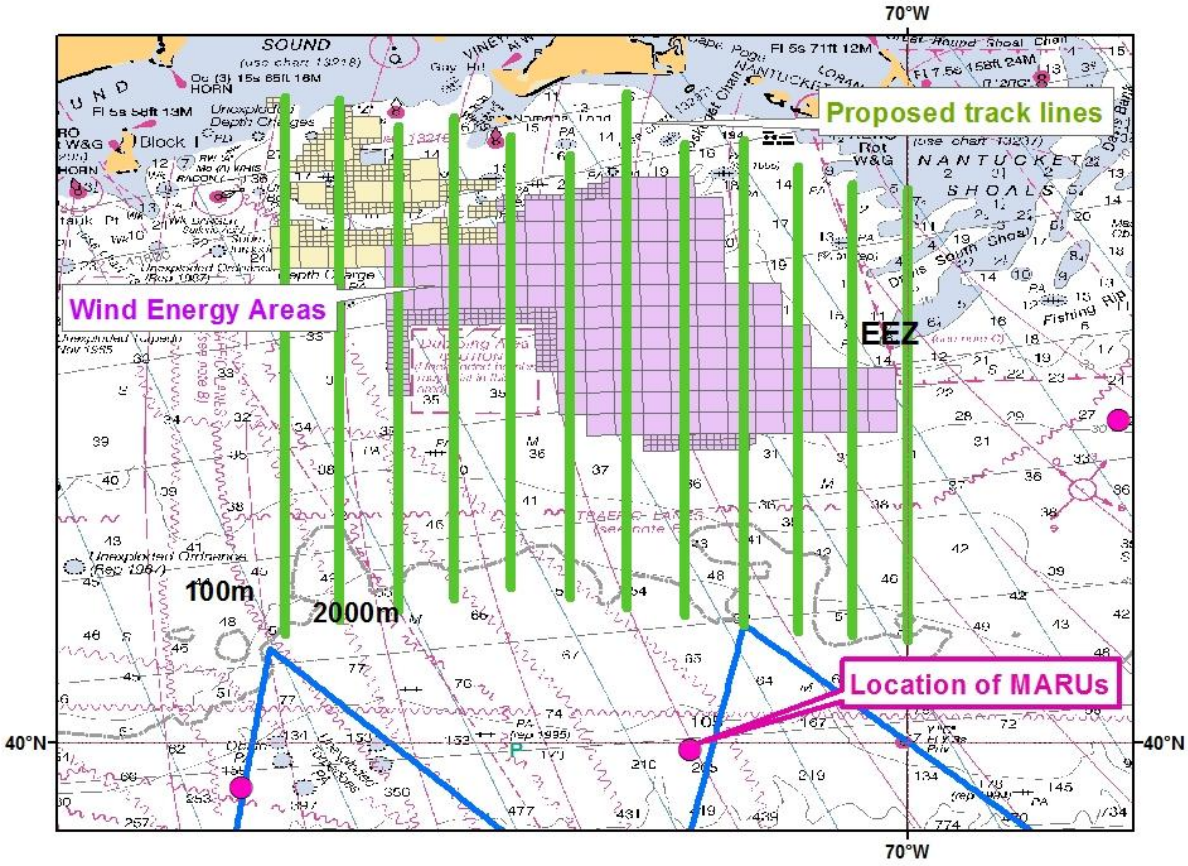

Figure 3. Closer view of the proposed track lines the VA BOEM wind energy area (red lines). Shelfbreak track lines are blue lines.

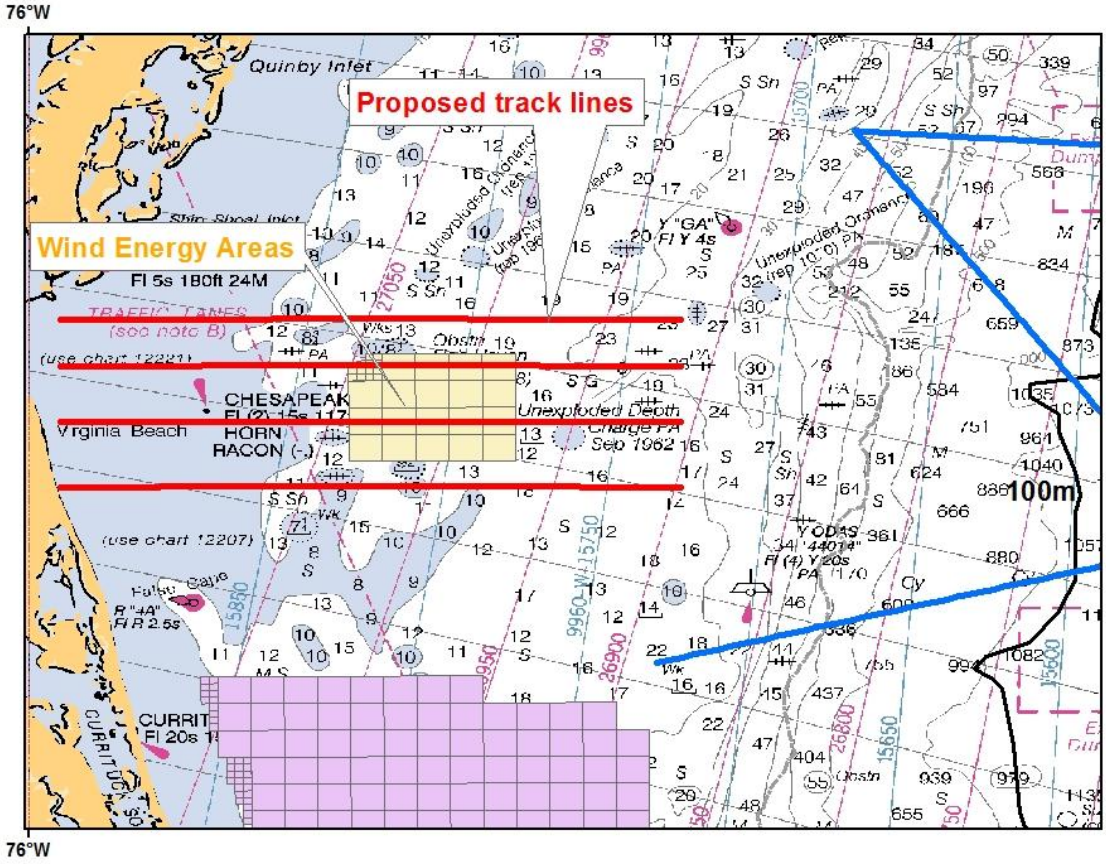

Figure 4. Photo of a marine autonomous recording unit (MARU). The yellow harness lines and white float are good points for grappling with the boat hook. The black power lines and the white burn connector (on the right side of the picture) should be avoided.