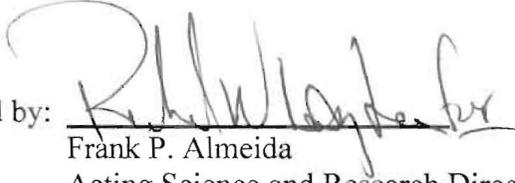




UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1026

Project Instructions

Date Submitted: 6 October 2011
Platform: NOAA Ship *Delaware II*
Cruise Number: DE 11-09
Project Title: Ecosystems Monitoring Survey & CliVEC Program
Cruise Dates: 31 October - 19 November 2011

Approved by:  Date: 10/6/11
Frank P. Almeida
Acting Science and Research Director
Northeast Fisheries Science Center

Approved by: _____ Date: _____
Captain David A. Score, NOAA
Commanding Officer
Marine Operations Center - Atlantic



COMMANDING OFFICER
NOAA Ship *Delaware II*

PROJECT INSTRUCTIONS: DE 11-09 Ecosystems Monitoring Survey & CliVEC Program

Project Dates: 31 October -19 November 2011

Area of Operation: The continental shelf from north of Cape Lookout, NC, including Georges Bank and the Gulf of Maine, to the Nova Scotia Shelf (including stations in Canada's Exclusive Economic Zone). Stations will be occupied in waters with depths ranging between 15 and 500 meters.

Objectives: The principal objective of the survey is to assess the changing biological and physical properties, which influence the sustainable productivity of the living marine resources of the northeast continental shelf ecosystem. This survey will be conducting rosette operations at a limited number of stations, several in each of the 4 regions surveyed to collect nutrient samples and data for the CliVEC (Climate Variability East Coast) program from different areas. The survey will also be deploying small hand-launched expendable drifter buoys to track patches of herring larvae located from the plankton tows in the Gulf of Maine and Georges Bank.

Secondary cruise missions include: 1) Conduct CTD casts in deep basin areas of the Gulf of Maine to within 5 meters of the basin bottom. Sampling in these basins will provide hydrographic data detailing the incursion of Labrador Current Water into the Gulf of Maine. 2) Collect zooplankton for the Census of Marine Zooplankton Project. Samples will be collected with a 20-cm bongo sampler piggybacked above the 61-cm bongo at a total of 20 selected stations throughout all four regions of the survey area. 3) A 20-cm bongo sampler will be piggybacked above the 61-cm bongo sampler at most of the Georges Bank and Gulf of Maine stations to locate and collect larval herring samples. 4) Reporting of northern right whale and other marine mammal sightings per standing protocols. 5) Deploying the 911 CTD and rosette to collect water samples for nutrient and ocean acidification measurements. 6) Collection of surface seawater samples for carbon and nitrogen stable isotope ratio analysis. 7) Collection of SCS and acoustic data, including the EK-60 from along the cruise track. 8) Analyze the size spectrum of water column particles using the Laser In-Situ Scattering and Transmissometry (LISST) instrument.

Key Changes and Points of Emphasis:

- 1. Watches are likely to be on a 12 “on”, 12 “off” basis.**
- 2. Departure and arrival will be from the NEFSC dock in Woods Hole. No port calls are planned.**

3. **Smoking and ship discharges from the water-maker will not be permitted during rosette deployments and water sample processing to minimize contamination of water samples.**
4. **All acoustic and SCS data logged during the cruise need to be saved and given to the chief scientist at the end of the cruise (media can be provided upon request).**

Planned Itinerary:

- 27 October: Load winches and scientific van.
- 28 October: Load and set up scientific equipment. Complete winch and van installation.
- 31 October: : Embark scientific personnel and depart Woods Hole, MA, to begin cruise activities.
- 19 November: Return to Woods Hole, MA. Disembark scientific personnel, and off-load scientific equipment and samples.

Operational Plans: The survey consists of 120 random stratified stations in the Middle Atlantic Bight, Southern New England, Georges Bank and the Gulf of Maine (Figure 1). In addition to these randomly selected stations there will also be 5 fixed-position stations that will be sampled in the Gulf of Maine. Station positions and a station location and cruise track will be provided to the vessel prior to sailing to allow the navigation officer ample time to load this information into the navigational computer. Stations that have large numbers of herring larvae will be marked with drifter buoys. Additional stations may be added to the cruise track after completing all routine ecosystem monitoring sampling. This will be for re-sampling the herring patch areas that had been marked with drifter buoys. The Master and Chief Scientist will jointly modify the track during the cruise as weather conditions and time constraints vary to best achieve the cruise objectives. Highest reasonable cruising speeds should be employed to improve the potential to complete the cruise missions.

Rosette casts with the CTD 911 will be made at approximately 20 of the Ecosystem Monitoring station locations, five in each subarea, sampling water at several depths for measurements of dissolved inorganic carbon (DIC), particulate organic carbon (POC), chlorophyll maxima and particulate counts and measurements. If weather conditions do not permit safe deployment of the rosette/CTD 911 array, water will be drawn from the flow-through system to permit sampling of near-surface water on the station site. An 8 foot by 12 foot van will be secured to the port side of the aft deck with its access door facing forward, to increase available laboratory space. Placement of the van will be subject to final approval by the ship's commanding officer. A PAR sensor will also be mounted in a location least likely to be shadowed by vessel superstructure. A Laser In-Situ Scattering and Transmissometry (LISST) instrument mounted horizontally on the rosette frame below the Niskin bottles will provide particulate counts and measurements. There will be 3 deck-mounted incubators placed on the aft deck, using the decked-over trawlway to place them where they are less

likely to be shadowed by the ship's superstructure (Figure 2). They will receive seawater from the ship's seawater system via a garden hose.

All CTD and bongo net plankton operations will be conducted utilizing the Sea Mac winch from the aft-starboard A-frame workstation for maximum safety and ease of operation in rough seas. The presence of an electronics technician will be required to ensure all electronic sensors and sampling equipment is able to communicate in real-time with computers aboard the vessel through the conductive towing cable. The ship's scientific seawater flow-through system should be cleaned prior to the cruise.

Hydrographic winch electro-mechanical cables will be re-terminated and the slip rings checked several days in advance of the cruise so that issues can be dealt with without delays to the sailing schedule, and that at the end of the cruise the electronics technician provide the chief scientist with a copy of the 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 will 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.nero.noaa.gov/whaletrp/plan/disent/Guide%20to%20reporting%20Whale%20Sightings%20FINAL%20complete_8.7.07.pdf) and laminated copies will be provided by the Protected Species Branch. 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 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 **978-281-9351** to report the incident and receive further instructions.

CTD Support: CTD operators will be trained and certified by the Center's Oceanography Branch. CTD operator training requires two hours and must be completed prior to the beginning of the cruise unless a trainer is included in the scientific complement. In the event that CTD difficulties are encountered during the cruise, shore based support is available. Requests for support should be forwarded to ctdhelp@mercury.wh.who.edu which is monitored daily. Once contact has been established via email, to assure continuous support, the ctdhelp address above should be copied on *all* email communications.

Stellwagen Bank: Any artifacts brought aboard the vessel due to fishing in the [Stellwagen Bank](#) National Marine Sanctuary must be discarded over the side and returned to the sanctuary. 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.

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

- (1) Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
- (2) Installation of the latest critical operating system security patches.
- (3) No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

Data Management: All station and biological data will be electronically recorded. Plankton samples will be processed through the NEFSC laboratory in Narragansett, RI. Data from the CTD will be processed at the NEFSC Woods Hole Laboratory. Samples and data collected for specific individuals, agencies or organizations will be processed by same.

ROSCOP 3_forms (IOC SC-90/WS-23) will be completed and forward to NODC, Washington, D.C. In addition to the "Ship Operation Evaluation Form" referenced below a Cruise Report will be completed will be completed and submitted by the Chief Scientist to the NEFSC Vessel

Coordinator within 20 days following the completion of the cruise.

Foreign National Access and Deemed Export Controls:

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>). The foreign national's sponsor is responsible for obtaining clearances and export licenses required and for providing for required escorts by the NAO. Programs sponsoring foreign nationals should consult with their designated line office personnel to assist with the process (<http://deemedexports.noaa.gov/contacts.html>).

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

Responsibilities of the Chief Scientist:

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

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

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist of the NOAA Foreign National List spreadsheet for each foreign national in the scientific party.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the cruise, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work

together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The Departmental Sponsor/NOAA of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA (or DOC) employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National Guest) as required by NAO 207-12 Section 5.03.h.

Communications: Routine communications will be conducted between the *Delaware II* and Woods Hole via email. Satellite based voice communication is available; the Command shall accommodate the Chief Scientist when requested. The ship's primary means of communication with the Marine Operations Center is the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

Hazardous Material: The Chief Scientist is responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists, released July 2002. Details regarding those requirements will be provided by the Chief of Operations, Marine Operations Center – Atlantic upon request and may be reached at 757-441-6842.

By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard and a chemical hygiene plan. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Chief Scientist.

The following chemicals will be placed aboard NOAA Ship *Delaware II* prior to departure:

ITEM	QUANTITY	FURNISHED BY
1. Ethanol 95%	40 liters	Woods Hole Oceanographic Institution
2. Ethanol 95%	50 liters	NMFS, NEFSC, Narragansett, RI
3. Formalin concentrated 37%	40 liters	NMFS, NEFSC, Narragansett, RI

4. Paraformaldehyde	1 liter	Old Dominion University, VA
5. Mercuric Chloride	200 ml	Old Dominion University, VA
6. Acetone	5 liters	ODU, VA & NEFSC, Narragansett, RI
7. Glutaraldehyde	1 liter	Old Dominion University, VA
8. Sodium Bicarbonate (carbon 13)	5 grams	Old Dominion University, VA
9. Sulfuric acid	500 ml	Old Dominion University, VA
10. Sodium Thiosulfate solution	1 liter	Old Dominion University, VA
11. Manganous Sulfate	500 ml	NMFS, NEFSC, Narragansett, RI
12. Dewar Flask charged with liquid nitrogen	1	NMFS, NEFSC, Narragansett, RI

Radioactive Isotopes: None

Medical Clearances and Emergency Contacts: NOAA Fleet Medical Policy requires all personnel embarking on NOAA vessels to furnish a completed copy of the NOAA Health Services Questionnaire (NHSQ) to the Health Services Office of the Marine Operations Center. This form should be submitted 30 days in advance of sailing, but no later than 7 days in advance of sailing. The Chief Scientist is responsible for the timely submission of NHSQs for scientific personnel to the Health Services Office.

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

Accident/Illness Reporting: Mishaps, injuries and near misses must be reported to the vessel's Executive Officer and Medical Person in Charge so that appropriate reporting can be made through the OMAO chain of command. In addition, all work-related mishaps involving scientific staff that result in an employee injury or illness, or any work related mishap or near miss, including those that do not require first aid or medical attention, must be reported within 24 hours of occurrence to the NOAA Fisheries Deputy Assistant Administrator for Operations. The reporting will be accomplished using a Mishap Reporting Form, via email, originating from the Chief Scientist, through the OMI Facility Operations and Safety (FOS) Branch (Jack.Emberg@noaa.gov with copies sent to Linda.Arlen@noaa.gov and Joseph.Finnegan@noaa.gov)

Email Contact: The following should be included as recipients of the daily e-mail message:

Survey.WH@mercury.wh.who.edu	{Ecosystem Surveys Branch}
Wendy.Gabriel@noaa.gov	{FEMAD Branch Chief}
Fred.Serchuk@noaa.gov	{Senior Science Advisor}
Frank.Almeida@noaa.gov	{Acting Science and Research Director}
Rich.Langton@noaa.gov	{Acting Deputy Center Director}
Charles.Byrne@noaa.gov	{NEFSC Vessel Coordinator}
Jon.Hare@noaa.gov	{Ecosystem Monitoring Task Leader}
Tamara.Holzwarth-Davis@noaa.gov	{Oceanography Branch}
CO.Delaware@noaa.gov	{Commanding Officer – DELAWARE II}
CO.Henry.Bigelow@noaa.gov	{Commanding Officer – HENRY B. BIGELOW}
Michael.S.Abbott@noaa.gov	{NEFSC Port Captain}
Apryl.Corey@noaa.gov	{NEFSC Port Office}

Watches: Vessel operations will be conducted 24 hours per day. The scientific watch schedule will be determined and submitted as part of the Addendum one week prior to sailing. Scientific personnel will be on duty for 12 hour watches each day.

Meals and Berthing: Meals and berthing are required for up to eight scientists. Meals will be served three times daily beginning one hour before scheduled departure, extending throughout the cruise, and ending two hours after the termination of the cruise. Berthing requirements, including number and gender of the science crew, 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.

All NOAA Scientists will have proper travel orders when assigned to a NOAA ship. The Chief Scientist will ensure that all non-NOAA and/or non-Federal employee scientists aboard will also have proper orders or the means to support themselves in the event that the ship becomes uninhabitable and/or the galley is closed during a port call during any part of the scheduled 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 two weeks prior to the survey.

Shipboard Safety: Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

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

Post Cruise Reporting Requirements: Upon completion of each cruise leg, a post-cruise meeting will be held (unless prior alternate arrangements are made) and attended by ship's officers, the Chief Scientist, members of the scientific party, the Vessel Coordinator and the Port Captain to review the cruise. Concerns regarding safety, efficiency, and suggestions for improvements for future cruises should be discussed. Minutes of the post-cruise meeting will be distributed to all participants via email and to the CO.MOC.Atlantic@noaa.gov and ChiefOps.MOA@noaa.gov. The Port Captain, if attending, is responsible for the recording and distributing the minutes. In his/her absence, the Operations Officer shall be responsible for the minutes.

Within 20 days of the completion of each cruise leg, a Ship Operation Evaluation form is to be completed by the Chief Scientist and submitted to NOAA's Office of Marine and Aviation Operations.

At the completion of the survey the OCE will provide a Cruise Report to the NEFSC vessel coordinator. ROSCOP 3_forms (IOC SC-90/WS-23) will be completed and forward to NODC, Washington, D.C.

Personnel List (Scientific):

<u>Name</u>	<u>Title</u>	<u>Organization</u>
Jerome Prezioso (m, US)	Chief Scientist	NMFS, NEFSC, Narragansett, RI
Cory J. Staryk (m, US)	Graduate Student	Old Dominion U. Norfolk, VA
Cristina Bascunan (f, US)	Physical Science Technician	NMFS, NEFSC, Woods Hole, MA
Christopher Vogel (m, US)	Marine Mammal & Bird Observer	College of Staten Island, CUNY
Holly Goyert (f, US)	Marine Mammal & Bird Observer	College of Staten Island CUNY
Tamara Holzwarth-Davis (f, US)	Physical Sci.Technician	NMFS, NEFSC, Woods Hole, MA
Christopher Taylor (m, US)	Contractor	Integrated Statistics, Woods Hole, MA

Equipment and Supply List: The following sampling and scientific equipment will be placed aboard NOAA Ship *Delaware II* prior to departure:

ITEM	QUANTITY	FURNISHED BY
1. 61 cm bongo nets w/335 micron mesh	2	NMFS, NEFSC, Narragansett, RI
2. 61 cm bongo nets w/335 and 505 micron mesh	1	NMFS, NEFSC, Narragansett, RI
3. Plastic bags for freezing of juvenile fish samples	50	NMFS, NEFSC, Narragansett, RI
4. 0.5 X 1.0 M neuston net w/505 micron mesh	1	NMFS, NEFSC, Narragansett, RI
5. 20 cm bongo nets w/165 micron mesh	2	NMFS, NEFSC, Narragansett, RI
6. 45 kg depressor weight	3	NOAA Ship <i>Delaware II</i>
7. Plankton sieves 4 millimeter	2	NMFS, NEFSC, Narragansett, RI
8. Plankton sieves 200 micron	2	NMFS, NEFSC, Narragansett, RI
9. Plankton sieves 100 micron	2	NMFS, NEFSC, Narragansett, RI
10. Chlorophyll extraction apparatus	1	NMFS, NEFSC, Narragansett, RI
11. Turner Designs discrete sample fluorometer	1	NMFS, NEFSC, Narragansett, RI
12. Plastic buckets for large plankton samples	2	NMFS, NEFSC, Narragansett, RI
13. Sample quart jars	35 boxes	NMFS, NEFSC, Narragansett, RI
14. Sample pint jars	4 boxes	Woods Hole Oceanographic Institution
15. Sample jar holder for sink	1	NMFS, NEFSC, Narragansett, RI
16. Winkler Titration Apparatus	1	ODU, VA & NMFS, NEFSC, Narragansett, RI
17. Net washdown hose w/nozzle	1	NOAA Ship Delaware II
18. Net washdown hose w/nozzle	1	NMFS, NEFSC Narragansett, RI.
19. Salinity bottles	2 cases	NMFS, NEFSC, Woods Hole, MA
20. CTDs	3	NMFS, NEFSC, Woods Hole, MA
21. Rosette	1	NMFS, NEFSC, Woods Hole, MA
22. Niskin Bottles, 10 liters	12	NMFS, NEFSC, Woods Hole, MA
23. Niskin Bottles, 1.7 liter	2	NMFS, NEFSC, Woods Hole, MA
24. Niskin Bottles, 3 liters	1	NMFS, NEFSC, Woods Hole, MA
25. Messengers	3	NMFS, NEFSC, Woods Hole, MA
26. Clerical supplies (various)	ample	NMFS, NEFSC, Narragansett, RI
27. label printer	1	NMFS, NEFSC, Narragansett, RI
28. Computer	1	NOAA Ship <i>Delaware II</i>
29. Seabird 911 deck unit	1	NMFS, NEFSC, Woods Hole, MA
30. Filters for Seawater	ample	NASA/ODU/EPA/GSO
31. Nutrient filters, bottles, syringes	ample	U. Maine, Orono, ME
32. Sea Mac Winch for CTD and Bongos	1	NOAA Ship Delaware II
33. Expendable hand-launched drifter buoys	12	NMFS, NEFSC, Woods Hole, MA
34. Deck-mounted incubators	3	Old Dominion University, VA
35. LISST unit	1	NMFS, NEFSC, Narragansett, RI

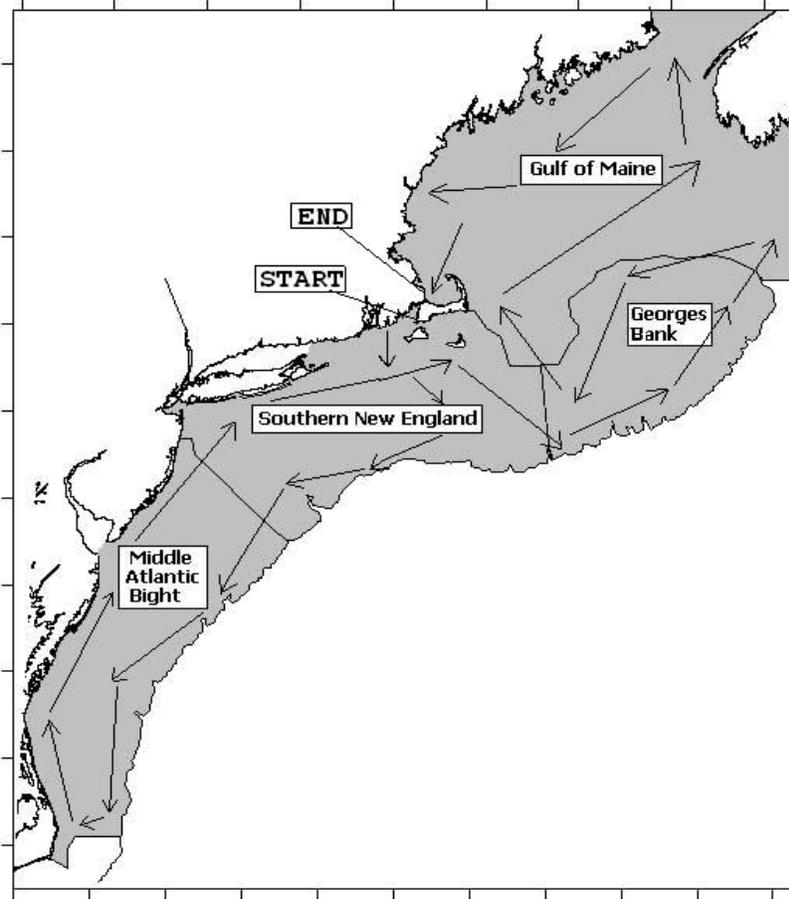


Figure 1. Area of operations and a generalized proposed cruise track for DE 11-09 Late Autumn Ecosystems Monitoring Survey.



Figure 2. Incubators mounted on aft deck of Delaware II, using decked-over trawlway.