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 Peter Fischel, NOAA
Commanding Officer, NOAA Ship *Pisces*

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

SUBJECT: Project Instruction for PC-14-05
Northeast Integrated Pelagic Survey

Attached is the final Project Instruction for PC-14-05, Northeast Integrated Pelagic Survey, which is scheduled aboard NOAA Ship *Pisces* during the period of November 3 – 20, 2014. Of the 18 DAS scheduled for this project, 18 days are funded by a Line Office 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: October 17, 2014

Platform: NOAA Ship *Pisces*

Project Number: PC 14-05

Project Title: Northeast Integrated Pelagic Survey

Project Dates: November 3, 2014 to November 20, 2014

Approved by: Russell W. Brown for Dated 10-17-2014
William A. Karp, Ph.D.
Acting Science and Research Director
Northeast Fisheries Science Center

Approved by: Anne K. Lynch CAPT/NOAA Date: 10/23/2014
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

The principal objective of the survey is to assess the pelagic components of the Northeast U.S. Continental Shelf Ecosystem from water currents to plankton, pelagic fishes, marine mammals, sea turtles, and seabirds. Specifically we will quantify the spatial distribution of the following parameters: water currents, water properties, phytoplankton, microzooplankton, mesozooplankton, pelagic fish and invertebrates, sea turtles, marine mammals, and sea birds. We will use traditional and novel techniques and instruments. In essence, the approaches of the Ecosystem Monitoring survey and the Herring Acoustic survey are combined here and augmented to include a broad array of measurements of the pelagic ecosystem during the 4 - 21 November 2014 time period.

B. Days at Sea (DAS)

Of the _18_ DAS scheduled for this project, _18_ DAS are funded by a Line Office Allocation. This project is estimated to exhibit a __Medium__ Operational Tempo.

C. Operating Area

The continental shelf from north of Cape Hatteras, 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.

D. Summary of Objectives

Operational objectives are to: (1) collect underway data using TSG, SCS, and ADCP; 2) complete CTD and bongo operations at stations throughout area, (3) calibrate the EK60 Scientific Sounder, (4) conduct acoustic surveys using the EK60 and ME70, (5) collect biological data to verify species-specific acoustic measurements using midwater trawls, (6) collect marine mammal and seabird observations, and (7) collect butterfish and conduct in situ respirometer experiments while at sea.

This survey is multidisciplinary and as such will integrate all these operations. The cruise plan will evolve with input from scientists as well as the officers and crew of *Pisces*. An extended post-cruise meeting will focus on lessons learned and improvements made since

the first Integrated Pelagic Survey in 2013, and what can be done to further improve future cruises of this type.

E. Participating Institutions

NMFS-Northeast Fisheries Science Center
Woods Hole Oceanographic Institute
City University of New York
Rutgers University
University of Maine

F. Personnel/Science Party

Name (Last, First)	**Title**	**Date Aboard**	**Date Disembark**	**Gender**	**Affiliation**	**Nationality**
Prezioso, Jerome	Chief Scientist.	11/3/2014	11/20/2014	M	NMFS	US
Jech, Michael	Lead Midwater	11/3/2014	11/20/2014	M	NMFS	US
Hare, Jonathan	Lead Ecosystem	11/3/2014	11/20/2014	M	NMFS	US
Taylor, Christopher	Fishery Biologist	11/3/2014	11/20/2014	M	Integrated Statistics	US
Walsh, Harvey	Fishery Biologist	11/3/2014	11/20/2014	M	NMFS	US
Holzwarth-Davis, Tamara	Lead CTD Specialist	11/3/2014	11/20/2014	F	NMFS	US
Brownlee, Emily	IFloCytobot Specialist	11/3/2014	11/20/2014	F	WHOI	US
Vendettuoli, Daniel	Biological Technician	11/3/2014	11/20/2014	M	Integrated Statistics	US
Bell, Richard	Fishery Biologist	11/3/2014	11/20/2014	M	NMFS	US
Saba, Grace	Respirom. Scientist	11/3/2014	11/20/2014	F	Rutgers University	US
Johnson, Thomas	Bird Observer	11/3/2014	11/21/2014	M	CUNY	US
Metheny, Nick	Bird Observer	11/3/2014	11/21/2014	M	CUNY	US

Thomas, Maura	Nutrients Scientist	11/3/2014	11/21/2014	F	U. Maine	Canada
Godlewski, Joseph	Acoustic Engineer	11/3/2014	11/3/2014	M	NMFS	US
Ryan,	Acoustic Technician	11/3/2014	11/3/2014	M	Integrated Statistics	US

The Foreign National sponsors will be Jerome Prezioso.

G. Administrative

1. Points of Contacts: Chief Scientist – Jerome Prezioso, Alternate- Harvey Walsh
   Project Operations Leads-Jonathan Hare, Michael Jech
   Ops Officer- LT Kyle Byers
   Agent- Nathan Keith, Vessel Coordinator

2. This project involves Marine Scientific Research in waters under the jurisdiction of Canada. The Pisces will operated under Canadian Fishing Vessel License NO: 000022.

II. Operations

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

A. Project Itinerary:

3 November: Depart Naval Station Newport, RI. Conduct EK60 calibrations in Narragansett Bay, then disembark calibration personnel via small boat to Naval Station Newport, and depart Narragansett Bay to commence survey.

20 November: Complete cruise operations outside of Chesapeake Bay.

B. Staging and Destaging:

29 October: Begin cruise staging at Naval Station Newport: Loading and spooling mid-water trawls.

31 October: Complete cruise staging. Load and set up remainder of scientific equipment and complete FSCS installation.

20 November: Dock at Little Creek, Norfolk, VA. Disembark scientific personnel, and off-load scientific equipment and samples. The Canadian national will disembark with the scientific party and travel with them back to Narragansett, RI, accompanied by her sponsor.

C. Operations to be conducted:

The survey consists of 155 random-stratified and fixed Oceanography stations in the Middle Atlantic Bight, Southern New England, Georges Bank and the Gulf of Maine (Figure 1). These stations are randomly distributed at varying distances, and as such there is no fixed expectation of number to be covered each day. Rather, the progress of the survey will depend on transit time, sea state, and water depth of the stations, with deeper stations requiring more time to complete operations. Some stations will also have more complex operations scheduled, such as a water cast and a bongo tow, which will increase the amount of time spent on-station. In addition, two mid-water trawl stations will be conducted per day; these stations will be chosen based on real-time monitoring of the fisheries acoustic system. Several of the ship's systems will be running and continuously logging: ADCP, TSG, ME-70, and EK-60 data from the entire trackline. Personnel from Rutgers and NMFS will be taking juvenile fish from some of the trawl catches and placing the fish in the respirometer for on-board study. Marine mammal and seabird observers had been planned to be on the bridge making continual observations during daylight hours, but this was cancelled due to lack of funding.

Oceanographic station locations 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. Mid-water trawl stations will be sampled twice per day based on the fisheries acoustic system and additional oceanographic stations may be added on an adaptive basis to improve coverage should time permit within the allotted cruise window. The Commanding Officer 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.

Oceanography Stations: A Seabird CTD profiler attached to a bongo net will be deployed at approximately 130-150 stations. In addition, Seabird CTD profiler will be deployed alone to collected data at deep stations (>200 m) and to collect water for salinity calibrations. A 911 CTD will be deployed at a subset of stations for more detailed oceanographic data and water for

numerous measurements. These deployments will use the two oceanographic winches and the CTD computer located in the dry lab.

Acoustic Survey Operations: EK60 operations will be conducted continuously throughout the cruise track at the highest safe transit speed possible, and during scientific gear deployments. The retractable keel should be positioned at depths commensurate with the sea state and corresponding noise in the EK60 echo sounders. We expect the keel to be fully lowered during most of the cruise unless operating in restricted waters. We do not have much experience on *Pisces* with how high the sea state can get before we suspend acoustic operations, so decisions will most likely be made on an ad hoc basis, based on the acoustic returns visible at the different frequencies being used.

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 at the Newport Naval Anchorage across the channel from the Newport Naval Station. Two assistants with this calibration will disembark from the vessel upon completing the process and be brought back to the Naval Station via a small boat.

SonarData Echoview Post-processor: SonarData software (v. 5.x) will be used for data acquisition and post-processing of EK60 data during the cruise. The Echoview module will be used to conduct preliminary post-processing of EK60 data at sea, which involves removing extraneous bottom echoes or water column noise. Echoview will also be utilized for preliminary partitioning of species-specific acoustic backscatter. EK60 data and Echoview files will be logged and archived directly into the data server via the Ethernet.

Pelagic Trawls:

Two midwater rope trawls will be brought along for midwater trawling. One will be the *Polytron Midwater Rope Trawl (PMRT)* and the second will be a *Shallow Water Midwater Trawl (SWMT)*. Mike Jech, the Lead Midwater Scientist, will choose which of the two nets to deploy at any given time, based on the acoustic returns from the EK60. These nets will be towed at about 4 knots, depending on trawl performance and water currents. The duration and depth of the trawl hauls are not standardized, thus it is incumbent upon the Chief Scientist or Watch Chief to communicate with the bridge officers the haul duration and depths. Tow locations will be determined on an ad hoc basis, depending on acoustic backscatter. The Chief Scientist or Watch Chief will be on the bridge during the tow to monitor and direct scientific operations. The Simrad FS70 will be deployed with every tow. Typically, the trawl will be fished obliquely by incrementally increasing the wire-out until the trawl is close to the bottom. Officers will record the time, date, navigational, and station data in FSCS ensuring the proper sequential deployment number is used, while the scientists will record the catch data for each station deployment. Catch data will be recorded using the FSCS on-board entry system.

The NET system 3.5 m^2 doors (white) will be the primary doors. The US Jet Suberkrup 1.8 m^2 doors (yellow) will be used as back up. 500-700 lb. tom weights will be used.

In addition, a 6-foot wide Issacs Kidd Midwater trawl (Figure 2.) will be used to collect live butterfish for use in the in situ respirometers. Collections will be made adaptively depending on acoustic and catches in the other nets. This net will be fished from the side-sampling station in the same manner as the bongo plankton net, using a Seabird 19+ CTD on the tow wire transmitting temperature, salinity and depth in real time so this net can be towed down to within 5 meters of the seafloor, during a double oblique tow made at 1.5 to 2 knots.

Simrad FS70 and ITI Trawl Monitoring and Third-wire Winch System: The trawl will be monitored using two trawl-monitoring systems, referred to as the FS70 and ITI systems. The Simrad FS70 Trawl Monitoring System is a third-wire device that provides real-time trawl performance information through its sonar images of the trawl opening. The Simrad ITI wireless trawl sensors provide point measurements of the trawl depth, horizontal and vertical opening, and door spread. The scientific party will record measurements at specified intervals during each deployment. The FS70 is deployed from the constant tension winch. The software is operated from a computer station on the bridge. The FS70 data will be recorded for every tow. The FS70 is critical for midwater trawl operations – a trawl will not be deployed without the FS70 in operation.

Scientific Computer System (SCS) and Fisheries Scientific Computer System (FSCS): *Pisces'* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. The SCS EventLog program has also been configured for NEFSC Fisheries Acoustic Survey operations, and will be used by the scientists to document all operational events (*e.g.*, begin and end of transects and deployments). Date and time for data collections from computers, instrumentation, and logsheets recording will be synchronized using the vessel's GPS master clock and Dimension IV software. The FSCS system will be used for on-board data logging of the biological and catch data. The NEFSC is responsible for setting up FSCS hardware and software, and the NEFSC and *Pisces'* ET are responsible for ensuring data collection and logging.

Vemco Minilog Probes: Minilog temperature-depth probes (set at a 1 sec sampling rate) will be attached to all scientific gear deployments, including the midwater trawl headrope and footrope.

Biological Sampling: Trawl catches will be sorted by species, weighed and measured (to the nearest cm FL) according to standard NEFSC procedures. Subsamples will be taken at each station for detailed lengths (TL and FL in mm), individual weights (to nearest 0.1 g), sex/maturity staging, and otolith samples (freeze herring whole) for selected species. *Pisces'* FSCS system will be used for on-board entry and auditing of trawl station and biological data.

Trawl catches will be sorted by species, weighed and measured (to the nearest cm FL) according to standard NEFSC procedures. Subsamples will be taken at each station for detailed lengths (TL and FL in mm), individual weights (to nearest 0.1 g), sex/maturity staging, and otolith

samples (freeze herring whole) for selected species. *Pisces'* FSCS system will be used for on-board entry and auditing of trawl station and biological data.

In situ Respirometers: In situ respirometers will be installed in the wet lab. Seawater supply will be needed for the flow through system. The system is described here: http://www.loligosystems.com/?action=shop_show&varenr=SW10060. The holding tank in the rear of the side sampling station will be used to hold fish before use in experiments. This cruise will be the first to use this equipment so the major objective is to develop effective protocols for use on future cruises.

1.Continuous Underway Sampling:

1.1. SCS

1.1.1. Navigational, meteorological, and environmental data will be archived throughout the cruise using *Pisces'* Scientific Computer System (SCS).

1.1.2. Ship Requirements

1.1.2.1. SCS system should be running for duration of cruise

1.2. ADCP

1.2.1. Current speed and direction

1.2.2. Backscatter at 150 kHz

1.2.3. Ship Requirements

1.2.3.1. ADCP running during cruise and logging data

NOTE: The ADCP is set with an external trigger to be a slave with the EK60. There still is some minor interference we are seeing on the 120kHz EK60. This issue needs to be resolved.

1.3. Flow-through system

1.3.1. TSG - salinity, temperature, density

1.3.2. Fluorometer – chlorophyll a concentration

1.3.3. Discrete samples – drawn from flow-through by scientists

1.3.3.1. DIC – dissolved inorganic carbon

1.3.3.2. chlorophyll a – measured directly

1.3.3.3. salt – for salinity calibrations

1.3.4. Ship Requirements

1.3.4.1. Flowthrough system cleaned prior to cruise (freshwater flush)

1.3.4.2. Flowthrough system running during cruise and logging data

1.3.4.3. Ability to draw water samples from system

1.4. Fisheries acoustics

1.4.1. ME-70

1.4.2. EK-60

1.4.3. Ship Requirements

1.4.3.1. Both acoustics running during cruise at all frequencies and logging data

NOTE: Extraneous echo sounders should be turned off to eliminate or at least minimize acoustic interference with the EK60

1.4.4. Ship Requirements

1.4.5.

1.4.6. Ship Requirements

1.4.6.1. None

1.5 Water Bottle Cast - deployed at subset of stations surface to 500 m or 5 m from bottom

1.5.1 SBE19 – Temperature, conductivity, depth

1.5.2 Water bottles – tripped manually with a messenger

Salt - for salinity calibrations

None

1.6 Mid-water trawl operations:

1.6.1 Mid-water trawl – will be deployed once per 12 hour watch at a location determined in real time by monitoring the fisheries acoustic systems. The 2 trawl nets, provided by the scientific party will be spooled onto the 2 net reels of *Pisces*.

Ship Requirements

1.6.2 The trawl will be monitored using the FS70 system. The Simrad FS70 Trawl Monitoring System is a third-wire device that provides real-time trawl performance information through its sonar images of the trawl opening. The FS70 is deployed from the constant tension winch. The software is operated from a computer station on the bridge.

Data: At the end of the cruise the ship will provide the chief scientist with three copies 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.

D. Dive Plan

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which would preclude normal operations may include the following:

Adverse weather – Marginal conditions such as high seas and winds that make deploying gear over the side hazardous to personnel, and secondarily to the equipment, warrant having operations suspended until the command deems conditions safe again. One way to mitigate such interruptions would involve coordination between the chief scientist and the command to adjust the cruise track to avoid the worst weather and continue operations in a more sheltered area where they can be conducted safely.

Equipment failures - if scientific, may involve the adjustment of sampling strategies to permit survey operations to continue with functional equipment. Vessel equipment failures will be worked out on an ad hoc basis between the scientists and command to permit survey operations to continue with the understanding that the safety of the vessel is always the top priority.

III. Equipment

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

Ship Requirements for Acoustics

Simrad EK60 Scientific Sounder: The Simrad EK60 Scientific Sounder will be the primary sampling gear used during fisheries acoustic surveys for providing species-specific abundance estimates. The EK60 operates four transducers mounted on the retractable keel (18, 38, 120, and 200 kHz split-beam transducers). EK60 data are logged to the EK60 data server, which is on the ships and scientific networks. RS232 connections are used for navigational (Differential GPS) input. The SCS Event Logger will be used to record all operational events (e.g., begin and end points of transects, stations, gear deployments, and other events that affect the track cruise and vessel speed) during the cruise.

The EK60 will be synchronized to the ADCP, ships ES60 echo sounders, and ME70. All extraneous echo sounders need to be turned off to eliminate or at least minimize acoustic interference with the EK60. At the beginning of the cruise, it may be necessary to turn off sounders to determine sources of interference. The ADCP is set with an external trigger to be a slave with the EK60. There still is some minor interference at 120kHz on the EK60 and thus, the ADCP may need to be turned off at times during the cruise.

Simrad ME70: The ME70 is a state-of-the-art multibeam system that can simultaneously collect water column and sea-floor acoustic backscatter. The ME70 will collect data on an ad hoc basis. The science watch will determine when to collect ME70 data. The science watch will work with *Pisces'* ST and ET to log the data.

Both acoustics running during cruise at all frequencies and logging data
NOTE: Extraneous echo sounders should be turned off to eliminate or at least minimize acoustic interference with the EK60

Ship Requirements for Trawling

Both net reels with one net on each (one to use and one spare)
FS70 with back-up
Constant tension winch
Block for constant tension wire
Two FSCS stations operational
Need to discuss and consider use of autotrawl for sampling
1 crew member per watch with experience mid-water trawling

Scientific Computer System (SCS) and Fisheries Scientific Computer System (FSCS): *Pisces'* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. The SCS EventLog program has also been configured for NEFSC Fisheries Acoustic Survey operations, and will be used by the scientists to document all operational events (*e.g.*, begin and end of transects and deployments). Date and time for data collections from computers, instrumentation, and logsheets recording will be synchronized using the vessel's GPS master clock and Dimension IV software. The FSCS system (version 1.6) will be used for on-board data logging of the biological and catch data. The NEFSC is responsible for setting up FSCS hardware and software, and the NEFSC and *Pisces'* ST and ET are responsible for ensuring data collection and logging.

Ship Requirements for Side Sampling Station and Oceanographic Operations

SBE911 connected to conducting cable on forward winch.
Terminations be redone prior to cruise and redone if necessary.
Slip rings be checked prior to cruise and redone if necessary.

SBE19 connected to conducting cable on aft winch for bongo deployments.
NEMA Data String for CTD Computer.
Disposal of waste water cannot happen before, during, or right after CTD rosette operations.
Smoking is not allowed on Oceanography deck owing to nutrient collections and carbonate chemistry collections.
NEMA Data String to Computer Lab.
Ultra-cold (-80^{o}C) freezer (tested prior to embarkation) for storage of samples.

Ship Requirements for Continuous Underway Sampling

SCS - Navigational, meteorological, and environmental data will be archived throughout the cruise using *Pisces'* Scientific Computer System (SCS).
SCS system should be running for duration of cruise.

ADCP - Running during cruise and logging data.
NOTE: The ADCP is set with an external trigger to be a slave with the EK60. There still is some minor interference we are seeing on the 120kHz EK60. This issue needs to be resolved.

Flow-through system - TSG - salinity, temperature, density.
Fluorometer – chlorophyll a concentration.
Discrete samples – drawn from flow-through by scientists.
DIC – dissolved inorganic carbon.
chlorophyll a – measured directly.
salt – for salinity calibrations.

Flowthrough system cleaned prior to cruise (freshwater flush).

Flowthrough system running during cruise and logging data.
Ability to draw water samples from system and to plumb in Imaging FlowCytobot instrument from WHOI.

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

CTD Rosette Operations :

A CTD Rosette will be deployed at subset of stations surface to 500 m or 5 m from bottom; approximately 20-50 locations during the course of the cruise.

SBE911 – salinity, temperature, density.
LISST – biomass size spectrum.
Fluoroprobe – distinguishes among groups of phytoplankton.
Fluorometer – chlorophyll a concentration.
PAR – for light measurement.
Water bottles – tripped automatically from computer in CTD Lab.
Salt - for salinity calibrations.
Nutrients – N, P, Si, others.
Ocean Carbon – DIC, Talk.
Phytoplankton species composition.
Microzooplankton species composition.

Oceanography Stations:

CTD/Bongo – deployed at most stations surface to 200 m or 5 m from bottom.
SBE19 – Temperature, conductivity, depth deployed with rosette having 10 ten-liter bottles, radiometer and LISST unit.
61 cm, 333 micron mesh– zooplankton and ichthyoplankton.
20 cm, 165 micron mesh – microzooplankton and zooplankton (20 stations).
45 kg depressor weight for bongo net deployments.

Trawling:

Vemco Minilog Probes: Minilog temperature-depth probes (set at a 1 sec sampling rate) will be attached to all scientific gear deployments, including the midwater trawl headrope and footrope.

Pelagic Trawls:

Two midwater rope trawls will be brought along for midwater trawling. One will be the *Polytron Midwater Rope Trawl (PMRT)* and the second will be a *Shallow Water Midwater Trawl (SWMT)*. Mike Jech, the Lead Midwater Scientist, will choose which of the two nets to deploy at any given time, based on the acoustic returns from the EK60. These nets will be towed at about 4 knots, depending on trawl performance and water currents. The duration and depth of the trawl hauls are not standardized, thus it is incumbent upon the Chief Scientist or Watch Chief to communicate with the bridge officers the haul duration and depths. Tow locations will be determined on an ad hoc basis, depending on acoustic backscatter. The Chief Scientist or Watch Chief will be on the bridge during the tow to monitor and direct scientific operations. The Simrad FS70

will be deployed with every tow. Typically, the trawl will be fished obliquely by incrementally increasing the wire-out until the trawl is close to the bottom. Officers will record the time, date, navigational, and station data in FSCS ensuring the proper sequential deployment number is used, while the scientists will record the catch and ITI data for each station deployment. Catch data will be recorded using the FSCS on-board entry system.

The NET system 3.5 m^2 doors (white) will be the primary doors. The US Jet Suberkrup 1.8 m^2 doors (yellow) will be used as back up. 500-700 lb. tom weights will be used.

In situ Respirometers: In situ respirometers will be installed on the side deck. Seawater supply will be needed for the flow through system. The system is described here: http://www.loligosystems.com/?action=shop_show&varenr=SW10060. The holding tank in the rear of the side sampling station will be used to hold fish before use in experiments. This cruise will be the first to use this equipment so the major objective is to develop effective protocols for use on future cruises.

Continuous Underway Sampling:

Imaging FlowCytoBot: An Imaging Flow Cytobot unit will be plumbed into the scientific flow-through system and used throughout the cruise. The unit will require a very small amount of seawater from the flow-through system and 110 VAC.

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**
Acetone Solution (95%)	1 x 500ml	Alkalinity	Jerome Prezioso	A
Formaldehyde solution (37%)	2 x 20 liters	Alkalinity, Stored in ship chem. lkr	Jerome Prezioso	F
Ethanol (95%)	2 x 20 liters	Alkalinity, Stored in ship chem. lkr	Jerome Prezioso	E
Mercuric Chloride	1 x 50 ml.	Located in chem. lab hood.	Chris Taylor	M

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.

D. 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

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

A. Data Classifications: *Under Development*

a. OMAO Data

b. Program Data

B. Responsibilities: *Under Development*

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 of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships', specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

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

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Chief Scientist is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from

the Chief Scientist or the NOAA website http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf.
All NHSQs submitted after March 1, 2014 must be accompanied by NOAA Form (NF) 57-10-02 - Tuberculosis Screening Document in compliance with OMAO Policy 1008 (Tuberculosis Protection Program).
The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.
The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).
The only secure email process approved by NOAA is Accellion Secure File Transfer which requires the sender to setup an account. Accellion's Web Users Guide is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The 'Send Tab" function will be accessible for 30 days.
Contact information:
Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
Email MOA.Health.Services@noaa.gov

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

C. Shipboard Safety

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

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

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via email and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

E. IT Security

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

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

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

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.

Foreign National access must be sought not only for access to the ship involved in the project but also for any Federal Facility access (NOAA Marine Operations Centers, NOAA port offices, USCG Bases) that foreign nationals might have to traverse to gain access to and from the ship. 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 email generated by the Servicing Security Office granting approval for the foreign national guest's visit. (For NMFS-sponsored guests, this email will be transmitted by FNRS.) This email 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 email 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 (all that apply)

1. Figures, maps, tables, images, etc.

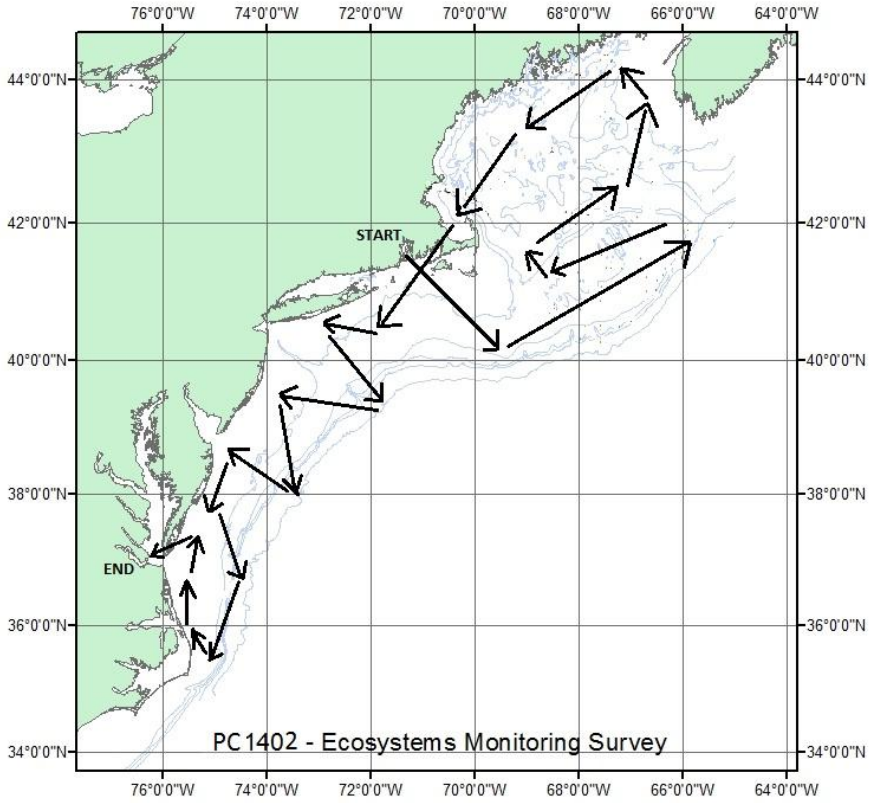

Figure 1. Area of operations and a generalized proposed cruise track for PC14-02 Northeast Integrated Pelagic Survey, 3-20 November 2014.

Figure 2. Six foot wide Isaacs Kidd Midwater Trawl.

2. Station/Waypoint List (coordinates in Latitude, Longitude: degree-minutes)

Type	Name	Lat (DDMM)		Long (DDMM)		Lat_DD	Long_DD
Fixed+Bongo	LNG (Acid 1)	42	25.01	70	36.797	42.4168	-70.6133
Fixed+Bongo	NE Ch (Acid 2)	42	13.5	65	46.002	42.2250	-65.7667
Fixed+Bongo	WilksnBasin(Acid 3)	42	30	69	40.002	42.5000	-69.6667
Fixed+Bongo	GeorgsBasin(Acid 4)	42	22.42	67	2.675	42.3737	-67.0446
Fixed+Bongo	JordanBasin(Acid 5)	43	24	67	42	43.4000	-67.7000
Fixed	Acid 6 MAB	36	0.018	75	28.315	36.0003	-75.4719
Fixed	Acid 7 MAB	36	0.018	75	10.37	36.0003	-75.1728
Fixed	Acid 8 MAB	36	0.018	74	46.631	36.0003	-74.7772
Fixed	Acid 9 MAB	36	0.018	74	40.158	36.0003	-74.6693
Fixed	Acid 10 MAB	37	59.97	74	57.418	37.9995	-74.9570

Fixed	Acid 11 MAB	37	50.6	74	34.758	37.8434	-74.5793
Fixed	Acid 12 MAB	37	42.07	74	15.336	37.7012	-74.2556
Fixed	Acid 13 MAB	39	42.49	74	0.224	39.7082	-74.0037
Fixed	Acid 14 MAB	39	21.68	73	23.532	39.3614	-73.3922
Fixed	Acid 15 MAB	39	3.228	72	44.679	39.0538	-72.7447
Fixed	Acid 16 MAB	39	0.764	72	34.968	39.0127	-72.5828
Fixed	Acid 17 SNE	41	6.306	70	37.334	41.1051	-70.6222
Fixed	Acid 18 SNE	40	40.2	70	37.334	40.6700	-70.6222
Fixed	Acid 19 SNE	40	2.226	70	36.068	40.0371	-70.6011
Fixed	Acid 20 SNE	39	49.95	70	37.333	39.8325	-70.6222
Fixed	Acid 21 GB	42	0.404	67	41.43	42.0067	-67.6905
Fixed	Acid 22 GB	41	28.2	67	41.43	41.4699	-67.6905
Fixed	Acid 23 GB	40	55.72	67	42.51	40.9286	-67.7085
Fixed	Acid 24 GB	40	22.97	67	41.43	40.3828	-67.6905
Fixed	Acid 25 GB	40	14.74	67	41.43	40.2456	-67.6905
Fixed	Acid 26 GB	41	45.14	65	26.528	41.7524	-65.4421
Fixed	Acid 27 GOM	43	1.652	66	20.486	43.0275	-66.3414
Fixed	Acid 32 GOM	42	18.94	70	16.762	42.3156	-70.2794
Fixed	Acid 33 GOM	42	21.4	70	27.924	42.3567	-70.4654
Fixed	Great South Ch	40	54	69	9.444	40.9000	-69.1574
Fixed	BI01	44	29.13	67	13.66	44.4855	-67.2277
Fixed	JT04	43	46.3	68	40.2	43.7717	-68.6700
Fixed	PF01	42	59.92	70	25.3	42.9987	-70.4217
Fixed	Jordan Basin N	44	12	67	42	44.2	-67.7000
Fixed	Jordan Basin S	42	42.06	67	42	42.701	-67.7000
Bongo	1-MAB-1	35	59.98	74	45.03	35.9996	-74.7505
Bongo	2-MAB-1	35	34.99	74	55.026	35.5831	-74.9171
Bongo	2-MAB-2	36	24.97	75	25.014	36.4161	-75.4169
Bongo	3-MAB-1	35	29.99	75	15.018	35.4998	-75.2503
Bongo	3-MAB-2	35	54.98	75	25.014	35.9163	-75.4169
Bongo	4-MAB-1	36	44.96	74	45.03	36.7493	-74.7505
Bongo	5-MAB-1	37	29.94	75	20.016	37.499	-75.3336
Bongo	5-MAB-2	37	9.948	75	5.022	37.1658	-75.0837
Bongo	5-MAB-3	37	24.94	74	45.03	37.4157	-74.7505
Bongo	5-MAB-4	37	29.94	74	45.03	37.499	-74.7505
Bongo	5-MAB-5	36	59.95	75	25.014	36.9992	-75.4169
Bongo	6-MAB-1	37	24.94	75	25.014	37.4157	-75.4169
Bongo	6-MAB-2	37	24.94	75	25.014	37.4157	-75.4169
Bongo	7-MAB-1	37	54.93	74	0.048	37.9155	-74.0008
Bongo	7-MAB-2	38	34.91	73	45.054	38.5819	-73.7509
Bongo	8-MAB-1	38	19.92	74	45.03	38.332	-74.7505

Bongo	8-MAB-2	38	9.924	74	30.036	38.1654	-74.5006
Bongo	8-MAB-3	38	49.91	74	5.046	38.8318	-74.0841
Bongo	8-MAB-4	38	49.91	74	15.042	38.8318	-74.2507
Bongo	9-MAB-1	38	24.92	74	50.028	38.4153	-74.8338
Bongo	10-MAB-1	38	49.91	73	5.07	38.8318	-73.0845
Bongo	10-MAB-2	38	44.91	73	35.058	38.7485	-73.5843
Bongo	10-MAB-3	39	14.9	73	0.072	39.2483	-73.0012
Bongo	11-MAB-1	39	14.9	73	20.064	39.2483	-73.3344
Bongo	11-MAB-2	38	54.91	73	35.058	38.9151	-73.5843
Bongo	11-MAB-3	39	39.89	73	35.058	39.6648	-73.5843
Bongo	11-MAB-4	39	29.89	73	35.058	39.4982	-73.5843
Bongo	12-MAB-1	38	44.91	74	45.03	38.7485	-74.7505
Bongo	13-MAB-1	40	9.876	74	0.048	40.1646	-74.0008
Bongo	13-MAB-2	39	29.89	74	15.042	39.4982	-74.2507
Bongo	14-SNE-1	39	34.89	72	5.094	39.5815	-72.0849
Bongo	15-SNE-1	39	54.88	73	10.068	39.9147	-73.1678
Bongo	15-SNE-2	39	29.89	72	45.078	39.4982	-72.7513
Bongo	15-SNE-3	39	49.88	73	5.07	39.8314	-73.0845
Bongo	15-SNE-4	39	39.89	73	0.072	39.6648	-73.0012
Bongo	16-SNE-1	40	39.86	72	45.078	40.6644	-72.7513
Bongo	16-SNE-2	40	4.878	72	50.076	40.0813	-72.8346
Bongo	16-SNE-3	39	39.89	73	15.066	39.6648	-73.2511
Bongo	16-SNE-4	40	44.86	72	30.084	40.7477	-72.5014
Bongo	17-SNE-1	40	19.87	73	55.05	40.3312	-73.9175
Bongo	18-SNE-1	40	14.87	71	0.12	40.2479	-71.002
Bongo	19-SNE-1	40	49.86	71	35.106	40.831	-71.5851
Bongo	19-SNE-2	40	44.86	71	5.118	40.7477	-71.0853
Bongo	19-SNE-3	40	29.87	71	0.12	40.4978	-71.002
Bongo	19-SNE-4	40	9.876	71	45.102	40.1646	-71.7517
Bongo	19-SNE-5	40	14.87	71	25.11	40.2479	-71.4185
Bongo	20-SNE-1	40	59.86	71	35.106	40.9976	-71.5851
Bongo	20-SNE-2	41	19.85	71	15.114	41.3308	-71.2519
Bongo	20-SNE-3	41	9.852	71	10.116	41.1642	-71.1686
Bongo	21-SNE-1	41	24.85	71	15.114	41.4141	-71.2519
Bongo	22-SNE-1	39	59.88	70	5.142	39.998	-70.0857
Bongo	23-SNE-1	40	9.876	69	15.162	40.1646	-69.2527
Bongo	23-SNE-2	40	24.87	69	20.16	40.4145	-69.336
Bongo	23-SNE-3	40	14.87	70	15.138	40.2479	-70.2523
Bongo	23-SNE-4	40	34.87	70	25.134	40.5811	-70.4189
Bongo	23-SNE-5	40	4.878	69	35.154	40.0813	-69.5859
Bongo	24-SNE-1	40	44.86	69	15.162	40.7477	-69.2527

Bongo	24-SNE-2	40	44.86	70	20.136	40.7477	-70.3356
Bongo	24-SNE-3	40	39.86	69	55.146	40.6644	-69.9191
Bongo	25-SNE-1	41	4.854	70	5.142	41.0809	-70.0857
Bongo	26-GB-1	40	29.87	67	20.208	40.4978	-67.3368
Bongo	26-GB-2	40	19.87	68	15.186	40.3312	-68.2531
Bongo	27-GB-1	40	39.86	67	50.196	40.6644	-67.8366
Bongo	27-GB-2	40	44.86	67	30.204	40.7477	-67.5034
Bongo	27-GB-3	41	4.854	67	15.21	41.0809	-67.2535
Bongo	27-GB-4	40	54.86	67	5.214	40.9143	-67.0869
Bongo	27-GB-5	40	39.86	67	45.198	40.6644	-67.7533
Bongo	27-GB-6	40	24.87	68	40.176	40.4145	-68.6696
Bongo	28-GB-1	40	59.86	66	30.228	40.9976	-66.5038
Bongo	28-GB-2	41	9.852	66	20.232	41.1642	-66.3372
Bongo	29-GB-1	41	54.83	66	15.234	41.9139	-66.2539
Bongo	29-GB-2	41	4.854	66	50.22	41.0809	-66.837
Bongo	29-GB-3	41	34.84	66	15.234	41.5807	-66.2539
Bongo	29-GB-4	40	54.86	66	50.22	40.9143	-66.837
Bongo	29-GB-5	41	54.83	66	5.238	41.9139	-66.0873
Bongo	29-GB-6	41	9.852	66	45.222	41.1642	-66.7537
Bongo	29-GB-7	41	34.84	66	55.218	41.5807	-66.9203
Bongo	29-GB-8	40	59.86	66	50.22	40.9976	-66.837
Bongo	30-GB-1	41	29.84	67	35.202	41.4974	-67.5867
Bongo	30-GB-2	40	59.86	67	45.198	40.9976	-67.7533
Bongo	30-GB-3	41	14.85	68	0.192	41.2475	-68.0032
Bongo	30-GB-4	41	19.85	67	15.21	41.3308	-67.2535
Bongo	30-GB-5	41	9.852	67	35.202	41.1642	-67.5867
Bongo	30-GB-6	41	14.85	67	40.2	41.2475	-67.67
Bongo	30-GB-7	41	34.84	67	10.212	41.5807	-67.1702
Bongo	31-GB-1	41	34.84	68	10.188	41.5807	-68.1698
Bongo	31-GB-2	41	49.84	67	35.202	41.8306	-67.5867
Bongo	31-GB-3	41	49.84	67	35.202	41.8306	-67.5867
Bongo	32-GB-1	42	9.828	67	40.2	42.1638	-67.67
Bongo	32-GB-2	42	4.83	67	0.216	42.0805	-67.0036
Bongo	33-GOM-1	41	49.84	69	50.148	41.8306	-69.8358
Bongo	34-GOM-1	41	59.83	69	40.152	41.9972	-69.6692
Bongo	34-GOM-2	41	24.85	68	50.172	41.4141	-68.8362
Bongo	34-GOM-3	42	19.82	68	40.176	42.3304	-68.6696
Bongo	35-GOM-1	42	4.83	70	5.142	42.0805	-70.0857
Bongo	36-GOM-1	42	19.82	70	25.134	42.3304	-70.4189
Bongo	36-GOM-2	42	59.81	70	10.14	42.9968	-70.169
Bongo	37-GOM-1	42	44.81	69	30.156	42.7469	-69.5026

Bongo	37-GOM-2	42	24.82	69	55.146	42.4137	-69.9191
Bongo	38-GOM-1	42	14.83	67	45.198	42.2471	-67.7533
Bongo	38-GOM-2	42	34.82	68	10.188	42.5803	-68.1698
Bongo	38-GOM-3	42	29.82	66	30.228	42.497	-66.5038
Bongo	39-GOM-1	42	34.82	67	15.21	42.5803	-67.2535
Bongo	40-GOM-1	43	34.79	70	10.14	43.5799	-70.169
Bongo	41-GOM-1	43	14.8	69	30.156	43.2467	-69.5026
Bongo	41-GOM-2	42	49.81	68	45.174	42.8302	-68.7529
Bongo	41-GOM-3	43	19.8	69	20.16	43.33	-69.336
Bongo	41-GOM-4	42	49.81	68	40.176	42.8302	-68.6696
Bongo	42-GOM-1	43	19.8	67	25.206	43.33	-67.4201
Bongo	42-GOM-2	43	9.804	67	20.208	43.1634	-67.3368
Bongo	42-GOM-3	43	9.804	67	40.2	43.1634	-67.67
Bongo	42-GOM-4	43	14.8	68	15.186	43.2467	-68.2531
Bongo	43-GOM-1	43	9.804	67	5.214	43.1634	-67.0869
Bongo	43-GOM-2	43	54.79	66	40.224	43.9131	-66.6704
Bongo	44-GOM-3	43	54.79	66	35.226	43.9131	-66.5871
Bongo	45-GOM-1	44	9.78	67	50.196	44.163	-67.8366
Bongo	46-GOM-1	44	14.78	66	55.218	44.2463	-66.9203
Bongo	47-GOM-1	42	34.82	65	15.258	42.5803	-65.2543
Bongo	47-GOM-2	42	49.81	66	35.226	42.8302	-66.5871
Bongo	47-GOM-3	42	39.82	65	55.242	42.6636	-65.9207