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 William Mowitt, NOAA
Commanding Officer, NOAA Ship *Pisces*

FROM: Captain Scott M. Sirois, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for PC-16-07
Summer Ecosystem Monitoring Survey

Attached is the final Project Instruction for PC-16-07, Spring Ecosystem Monitoring Survey, which is scheduled aboard NOAA Ship *Pisces* during the period of August 7 – August 19, 2016. Of the 13 DAS scheduled for this project, 13 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.

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: 28 July 2016

Platform: NOAA Ship *Pisces*

Project Number: PC 16-07

Project Title: Summer Ecosystem Monitoring Survey

Project Dates: 7 – 19 August 2016

Prepared by: Jerome Prezioso
Fisheries Oceanography Branch
Northeast Fisheries Science Center
Narragansett Laboratory

Approved by: William Karp Date: 7/28/16
William A. Karp, Ph.D.
Science and Research Director
Northeast Fisheries Science Center

Approved by: COR/NOAA Date: 7/29/2016
Captain Scott Sirois, 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 hydrographic, planktonic and pelagic components of the Northeast U.S. Continental Shelf Ecosystem. Specifically we will quantify the spatial distribution of the following parameters: water currents, water properties, phytoplankton, microzooplankton, mesozooplankton, sea turtles and marine mammals. We will use traditional and novel techniques and instruments. A broad array of measurements of the pelagic ecosystem will be made during the 7 – 19 August time period.

B. Days at Sea (DAS)

Of the_13_DAS scheduled for this project,_13_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. Given the limited number of days, it is probable that not all of the 155 stations listed will be visited, but their positions are included and it will be up to the Chief Scientist, working with the vessel's Command, to determine which have the highest priority and are most likely to be successfully sampled within the time allotted for this cruise.

D. Summary of Objectives

Operational objectives are to: (1) collect underway data using TSG, and SCS; 2) complete 24 hour CTD and bongo operations at stations throughout area, (2) collect biological data with bongo plankton nets, (3) collect marine mammal and seabird observations, and (4) collect online data and imagery of phytoplankton and ciliates using Imaging FlowCytobot units.

The Ecosystem Monitoring surveys contribute to stock assessments, protected species assessments, ecosystem assessments, and climate assessments. As such, the surveys are multi-objective. Ichthyoplankton and hydrographic data are collected for stock assessments. A range of ecosystem observations are made, from nutrients and ocean acidification to marine mammals, and a number of the measurements are used in NEFSC ecosystem assessment products. The ocean acidification and hydrographic measurements are incorporated into the region's climate assessments.

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*. A post-cruise meeting will focus on lessons learned and improvements to make for subsequent surveys of this type.

E. Participating Institutions

NMFS-Northeast Fisheries Science Center
Woods Hole Oceanographic Institute
University of Maine
Canadian Wildlife Service
University of Rhode Island

F. Personnel/Science Party

Name (Last, First)	**Title**	**Date Aboard**	**Date Disembark**	**Gender**	**Affiliation**	**Nationality**
Walsh, Harvey	Chief Scientist	08/05/2016	08/19/2016	M	NMFS	US
Holzwarth-Davis, Tamara	Lead CTD Specialist	08/05/2016	08/19/2016	F	NMFS	US
Davis, Asia	Student Volunteer	08/05/2016	08/19/2016	M	Bridgewater State University	US
Verdiyev, Rufat	Student Volunteer	08/05/2016	08/19/2016	M	Stony Brook University	Azerbaijani (green card)
Hogan, Holly	Seabird Observer	08/05/2016	08/19/2016	F	Canadian Wildlife Service	Canada
TBD	Student Volunteer	08/05/2016	08/19/2016	F	University of Rhode Island	US
Jerome Prezioso*	Cruise loading and set-up	08/05/2016	08/07/2016	M	NMFS	US
Chris Melrose*	Cruise loading and set-up	08/05/2016	08/07/2016	M	NMFS	US

Emily Peacock*	Cruise loading and set-up	08/05/2016	08/07/2016	F	WHOI	US

* Note: Berthing requested for 3 personnel to assist with loading and set-up for the cruise.

G. Administrative

1. Points of Contact:
Chief Scientist – Harvey Walsh, NOAA Fisheries, 28 Tarzwell Drive, Narragansett, RI 02882, Harvey.walsh@noaa.gov 401-782-3313.
Project Operations Lead-Tamara Holzwarth-Davis-NOAA Fisheries 166 Water Street, Woods Hole, MA 02543 tamara.holzwarth-davis@noaa.gov 508 495-2113.
Ops Officer- ops.pisces@noaa.gov
Agent- Nathan Keith, Vessel Coordinator

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

Wendy.Gabriel@noaa.gov {FEMAD Chief}
Thomas.Noji@noaa.gov {EPD Chief}
Bill.Karp@noaa.gov {Science and Research Director}
Susan Gardner@noaa.gov {Acting Deputy Science and Research Director}
Nathan.Keith@noaa.gov {NEFSC Vessel Coordinator}
Jon.Hare@noaa.gov {Oceanography Branch Chief}
Tamara.Holzwarth-Davis@noaa.gov {Oceanography Branch}
CO.Pisces@noaa.gov {Commanding Officer – *Pisces*}
Michael.S.Abbott@noaa.gov {NEFSC Port Captain}
ops.Pisces@noaa.gov {Operations Officer – *Pisces*}

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

3. Licenses and Permits
This project will be conducted under the direction of the Science and Research Director of the Northeast Fisheries Science Center.

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:

7 August: Depart Morehead City, NC.

19 August: Complete cruise operations and dock in Newport, RI.

B. Staging and Destaging:

5-6 August: Begin cruise staging at Morehead City, NC. Hand loading will be done on 05 August by science party and loading and set up of scientific equipment and complete CTD and SCS installations will be finished on 06 August.

19 August: Dock in Newport, RI. Disembark scientific personnel, and off-load scientific equipment and samples.

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 (Table 1, 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. Given the limited amount of time scheduled, it is unlikely that all 155 stations will be sampled, but all have been listed, with the understanding that the Chief Scientist, working with the Command, will choose which stations are of the highest priority and conduct sampling operations there.

Several of the ship's systems will be running and continuously logging: TSG and EK-60 data from the entire track-line. Personnel from Woods Hole Oceanographic Institution will be using water from the scientific seawater flow-through system to capture images of phytoplankton with an Imaging FlowCytobot Unit on a dedicated computer. Marine mammal and seabird observers will be stationed on the bridge or flying bridge making continual observations during daylight hours.

Oceanographic station locations and a cruise track will be provided to the vessel prior to sailing to allow the navigation officer ample time to load this information into the navigation systems. 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. Transiting between stations located 15 or more nautical miles apart at speeds of 10 knots or greater when possible can greatly improve the coverage of the survey area within the 13 allotted days for this cruise.**

Oceanography Stations: A Seabird CTD profiler attached to a bongo net will be deployed at approximately 125 stations (Figure 2). In addition, a Seabird CTD 19+ profiler will be deployed alone or with a single Niskin bottle to collect data at deep stations (>200 m) and to collect water for salinity and chlorophyll calibrations, nutrient, DIC and total alkalinity analysis. A Seabird 911+ CTD will be deployed on a rosette frame with a carousel water sampling system (SBE32) and 11 10-liter Niskin bottles at a subset of fixed stations (Figure 3). This package will collect profiles of water temperature, salinity, chlorophyll-a and oxygen levels. Water samples collected by the Niskin sampling bottles at multiple depths along the upcast will be processed ashore for nutrients and carbonate chemistry.

The deployments of the Seabird 19+ and 911+ CTD units will use the two oceanographic winches and the CTD computer located in the dry lab.

Acoustic Survey Operations: EK-60 operations will be conducted continuously throughout the cruise track at the highest safe transit speed possible, and during scientific gear deployments.

Scientific Computer System (SCS): *Pisces's* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. 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.*, beginning and end of gear 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 NEFSC and *Pisces's* ET are responsible for ensuring data collection and logging.

1. Continuous Underway Sampling:

1.1. SCS

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

1.1.2. Ship Requirements

1.1.2.1. SCS system should be running for duration of cruise

1.2. Flow-through system

1.2.1. TSG - salinity, temperature, density

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

1.2.2.1. DIC – dissolved inorganic carbon

1.2.2.2. salt – for salinity calibrations

1.2.3. Ship Requirements

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

1.2.3.2. Flowthrough system running during cruise and logging data

1.2.3.3. Ability to draw small amount of water from system for Imaging FlowCytoBot unit.

1.3. Fisheries acoustics

1.3.1. EK-60

1.3.2. Ship Requirements

1.3.2.1. 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.

1.6 Surface observations

1.6.1 Seabird observations will be made from the bridge by an observer during daylight hours.

1.6.2 Ship Requirements

1.6.2.1 110 VAC available on the bridge for the observers' laptop.

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

1.7.2 SBE19 – Temperature, conductivity, depth

1.7.3 Water bottles – tripped manually with a messenger for salinity calibrations.

1.7.4 Ship Requirements

1.7.4.1 None

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. The chief scientist will provide a 1 terabyte drive for this. A copy of the SCS data should also be FTP'd 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.

Protected Resources

North Atlantic right whale protection: The vessel is requested to adhere to right whale protection regulations. Information on Seasonal Management Area (SMA) and Dynamic Management Area (DMA) regulations and information for protecting right whales from collisions with vessels are provided through the NOAA Protected Resources website (http://www.nmfs.noaa.gov/pr/shipstrike/), Right Whale Sighting Advisory System (SAS) website (http://www.nefsc.noaa.gov/psb/surveys/), the U.S. Coast Guard's "Notices To Mariners" and NOAA weather radio.
Mariners are urged to use caution and proceed at safe speeds in areas where right whales occur. U.S. Law (50 CFR 224.105) prohibits operating vessels 65 feet (19.8 meters) or greater in excess of 10 knots in Seasonal Management Areas (SMAs) along the U.S. east coast. Mariners are also requested to route around voluntary speed restriction zones, Dynamic Management Areas (DMAs) or transit through them at 10 knots or less. Approaching within 500 yards of right whales is prohibited, unless the Chief Scientist is in possession of an ESA/MMPA permit allowing such approaches.

Whale sightings: Sightings of right whales, or dead or entangled whales of any species, are extremely valuable and reports are urgently requested. Please report all right whale sightings north of the Virginia-North Carolina border to 866-755-6622; right whale sightings south of that border should be reported to 877-WHALE HELP. Right whale sightings in any location may be reported to the U.S. Coast Guard via VHF channel 16. Protocols for reporting sightings are described in the Guide to Reporting Whale Sightings placard. The placard is available online (http://www.nefsc.noaa.gov/psb/surveys/documents/20120919_Report_a_Right_Whale.pdf) and laminated copies will be provided by the Protected Species Branch upon request. It is requested that this placard be kept on the bridge for quick reference and to facilitate rapid reporting (via satellite phone if necessary). Opportunistic sightings of other marine mammal species that are live and well may be reported using the Platforms of Opportunity (POP) forms and protocols. To information regarding the WhaleALERT application http://stellwagen.noaa.gov/protect/whalealert.html. For information on reporting a dead whale http://www.nefsc.noaa.gov/psb/surveys/documents/20120919_Report_a_Dead_Whale.pdf

Mitigation for Protected Resources:

Plankton Nets, Small-mesh Towed Nets, Oceanographic Sampling Devices, Video Cameras, and Remotely Operated Vessel (ROV) Deployments
The NEFSC deploys a wide variety of gear to sample the marine environment during many of their research cruises, such as plankton nets, oceanographic sampling devices,

video cameras, and ROVs. These types of gear are not considered to pose any risk to protected species because of their small size, slow deployment speeds, and/or structural details of the gear and are therefore not subject to specific mitigation measures. However, the officer on watch and crew monitor for any unusual circumstances that may arise at a sampling site and use their professional judgment and discretion to avoid any potential risks to protected species during deployment of all research equipment.

"Take" of Protected Resources: Under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) it is unlawful to take a protected species. The MMPA defines take as "harass, hunt, capture, kill, or collect, or attempt to harass, hunt, capture, or collect" **unless specifically authorized under a Marine Mammal Protected Species Permit**. The ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." An incidental take is one that is incidental to, but not the purpose of, otherwise lawful activities.

In the event of an incidental take of a marine mammal or federally listed threatened or endangered species during the cruise, the chief scientist will take the following actions:

Marine turtle, Sturgeon and Atlantic salmon bycatch: All marine turtles, sturgeon and Atlantic salmon taken incidental to fishing activities, must be documented, sampled and handled according to established procedures in **the Endangered Species Act Section 7 Consultation Biological Opinion (BIOP)** issued on November 30, 2012. Dead turtles shall, if feasible, be frozen and returned to the Woods Hole Laboratory. Please refer to the appendices for handling and sampling procedures. Information should be collected on the provided Data Collection Sheets and required information should be submitted within 24 hours of the take to Incidental.Take@noaa.gov, Elizabeth.Josephson@noaa.gov, Nathan.Keith@noaa.gov, Sarah.Pike@noaa.gov for PSIT entry.

Marine mammal bycatch: All marine mammals taken incidental to fishing activities must be documented and handled according to established protocols outlined in the **Procedures & Actions for Incidental Takes of Marine Mammals in Research & Monitoring Activities** located in the appendices. Information should be collected on the Marine Mammal Data Collection Sheet and required PSIT information should be submitted within 24 hours of the take to Incidental.Take@noaa.gov, Elizabeth.Josephson@noaa.gov, Nathan.Keith@noaa.gov, Sarah.Pike@noaa.gov.

Migratory bird salvage: Please refer to the Federal Fish and Wildlife "Special Purpose – Salvage" Permit located in the appendices for the salvage of dead migratory birds (except species listed as threatened or endangered under the Endangered Species Act; see 50 CFR 17.11).

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 ship's 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.

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.

Acoustics are running during cruise at all frequencies and logging data.

Scientific Computer System (SCS): *Pisces's* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. The SCS EventLog program will be used by the scientists to post process all operational events (*e.g.*, beginning and end of 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 NEFSC and *Pisces's* ST and ET are responsible for ensuring data collection and logging.

Ship Requirements for Side Sampling Station and Oceanographic Operations

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

New terminations will be done prior to the start of this cruise for both oceanographic winches.

SBE19 connection 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 due to nutrient and carbonate chemistry sampling.

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's* Scientific Computer System (SCS). SCS system should be running for duration of cruise.

Flow-through system - TSG - salinity, temperature, density.
Fluorometer – chlorophyll-a concentration.
Imaging FlowCytobot – small amount of seawater drawn from the system to obtain phytoplankton images.
Discrete samples – drawn from flow-through by scientists.
DIC – dissolved inorganic carbon.
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 max depth** or 5 m from bottom; at approximately 20-50 locations during the course of the cruise.
SBE911 – salinity, temperature, density.
Fluoroprobe – distinguishes among groups of phytoplankton.
Fluorometer – chlorophyll a concentration.
PAR – for light measurement.
Water bottles – tripped remotely from computer in CTD Lab.
Salt - for salinity calibrations.
Nutrients – N, P, Si, others.
Ocean Carbon – DIC, Total alkalinity.
Phytoplankton species composition.
Microzooplankton species composition.
Chlorophyll-a – measured directly.

Oceanography Stations:

SBE19 CTD/Bongo – deployed at most stations surface to **200 m max depth** or 5 m from bottom.
Seabird 911– Temperature, conductivity, depth deployed with rosette having 10 ten-liter bottles plus a fluorometer and radiometer.
61 cm, 333 micron mesh– zooplankton and ichthyoplankton.
20 cm, 165 and 333 micron mesh – microzooplankton and zooplankton.
45 kg depressor weight for bongo net deployments.

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 (Figure 4). This unit will be brought to the ship as early as possible during staging to ensure optimal installation and functionality.

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 (90%)	2 x 500 ml.	Located in chem lab.	Harvey Walsh	E
Formaldehyde solution (37%)	2 x 20 liters	Stored in ship chem. locker. 20 liters will be in dispensing carboy in Preservation Area.	Harvey Walsh	F
Ethanol (95%)	6 x 20 liters (5 gallon cans, 14" (height) X 11.5" (diameter)	Stored in ship flammable locker. 20 liters will be in dispensing carboy in Preservation Area.	Harvey Walsh	E
Mercuric Chloride	1 x 50 ml.	In Tertiary containment, in hood.	Harvey Walsh	M

C. Chemical safety and spill response procedures

E: Ethanol/Acetone

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

F: Formalin/Formaldehyde/Ethanol/Acetone

- Ventilate area of leak or spill. Remove all sources of ignition.
- Wear appropriate personal protective equipment (contained in spill kits).
- Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.
- Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., Formaldehyde Eater, vermiculite,

dry clay), and place in a chemical waste container.
• Do not use combustible materials, such as saw dust.

M: Mercuric Chloride
• Wear appropriate personal protective equipment (contained in spill kits).
• Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.
• Collect liquid with an appropriate chemical absorbent pad, and place in a hazmat waste container.
• If spill is outside, rinse area with lots of water. If spill is inside, treat the spill area with a mercury spill kit.

Inventory of Spill Kits

Product Name	Amount	Chemical it is useful against
Formaldehyde Eater	2 X 5 gal bucket	Formaldehyde, Formalin
Absorbent ground clay	2 x 14 lbs	Formaldehyde, Formalin
Absorbent chemical pads	75 pads	Acetone, Ethanol, Mercuric Chloride
Mercury Tamer	250 g	Mercury

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*

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 hours 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.
8. 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.

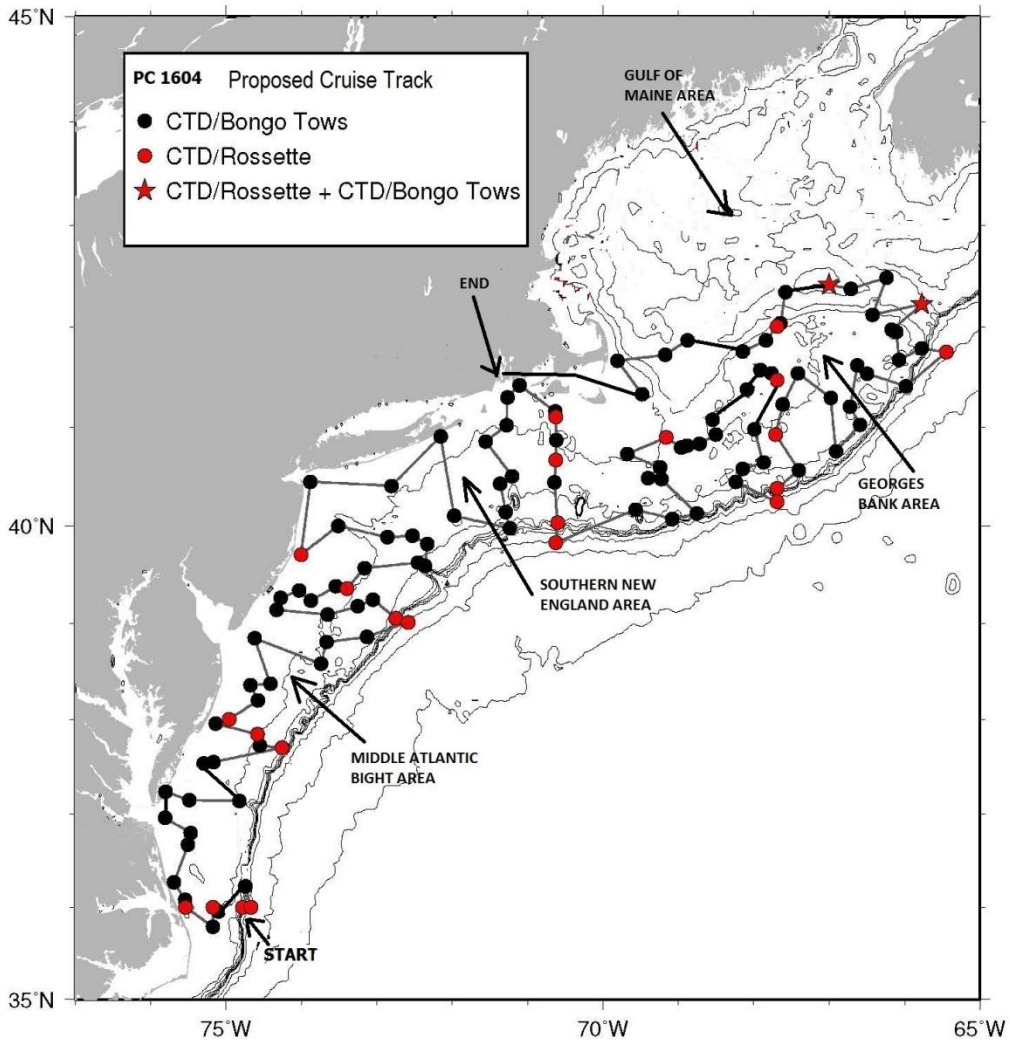

Figure 1. Station locations and proposed cruise track for PC 16-04 Ecosystem Monitoring Survey
7 – 19 August 2016.

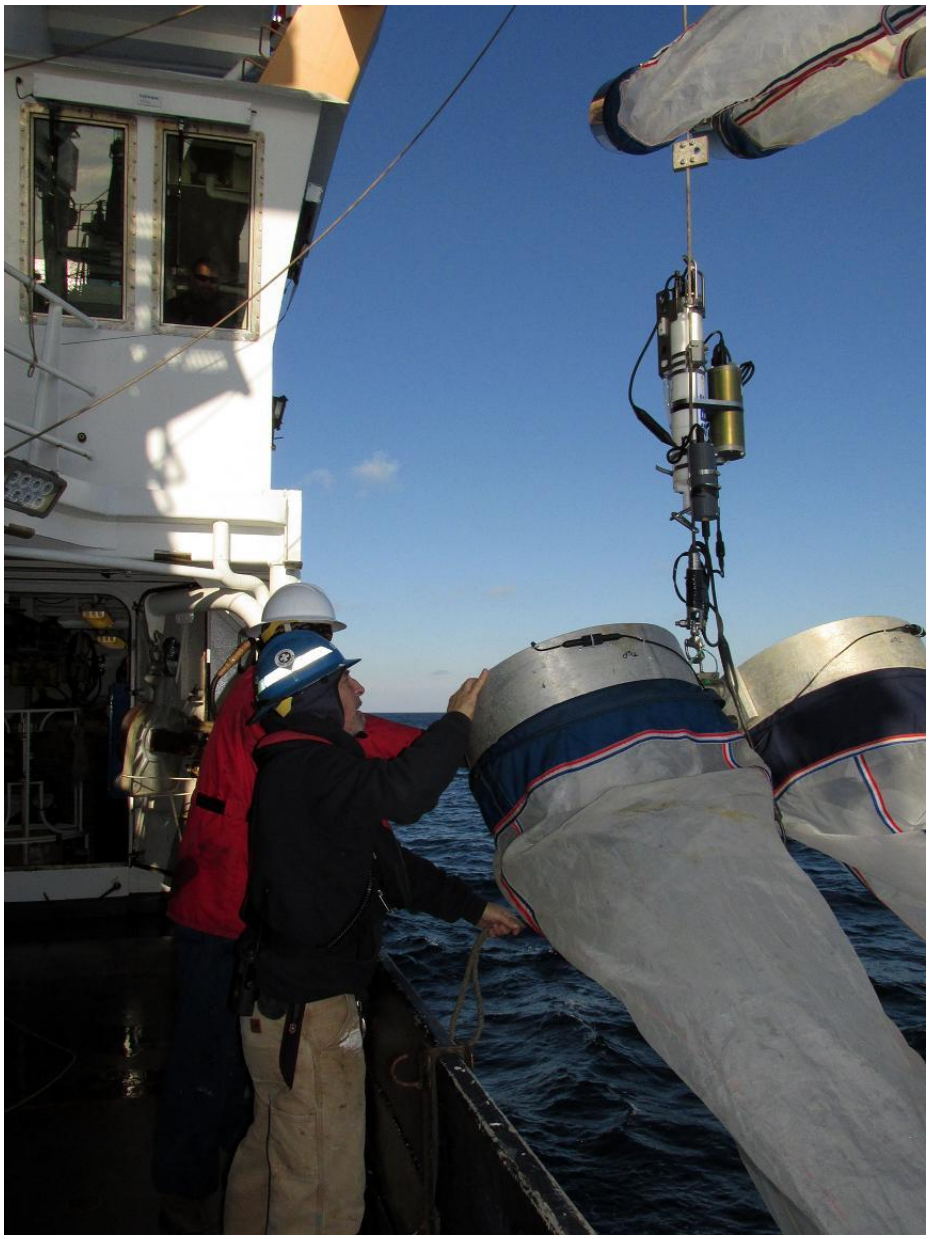

Figure 2. Plankton net sampling array, showing 61 and 20 cm bongo frames, and CTD unit.

Figure 3. A Niskin bottle rosette sampler equipped with 10 liter Niskin bottles.

Figure 4. The cylindrical Imaging FlowCytobot unit.

Table 1. Station/Waypoint List (coordinates in Latitude, Longitude: degree-minutes)

Seq	Name	Region	Strata	Deployment	Bongo Protocol	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
1	1-MAB-1	MAB	1	CTD/Bongo Oblique	STD	36	14.97	74	50.028
2	2-MAB-1	MAB	2	CTD/Bongo Oblique	STD	36	19.968	74	55.026
3	2-MAB-2	MAB	2	CTD/Bongo Oblique	STD	36	29.964	75	30.012
4	3-MAB-1	MAB	3	CTD/Bongo Oblique	STD	35	44.982	75	15.018
5	3-MAB-2	MAB	3	CTD/Bongo Oblique	STD	35	34.986	75	15.018
6	4-MAB-1	MAB	4	CTD/Bongo Oblique	STD	37	24.942	74	30.036
7	5-MAB-1	MAB	5	CTD/Bongo Oblique	STD	36	44.958	75	5.022
8	5-MAB-2	MAB	5	CTD/Bongo Oblique	STD	37	4.95	75	15.018
9	5-MAB-3	MAB	5	CTD/Bongo Oblique	STD	37	14.946	75	5.022
10	5-MAB-4	MAB	5	CTD/Bongo Oblique	STD	37	44.934	75	5.022
11	5-MAB-5	MAB	5	CTD/Bongo Oblique	STD	37	29.94	75	0.024
12	6-MAB-1	MAB	6	CTD/Bongo Oblique	STD	36	44.958	75	50.004
13	6-MAB-2	MAB	6	CTD/Bongo Oblique	STD	36	59.952	75	50.004
14	7-MAB-1	MAB	7	CTD/Bongo Oblique	STD	38	19.92	73	45.054
15	7-MAB-2	MAB	7	CTD/Bongo Oblique	STD	38	29.916	73	40.056
16	8-MAB-1	MAB	8	CTD/Bongo Oblique	STD	38	4.926	74	20.04
17	8-MAB-2	MAB	8	CTD/Bongo Oblique	STD	38	34.914	74	45.03
18	8-MAB-3	MAB	8	CTD/Bongo Oblique	STD	38	34.914	74	5.046
19	8-MAB-4	MAB	8	CTD/Bongo Oblique	STD	38	34.914	74	25.038
20	9-MAB-1	MAB	9	CTD/Bongo Oblique	STD	37	49.932	75	25.014
21	10-MAB-1	MAB	10	CTD/Bongo Oblique	STD	38	49.908	73	10.068
22	10-MAB-2	MAB	10	CTD/Bongo Oblique	STD	39	9.9	72	45.078
23	10-MAB-3	MAB	10	CTD/Bongo Oblique	STD	39	14.898	73	0.072
24	11-MAB-1	MAB	11	CTD/Bongo Oblique	STD	39	9.9	73	50.052
25	11-MAB-2	MAB	11	CTD/Bongo Oblique	STD	39	14.898	73	20.064
26	11-MAB-3	MAB	11	CTD/Bongo Oblique	STD	39	4.902	73	35.058
27	11-MAB-4	MAB	11	CTD/Bongo Oblique	STD	39	24.894	73	35.058
28	12-MAB-1	MAB	12	CTD/Bongo Oblique	STD	38	44.91	75	0.024
29	13-MAB-1	MAB	13	CTD/Bongo Oblique	STD	39	39.888	73	55.05
30	13-MAB-2	MAB	13	CTD/Bongo Oblique	STD	39	54.882	74	0.048
31	14-SNE-1	SNE	14	CTD/Bongo Oblique	STD	39	19.896	72	35.082
32	15-SNE-1	SNE	15	CTD/Bongo Oblique	STD	39	54.882	72	10.092

33	15-SNE-2	SNE	15	CTD/Bongo Oblique	STD	39	24.894	72	55.074
34	15-SNE-3	SNE	15	CTD/Bongo Oblique	STD	40	14.874	72	40.08
35	15-SNE-4	SNE	15	CTD/Bongo Oblique	STD	40	4.878	72	30.084
36	16-SNE-1	SNE	16	CTD/Bongo Oblique	STD	40	19.872	72	25.086
37	16-SNE-2	SNE	16	CTD/Bongo Oblique	STD	40	24.87	72	50.076
38	16-SNE-3	SNE	16	CTD/Bongo Oblique	STD	39	44.886	73	30.06
39	16-SNE-4	SNE	16	CTD/Bongo Oblique	STD	40	4.878	73	45.054
40	17-SNE-1	SNE	17	CTD/Bongo Oblique	STD	40	24.87	73	35.058
41	18-SNE-1	SNE	18	CTD/Bongo Oblique	STD	39	54.882	71	25.11
42	19-SNE-1	SNE	19	CTD/Bongo Oblique	STD	40	19.872	70	50.124
43	19-SNE-2	SNE	19	CTD/Bongo Oblique	STD	40	34.866	71	35.106
44	19-SNE-3	SNE	19	CTD/Bongo Oblique	STD	40	24.87	71	10.116
45	19-SNE-4	SNE	19	CTD/Bongo Oblique	STD	40	19.872	72	5.094
46	19-SNE-5	SNE	19	CTD/Bongo Oblique	STD	40	14.874	71	10.116
47	20-SNE-1	SNE	20	CTD/Bongo Oblique	STD	40	59.856	71	10.116
48	20-SNE-2	SNE	20	CTD/Bongo Oblique	STD	41	9.852	71	20.112
49	20-SNE-3	SNE	20	CTD/Bongo Oblique	STD	41	19.848	71	15.114
50	21-SNE-1	SNE	21	CTD/Bongo Oblique	STD	40	49.86	72	20.088
51	22-SNE-1	SNE	22	CTD/Bongo Oblique	STD	40	4.878	69	5.166
52	23-SNE-1	SNE	23	CTD/Bongo Oblique	STD	40	19.872	70	30.132
53	23-SNE-2	SNE	23	CTD/Bongo Oblique	STD	40	34.866	70	25.134
54	23-SNE-3	SNE	23	CTD/Bongo Oblique	STD	40	9.876	70	0.144
55	23-SNE-4	SNE	23	CTD/Bongo Oblique	STD	40	24.87	69	10.164
56	23-SNE-5	SNE	23	CTD/Bongo Oblique	STD	40	14.874	69	45.15
57	24-SNE-1	SNE	24	CTD/Bongo Oblique	STD	40	44.862	69	50.148
58	24-SNE-2	SNE	24	CTD/Bongo Oblique	STD	40	54.858	69	15.162
59	24-SNE-3	SNE	24	CTD/Bongo Oblique	STD	40	44.862	69	40.152
60	25-SNE-1	SNE	25	CTD/Bongo Oblique	STD	41	14.85	70	40.128
61	26-GB-1	GB	26	CTD/Bongo Oblique	STD	40	24.87	68	0.192
62	26-GB-2	GB	26	CTD/Bongo Oblique	STD	40	24.87	67	35.202
63	27-GB-1	GB	27	CTD/Bongo Oblique	STD	40	59.856	68	50.172
64	27-GB-2	GB	27	CTD/Bongo Oblique	STD	40	59.856	67	15.21
65	27-GB-3	GB	27	CTD/Bongo Oblique	STD	40	39.864	68	50.172
66	27-GB-4	GB	27	CTD/Bongo Oblique	STD	40	49.86	68	45.174
67	27-GB-5	GB	27	CTD/Bongo Oblique	STD	40	59.856	68	40.176
68	27-GB-6	GB	27	CTD/Bongo Oblique	STD	40	34.866	67	40.2
69	28-GB-1	GB	28	CTD/Bongo Oblique	STD	41	49.836	65	45.246
70	28-GB-2	GB	28	CTD/Bongo Oblique	STD	40	49.86	66	45.222
71	29-GB-1	GB	29	CTD/Bongo Oblique	STD	41	39.84	66	50.22
72	29-GB-2	GB	29	CTD/Bongo Oblique	STD	41	29.844	66	10.236
73	29-GB-3	GB	29	CTD/Bongo Oblique	STD	41	34.842	66	30.228
74	29-GB-4	GB	29	CTD/Bongo Oblique	STD	40	54.858	66	55.218
75	29-GB-5	GB	29	CTD/Bongo Oblique	STD	41	39.84	65	55.242

76	29-GB-6	GB	29	CTD/Bongo Oblique	STD	41	34.842	67	0.216
77	29-GB-7	GB	29	CTD/Bongo Oblique	STD	41	29.844	67	0.216
78	29-GB-8	GB	29	CTD/Bongo Oblique	STD	40	59.856	66	40.224
79	30-GB-1	GB	30	CTD/Bongo Oblique	STD	40	59.856	67	45.198
80	30-GB-2	GB	30	CTD/Bongo Oblique	STD	41	24.846	67	50.196
81	30-GB-3	GB	30	CTD/Bongo Oblique	STD	41	54.834	67	10.212
82	30-GB-4	GB	30	CTD/Bongo Oblique	STD	41	49.836	67	0.216
83	30-GB-5	GB	30	CTD/Bongo Oblique	STD	41	9.852	68	5.19
84	30-GB-6	GB	30	CTD/Bongo Oblique	STD	40	59.856	68	15.186
85	30-GB-7	GB	30	CTD/Bongo Oblique	STD	40	54.858	68	25.182
86	31-GB-1	GB	31	CTD/Bongo Oblique	STD	41	34.842	68	10.188
87	31-GB-2	GB	31	CTD/Bongo Oblique	STD	41	4.854	68	35.178
88	31-GB-3	GB	31	CTD/Bongo Oblique	STD	41	24.846	68	20.184
89	32-GB-1	GB	32	CTD/Bongo Oblique	STD	42	9.828	66	20.232
90	32-GB-2	GB	32	CTD/Bongo Oblique	STD	42	4.83	66	30.228
91	33-GOM-1	GOM	33	CTD/Bongo Oblique	STD	41	49.836	69	55.146
92	34-GOM-1	GOM	34	CTD/Bongo Oblique	STD	41	34.842	68	35.178
93	34-GOM-2	GOM	34	CTD/Bongo Oblique	STD	41	39.84	69	15.162
94	34-GOM-3	GOM	34	CTD/Bongo Oblique	STD	41	24.846	69	5.166
95	35-GOM-1	GOM	35	CTD/Bongo Oblique	STD	42	19.824	70	40.128
96	36-GOM-1	GOM	36	CTD/Bongo Oblique	STD	43	9.804	70	15.138
97	36-GOM-2	GOM	36	CTD/Bongo Oblique	STD	42	49.812	70	0.144
98	37-GOM-1	GOM	37	CTD/Bongo Oblique	STD	41	59.832	69	10.164
99	37-GOM-2	GOM	37	CTD/Bongo Oblique	STD	42	59.808	69	55.146
100	38-GOM-1	GOM	38	CTD/Bongo Oblique	STD	42	29.82	67	10.212
101	38-GOM-2	GOM	38	CTD/Bongo Oblique	STD	42	4.83	68	15.186
102	38-GOM-3	GOM	38	CTD/Bongo Oblique	STD	42	34.818	67	45.198
103	39-GOM-1	GOM	39	CTD/Bongo Oblique	STD	42	34.818	67	0.216
104	40-GOM-1	GOM	40	CTD/Bongo Oblique	STD	43	44.79	69	40.152
105	41-GOM-1	GOM	41	CTD/Bongo Oblique	STD	43	49.788	68	10.188
106	41-GOM-2	GOM	41	CTD/Bongo Oblique	STD	42	49.812	68	40.176
107	41-GOM-3	GOM	41	CTD/Bongo Oblique	STD	43	44.79	68	10.188
108	41-GOM-4	GOM	41	CTD/Bongo Oblique	STD	43	19.8	68	45.174
109	42-GOM-1	GOM	42	CTD/Bongo Oblique	STD	42	59.808	68	25.182
110	42-GOM-2	GOM	42	CTD/Bongo Oblique	STD	43	29.796	68	0.192
111	42-GOM-3	GOM	42	CTD/Bongo Oblique	STD	42	54.81	68	5.19
112	42-GOM-4	GOM	42	CTD/Bongo Oblique	STD	43	39.792	67	35.202
113	43-GOM-1	GOM	43	CTD/Bongo Oblique	STD	43	54.786	66	50.22
114	43-GOM-2	GOM	43	CTD/Bongo Oblique	STD	43	9.804	66	55.218
115	44-GOM-3	GOM	44	CTD/Bongo Oblique	STD	43	34.794	66	25.23
116	45-GOM-1	GOM	45	CTD/Bongo Oblique	STD	44	14.778	67	45.198
117	46-GOM-1	GOM	46	CTD/Bongo Oblique	STD	44	9.78	66	45.222
118	47-GOM-1	GOM	47	CTD/Bongo Oblique	STD	42	34.818	65	20.256

119	47-GOM-2	GOM	47	CTD/Bongo Oblique	STD	42	29.82	65	40.248
120	47-GOM-3	GOM	47	CTD/Bongo Oblique	STD	42	44.814	66	40.224
121	LNG (Acid 1)	GOM	36	CTD Profile 911+, CTD/Bongo Oblique	STD	42	25.008	70	36.797
122	Wilkinson Basin (Acid 3)	GOM	37	CTD Profile 911+, CTD/Bongo Oblique	STD	42	30	69	40.002
123	NE Ch (Acid 2)	GOM	38	CTD Profile 911+, CTD/Bongo Oblique	STD	42	13.5	65	46.002
124	Georges Basin (Acid 4)	GOM	39	CTD Profile 911+, CTD/Bongo Oblique	STD	42	22.42	67	2.675
125	Jordon Basin (Acid 5)	GOM	42	CTD Profile 911+, CTD/Bongo Oblique	STD	43	23.999	67	42
126	Acid 8 MAB	MAB	1	CTD Profile 911+		36	0.018	74	46.631
127	Acid 7 MAB	MAB	2	CTD Profile 911+		36	0.018	75	10.37
128	Acid 6 MAB	MAB	3	CTD Profile 911+		36	0.018	75	28.315
129	Acid 12 MAB	MAB	7	CTD Profile 911+		37	42.072	74	15.336
130	Acid 10 MAB	MAB	8	CTD Profile 911+		37	59.967	74	57.418
131	Acid 11 MAB	MAB	8	CTD Profile 911+		37	50.604	74	34.758
132	Acid 14 MAB	MAB	11	CTD Profile 911+		39	21.684	73	23.532
133	Acid 13 MAB	MAB	13	CTD Profile 911+		39	42.489	74	0.224
134	Acid 19 SNE	SNE	18	CTD Profile 911+		40	2.226	70	36.068
135	Acid 18 SNE	SNE	23	CTD Profile 911+		40	40.2	70	37.334
136	Great South Ch (Acid 28)	GOM	23	CTD Profile 911+		40	54	69	9.444
137	Acid 17 SNE	SNE	24	CTD Profile 911+		41	6.306	70	37.334
138	Acid 24 GB	GB	26	CTD Profile 911+		40	22.97	67	41.43
139	Acid 23 GB	GB	27	CTD Profile 911+		40	55.718	67	42.51
140	Acid 22 GB	GB	30	CTD Profile 911+		41	28.196	67	41.43
141	Acid 21 GB	GB	32	CTD Profile 911+		42	0.404	67	41.43
142	Acid 32 GOM	GOM	36	CTD Profile 911+		42	18.936	70	16.762
143	Acid 33 GOM	GOM	36	CTD Profile 911+		42	21.402	70	27.924
144	Jordan Basin S (Acid 35)	GOM	38	CTD Profile 911+		42	42.06	67	42
145	PF01 (Acid 26)	GOM	40	CTD Profile 911+		42	59.92	70	25.3
146	Jordan Basin N (Acid 34)	GOM	41	CTD Profile 911+		44	12	67	42
147	JT04 (Acid 30)	GOM	41	CTD Profile 911+		43	46.3	68	40.2
148	Acid 27 GOM	GOM	47	CTD Profile 911+		43	1.652	66	20.486
149	BI01 (Acid 29)	GOM	48	CTD Profile 911+		44	29.13	67	13.66
150	Acid 9 MAB	MAB	50	CTD Profile 911+		36	0.018	74	40.158
151	Acid 15 MAB	MAB	56	CTD Profile 911+		39	3.228	72	44.679
152	Acid 16 MAB	MAB	56	CTD Profile 911+		39	0.764	72	34.968
153	Acid 20 SNE	SNE	60	CTD Profile 911+		39	49.95	70	37.333
154	Acid 25 GB	GB	62	CTD Profile 911+		40	14.738	67	41.43
155	Acid 26 GB	GB	68	CTD Profile 911+		41	45.144	65	26.528