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

March 22, 2017

MEMORANDUM FOR: Captain David Nelson
Master, NOAA Ship *Oregon II*

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

SUBJECT: Project Instruction for R2-17-02
SEAMAP Spring Ichthyoplankton

Attached is the final Project Instruction for R2-17-02, SEAMAP Spring Ichthyoplankton, which is scheduled aboard NOAA Ship *Oregon II* during the period of April 28 to May 30, 2017. Of the 30 DAS scheduled for this project, 30 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:
Karen Mitchell

U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center

3209 Frederic St.
Pascagoula, MS 39567

Project Instructions

Date Submitted: 03/14/2017

Platform: NOAA Ship OREGON II

Cruise Number: R2-17-02 (322)

Project Title: SEAMAP Spring Ichthyoplankton

Cruise Dates: 04/28/2017 - 03/30/2017

Prepared by: MILLETT.ANDREW.FRANCIS.1398325792 Digitally signed by MILLETT.ANDREW.FRANCIS.1398325792 Date: 2017.03.14 10:41:31 -05'00'
Field Party Chief
Date: 03/14/2017

Approved by: DESFOSSE.LISA.L.1365834519 Digitally signed by DESFOSSE.LISA.L.1365834519 Date: 2017.03.17 09:29:50 -05'00'
Lab Director
Date: 03/17/2017

Approved by: BRAINERD.THEOPHILUS.R.DR.1365819285 Digitally signed by BRAINERD.THEOPHILUS.R.DR.1365819285 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=BRAINERD.THEOPHILUS.R.DR.1365819285 Date: 2017.03.20 08:33:55 -04'00'
Dr. Bonnie Ponwith
Director, SEFSC
Date: 03/20/2017

Approved by:
Captain Scott M. Sirois, NOAA
Commanding Officer
Marine Operations Center - Atlantic
Date: 4/3/17

I. Overview

A. Brief Summary and Project Period

Conducting the SEAMAP Spring Ichthyoplankton survey on board the NOAA Ship *Oregon II* (R2-17-02; 322) from April 28 – May 30, 2017 in order to assess the occurrence, abundance and geographical distribution of the early life stages of spring spawning fishes, especially bluefin tuna (*Thunnus thynnus*), from mid-continental shelf to deep waters in the northern Gulf of Mexico (GOM).

B. Days at Sea (DAS)

Of the 30 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 30 DAS are funded by a Line Office Allocation, 0 DAS are Program funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area

United States northern GOM along the continental shelf break from 82º00' to 97º00' W and 25º00' to 30º00' N. A list of the station locations and a map of the area of operations are found in Table 1 and Figure 1 respectively.

D. Summary of Objectives

1. *Primary Objectives*

a. Assess the occurrence, abundance and geographical distribution of the early life stages of spring spawning fishes, especially bluefin tuna (*Thunnus thynnus*), from mid-continental shelf to deep Gulf waters using a 61 cm bongo frame fitted with 0.335 mm nets, a neuston frame fitted with a 0.950 mm net, and a 61 cm bongo frame fitted with a 0.500 mm net, referred to as the Shallow Bongo, at selected Southeast Area Monitoring and Assessment Program (SEAMAP) stations in support of annual stock assessments.

b. Describe the pelagic habitat of fish larvae through measurements of various physical and biological parameters:
   i. Record profiles through the water column of temperature, salinity, fluorescence, dissolved oxygen, and turbidity using a CTD at SEAMAP stations.
   ii. Measure chlorophyll a in replicate water samples taken at surface, mid or maximum chlorophyll layer and near bottom (to a maximum of 200 m) depths using bench top fluorometry.
   iii. Detect and measure frontal features along the survey cruise track using data from the ship's Fluoro-thermosalinograph flow-through system (TSG).

c. Measure the vertical distribution of fish larvae by sampling at discrete depths in the water column at selected locations along the SEAMAP plankton survey grid using a 1 m Multiple Opening/Closing Net and Environmental Sensing

System (MOCNESS) during both legs of the survey.

d. Collect detailed observations of net-caught jellyfish and ctenophores.
e. Collect volumetric measurements of net caught *Sargassum* spp.

E. Participating Institutions

National Marine Fisheries Service – Pascagoula Laboratory

F. Personnel (Science Party)

Name (Last, First)	Title	Leg	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Bond, Pam	WL	1 and 2	April 28, 2017	May 30, 2017	F	NMFS	US
Bromschwig, Michelle	WS	2	May 16, 2017	May 30, 2017	F	TAMUCC[2]	Germany
Clark, Kaitlin	BO	1	April 28, 2017	May 12, 2017	F	USFWS[3]	US
Drass, Denice	WL	2	May 16, 2017	May 30, 2017	F	NMFS	US
Geist, Simon	WS	2	May 16, 2017	May 30, 2017	M	TAMUCC[2]	Germany
Grace, Mark	WS	1	April 28, 2017	May 12, 2017	M	NMFS	US
Hamilton, Alonzo	WS	1 and 2	April 28, 2017	May 30, 2017	M	NMFS	US
Haney, Chris	BO	2	May 16, 2017	May 30, 2017	M	USFWS[3]	US
McDowell, Michelle	BO	2	May 16, 2017	May 30, 2017	F	USFWS[3]	US
Metheny, Nicholas	BO	1	April 28, 2017	May 12, 2017	M	USFWS[3]	US
Millett, Andrew	FPC	1 and 2	April 28, 2017	May 30, 2017	M	Riverside[1]	US
Stepongzi, Chrissy	WS	1	April 28, 2017	May 12, 2017	F	Riverside[1]	US
Wallace, Taniya	WS	1	April 28, 2017	May 12, 2017	F	Riverside[1]	US
Zapfe, Glenn	WS	2	May 16, 2017	May 30, 2017	M	NMFS	US

1 – Riverside Technology, Inc.
2 – Texas A&M University, Corpus Christi
3 – US Fish and Wildlife Service

- FPC= Field Party Chief, WL= Watch Leader, WS= Watch Stander, BO= Bird Observer

G. Administrative

1. Points of Contact:
   a. Field Party Chief: Andy Millett; 3209 Frederic St. Pascagoula, MS 39567; (228) 549-1645; Andrew.Millett@noaa.gov
   b. Operations Officer: Reni Rydlewicz; NOAA Ship *Oregon II*, 151 Watts Ave, Pascagoula, MS 39567; (228) 762-6422; OPS.Oregon@noaa.gov

2. Diplomatic Clearances: None Required

3. Licenses and Permits:

This project will be conducted under the following permits:

1. Alabama Scientific Collecting Permit issued by the Alabama Department of Conservation and Natural Resources on January 3, 2017 to Andrew Millett
2. Florida Special Activity License issued by the Florida Fish and Wildlife Conservation Commission on February 23, 2017 to Andrew Millett (License # SAL-14-0135-SR)
3. Louisiana Saltwater Scientific Collecting Permit issued by Louisiana Department of Wildlife and Fisheries on January 3, 2017 to Andrew Millett
4. Mississippi Saltwater Scientific Collecting Permit issued by Mississippi Department of Marine Resources on January 1, 2017 to Andrew Millett (Permit # SRP-008-17)
5. Texas Scientific Permit issued by Texas Parks and Wildlife Department on July 10, 2015 to Andrew Millett (Permit # SPR-0614-096)
6. Southeast Fisheries Science Center Scientific Research Permit (SRP) and Turtle Excluder Device (TED) Exemption issued by NOAA/NMFS on March 3, 2017 to Andrew Millett

II. Operations

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

A. Project Itinerary

Leg	Date	Location
1	Apr 28, 2017	Depart Pascagoula, MS
	May 12, 2017	Arrive Pascagoula, MS
Leg	Date	Location
2	May 16, 2017	Depart Pascagoula, MS
	May 30, 2017	Arrive Pascagoula, MS

B. Staging and Destaging

Staging: April 26-27; Pascagoula, MS
Destaging: May 30 – June 1; Pascagoula, MS

C. Operations to be conducted

NOAA Ship *Oregon II* will depart Pascagoula, Mississippi on April 28, 2017 to conduct the spring SEAMAP Ichthyoplankton survey. The 30-day cruise will be divided into two legs: Leg 1, 15 days; Leg 2, 15 days. Both legs of the survey will be conducted along a standard ichthyoplankton cruise track with a modified sampling plan designed to

incorporate adaptive sampling based upon current oceanographic conditions. This trackline includes 97 pre-selected stations located approximately 30 n mi apart (Figure 1). Ichthyoplankton operations will be conducted throughout the day and night. Table 1 lists the 97 stations, station positions, and the plankton gear used at each station. The station order listed in Table 1 is the preferred order of sampling as developed since 1978 for the sampling of bluefin tuna larvae in the GOM and changes to this order may be made by the FPC during the survey, but only after consulting with the CO. The survey will require 24 h operations with two scientific watches: 12 am – 12 pm, 12 pm – 12 am.

Standard stations will follow SEAMAP sampling protocols with an oblique bongo tow to a maximum depth of 200 m, a 10 min neuston tow, and a CTD profile to a maximum depth of 200 m. In addition, a 10 min shallow bongo will be conducted at each station using 61 cm bongo frame outfitted with two 0.500 mm mesh nets.

Prior to arrival at the first station the SBE 9/11 plus CTD and the SEACAT SBE 19 CTD (with a weight) will be deployed in water depth greater than 100 m in order to test the functionality of the winches, hydraulics, CTD array, and SEACAT. Any problems encountered during the test can then be corrected prior to arriving on the first station. The Chief Engineer will be made aware of expected time of arrival at the first station so the salt water pumps can be turned on and ready.

Communication between the scientists and the bridge while on station will be accomplished via hand held radios. During rough weather, the watch leader and OOD with consultation from the ship's crew will determine which sampling gear can be deployed safely. The FPC should be notified of any change to station location or delays to sampling due to mechanical, medical, or weather issues as well.

PRIMARY STATION OPERATIONS – At the Bridge's 10 min warning, scientists and deck personnel will proceed to duty stations and prepare for station. Scientists and deck personnel should be ready and standing by for bridge's call that the ship is on station and ready to proceed. Smoking is not permitted near or while handling any plankton nets due to the likelihood of burning holes in the nets.

Bongo Sampling

The SEAMAP bongo plankton sampler is comprised of two 61 cm diameter collars with two 0.335 mm nets. Prior to deployment of the bongo sampler, the watch leader must run software programs and prepare them for the bongo cast. The lab scientist must make sure the bridge and deck are ready to deploy before hitting >Ok on SBE 19 SEACAT program because this program only allows 60 s to turn on the magnetic switch or the setup process must be repeated, often including re-booting the computer. The lab scientist should wait for the bridge and deck to relay their readiness to deploy gear, hit ok on the program, have the deck turn on the magnetic switch at the appropriate time, and wait for data to begin scrolling. There is a small delay between the switch and data scroll, therefore, the lab scientist will relay to the deck when to put the net into the water. The bongo sampler is towed in an oblique path from near bottom, or 200 m maximum, to the surface. The SBE-19 SEACAT will be used to monitor the tow path of the bongo net. Vessel speed should be adjusted during the bongo tow to maintain a 45º wire angle in order to uniformly sample throughout the water column. If angle exceeds 55º, falls to 35º or if combined variation exceeds 15º, then tow must be repeated (the

samples will be saved until a better tow is completed). If available, an electronic wire angle indicator with readouts on the bridge and in the dry lab will also be used to monitor wire angle. The net depth will be monitored on the dry lab computer by the watch leader. The Deck Scientist will report wire angles periodically during downcast. On the watch leader's command at maximum depth, stop payout of cable and immediately start retrieval (do not allow net to 'settle'). At that time, the Deck Scientist (or winch operator) will report wire angle and wire out to the watch leader. The watch leader should tell the winch operator to slowly retrieve the bongo array at 20 m per min for tow depths of 100 m or deeper; for shallower stations the retrieval rate will be determined at each station based on station depth. The Deck Scientist (or winch operator) must report wire angle and remaining wire out to watch leader when asked for (on upcast or downcast).

The Deck Scientist should report when the bongo array breaks the surface. Time will be recorded to the second (by the watch leader) when net breaks surface and flowmeters stop turning, at which time the winch operator immediately pulls the frame from the water; taking care not to let the bongo array continue to fish once it breaks the surface. When possible, plankton will be rinsed into the cod end of the net with a seawater hose while the net hangs over the side. In high winds, the watch leader may request that the net is brought directly on board and rinsed down completely on deck. Great care must be taken not to rest the frame on the nets, scrape the net with the frame against the deck, or walk on the ichthyoplankton nets. The abrasions can cause holes in the nets requiring repair or replacement of these expensive sampling devices.

If bottom sediment is present in both samples, the tow must be repeated. Any marginal sample will be saved until completion of the next tow. If bottom sediment (no more than 2 Tb) is present in only one sample the tow need not be repeated. Initial preservative for right bongo samples is 95% ETOH (Ethyl Alcohol) and initial preservative for left bongo samples is 10% formalin. Formalin preserved samples are transferred to 95% ETOH after 36 h. Ethanol samples will be transferred to new 95% ETOH after 24 h. Any sample requiring more than six quart jars will not be preserved and will be immediately discarded.

Neuston Sampling

The neuston net is a 1 x 2 m frame outfitted with a 0.950 mm mesh net. Each neuston tow will be conducted for 10 min at a vessel speed of approximately 2 kt to keep half the frame submerged in the water. If necessary, the ship should steam forward in a wide arc to keep the neuston net (mouth opening) out of the influence of the prop wash. The duration of a neuston tow may be shortened up to 5 min when there are high concentrations of jellyfish, ctenophores, Sargassum, floating weed and/or debris. After retrieval, plankton is rinsed into cod end with seawater while net hangs over side (if windy, watch leader may request net to be brought directly on board and rinsed on deck). Samples will be preserved in 95% ETOH initially and transferred to new 95% ETOH after 24 h. Any sample requiring more than six quart jars will not be preserved and will be immediately discarded.

Shallow Bongo Sampling

The shallow bongo tow uses a 61 cm bongo frame outfitted with a 0.500 mm

mesh net. The net is towed in a multi-oblique pattern from the surface to a depth of 10 m for 10 min. Vessel speed should be adjusted during the bongo tow to maintain a 45º wire angle in order to uniformly sample throughout the water column. If angle exceeds 55º, falls to 35º or if combined variation exceeds 15º, then tow must be repeated. The duration of a tow may be shortened up to 5 min when there are high concentrations of jellyfish, ctenophores, Sargassum, floating weed and/or debris. After retrieval, plankton is rinsed into cod end with seawater while net hangs over side (if windy, watch leader may request net to be brought directly on board and rinsed on deck). Samples will be preserved in 95% ETOH initially and transferred to new 95% ETOH after 24 h. Any sample requiring more than six quart jars will not be preserved and will be immediately discarded.

1 m MOCNESS Sampling

A 1 m MOCNESS equipped with a maximum of nine, 0.505 mm mesh nets will be deployed from the stern using the dedicated MOCNESS winch equipped with a 3/8 in conducting wire and poded termination. Prior to deployment, the ship speed will be maintained at 2 kt. Once deployed, a series of up to nine nets can be opened independently at specific depths to obtain a discrete sample of that depth bin. Winch and ship speed will be controlled by the watch leader throughout the tow via communication with the deck and bridge. This is done in order to maintain the gear in a specific depth stratum and allow the net to filter the targeted volume of water, i.e. 250 – 350 m^3 per net. In order to ensure enough volume is filtered for each depth bin, a 'bounce' method will be used during the retrieval in shallower depth bins. The MOCNESS will be brought up to the top of the depth bin, lowered back down to the bottom of the bin, and then brought back up to the top. This method allows for consistency in sampling each of the depth bins during the tow. After retrieval, samples will be rinsed into cod ends with seawater before bringing the MOCNESS on deck. The sample in net 0 (surface to max depth) will be initially preserved in 10% formalin and transferred to 95% ETOH after 36 h. Samples from the remaining nets will be initially preserved in 95% ETOH and then transferred to fresh 95% ETOH after 24 h. More detailed protocols for conducting a MOCNESS event will be provided by the FPC. Any sample requiring more than six quart jars will not be preserved and will be immediately discarded.

Initial MOCNESS station locations will be determined by the FPC prior to departure.

SEAMAP CTD Profiles

The CTD unit with the SBE 32 water carousel with three Niskin bottles will be deployed to just below the surface of the water when all areas are ready. When at the surface, the lab scientist will start the CTD recording. The sampler must then remain submerged for 3 min at the surface for the temperature gauge to adjust to the water temperature after sitting on deck between stations. After the 3 min soak period it will be lowered to a depth of 200 m (or 2 m above the bottom). After the cast, the CTD is carefully set on deck, taking care not to jar the sensitive electronics. During each CTD profile, water samples will be collected at the surface, bottom (or max depth), and the in situ observed chlorophyll maximum.

Jellyfish data collection

Jellyfish and select ctenophores collected in plankton samples will be rinsed, removed from the sample, identified, counted, measured, and weighed. These data will be recorded on special data sheets and noted in the SEAMAP Access database.

Modifications to Field Operations

Sampling protocol may be altered by the FPC or watch leader in order to optimize sampling for time conservation. The FPC may alter the project instructions in order to accomplish mission objectives but will do so only after consulting with the CO. If additional time becomes available during a leg, the FPC will provide the ship with further station locations at that time, after consulting with the CO. The watch schedule for the scientific party will be posted. At times the schedule may change due to unforeseen circumstances during the cruise. If the schedule does change the ship will be notified.

Mitigation Measure for Protected Species

Under the Preferred Alternative, the SEFSC will initiate a formalized "Move-on" Rule. If any marine mammals, sea turtles or other protected species are sighted around the vessel before setting the gear, the vessel may be moved away from the animals to a different section of the sampling area if the animals appear to be at risk of interaction with the gear at the discretion of the FPC (Chief Scientist) and Scientific Watch Leader. In most cases, fishing gear is not deployed if marine mammals or sea turtles have been sighted near the ship unless those animals do not appear to be in danger of interactions with the gear, as determined by the judgment of the FPC (Chief Scientist) and Scientific Watch Leader.

The SEFSC will initiate a process for its FPC (Chief Scientist), Scientific Watch Leaders and vessel officers to communicate with each other about their experiences with protected species interactions during research work with the goal of improving decision-making regarding avoidance of adverse interactions. As noted in the Status Quo Alternative description of mitigation measures, there are many situations where professional judgment is used to decide the best course of action for avoiding protected species interactions before and during the time research gear is in the water. The intent of this mitigation measure would be to draw on the collective experience of people who have been making those decisions, provide a forum for the exchange of information about what went right and what went wrong, and try to determine if there are any rules-of-thumb or key factors to consider that would help in future decisions regarding avoidance practices. The SEFSC would coordinate not only among its staff but also with those from other fisheries science centers with similar experience.

The SEFSC deploys a wide variety of gear to sample the marine environment during all 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.

D. Dive Plan

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

Scientific dives are not planned for this project. If the ship must conduct dive ops while at sea the CO will confer with the FPC as to when the dive ops will occur so the dive will have the least impact on the scientific work.

E. Applicable Restrictions

Inclement weather

III. Equipment

A. Equipment and Capabilities Provided by the Ship

1. Because of the importance of the CTD equipment package to record environmental data and the need for the Scientific Computing System (SCS) to populate the Fishery Scientific Computing System (FSCS), an Electronics Technician is imperative.
2. Hydrographic winch with wire and meter readout to accomplish CTD/bottle casts and bongo tows up to a 200 m depth. Winch speed should be variable to include 50 m/min during pay-out and 20 m/min during haul back (for bongo tows). Spare slip rings for each winch. Fully functional wire readouts for each winch.
3. Winch, block and wire for deploying neuston net.
4. Winch, block and wire for deploying the MOCNESS sampling system.
5. One (1) Primary SBE 9plus CTD configured as follows:
    a. Unit should be mounted horizontally and mounted in the water sampling frame. The frame should be examined to ensure it is in good physical condition and there are no breaks present in any of the welds supporting the frame.
    b. The standard 12 position SBE 32 Carousel should be properly mounted in the water sampler section of the frame and tested to ensure that all 12 bottle positions are working properly and respond to software requests for firing.
    c. The internal Digiquartz pressure sensor should be in good working order and have a calibration/service date not to exceed 365 days.
    d. The primary sensor suite should be installed and consist of the following (the sensors should have a calibration date as recent as possible, not to exceed 365 days):
        i. One (1) SBE 3 Premium Temperature sensor

ii. One (1) SBE 4 Conductivity sensor
iii. One (1) SBE 43 Dissolved Oxygen sensor
iv. One (1) "Y" air bleeder valve. Valve should be checked to ensure it is not clogged.
v. One (1) Wetlabs Wetstar pumped fluorometer
vi. One (1) SBE 5T pump that has been checked by Seabird within the last 365 days for proper operation
vii. One (1) Wetlabs C-Star transmissometer
viii. Proper plumbing. Tubing should be checked to ensure it meets Seabird's recommended method of plumbing and is free from cracks and holes. With red end caps for proper storage between stations.

e. The secondary sensor suite should be installed and consist of the following (the sensors should have a calibration date as recent as possible, not to exceed 365 days):
i. One (1) SBE 3 Premium Temperature sensor
ii. One (1) SBE 4 Conductivity sensor
iii. One (1) SBE 43 Dissolved Oxygen sensor
iv. One (1) "Y" air bleeder valve. Valve should be checked to ensure it is not clogged
v. One (1) Wetlabs Wetstar pumped fluorometer
vi. One (1) SBE 5T pump that has been checked by Seabird within the last 365 days for proper operation
vii. One (1) Wetlabs C-Star transmissometer
viii. Proper plumbing. Tubing should be checked to ensure it meets Seabird's recommended method of plumbing and is free from cracks and holes.

f. The unit should be properly terminated and connected to a properly functioning SBE 11 Deck Unit. The deck unit should be connected to allow the following:
i. Proper control of the SBE Water Sampler Carousel via the SEASAVE application
ii. Integration of a proper NMEA signal from a GPS unit.

6. A second SBE 9plus profiler should be available as well. Unit does not have to be configured as a complete functioning ready-to-install on the sea cable unit; however, it should have the following components available:
a. Sensors for a Primary suite (with a calibration date as recent as possible, not to exceed 365 days):
i. One (1) SBE 3 Premium Temperature sensor
ii. One (1) SBE 4 Conductivity sensor
iii. One (1) SBE 43 Dissolved Oxygen sensor
iv. One (1) "Y" air bleeder valve. Valve should be checked to ensure it is not clogged.
v. One (1) Wetlabs Wetstar pumped fluorometer
vi. One (1) SBE 5T pump that has been checked by Seabird within the last 365 days for proper operation.

vii. One (1) Wetlabs C-Star transmissometer
viii. Proper plumbing. Tubing should be checked to ensure it meets Seabird's recommended method of plumbing and is free from cracks and holes.

b. Sensors for a complete Secondary suite (with a calibration date as recent as possible, not to exceed 365 days):
i. One (1) SBE 3 Premium Temperature sensor
ii. One (1) SBE 4 Conductivity sensor
iii. One (1) SBE 43 Dissolved Oxygen sensor
iv. One (1) "Y" air bleeder valve. Valve should be checked to ensure it is not clogged.
v. One (1) Wetlabs Wetstar pumped fluorometer
vi. One (1) SBE 5T pump that has been checked by Seabird within the last 365 days for proper operation.
vii. One (1) Wetlabs C-Star transmissometer**.**
viii. Proper plumbing. Tubing should be checked to ensure it meets Seabird's recommended method of plumbing and is free from cracks and holes.

7. A second SBE 11 Deck Unit should be on the ship to be put into service if needed.
8. Two (2) fully operational SBE 19 SEACAT profilers should be available. One of the units should be installed on the sea cable. Both units should have calibration dates not to exceed 365 days.
9. Two (2) functional SBE 36 Deck units should be available (1 for backup) that are configured for the model SEACAT being supplied.
10. Two (2) PDIM units should be available for use with the SBE 19 units. One of these PDIM units should be installed on the primary SBE19 on the sea cable. These PDIM units should also be the proper units that are used with the model SEACATs being used.
11. A fully functional SBE 21 thermosalinograph should be available for the survey. The unit should have calibrations that do not exceed 365 days. The calibration data must be verified/entered into the SEABIRD-TSB.CAL file in the Ship Directory of SCS.
12. The Turner 10-AU Fluorometer associated with the flow-through system should be verified as working. Proper spare bulbs should be made available to the rotating ET so they can be replaced as needed during the survey.
13. It is highly desirable to have the following additional spare sensors on-board if possible:
    a. One (1) SBE 43 DO Sensor
    b. One (1) SBE 3 Temperature Sensor
    c. One (1) SBE 4 Conductivity Sensor
    d. One (1) Wetlabs Wetstar pumped fluorometer
    e. One (1) Wetlabs C-Star Transmissometer
    f. One (1) SBE 5T Pump
14. Copies of all calibration sheets for CTD profilers, TSG, and spare sensors should be provided to the laboratories' Shipboard System Specialist prior to

sailing.

15. CTD capable winch and J-frame for CTD casts, with sufficient electromechanical cable for casts to 200 m.
16. NMEA GPS input to CTD header file.
17. SCS data requested: The SCS system should be fully operational for the duration of the survey. A listing of any sensors that will not be functional for the survey should be provided prior to sailing to the FPC, taking into consideration that event templates will have to be checked by the Shipboard System Specialists to ensure there will be no impact or an alternative sensor can be selected.
    a. Furuno 951 GPS
        i. UTC time
        ii. Latitude
        iii. Longitude
        iv. Speed over ground
        v. Course over ground
    b. Furuno GP-90 GPS
        i. Latitude
        ii. Longitude
        iii. Speed over ground
        iv. Course over ground
    c. Furuno doppler speed log
        i. Speed through the water
        ii. Speed over ground
    d. EQ50 and EK60 depth in meters
    e. Gyro-heading
    f. Air temperature (°C)
    g. Corrected barometric pressure
    h. True wind speed
    i. True wind direction
    j. Information should be passed to the Rotating ET to ensure the following:
        i. The Automatic Logger Control on the SCS Server must be enabled anytime ACQ is started and should use the default of 0:00:00 (Midnight GMT).
        ii. The contents of the Eventdata folder should be allowed to remain present for the duration of the survey (they should not be deleted between legs). This will ensure that event IDs do not restart for the respective events during the survey.
    k. SEASAVE SOFTWARE: Prior to sailing, the proper .CON files should be built in SEASAVE. The software should be set to look for the proper .CON file for the respective instrument.
18. It is also highly desirable that the ASCII Out function be allowed to feed CTD data into SCS via serial cable.

B. Equipment and Capabilities Provided by the Scientists

1. Flowmeters (6)
2. 2- 61 cm bongo frames, chain and weight, (6) 0.335 mm nets
3. 3- 1 x 2 m neuston frames, (4) 0.950 mm nets, (2) 0.500 mm nets
4. 1 m MOCNESS frame, (9) 0.505 mm nets, and electronic equipment
5. Bongo/neuston gear and equipment box
6. Plankton sampling supplies box
7. Plankton preserving jars, lids and labels
8. Turner Designs 10-AU benchtop Fluorometer
9. Chemical transfer pumps
10. GF/F filters
11. 6 Niskin bottles
12. 4 Garden hoses for washing down nets, nozzles, and hose repair parts
13. Plankton transfer table
14. 5 gal buckets
15. Various clerical supplies
16. Spare batteries for the SBE 19 SEACAT profilers

IV. Hazardous Materials

A. Policy and Compliance:

The FPC 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**
Formaldehyde solution (37%)	3 x 4L plastic bottles		Andrew Millett	F
Ethanol (90%)	3 x 55 gal drum		Andrew Millett	E
Acetone (90%)	3 x 4L plastic bottles		Andrew Millett	A

C. Chemical safety and spill response procedures

A: Acetone

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

E: Ethanol

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

- Do not use combustible materials, such as saw dust.

F: Formalin/Formaldehyde

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

Product Name	**Amount**	**Chemicals it is useful against**	**Amount it can clean up**
Formaldehyde neutralizer	5 gallon bucket	Formaldehyde	30 gallons per 5 gallon bucket
Universal Spill CleanUp Kit	5 gallon kit	Any chemical spill	5 gallons per kit
Kitty Litter	3*5 gallon buckets	Any chemical spill	10 gallons per bucket

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*
   1. OMAO Data
   2. Program Data

B. Responsibilities:
   The FPC is responsible for submission of a ROSCOP II form (NOAA, Form 2423) to the National Oceanographic Data Center within 30 days after cruise termination.

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The FPC and CO 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 FPC in arranging this meeting.

B. Vessel Familiarization Meeting: The CO 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 h of the project's start and is normally presented by the ship's Operations Officer.

C. Post-Project Meeting: The CO is responsible for conducting a meeting no earlier than 24 h before or no later than seven 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, vessel coordinator, FPC, and members of the scientific party and is normally arranged by the Operations Officer and FPC.

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 three 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 FPC. The FPC and CO 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 FPC 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 FPC 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 FPC will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the FPC 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 CO. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, Revised: 02 JAN 2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the FPC 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
E-mail MOA.Health.Services@noaa.gov

Prior to departure, the FPC must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, e-mail 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's 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 FPC to ensure members of the scientific party report aboard with the proper attire.

D. Communications

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

E. IT Security

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

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

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

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within three 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 FPC:

1. Provide the CO 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 FPC 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 CO and the FPC 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 CO:

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 FPC 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 FPC 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 FPC of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the FPC can take steps to prevent unlicensed export of Program controlled technology. The CO and the FPC 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

IX. Appendices

Table 1. *Oregon II* Cruise R2-17-02 (322) ichthyoplankton stations. A CTD cast will be done last at all stations. BN = 61 cm Bongo; NN = 1x2 m Neuston; SB= Shallow Bongo.

SEAMAP ISS* Number	Plankton Gear	Latitude	Longitude
B172	SB/BN/NN	29° 59'00	87° 00'00
B169	SB/BN/NN	29° 30'00	86° 30'00
B165	SB/BN/NN	29° 12'00	86° 00'00
B160	SB/BN/NN	28° 40'00	85° 30'00
B153	SB/BN/NN	28° 00'00	85° 00'00
B152	SB/BN/NN	27° 30'00	85° 00'00
B151	SB/BN/NN	27° 00'00	85° 00'00
B150	SB/BN/NN	26° 30'00	85° 00'00
B149	SB/BN/NN	26° 00'00	85° 00'00
B147	SB/BN/NN	26° 00'00	84° 30'00
B131	SB/BN/NN	26° 00'00	84° 00'00
B130	SB/BN/NN	25° 30'00	84° 00'00
B129	SB/BN/NN	25° 00'00	84° 00'00
B128	SB/BN/NN	24° 30'00	84° 00'00
B125	SB/BN/NN	24° 30'00	83° 30'00
B126	SB/BN/NN	24° 00'00	83° 30'00
B127	SB/BN/NN	24° 00'00	84° 00'00
B263	SB/BN/NN	24° 30'00	84° 30'00
B262	SB/BN/NN	25° 00'00	84° 30'00
B007	SB/BN/NN	25° 00'00	85° 00'00
B072	SB/BN/NN	24° 30'00	85° 00'00
** B266	SB/BN/NN	24° 40'00	85° 30'00
B261	SB/BN/NN	25° 00'00	85° 30'00
B008	SB/BN/NN	25° 00'00	86° 00'00
B074	SB/BN/NN	25° 30'00	86° 00'00
** B270	SB/BN/NN	25° 30'00	86° 27'00
B006	SB/BN/NN	26° 00'00	86° 00'00
B077	SB/BN/NN	26° 30'00	86° 00'00
B005	SB/BN/NN	27° 00'00	86° 00'00
B078	SB/BN/NN	27° 30'00	86° 00'00
B163	SB/BN/NN	28° 00'00	86° 00'00
B164	SB/BN/NN	28° 30'00	86° 00'00
B170	SB/BN/NN	29° 00'00	86° 30'00

Table 1 continued.

SEAMAP ISS* Number	Plankton Gear	Latitude	Longitude
B002	SB/BN/NN	29° 00'00	87° 00'00
B080	SB/BN/NN	28° 30'00	87° 00'00
B003	SB/BN/NN	28° 00'00	87° 00'00
B079	SB/BN/NN	27° 30'00	87° 00'00
B004	SB/BN/NN	27° 00'00	87° 00'00
B076	SB/BN/NN	26° 30'00	87° 00'00
** B009	SB/BN/NN	26° 17'00	87° 00'00
B273	SB/BN/NN	26° 00'00	87° 30'00
B010	SB/BN/NN	26° 00'00	88° 00'00
B066	SB/BN/NN	26° 30'00	88° 00'00
B011	SB/BN/NN	27° 00'00	88° 00'00
B288	SB/BN/NN	27° 00'00	88° 30'00
B012	SB/BN/NN	27° 00'00	89° 00'00
B063	SB/BN/NN	26° 30'00	89° 00'00
B013	SB/BN/NN	26° 00'00	89° 00'00
B291	SB/BN/NN	26° 00'00	89° 30'00
B014	SB/BN/NN	26° 00'00	90° 00'00
B062	SB/BN/NN	26° 30'00	90° 00'00
B015	SB/BN/NN	27° 00'00	90° 00'00
B296	SB/BN/NN	27° 00'00	90° 30'00
B018	SB/BN/NN	27° 00'00	91° 00'00
B059	SB/BN/NN	26° 30'00	91° 00'00
B019	SB/BN/NN	26° 00'00	91° 00'00
B299	SB/BN/NN	26° 00'00	91° 30'00
B020	SB/BN/NN	26° 00'00	92° 00'00
B058	SB/BN/NN	26° 30'00	92° 00'00
B021	SB/BN/NN	27° 00'00	92° 00'00
B304	SB/BN/NN	27° 00'00	92° 30'00
B024	SB/BN/NN	27° 00'00	93° 00'00
B055	SB/BN/NN	26° 30'00	93° 00'00
** B025	SB/BN/NN	26° 17'00	93° 00'00
** B307	SB/BN/NN	26° 01'00	93° 30'00
** B026	SB/BN/NN	26° 01'00	94° 00'00

Table 1 continued.

SEAMAP ISS* Number	Plankton Gear	Latitude	Longitude
B054	SB/BN/NN	26° 30'00	94° 00'00
B027	SB/BN/NN	27° 00'00	94° 00'00
B312	SB/BN/NN	27° 00'00	94° 30'00
B028	SB/BN/NN	27° 00'00	95° 00'00
B052	SB/BN/NN	26° 30'00	95° 00'00
** B029	SB/BN/NN	26° 01'00	95° 00'00
** B313	SB/BN/NN	26° 01'00	95° 30'00
** B030	SB/BN/NN	26° 01'00	96° 00'00
B240	SB/BN/NN	26° 30'00	96° 00'00
B031	SB/BN/NN	27° 00'00	96° 00'00
***B232	SB/BN/NN	27° 33'00	96° 00'00
B231	SB/BN/NN	28° 00'00	96° 00'00
B226	SB/BN/NN	28° 00'00	95° 30'00
B223	SB/BN/NN	28° 00'00	95° 00'00
B217	SB/BN/NN	28° 00'00	94° 30'00
B216	SB/BN/NN	28° 00'00	94° 00'00
B209	SB/BN/NN	28° 00'00	93° 30'00
B023	SB/BN/NN	28° 00'00	93° 00'00
B202	SB/BN/NN	28° 00'00	92° 30'00
B022	SB/BN/NN	28° 00'00	92° 00'00
B195	SB/BN/NN	28° 00'00	91° 30'00
B017	SB/BN/NN	28° 00'00	91° 00'00
B190	SB/BN/NN	28° 05'00	90° 30'00
B016	SB/BN/NN	28° 00'00	90° 00'00
B185	SB/BN/NN	28° 00'00	89° 30'00
B083	SB/BN/NN	28° 00'00	89° 00'00
B250	SB/BN/NN	28° 00'00	88° 30'00
B082	SB/BN/NN	28° 00'00	88° 00'00
B081	SB/BN/NN	28° 30'00	88° 00'00
B001	SB/BN/NN	29° 00'00	88° 00'00
B176	SB/BN/NN	29° 30'00	88° 02'00

* ISS = SEAMAP ichthyoplankton sampling site
** Denotes station locations moved 1 mile north from projected locations due to proximity to EEZ.
***Denotes station B# corrected from past years.

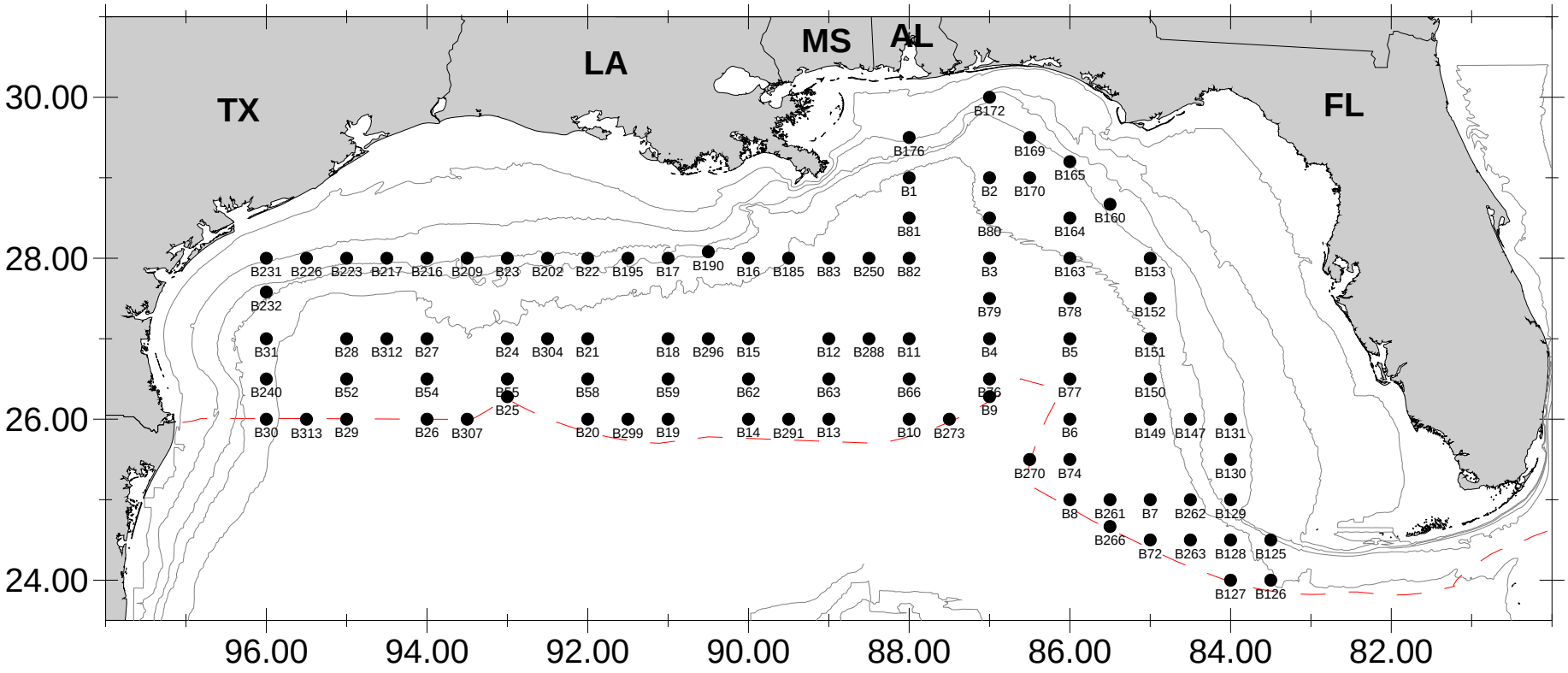

Figure 1. Cruise track with SEAMAP ichthyoplankton stations for NOAA Ship *Oregon II* Cruise 17-02 (322), April 28 – May 30, 2017.