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

September 14, 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 R2-17-05
SEAMAP Fall Groundfish

Attached is the final Project Instruction for R2-17 -05, SEAMAP Fall Groundfish, which is scheduled aboard NOAA Ship *Oregon II* during the period of October 7 to November 21, 2017. Of the 41 DAS scheduled for this project, 41 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. DEPARTME OF COMMERCE
National Oceanic and At ospheric Administration
National Marine isheries Service
Southeast Fisheri s Science Center
3209 Fr deric St.
Pascagoula MS 39567

Project In tructions

Date Submitted: 09/01/2017

Platform: NOAA Ship OREGON II

Cruise Number: R2 17-05 (325)

Project Title: SEAMAP Fall Groundfish

Cruise Dates: 10/07/2017 11/ 21/2017

Prepared by: DEBOSE.ANDRE.J.1365866097 Digitally signed by DEBOSE.ANDRE.J.1365866097 Date: 2017.09.07 13:50:00 -05'00'
Field Party Chief
Date: 09/07/2017

Approved by: DESFOSSE.LISA.L.1365834519 Digitally signed by DESFOSSE.LISA.L.1365834519 Date: 2017.09.12 13:13:21 -05'00'
Lab Director
Date: 09/12/2017

Approved by: BRAINERD.THEOPHILUS.R.DR.LU.SR.DR1365819285 Digitally signed by BRAINERD.THEOPHILUS.R.DR.LU.SR.DR.1365819285 Date: 2017.09.12 14:33:22 -04'00'
Dr. Bonnie Ponwith
Director, SEFSC
Date: 09/12/2017

Approved by:
Captain Scott M. Sirois, NOAA
Commanding Officer
Marine Operations Center - Atlantic
Date: 9/19/17

I. Overview

A. Brief Summary and Project Period

Sample the northern Gulf of Mexico (GOM) with Southeast Area Monitoring and Assessment Program (SEAMAP) standard trawl sampling gear to determine the abundance and distribution of the benthic fauna from October 7 to November 21, 2017.

B. Days at Sea (DAS)

Of the ___ DAS scheduled for this project, _0_ DAS are funded by an OMAO allocation, __ 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 between 81°00' and 97°30' W in depths of 5 to 60 fm. A list of the station locations and a map of the area of operations are found in Figure 1. Approximate station locations will be provided to the Operations Officer for importing into Nobeltec Visual Navigation Suite software.

D. Summary of Objectives

1. **Primary Objectives**
   a. Sample the northern GOM with SEAMAP standard trawl sampling gear to determine the abundance and distribution of benthic fauna.
   b. Collect length frequency data and life history samples for various species to determine population size structures.
   c. Record profiles through the water column of temperature, salinity, fluorescence, dissolved oxygen, and turbidity using a Conductivity/Temperature/Depth (CTD) unit at SEAMAP stations.
   d. Collect water samples weekly and perform benchtop dissolved oxygen tests using an Orion 3 Star Portable DO meter.
   e. Place an EchoLogger A400 autonomous hydroacoustic altimeter on the trawl foot-rope at every trawlable station.
   f. Conduct bottom mapping using a sidescan sonar, Olex system, and EK-60 depth sounder to determine trawlable habitat on all East Delta stations in depths less than 50 fm.
2. **Secondary Objectives**
   a. Conduct additional trawl sampling.
   b. Conduct additional CTD casts.

E. Participating Institutions

1. National Marine Fisheries Service (NMFS) – Pascagoula, MS Laboratory
2. Tulane University

3. Texas A&M University – Corpus Christi

F. Personnel/Science Party

Name (Last, First)	Title	Leg(s)	Date Aboard	Date Leaving	Gender	Affiliation	Nationality
Debose, Andre	FPC	all	10/7/2017	11/21/2017	M	NMFS	U.S.
Hamilton, Alonzo	Watch Leader	all	10/7/2017	11/21/2017	M	NMFS	U.S.
Kevin Rademacher	Watch Leader	1 & 3	10/7/2017 (1) 11/11/2017 (3)	10/22/2017 (1) 11/21/2017 (3)	M	NMFS	U.S.
John Moser	Watch Stander	1 & 3	10/7/2017 (1) 11/11/2017 (3)	10/22/2017 (1) 11/21/2017 (3)	M	NMFS	U.S.
Kenny Wilkinson	Watch Stander	1	10/7/2017	10/22/2017	M	NMFS	U.S.
Walter Ingram	Watch Stander	1	10/7/2017	10/22/2017	M	NMFS	U.S.
Celeste Morris	Watch Stander	1	10/7/2017	10/22/2017	F	Moss Point School District	U.S.
Randy Fink	Watch Stander	All	10/7/2017	11/21/2017	M	Grad. Student	U.S.
Paul Felts	Watch Stander	2	10/24/2017	11/6/2017	M	NMFS	U.S.
Michael Hendon	Watch Leader	2	10/24/2017	11/6/2017	M	NMFS	U.S.
Mark Grace	Watch Stander	2	10/24/2017	11/6/2017	M	NMFS	U.S.
Kendall Falana	Watch Stander	2	10/24/2017	11/6/2017	M	NMFS	U.S.
Emma Shultz	Watch Stander	2	10/24/2017	11/6/2017	F	Grad. Student	U.S.
Brandi Noble	Watch Stander	3	11/11/2017	11/21/2017	F	NMFS	U.S.
Nick Hopkins	Watch Stander	3	11/11/2017	11/21/2017	M	NMFS	U.S.

G. Administrative

1. Points of Contacts:

FPC of Legs 1, 2, and 3
Andre Debose
NMFS
3209 Frederic Street
Pascagoula, MS 39567
(228) 549-1669
Andre.j.debose@noaa.gov

Alternate Contact:
Eric Hoffmayer
NMFS

3209 Frederic Street
Pascagoula, MS 39567
(228) 549-1691
eric.hoffmayer@noaa.gov

Ship Point of Contact:
Lt. Reni Rydlewicz
NOAA Ship *Oregon II*
Gulf Marine Support Facility
151 Watts Avenue
Pascagoula, MS 39567-4112
(228) 769-7880
OPS.Oregon@noaa.gov

2. Diplomatic Clearances
   None Required.

3. Licenses and Permits
   a. Southeast Fisheries Science Center Scientific Research Permit (SRP) and Turtle Excluder Device (TED) Exemption
   b. NMFS 7541_FIM BiOp
   c. Texas Scientific Permit: SPR-0596-796
   d. Louisiana Saltwater Scientific Collecting Permit SCP 46
   e. Mississippi Saltwater Scientific Collecting Permit
   f. Alabama Scientific Collecting Permit
   g. Florida Special Activity License: Permit No. SAL-14-0135-SR

II. Operations

The Field Party Chief (FPC) is responsible for ensuring that 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	Depart Location	Date	Arrive Location	Sea Days
1	10/7/2017	Pascagoula, MS	10/22/2017	Galveston, TX	16
2	10/24/2017	Galveston, TX	11/6/2017	Pascagoula, MS	14
3	11/11/2017	Pascagoula, MS	11/21/2017	Pascagoula, MS	11

B. Staging and Destaging:
1. A pre-cruise meeting and vessel loading aboard NOAA Ship *Oregon II* will occur October 6th, 2017 in Pascagoula, MS.
2. Unloading of NOAA ship *Oregon II* will occur November 21, 2017 in Pascagoula, MS.

C. Operations to be conducted:

NOAA Ship *Oregon II* will depart Pascagoula, MS on October 7, 2017 to conduct the summer SEAMAP Bottomfish survey. The 41-day cruise will be conducted in three legs, requiring 24 hour operations with two scientific watches: 12 am-12 pm, 12 pm-12 am. The ship is requested to trawl at preselected stations between depths of 5 and 60 fm, from the south Texas coast eastward to south Florida (Figure 1). The FPC will provide sampling locations in electronic files suitable for importing into Nobletec navigation software and MX512A GPS. Trawling stations will usually consist of CTD casts followed by trawling tows. There may be occasions when the scientific party will request a second CTD cast at trawl sites (based on dissolved oxygen concentrations and magnitude of catch). Trawling station locations are not to be moved without prior consultation with the Watch Leader (WL) on watch or the FPC.

Prior to arrival at the first station on the SBE 9/11 plus CTD will be deployed in order to test the functionality of the winches, hydraulics, and CTD array. The Chief Engineer will be made aware of expected time of arrival at the first station so the saltwater pump to the wet lab and the conveyor belt will be turned on and ready prior to the first station. Likewise, the freezers in the dry lab and the forward freezers will be turned on. Any problems encountered during the test can then be corrected prior to arriving on the first station. Communication between the scientists and the bridge while on station will be accomplished via handheld radios. During rough weather, the watch leader with consultation from the ship's crew will determine which sampling gear can be deployed safely. The FPC should be notified of any delays to sampling due to mechanical, medical, or weather issues as well.

1. Primary Station Operations

CTD casts and trawl tows are to be made within a 2.5 nautical mile radius of the provided coordinates. 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 the bridge's call that the ship is on station and ready to proceed.

a. **CTD Cast**

CTD profiles and environmental data collection will be performed at each station. We request that the ship come to a complete stop, after which the CTD array is to be deployed to just below the water's surface where it will sit for 3 min. After the CTD array is overboard, clear of all personnel and being lowered to 3 m below the surface the watch leader (lab scientist) will turn on the power to the unit and start the CTD recording. The unit must remain at the surface for 3 min to allow the unit to equilibrate to ambient temperature, after which time the unit is raised to the surface and then lowered to approximately 2 m above the bottom or a max depth of 60 fm. After the cast, the CTD should be carefully set on deck, taking care not to jar the sensitive electronics. At least once a week, a water sample will be taken during the CTD cast. During these casts, the CTD protocol will be as described with the exception that the CTD unit will be held at depth for 1 min, a water sample collected, and then retrieved. The WL will clear the y-connections periodically throughout the cruise. Additional environmental data that will be collected during daylight hours are depth, water color, percent cloud cover, and sea condition. The

ship's thermosalinograph (TSG) will be in use 24 h/day. Dissolved oxygen concentrations from sensors on the CTD will be verified using an Orion 3 Star Portable DO meter made by Thermo Scientific daily by the FPC. The FPC will transmit data to a FTP site of NOAA's National Center for Environmental Information located at the Stennis Space Center, Mississippi.

b. Trawl Sampling

One 30 min tow will be conducted with a standard SEAMAP 40-ft trawl towed at a speed of 2.5 kt. Bridge watches are requested to conduct trawling operations such that each tow occurs completely within a 2.5 nautical mile radius of provided station locations. During development, the deck department will deploy the gear at a rate that allows the doors to properly spread just after being submerged. The net is to be kept moving across the bottom so that the tickler chain is towed gently across the bottom, and the doors gently glide across the top of the substrate. Tow direction will follow the depth contour when possible, and the WL or FPC will be consulted when that direction is not suitable. Upon retrieval, the deck department will bring the gear shipboard at a rate that allows the doors to meet, without crossing. If, at any time, the deck department or OOD notices an issue with the gear, deployment or retrieval, they will notify the watch leader or FPC immediately. We ask that the gear not be streamed between stations when transit time is 1 h or greater. The deck department is requested to drag the net for at least 3 min with the cod end in the water after the gear is brought to the block. The deck department is then requested to shake down the net after each station to remove all organisms. The handling of the gear will be conducted by the deck department, unless otherwise instructed by the crew. After clearance from the deck department, the scientists will collect all the organisms in baskets and begin weighing, identifying, measuring, and sampling the biota. After the catch is removed from the deck, the deck department will inspect the trawl net for any tears and holes in the net, report any findings to the watch leader, and repair the net. The net is to be cleaned of any debris, *Sargassum*, or organisms and the cod end is to be tied closed by the deck department prior to arrival at the next station. They are also asked to inspect tickler chain length at approximately 24 h intervals giving due consideration to weather conditions and work demands. If the net needs to be replaced, the deck department is to provide the watch leader with the net number of the damaged net and the replacement net. During legs with a Fisheries Methods and Equipment Specialist (FMES) aboard, the FMES and deck department will collaborate to evaluate and repair the gear. At any time that the trawl is not secured by the deck department, the scientific party will don personal protective equipment (PPE), which includes, but not limited to, work vest and hardhat. In case of extreme mud in the net, the deck department, OOD, and watch leader will determine the best way to wash down the gear before the catch is emptied from the net.

As the catch is being processed, the conveyor belt and salt water will be in use in the wet lab. The scientific party will secure all sorting gear to prevent it from falling down the fish chute. Likewise, they will monitor the discharge chute to prevent backups into the wet lab. After the catch is processed, any specimens being kept will be frozen or preserved in ethanol or formalin. The remaining catch will be removed from the vessel via the conveyor belt, unless

sampling gear is in the water. If sampling gear is in the water, the catch is to remain onboard until the gear is secured on deck again to avoid it being caught in the net and contaminating the new catch. The scientific party will wash equipment and the wet lab down as often as possible given work demands and weather conditions. To avoid damage to any other equipment, areas under the work benches and conveyor belts in the wet lab will be kept clear, unless it is in waterproof containers or can be wet. It is requested that the scientific party has shared control of the water in the fish chute with the engineering department to reduce the excessive noise during sampling.

c. Echologger AA40 Precision Autonomous Hydroacoustic Altimeter

The Echologger will be used at every trawlable station. The net will be brought near the railing so that the scientific party, FMES (or deck department personnel) will have access to the foot-rope in order to attach the altimeter. Once the tow is completed, the net will need to be brought to the railing again, so that the altimeter can be removed for data download.

d. **Modifications to Field Operations**

Sampling protocol may be altered by the FPC or WL 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 the survey, the FPC will provide the ship with additional station locations at that time, after consulting with the CO.

e. Mitigation Measures for Protected Species

i. Monitoring Methods

The officer on watch (or member of the Scientific Party), and crew standing watch on the bridge will visually scan for marine mammals, sea turtles, and other ESA-listed species (protected species) during all daytime operations. Bridge binoculars are used as necessary to survey the area upon arrival to the station, during visual and sonar reconnaissance of the trawl line to look for potential hazards (e.g., commercial fishing gear, unsuitable bottom for trawling, etc.), and while the gear is deployed. If any marine mammals or sea turtles are sighted by the bridge or deck crew prior to setting the gear or any time gear is in the water, the bridge crew and/or FPC are alerted immediately. Environmental conditions (e.g., lightning, sea state, precipitation, fog, etc.) often limit the distance for effective visual monitoring of protected species.

ii. Operational Procedures

If any marine mammals, sea turtles or other protected species are sighted around the vessel before gear deployment, in most cases, gear is not deployed unless those animals do not appear to be in danger of interactions with the gear, as determined by the judgment of the FPC/WL. The vessel may be moved or gear deployment may be delayed until the animals no longer appear to be at risk of interaction with the gear. If trawling operations have been delayed because of the presence of marine mammals or sea turtles, the vessel resumes trawl operations only when these species have not been recently sighted or otherwise determined to

no longer be at risk. This decision is at the discretion of the FPC or WL and is dependent on the situation.

Once the trawl net is in the water, if protected species are sighted before the gear is fully retrieved, the most appropriate response to avoid incidental take is determined by the professional judgment of the FPC or WL in consultation with the officer on watch as necessary. These judgments take into consideration the species, numbers, and behavior of the animals, the status of the trawl net operation (net opening, depth, and distance from the stern), the time it would take to retrieve the net, and safety considerations for changing speed or course. Most marine mammals have been caught during haul-back operations, especially when the trawl doors have been retrieved and the net is near the surface and no longer under tension. In some situations, risk of adverse interactions may be diminished by continuing to trawl with the net at depth until the marine mammals and/or sea turtles have left the area before beginning haul-back operations. In other situations, swift retrieval of the net may be the best course of action. The appropriate course of action to minimize the risk of incidental take of protected species is determined by the professional judgment of the FPC or WL based on all situational variables, even if the choices compromise the value of the data collected at the station.

Care is taken when emptying the trawl, including opening the cod end as close as possible to the deck of the checker (or sorting table) in order to avoid damage to protected species that may be caught in the gear but are not visible upon retrieval. The gear is emptied as quickly as possible after retrieval in order to determine whether or not protected species are present.

iii. Tow duration

In 2008, standard tow durations for bottom trawl surveys were reduced from 55 min to 30 min at targeted depth, excluding deployment and retrieval time, to reduce the likelihood of attracting and incidentally taking protected species. These short tow durations decrease the opportunity for curious marine mammals to find the vessel and investigate. Tow times are less than the 55 min tow time restriction required for commercial shrimp trawlers not using turtle excluder devices (TEDs) (50 CFR 223.206). The resulting distance towed is typically one to two nautical miles or less, depending on the survey and trawl speed. Short tow times reduce the likelihood that captured sea turtles would drown.

Trawl projects designed to test bycatch reduction devices and TEDs for commercial fishing gear may have longer tow times (up to 4 h). These exceptions to the short tow duration protocols are necessary to meet their research objectives. TEDs are used in nets that are towed in excess of 55 min as required by 50 CFR 223.206.

f. Mitigation Measures for Live Bottom

Due to the high occurrence of live bottom (sponges and corals) in the East Delta, the following mitigation measures will be used during the survey to avoid these areas. Bathymetric mapping with side scan sonar equipment will be conducted with an Edgetech 4125 dual frequency side scan sonar. The Side scan sonar will be deployed using the stern crane. Prior to deployment a rub test will be performed to confirm system readiness. During deployment the ship should be underway at a slow speed (0-2 kt) or stopped in neutral

depending on the situation and sea conditions. The Edgetech side scan sonar will be used along with the EK-60 and OLEX bottom depth sounder, a Real Time SCS program, and Global Positioning System to help identify and avoid any habitat or obstructions along the sea floor. Every station in depths less than 50 m (27 fm) in the East Delta will be surveyed at least once at a target speed of 5.0 kt. All three methods will be used in combination to assist the WL and FPC in designating whether a station is trawlable. Up to three transects will be conducted at each station unless time allows for more. If all transects are deemed untrawlable, the station will be dropped at the discretion of the WL or FPC. When a transect is deemed trawlable, a CTD and a trawl will be completed.

Equipment

A. Provided by ship
   1. Stern (Side Scan Sonar operations)
   2. Mounting and power supply (230/460VAC, 3 phase, 50/60HZ) for one Side Scan Sonar winch

B. Provide by scientist
   1. Edgetech 4125 Series dual frequency side scan sonar
   2. Edgetech topside box
   3. Tow winch for SSS with 500m of cable
   4. inch control extension lever
   5. Deck cable for SSS
   6. Power cable for SSS and hydrophone
   7. Ethernet cable for SSS and hydrophone

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.

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

E. Applicable Restrictions

Conditions which preclude normal operations: adverse weather conditions

III. Equipment

A. Equipment and Capabilities Provided by the Ship:
   1. SCS version 451.1063

2. Because of the importance of the CTD equipment package to record environmental data and the need for the Scientific Computing System (SCS), an Electronics Technician is imperative.
3. Trawl winch with sufficient wire to fish in 60 fm depths and meter readouts to determine warp length
4. Hydrographic winch with wire and meter readout to accomplish CTD and bottle casts. Spare slip rings and fully functional wire readouts for each winch.
5. Three (3) touch screen monitors for the Fishery Scientific Computing System (FSCS).
6. 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.

7. 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.

8. A second SBE 11 Deck Unit should be on the ship to be put into service if needed.

9. 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.

10. 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.

11. It is highly desirable to have the following additional spare sensors on-board:
    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

12. Copies of all calibration sheets for CTD profilers, TSG, and spare sensors should be provided to the laboratories' Shipboard System Specialist prior to sailing.

13. CTD capable winch and J-frame for CTD casts, with sufficient electromechanical cable for casts to 200 m.

14. NMEA GPS input to CTD header file.

15. Inside and outside conveyor belts for processing catches.

16. Freezer space for preserving scientific specimens.

17. SCS data requested
The SCS system should be fully operation for the duration of the survey. Due to the nature of the survey work, we request that all the events (CTD and trawls) be conducted from the dry lab. 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. SIMRAD - primary
        i. UTC time
        ii. Latitude
        iii. Longitude
        iv. Speed over ground
        v. Course over ground
    b. SIMRAD - secondary
        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. OLEX- HT system
i. Latitude
ii. Longitude
iii. Depth
iv. Percent hardness

e. EQ50 and EK60 depth in meters

f. Gyro-heading

g. Air temperature (°C)

h. Corrected barometric pressure

i. True wind speed

j. True wind direction

k. 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.

l. 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.

m. It is also highly desirable that the ASCII Out function be allowed to feed CTD data into SCS via serial cable.

18. Drylab remote computers – Due to the nature of the work involved with data collection for this survey, it is recommended that all three (3) FSCS Remote units be verified for the following prior to sailing:

a. All three (3) computers are 100% operational

b. All three (3) computers are properly setup to interface as SCS clients

c. Two (2) of the units have a functioning copy of Microsoft Office XP Professional. The Office suite must provide at minimum the following programs: Word, Excel, PowerPoint and Access

d. All three (3) computers must be able to print to a functioning printer

e. At least one (1) computer needs to have QGIS

19. FPC computer – It is requested the following software be installed on the computer in the FPC's stateroom:

a. Microsoft Office XP Professional or Microsoft Office 2003 Professional consisting of the following minimum components:
i. Microsoft Word 2002 or Greater
ii. Microsoft Excel 2002 or Greater
iii. Microsoft Access 2002 or Greater
iv. PowerPoint 2002 or Greater

v. SAS (Statistical Analysis System) – It is recommended that the lab's Shipboard Systems Specialist be permitted to install this software to ensure the latest version of the software is installed. This software is licensed for installation on the ship. The *Oregon II* domain user Admin.Science has sufficient permissions to perform installation.

vi. QGIS

20. No updates to computers/software should be conducted during the survey as this can cause scientific computer systems to fail and ultimately data cannot be collected until systems are reconfigured and back up and running.

B. Equipment and Capabilities Provided by the Scientists:

1. Ten 40-ft semi-balloon trawls
2. Four sets of 8' x 40" wooden doors
3. Four 30-fm trawl bridles
4. Four 18-fm lazy lines
5. Equipment and materials for repair and maintenance of trawl gear
6. 12 plastic fish baskets
7. Four deck shovels
8. Sorting rakes and trays
9. Latex and Nitrile puncture resistant work gloves, and goggles
10. Five Marel 1100 electronic weighing scales
    a. Two 30-kg capacity
    b. Three 3-kg capacity
11. Three electronic fish measuring boards
12. Handheld Orion 3 star meter and equipment box
13. Five hundred plastic specimen bags
14. Formalin and ethyl alcohol
15. Triton-X (1%)
16. Six Niskin bottles
17. Various clerical supplies
18. Spent chemical collection drum
19. Fish and Invertebrate identification reference materials
20. Vermiculite or kitty litter (chemical absorbent)
21. 3 ICOM VHF Marine handheld radios (IC-M72)

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:

1. List of chemicals by name with anticipated quantity
2. List of spill response materials, including neutralizing agents, buffers, and absorbents
3. Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
4. 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:

1. An inventory list showing actual amount of hazardous material brought aboard
2. An MSDS for each material
3. 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
4. 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	Quantity	Notes	Trained	Spill Control

of Material			Individual	
Formaldehyde Solution (37%)	2 X 1 gallon	Alkalinity, stored in ship chemical locker	Debose, Andre	F
Ethanol (95%)	1 X 55 gal drum	Alkalinity, stored in ship chemical locker	Debose, Andre	E
Triton X (1%)	1 X 5 L	Stored in ship chemical locker	Debose, Andre	U

C. Chemical safety and spill response procedures

1. Formalin/Formaldehyde (F)
    - 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.

2. Ethanol (E)
    - 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.

3. Universal Chemical, all other chemicals (U)
    - 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.

Inventory of Spill Kit supplies

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 bucket	Ethanol	5 gallons per kit
Formalin Spill Control	11 oz bottle	Formaldehyde	40 oz of 10% or 9 oz of 37%
Kitty litter	3-5 gallon	Ethanol	30 gallons of chemical
PIG®HazMat Spill Kit in bucket	5 gallon kit	Ethanol	5 gallons of chemical

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. Meeting, 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 hours 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 hours 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 Ship Operation Evaluation form is to be completed by the FPC. The form is available at https://docs.google.com/a/noaa.gov/forms/d/e/1FAIpQLScfSPlZpCGJleLMKFnYleky2q7Uiwhk4d-GdzjCt-IhWoqatA/viewform 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 up to 12 scientists. 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. The completed form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan and send via secure e-mail the form using the contact information below; participants should take precautions to protect their Personally Identifiable Information (PII) and medical information. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

Contact information:
Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street

Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
E-mail MOA.Health.Services@noaa.gov

Prior to departure, the 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, 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

Foreign National access to the NOAA ship or Federal Facilities is not required for this project.

IX. Appendices (all that apply)

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

Figure 1. Cruise track with standard SEAMAP Shrimp/Bottomfish stations for NOAA ship *Oregon II* cruise R2-17-05 (325), 7 October-21 November, 2017.

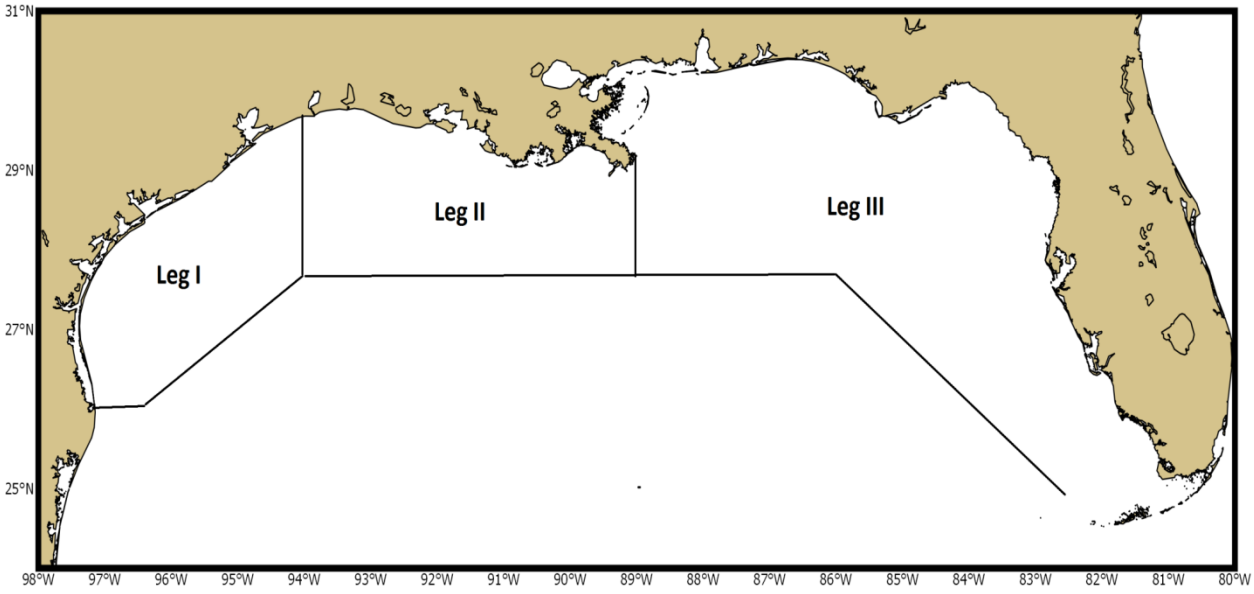

Figure 2. Map of Statistical Zones