UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center
439 W. York Street
Norfolk, VA 23510-1114

MEMORANDUM FOR: Captain Michael Hopkins, NOAA
Commanding Officer, NOAA Ship *Pisces*

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

SUBJECT: Project Instruction for PC-16-01
SEAMAP Reef Fish

Attached is the final Project Instruction for PC-16-01, SEAMAP Reef Fish, which is scheduled aboard NOAA Ship *Pisces* during the period of April 4 – June 4, 2016. Of the 61 DAS scheduled for this project, 61 days are funded by a Line Office Allocation and 55 DAS are now scheduled to occur due to repair delays. This project is estimated to exhibit a High 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 Street
Pascagoula, MS 39567

Project Instructions

Date Submitted: 03/04/2016

Platform: NOAA Ship PISCES

Cruise Number: 16-01

Project Title: SEAMAP Reef Fish

Cruise Dates: ~~03/29/2016~~ 4/4/2016 - 06/04/2016

Prepared by: RADEMACHER.KEVIN.RAY.1216603172 Digitally signed by RADEMACHER.KEVIN.RAY.1216603172 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=RADEMACHER.KEVIN.RAY.1216603172 Date: 2016.03.04 12:54:49 -06'00'
Field Party Chief
Date: 03/04/2016

Approved by: DESFOSSE.LISA.L.1365834519 Digitally signed by DESFOSSE.LISA.L.1365834519 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=DESFOSSE.LISA.L.1365834519 Date: 2016.03.07 07:52:56 -06'00'
Lab Director
Date: 03/07/2016

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: 2016.03.08 09:13:52 -05'00'
Dr. Bonnie Ponwith
Director, SEFSC
Date: 03/08/2016

Approved by: Anne K Lynch CAPT/NOAA
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center - Atlantic
Date: 3/14/2016

I. Overview

A. Brief Summary and Project Period

SEAMAP Reeffish survey on the U.S. continental shelf in the Gulf of Mexico (GOM) from ~~March 29~~ April 4 to June 4, 2016. Calibration of the Simrad EK60 and a patch test of the ME70 multibeam echosounder will be conducted.

B. Days at Sea (DAS)

Of the 61 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, ~~61~~ 55 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 High Operational Tempo.

C. Operating Area

The area of operation is the U.S. shelf waters of the GOM (26° 50' N, 96° 50' W; 24° 50' N, 83° 50' W) in depths between 30 and 150 m (Figures 1 & 2; Table 1).

D. Summary of Objectives

NOAA Ship *Pisces* will conduct a survey of reef fish on the U.S. continental shelf of the GOM using a custom built stereo/video camera system and bandit reels. The ship's ME70 multibeam system and Simrad EK60 echosounder will be used to map predetermined targeted areas on a nightly basis to improve or increase the reef fish sample universe. The calibration of the EK60 and a patch test of the ME70 multibeam echosounder will be conducted when time and weather permit. During Leg II zooplankton samples will be collected following the camera gear deployment using a 0.5 m diameter (1:4), with 0.202 mm mesh and a cod-end. The net will be attached to the CTD array and deployed at camera stations. Following deployment the net will be rinsed with saltwater and the samples stored in 5% buffered formalin solution.

E. Participating Institutions

NOAA/NMFS/SEFSC Mississippi Laboratories

F. Personnel/Science Party

Name (Last, First)	Title	Leg	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Kevin Rademacher	FPC	1	3/29/2016	4/14/2016	M	NMFS Pascagoula	U.S.
Ryan Caillouet	Fisheries Biologist	1	3/29/2016	4/14/2016	M	Riverside Pascagoula	U.S.

Name (Last, First)	Title	Leg	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
David Huddleston	Fisheries Biologist	1	3/29/2016	4/14/2016	M	Riverside Pascagoula	U.S.
	Fisheries Biologist	1	3/29/2016	4/14/2016			U.S.
Ken Wilkinson	Electronics Tech.	1	3/29/2016	4/14/2016	M	NMFS Stennis SC	U.S.
Brandi Noble	FPC	2	4/16/2016	4/29/2016	F	NMFS Pascagoula	U.S.
Matthew Campbell	Fisheries Biologist	2	4/16/2016	4/29/2016	M	NMFS Pascagoula	U.S.
John Moser	Fisheries Biologist	2	4/16/2016	4/29/2016	M	NMFS Pascagoula	U.S.
Jillian Gilmartin	Student Volunteer	2	4/16/2016	4/29/2016	F	Texas A&M University	U.S.
James Johnson	Electronics Tech.	2	4/16/2016	4/29/2016	M	NMFS Stennis SC	U.S.
Kevin Rademacher	FPC	3	5/4/2016	5/17/2016	M	NMFS Pascagoula	U.S.
Paul Felts	Fisheries Biologist	3	5/4/2016	5/17/2016	M	NMFS Pascagoula	U.S.
Joey Salisbury	Fisheries Biologist	3	5/4/2016	5/17/2016	M	Riverside Pascagoula	U.S.
Hunter Brendel	Volunteer	3	5/4/2016	5/17/2016	M	NMFS FGBNMS	U.S.
Ken Wilkinson	Electronics Tech.	3	5/4/2016	5/17/2016	M	NMFS Stennis SC	U.S.
Matthew Campbell	FPC	4	5/20/2016	6/4/2016	M	NMFS Pascagoula	U.S.
Paul Felts	Fisheries Biologist	4	5/20/2016	6/4/2016	M	NMFS Pascagoula	U.S.

Name (Last, First)	Title	Leg	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Joey Salisbury	Fisheries Biologist	4	5/20/2016	6/4/2016	M	Riverside Pascagoula	U.S.
John Moser	Fisheries Biologist	4	5/20/2016	6/4/2016	M	NMFS Pascagoula	U.S.
James Johnson	Electronics Tech.	4	5/20/2016	6/4/2016	M	NMFS Stennis SC	U.S.

G. Administrative

1. Points of Contacts:

Field Party Chief (Legs 1&3): Kevin R. Rademacher, NMFS 3209 Frederic St. Pascagoula, MS 39567. 228-549-1635 kevin.r.rademacher@noaa.gov

Alternate Contact: Matthew Campbell, NMFS 3209 Frederic St. Pascagoula, MS 39567. 228-549-1690 matthew.d.campbell@noaa.gov

Ops Officer: LT Rachel Kotkowski, OMAO, 151 Watts Ave, Pascagoula, MS 39567. 228-769-7905; Ops.Pisces@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

This cruise will be conducted under the following permits:

NMFS Southeast Regional Office Scientific Research Permit

NMFS HMS Scientific Research Permit

Flower Gardens National Marine Sanctuary

NMFS Sea Turtle Permit

Texas Scientific Research Permit: SPR-0614-096

Louisiana Saltwater Scientific Collection Permit: Permit No. SCP 46

Mississippi Saltwater Scientific Collection Permit: SRP-007-16

Alabama Saltwater Scientific Collection Permit Letter

Florida Special Activity License: SAL-14-0135-SR

Florida Keys National Sanctuary Permit: FKNMS-2012-073

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	Depart/Arrive Location	Sea Days
Leg 1	03/29/2016	Depart Pascagoula, MS	17
	04/14/2016	Arrive Galveston, TX	
Leg 2	04/16/2016	Depart Galveston, TX	14
	04/29/2016	Arrive Pascagoula, MS	
Leg 3	05/02/2016	Depart Pascagoula, MS	14
	05/17/2016	Arrive Pascagoula, MS	
Leg 4	05/20/2016	Depart Pascagoula, MS	16
	06/04/2016	Arrive Mayport, FL	

B. Staging and Destaging:
Pascagoula, MS and Mayport, FL

C. Operations to be conducted (including mitigation measures):

NOAA Ship *Pisces* will conduct a survey of reef fish located on the continental shelf and shelf-edge of the GOM from March 29 through June 4, 2016. Forty-seven blocks have been selected for sampling with stereo/video cameras, bandit reels and CTD during daylight hours; 24 in the western GOM and 23 in the eastern GOM (Figures 1 & 2). Individual sampling sites within each block will be supplied prior to sailing. Mapping will be conducted during the day at three preselected blocks in the west Gulf (Figure 1) and at night at randomly selected areas near the day's sampling. During Leg II zooplankton samples will be collected following the camera gear deployment using a 0.5 m diameter (1:4), with 0.202 mm mesh and a cod-end. The net will be attached to the CTD array and deployed at camera stations. Following deployment the net will be rinsed with saltwater and the samples stored in 5% buffered formalin solution.

Mapping operations:

Bathymetry mapping will be conducted in and around all selected blocks at night (47) and at three predetermined blocks during the day with the ME70 sonar (Figures 1 & 2). Night-time mapping will commence at sunset, or when day operations have finished, in the general area of the block sampled that day or the area planned for the next day. Mapping will be concluded at sunrise, or whatever time is needed, in order to be on site for operations the next day. A CTD cast or XBT needs to be conducted prior to and after conducting acoustic transects to obtain speed-of-sound for proper processing of data. All other acoustic systems need to be turned off prior to and during acoustic transects to eliminate acoustic contamination of the mapping data. If other systems are required to ensure safe transit while mapping, ensure that the acoustic signals are offset and not interfering with each other. Transects for mapping will be composed in Hypack by the FPC and made available to the ship's bridge crew. The mapping goal is to locate features within and outside our current universe to expand the sampling universe as well as improve the ability for site selection by closing gaps created by mapping with inferior systems. Day-time mapping at the blocks highlighted in Figure 1 may go into the night to increase the area mapped, but will be terminated to allow enough time to transit to the next working block.

Camera operations:

Camera operations will utilize three systems, the stereo camera array, the Modular Optical Underwater Survey System (MOUSS) and the Spherical Underwater Micro-Observatory (SUMO). Video cameras will be deployed no earlier than 1 h after sunrise, with the last gear retrieval 1 h prior to sunset. Each camera system will be baited with squid and soak on the sea floor for 40 min. A CTD cast will be conducted after the camera system is deployed.

The stereo camera array consists of paired black-and-white Videre stereo cameras along with a color mpeg camera housed in cylindrical pressure housings. The camera array consists of four housings positioned orthogonally and center mounted 51 cm above the bottom of the array. The camera array weighs around 550 lb and the housings are rated to 150 m.

For deep water deployments (>150 and < 250 m) we will deploy the MOUSS using the anchor and buoy system (Figure 2 left). The system is rated to 500 m (Table 1) and consists of a weight, weak link, cage with the stereo-camera system (cameras, cpu, and battery), and buoys. The system is tethered to the bottom using a weight sufficient enough to counteract the floatation above and to maintain the intended deployment position. Two buoys are deployed above the system giving enough positive floatation to counteract the weight of the MOUSS system but not more than the anchor. The system is deployed such that the anchor is the only point of contact with the reef, the cameras float above the reef and orient into the current. Should the anchor become entrapped a weak link attached between the anchor and cage allows for retrieval of the system.

The SUMO array (Figure 2 right) will be deployed in the same areas as our stereo video cameras. SUMO is a camera system that allows for simultaneous, near 360° video, thus enabling viewing in all directions at any given moment. The cameras housings, and thus the system, is rated to 1000 m (Table 2) and are capable of identification, enumeration of individuals and habitat at a

range of 0.5-10m. The SUMO array consists of 4 GoPro cameras on a mounting bracket, weight, weak link and buoys.

Fishing operations:

Four stations will be selected daily to be sampled with the bandit reels after the site is sampled with the cameras and the CTD. During bandit reel operations, the reels are only to be deployed under the following conditions: 1) a member of the deck department and scientific party are both present at each reel, 2) the ship is in position and stable with the OOD having notified as such and 3) the FPC has given the all clear for the reels to be baited and deployed.

Three electric (12V) bandit reels will be mounted on the side sampling station, starboard aft quarter, and starboard stern positions on the vessel. The aluminum spool on the bandit reel holds 275 m of 136.08 kg (300 lb) test monofilament line as the mainline. A detachable bandit gear section (backbone) attaches to the terminal end of the main line. The 6 m long backbone is constructed of 136.08 kg (300 lb) test monofilament line. Ten pairs of crimps are placed around every 0.61 m mark from the terminal ends of the backbone to secure the gangions in place. Each end of the backbone was fitted with a black anodized 2/0 swivel snap. Sufficient weight (5 or 10 kg) will be placed at the bottom terminal end of the backbone to anchor the gear to the site. Three sets of 10 gangions, one per reel, (30 cm of 45.4 kg test monofilament line, size 8/0, 11/0, and 15/0 circle hooks, and a 6/0 model 120, 308 stainless 5 in longline clamp with swivel) will be baited with cut Atlantic mackerel and attached to the backbones between the paired crimps.

Gangions with the varying hooks will be rotated through the three bandit reels and stations in an alternating order starting with a hook size that will be randomly selected before deployment. A 3 lb can float will be affixed to the terminal end of the mainline above the backbone as the gear is deployed to the bottom. When the weight reaches the bottom, a surface float will be attached to the mainline. The mainline will be paid out or reeled in to allow the gear to soak unimpeded by the vessel for 5 min from the time the weight hits the bottom to the start of retrieval. At the end of 5 min the mainline will be reeled in, the floats detached and each gangion detached. The NOAA Ship *Pisces* should be utilizing the Dynamic Positioning System during bandit reel operations. Once the surface floats are attached and all three reels are fishing the vessel may crab away to port from the surface floats 20-30 ft. Once notified from the scientific party that half of the fishing time has expired the ship should start crabbing back towards the gear to be within 10-15 ft from the surface floats when the 5 min fishing time is complete. This maneuvering keeps the vessel a safe distance from the gear to avoid entanglement with the rudder and propeller as well as to keep the ship close enough to avoid the gear being dragged across the bottom, getting hung, tangling with each other or losing fish that are on the hooks.

All fish captured on the bandit reel will be identified, measured, weighed, and have the sex and maturity determined. Select species will have otoliths and gonads collected for age and reproductive research. Select species may be retained whole for additional research.

Plankton Sampling:

During Leg II at selected Banks zooplankton samples will be collected following the camera gear deployment using a 0.5 m diameter (1:4), with 0.202 mm mesh and a cod-end. The net will be attached to the CTD array and deployed at camera stations. Following deployment the net will be rinsed with saltwater and the samples stored in 5% buffered formalin solution.

EK60 Calibration:

Calibration of the ships Simrad EK60 Echosounder will be performed during the survey. The exact date and location will be determined by the FPC and the ship's crew once at sea and when conditions permit. At minimum, two days will be set aside from scientific operations for the completion of the calibration. A CTD will be conducted prior to the execution of the calibration. Following the CTD, three outriggers will be positioned on the weather decks of the 01 level; one on the port side and two on the starboard side. Prior to anchoring, a hogging line will be positioned under the vessel by dropping a weighted line off the bow and walking the ends of the line back to the outrigger locations. Once completed, the ship will set anchor and remain at anchor with the centerboard fully retracted for the duration of calibration operations. The hogging line will be used to pull one outrigger line under the vessel and attach it to the other two. The calibration target will then be suspended under the vessel from the three outriggers and collection of calibration data will proceed. The entire execution of this procedure is fully detailed in 'Mississippi Laboratories Standard Operating Procedure for Calibration of Simrad EK60 Echosounder' (Appendix 3).

Sampling protocol may be altered by the FPC or Watch Leader in order to optimize survey effort or to adhere to mitigation measures for protected resources. Mitigation measures are as follows:

Under the Preferred Alternative, the SEFSC will initiate a formalized "Move-on" Rule. If any 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 protected species 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.

Mitigation Measure for Protected Species during Research with Bandit Reel/Vertical Line Gear and Hook and Line Gear

- Monitoring methods: The officer on watch (or member of the Scientific Party), and crew standing watch on the bridge visually scan for protected species during all daytime operations. Bridge binoculars are used as necessary to survey the area upon arrival at 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 protected species are sighted by the bridge or deck crew prior to setting the gear or at any time the gear is in the water, the bridge crew and 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.
- Operational procedures: If any 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/Scientific Watch Leader. 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.
- Soak time is reduced and standardized to 5-10 min per gear deployment.
- If protected species are detected during setting operations and are considered to be at risk, immediate retrieval or halting the setting operations may be warranted.
    - On the SEAMAP-GOM Reef Fish Survey (NMFS), if setting operations have been halted due to the presence of protected species, setting does not resume. The SEAMAP vertical line survey is piggy-backed onto the SEAMAP reef fish video survey, and only 50% of those video sites are subsampled, therefore the vessel simply moves to the next site rather than waiting.

- Plankton Nets, Fykes Nets, Bag Seines, Small-mesh Towed Nets, Oyster Dredges, Fish Traps, Oceanographic Sampling Devices, Video Cameras, and remotely Operated Vessels (ROV)
    - 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

Conditions which preclude normal operations: ME70 hardware or software failure. Adverse weather conditions such as hurricanes and tropical storms.

III. Equipment

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

1. Hydrographic winch for deploying CTD to a depth of 500 m
2. Hydraulic pot hauler
3. Two SBE9+ CTDs with calibrated sensors
   a. one Digiquartz depth sensor
   b. two SBE 3 Premium temperature sensor
   c. two SBE 4 conductivity sensor (items b. & c. connected w/ TC ducts)
   d. two SBE 43 dissolved oxygen sensor
   e. two SBE 5T pump
   f. one WetStar fluorometer
   g. one transmissometer
   h. one SBE water sampler
4. Freezer space for frozen squid and biological samples
5. Scientific Computer System (SCS)
6. Side Sampling A-frame
7. Mounting for three bandit reels; one at side-sampling station, one on starboard aft quarter, and one on starboard stern.
8. (3) 12V marine batteries and (3) trickle chargers for the (3) bandit reels at side-sampling station, starboard aft quarter, and starboard stern.
9. ME70 Multibeam with spare cards and other pertinent parts for repairs
10. EK60 Simrad Echosounder system
11. (3) outrigger poles (for EK60 calibration)
12. (3) downrigger reels (for EK60 calibration)
13. Mounting for three outrigger poles and three downrigger reels: one on port side and two on starboard side

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

1. Stereo camera array with buoy retrieval system, weights, spare bungee

2. (8) Stereo cameras and underwater housings, (2) batteries and spare parts
3. Specialized computer systems for stereo data downloads
4. Blu-ray discs, Blu-ray burners and external hard drives
5. (6) 12V Electric Bandit Reels, monofilament, hooks, floats, weights and hardware.
6. MOUSS camera system
7. SUMO camera system
8. (8) Poly Floats
9. (2) High-Flyers
10. Buoy line (½") for deploying the video array at depths between 30 and 150 m
11. 400 lb squid bait
12. 300 lb mackerel bait
13. One large/small capacity motion compensating scales
14. (4) Plastic fish baskets
15. (2) Grappling hooks with 10 m of attached rope
16. (1) Rib release hook
17. Hammer locks
18. VCR/monitor/cords
19. Back-up spool for buoy retrieval system
20. Triton X
21. 31.8mm-Grade 25 Tungsten-carbide with 6% Cobalt binder calibration target (for EK60 calibration)
22. 200 ft. lightweight nylon twine (for calibration)
23. (1) 1 lb. weight/shackle (for calibration)
24. (1) 4 lb. weight (for calibration)
25. Spectra fishing line (for calibration)
26. Dishwashing liquid (for calibration)
27. Plankton sampling equipment

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. If the spill is severe enough to require a respirator the scientific party will act as support. 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 (10%)	1 x 1 gallon	Stored under hood in Chemical Lab	Kevin Rademacher	F
Ethanol	1 x 1 gallon	Stored under hood in Chemical Lab	Kevin Rademacher	E

C. Chemical safety and spill response procedures

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.

E: Ethanol

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

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 lbs per 5 gallon bucket
Universal Spill Cleanup	5 gallon kit	Ethanol	5 gallons per kit
Formalin Spill Control	11 oz. bottle	Formaldehyde	40 oz of 10% or 9 oz of 37%

D. Radioactive Materials

No Radioactive Isotopes are planned for this project

V. Additional Projects

A. Supplementary ("Piggyback") Projects

No Supplementary Projects are planned.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

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

A. Data Classifications: *Under Development*

a. OMAO Data

b. Program Data

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The 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 conducted a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the 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 FPC. 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, NF 57-10-01 (3-14)) 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 four weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).

The only secure email process approved by NOAA is Accellion Secure File Transfer which requires the sender to setup an account. Accellion's Web Users Guide is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The "Send Tab" function will be accessible for 30 days.

Contact information:

Regional Director of Health Services

Marine Operations Center – Atlantic

439 W. York Street

Norfolk, VA 23510

Telephone 757-441-6320

Fax 757-441-3760

Email MOA.Health.Services@noaa.gov

Prior to departure, the 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 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 email and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

E. IT Security

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

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

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

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

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

VIII. Appendices

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

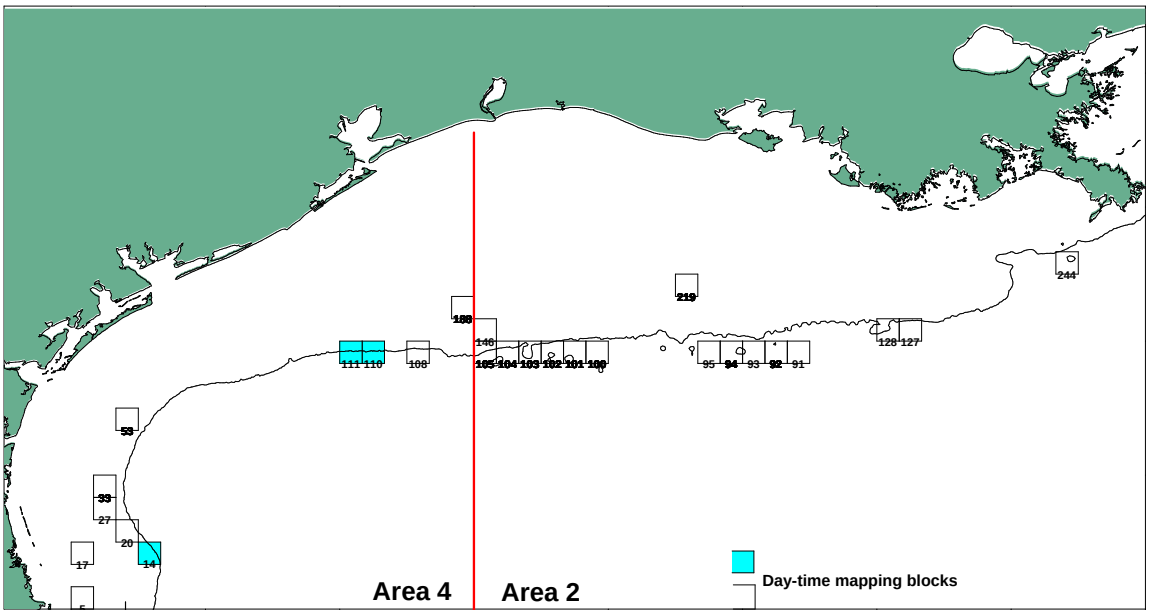


Figure 1. Blocks selected in the western Gulf of Mexico for sampling and mapping during NOAA Ship *Pisces* PC-16-01, SEAMAP Reeffish survey.

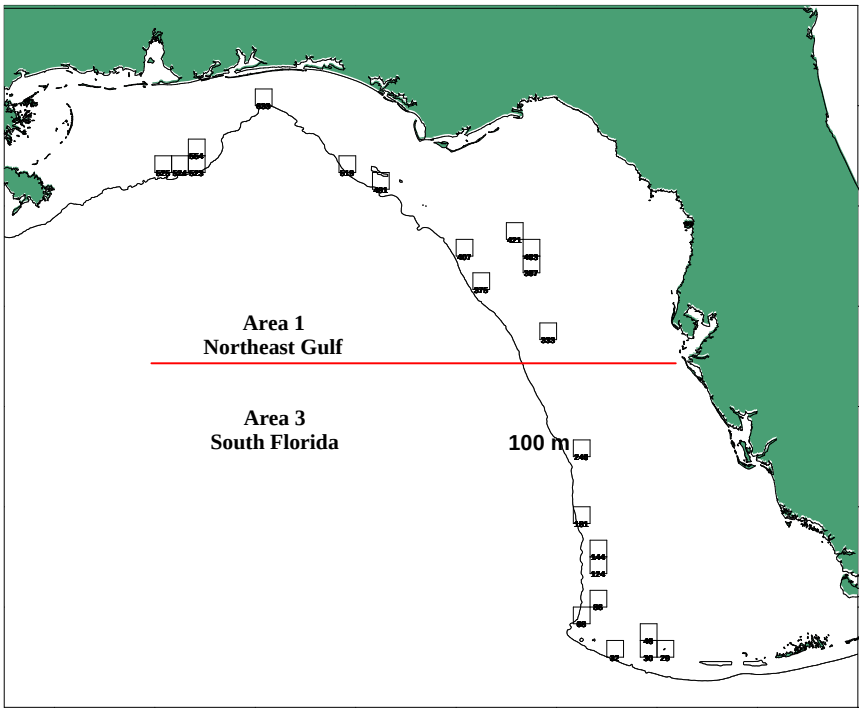


Figure 2. Blocks selected in the eastern Gulf of Mexico for sampling and mapping during NOAA Ship *Pisces* PC-16-01, SEAMAP Reeffish survey.

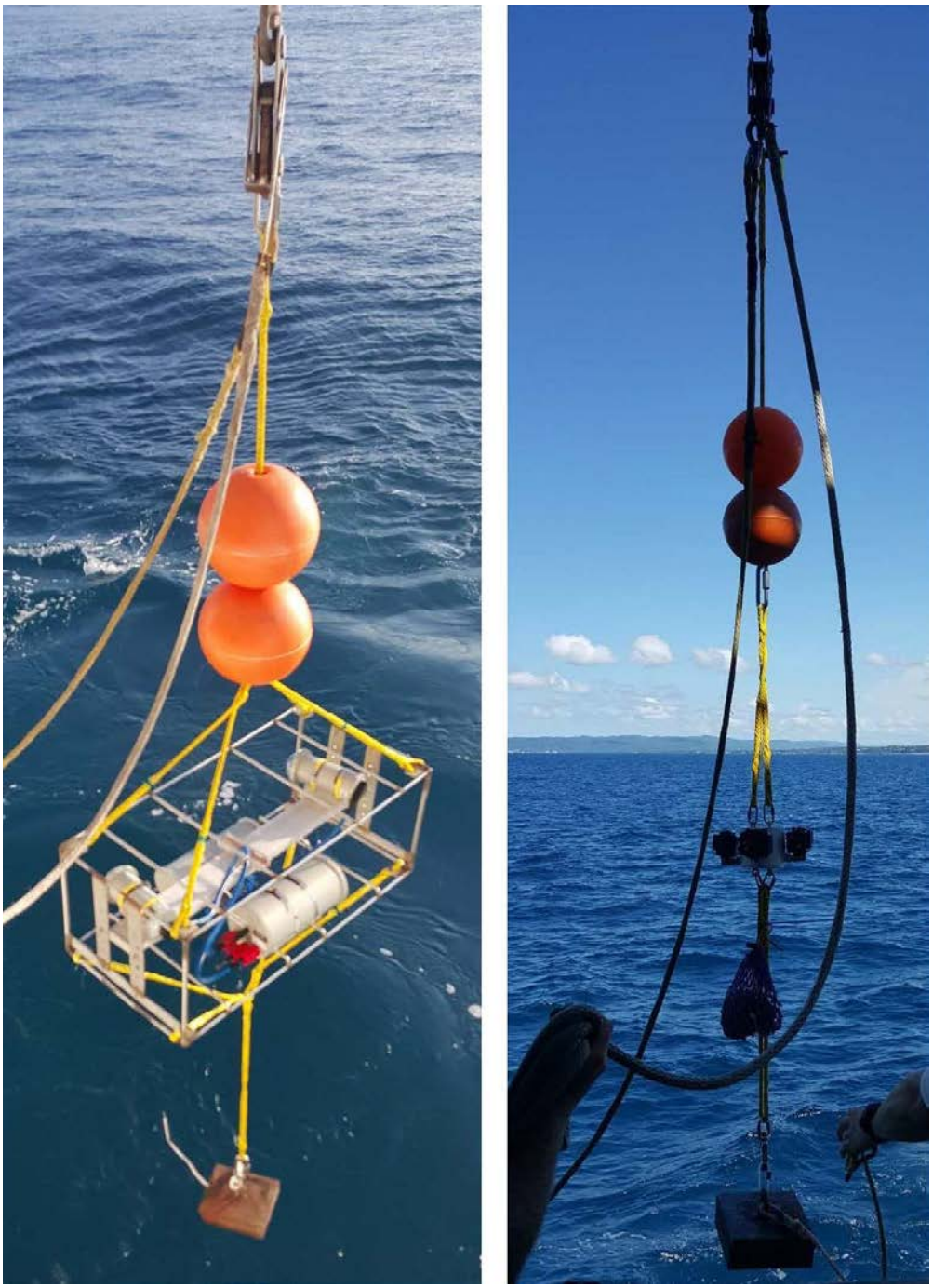


Figure 3. On left is the MOUSS and on the right is the SUMO.

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

Will be provided to the ship at a later date prior to departure on the survey.

3. Appendices.

EK60 Calibration Procedures

- You need at least 100 ft of water to conduct calibration
- Needs to be as calm as possible
- Need to have as little biomass in water column as possible
- Need to have as little current as possible

Setting up.

Before anchoring -

1. Conduct a CTD of the water column - ensure that you are collecting salinity, temperature, depth, and sound velocity.

2. Set up out riggers and down riggers at the three stations on the ship. On the *Pisces* one is on the port side, and two are on the starboard side.

3. Attach a lead weight to the swivel on the down rigger. Drop this weight to just below the surface. Once below surface, zero the counter on the down rigger. Repeat this procedure for all three down riggers.

4. Stretch a separate loose line from the down rigger on the port side all the way to the down rigger on the starboard forward side. (Make sure that the line is out board of everything.) Secure both ends of the loose line to the down riggers. You want to have enough play in the line to ensure that it will be able to go all the way under the ship.

5. Attach a lead weight to the center of the loose line at the bow of the ship, and gently drop the weight over the side of the ship. This will bring the line under the ship and will be tied off by the two down riggers.

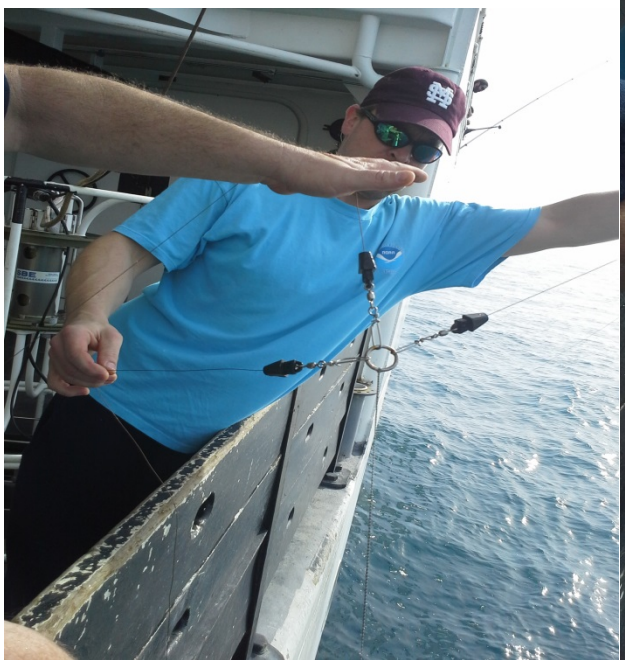
6. From the starboard forward position pull in the loose line in. Make sure someone is at the port position and is paying out line on the port down rigger. Once the line is brought all in, you should have the swivel from the port down rigger at the starboard forward position. Clip the port swivel off at the rail.

7. Make sure all of the slack is taken out of the port side down rigger.

8. Now you are ready to anchor the ship.

9. Bring the starboard aft down rigger swivel up to the starboard forward position (out board of everything). You should now have all three swivels from all three down riggers at the starboard forward position.

10. Using the small ring, attach all three swivels to the ring.



11. You will have a separate drop line. Attach a 4 lb weight to one end. In the middle of the drop line, make a loop where you attach the sphere. Before attaching sphere, make sure that you dunk it in soapy water. This will prevent any bubbles from forming on it when you lower it into the water.

12. Attach the drop line to the ring.**

13. Gently lower the additional weight, sphere, and ring with swivels into the water ensuring the sphere does not bump against the ship.

14. The sphere should now be in the water and underneath the ship, connected by all three down riggers/out riggers.

15. You will need a minimum of four people - one at each down rigger and one at the EK60 in the acoustics lab.

16. You have to pay out or bring in a little line at a time to try and locate the sphere on the EK60. (This can take a very long time!)

17. For PC-13-06 calibration, we used the following payouts:
    Visible on all for transducers: stb fwd-69, stb aft-83, port-70
    Center of the 38 kHz: stb fwd 65, stb aft-75, port-65

18. Once you have located the sphere with the EK60, make sure all of the down riggers are tightened down. You are now ready to calibrate.

Calibration

1. Set the EK60 to record on.
2. Pick which frequency you wish to calibrate.
3. Right click inside of the cross hairs of that frequency.
4. Click single target detection - set min echo spacing to 0 and then click apply.
5. Click calibration
6. Click file/new
7. Enter your transducer serial number (you can get that from the ET)
8. Enter target strength (TS) - Charles Thompson will give us a curve to figure this out. You will use the temperature and salinity from the CTD to factor this.
9. Enter the upper and lower limits of where your sphere is:

Example: Assuming you have a 10m drop line, your sphere is located at 25m, the swivels will be located at 20m and the additional weight will be located at 30m. You would want to set your upper limit to 22m and your lower limit to 28m. This will hopefully prevent you from picking up the swivels and/or additional weight on your pings.

10. Click ok
11. The EK60 will now start to ping the sphere. The cross hairs of the sensor will begin to pick up dots. Using the controls in the acoustics lab, you can start to adjust each down rigger.
12. Try to move the sphere all around in the cross hairs making sure that you have good coverage. Especially make sure you have good coverage in the center. At least 300 hits is decent.

13. Once you are done and happy with your coverage

14. Make folders for each transducer on the computer

15. Click file save as and enter the file name
Example: PC1306_200kHz_1024us_105W.txt

16. Click stop record - That frequency is now calibrated.

17. Repeat for the other three frequencies.

- **The drop line needs to be at least two pulse lengths.
- Example 1024 (us) x 1527 (sound velocity from CTD)=one pulse
- PC1306 used a drop line of about 10m.
- Drop line used was spectra braided fishing line - 80 lb test
- Center board of the Pisces needs to be in the retracted position.
- Ensure that the EK60 is set for the retracted position.