



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE/NOAA FISHERIES
Pacific Islands Fisheries Science Center
2570 Dole St. • Honolulu, Hawaii 96822-2396
(808) 983-5300 • Fax: (808) 983-2902

Final Project Instructions

Date Submitted: April 26, 2013
Platform: NOAA Ship *Oscar Elton Sette*
Cruise Number: SE-13-03
Project Title: Papahānaumokuākea Associated Cetacean Ecology Survey
Cruise Dates: May 07, 2013 to June 05, 2013

Prepared by: *Amanda J. Bradford* Dated: 26 April 2013
Amanda Bradford
Chief Scientist
Protected Species Division, PIFSC

Approved by: *Samuel Pooley* Dated: 4/26/2013
Samuel Pooley, Ph.D.
Research and Science Director
Pacific Islands Fisheries Science Center

Approved by: *Robert A. Kamphaus* Dated: 30 APR 2013
Commander Robert A. Kamphaus, NOAA
Commanding Officer
Pacific Islands Area Command



I. Overview

A. Brief Summary and Project Period

The 2013 Papahānaumokuākea Associated Cetacean Ecology Survey (PACES) is a cetacean assessment survey of the waters surrounding the Northwestern Hawaiian Islands, from the islands and atolls out to the Papahānaumokuākea Marine National Monument (PMNM) boundary (50 nm from shore). The overall objective of PACES is to evaluate the distribution, abundance, and population structure of cetaceans in the waters around the Northwestern Hawaiian Islands, collecting data needed to refine stock structure and estimate abundance for cetacean species in this region. The study will include collection of biopsy samples, identification photographs, telemetry data, and acoustic recordings of individual cetaceans and cetacean groups.

B. Service Level Agreements

Of the 30 DAS scheduled for this project 0 DAS are funded by the program and 30 DAS are funded by OMAO. This project is estimated to exhibit a Low Operational Tempo.

C. Operating Area

This project will be conducted in the waters of the Northwestern Hawaiian Islands within the Papahānaumokuākea Marine National Monument and the respective Special Management Areas and Special Protected Areas within it.

D. Summary of Objectives

The scientific objectives for this project are:

1. Collect visual and passive acoustic data on cetacean distribution within the PMNM.
2. Collect oceanographic data to further characterize cetacean habitat and its variation over time.
3. Collect skin biopsies of cetaceans to further investigate stock structure and phylogenetic relationships.
4. Photograph cetaceans to document variations in dolphin morphology and pigment patterns, and begin photographic catalog of potential island-associated populations.

E. Participating Institutions

NOAA Pacific Islands Fisheries Center (PIFSC), NOAA Southwest Fisheries Science Center (SWFSC).

F. Personnel

Name	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Bradford, Amanda	Chief Scientist	7 May 2013	5 June 2013	Female	NOAA-PIFSC	USA
Yin, Suzanne	Sr. Mammal Observer	7 May 2013	5 June 2013	Female	NOAA-SWFSC	USA
Breese, Dawn	Sr. Mammal Observer	7 May 2013	5 June 2013	Female	NOAA-SWFSC	USA
Ligon, Allan	Mammal Observer	7 May 2013	5 June 2013	Male	Contractor	USA
Bendlin, Andrea	Mammal Observer	7 May 2013	5 June 2013	Female	Contractor	USA
U, Adam	Mammal Observer	7 May 2013	5 June 2013	Male	NOAA-SWFSC	USA
Garver, Justin	Mammal Observer	7 May 2013	5 June 2013	Male	NOAA-SWFSC	USA
Barkley, Yvonne	Lead Acoustician	7 May 2013	5 June 2013	Female	Ocean Associates	USA
Trickey, Jennifer	Acoustician	7 May 2013	5 June 2013	Female	Scripps Institution of Oceanography	USA
Coates, Shannon	Acoustician	7 May 2013	5 June 2013	Female	Biowaves	USA
Rex, Patrick	Acoustician	7 May 2013	5 June 2013	Male	University of Hawaii	USA
Norris, Erik	Coxswain	7 May 2013	5 June 2013	Male	NOAA Corps	USA
Guisseffi, Louise	Biological Technician	7 May 2013	5 June 2013	Female	NOAA-PIFSC	USA
TBD	Visiting Scientist	7 May 2013	5 June 2013			

G. Administrative

1. Points of Contact

Amanda Bradford, Ph.D.
Chief Scientist
1601 Kapiolani Blvd
Ste 1000
Honolulu, HI 96814
Amanda.Bradford@noaa.gov

LT(jg) Erik Norris
CRP Operations Lead
1601 Kapiolani Blvd
Ste 1000

Honolulu, HI 96814
Erik.Norris@noaa.gov

LT Justin Keese
Operations Officer, NOAA Ship *Oscar Elton Sette*
Ops.sette@noaa.gov

2. Diplomatic Clearances – N/A

3. Licenses and Permits

This project will be conducted under the Marine Mammal Protection Act and Endangered Species Act scientific research permit (NMFS Permit No. 15240-00) issued to the Pacific Islands Fisheries Science Center by the National Marine Fisheries Service, Office of Protected Resources. Activities within the Papahānaumokuākea Marine National Monument are authorized under permit number PMNM-2013-001, issued collectively by the National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service (FWS), and the State of Hawaii.

II. Operations

A. Project Itinerary

The following operational itinerary is only considered a guide as to how the Chief Scientist expects the survey to progress without being able to predict weather, operational and scheduling problems, and equipment failures.

07 May

0700 All scientists aboard. 0900 Depart Ford Island, Pearl Harbor, HI and commence transit to the first transect line.

08 May – 03 June

0445 Conduct morning CTD. 0545 Deploy acoustic array. 0600 Commence visual observations. Deploy PIFSC small boat *Steel Toe* and sonobuoys opportunistically. 1900 Finish visual observations and retrieve acoustic array. 1915 Deploy sonobuoy. 1930 Commence evening CTD.

04 June

0445 Conduct morning CTD. 0545 Deploy acoustic array. 0600 Commence visual observations. Deploy PIFSC small boat *Steel Toe* and sonobuoys opportunistically. 1300 Finish scientific operations. Commence transit to PH.

05 June

0800 Arrive at PH and transit Ford Island, Pearl Harbor, HI. 0930 Offload scientific personnel and gear.

B. Staging and Destaging

Loading of scientific gear will occur between May 2 and May 6 in coordination with the ship's command. Assistance from the ship's personnel to operate the cranes will be required to load big eye binoculars and stands, small boat fuel, small boat cradle, small boat, and acoustic array; to set up and connect scientific party electronics; and connect and test acoustic array hydraulics.

Once the ship returns to port, ship's personnel will be needed to assist with disconnecting and offloading the previously stated equipment. Dates for offloading will be coordinated with the ship's command prior to entering port. Some scientific gear will remain aboard for the next cruise.

C. Operations to be Conducted

1. **Visual Surveys:** Line-transect survey methods will be used to collect cetacean abundance data. A daily watch for cetaceans will be maintained on the flying bridge during daylight hours (approximately 0600 to 1900) by six (6) mammal observers. Each observer will work in 2-hour rotations, manning each of the following three stations on the flying bridge for 40 minutes: a port side 25 x 150 binocular station, a center-line data recorder position, and a starboard 25 x 150 binocular station. An "independent observer" may keep a separate watch of animals sighted during the cetacean survey operations, to be compared later with the observer team's data.

Ship Speed, Order of Operations: At the beginning of each day, search effort should start on the trackline. The *Sette* should travel at 10 kt (through the water) along the designated trackline. While on search effort, if the ship's speed through the water should deviate from this by more than 1 kt, the bridge personnel will notify the mammal team on watch or the Chief Scientist.

On sighting a cetacean group or other feature of biological interest, the Chief Scientist or observer team on watch may request that the vessel be maneuvered to approach the group or feature for investigation. When the ship approaches a cetacean group, the observers will make independent estimates of group size. Biopsy and photography operations may commence from the bow, based on directions from the Chief Scientist or Senior Observers. In some instances, the Chief Scientist will request the deployment of a small boat for biopsy, photography, or other operations.

It may occasionally be necessary to divert the ship's course from the established trackline during regular effort due to glare or adverse sea conditions. Under these circumstances, the ship may divert up to 30 degrees from the established course. This deviation may continue until the ship is 5 nm from the trackline, at which point the ship should turn back toward the trackline.

When the observers have completed scientific operations for the sighting, the ship will resume the same course and speed as prior to the sighting. If the pursuit of the

sighting has taken the ship more than 5 nm from the trackline, the observers should be notified. The Chief Scientist or Senior Observers may request that, rather than proceed directly toward the next waypoint, the ship take a heading of 20 degrees back toward the trackline or return to the position at which the ship diverted before resuming effort.

Ship Equipment Required: The observation computer will be hooked up to the ship's global positioning system (GPS; for course, speed and position information) and shipboard computer system (SCS; for weather and heading information). If the SCS goes down for any reason, the ship's Electronics Technician must manually restart the WINDACS event (in addition to the other events). A log of observation conditions, watch effort, sightings and other required information will be entered into the observation computer. Please note that it is very important that all science computers be connected to the same ship GPS.

Ship Personnel Requirements: Weather permitting, the observer team on the flying bridge will conduct visual watches for cetaceans during all daylight hours (from sunrise to sunset). The Commanding Officer shall ensure that the flying bridge work area is free of tobacco smoke at all times when observers are on watch.

- 2. Biopsy Sampling:** Samples for genetic analyses of cetaceans will be collected on an opportunistic basis. Necessary permits will be present on the vessel.

Ship Speed, Order of Operations: The animals to be sampled will be approached by the research vessel during normal survey operations, will approach the vessel on their own or will be approached by a small boat. Samples will be collected from animals within 10 m to 30 m of the bow of the vessel, using a dart fired from a crossbow. Small boat deployment will be requested by the Chief Scientist on an opportunistic basis during all daylight hours, possibly multiple times in a single day, providing the Commanding Officer concurs that operating conditions are safe. Unless the Commanding Officer allows otherwise, the small boat will remain within sight and radio contact at all times while deployed. The Science party may bring their own small boat and coxswain for small boat operations around cetaceans.

Ship Equipment Required: The ship will provide the crane, hard hats, PFDs necessary for small boat operations, and blast freezer for storage of biopsy samples.

Ship Personnel Requirements: Ship personnel are required for launching the lab's small boat.

- 3. Photography:** Photographs of cetaceans will be taken on an opportunistic basis. Necessary permits will be present on the vessel.

Ship Speed, Order of Operations: The animals to be sampled will be approached by the research vessel during normal survey operations, will approach the vessel on their own or will be approached by a small boat. Small boat deployment will be requested

by the Chief Scientist on an opportunistic basis during all daylight hours, possibly multiple times in a single day, providing the Commanding Officer concurs that operating conditions are safe. Unless the Commanding Officer allows otherwise, the small boat will remain within sight and radio contact at all times while deployed. The Science party may bring their own small boat and coxswain for small boat operations around cetaceans.

Ship Equipment Required: The ship will provide the crane, hard hats, and PFDs necessary for small boat operations.

Ship Personnel Requirements: Ship personnel are required for launching the lab's small boat.

4. **Satellite tagging:** Satellite tags may be deployed onto certain cetacean species on an opportunistic basis. Necessary permits will be present on the vessel.

Ship Speed, Order of Operations: The animals to be tagged will be approached by a small boat. Tags will be deployed onto animals within 5 m to 10 m of the bow of the vessel, using a dart fired from a pneumatic rifle. Small boat deployment will be requested by the Chief Scientist on an opportunistic basis during all daylight hours, possibly multiple times in a single day, providing the Commanding Officer concurs that operating conditions are safe. Unless the Commanding Officer allows otherwise, the small boat will remain within sight and radio contact at all times while deployed. The Science party may bring their own small boat and coxswain for small boat operations around cetaceans.

Ship Equipment Required: The ship will provide the crane, hard hats, PFDs necessary for small boat operations, and blast freezer for storage of satellite tags.

Ship Personnel Requirements: Ship personnel are required for launching the lab's small boat.

5. **Salvage of Marine Mammals and Birds:** Marine mammal body parts and/or birds may be salvaged on an opportunistic basis at the discretion of the Chief Scientist. This includes whale and dolphin ivory and carcasses, and whole bird specimens. In the event that this occurs, scientific freezer space will be used to store the salvaged material. Permits to salvage and import marine mammal parts and birds will be present on the vessel. All marine mammal specimens obtained will be archived at the PIFSC or SWFSC but may be released on extended loan to recognized research institutions according to existing guidelines.

6. **Passive Acoustics**

- 6.A. **Towed Hydrophone Array:** A towed hydrophone array will be deployed approximately 300 m behind the vessel during daylight hours on all legs, weather permitting. The array will be deployed by the acoustics personnel prior to the start

of visual observations, and will be retrieved each evening after search effort ends. Acoustics personnel will monitor the array, record sounds made by cetaceans, and localize their positions.

Ship Speed, Order of Operations: The array will be retrieved at the end of visual effort or at other times as requested. To retrieve the array, the ship will first slow down to 5 kt and maintain its current heading. During array retrieval and deployment, the ship's course and speed must be maintained. Vessel speed must be within 3 and 10 kts, and turning must not exceed 180°. When traveling at 10 kts, it is requested that the ship use rudder commands on the order of 3 to 5 degrees to prevent damage to the towed hydrophone array cable. When traveling at less than 10 kts, larger rudder commands may be used so long as the officer on watch is mindful of the cable angle and reduces rudder commands if requested by the acoustic personnel. The acoustics team must be informed of potential hazards, such as fishing gear, with the maximum lead time.

Ship Equipment Required: The array will be wound onto a hydraulic-powered winch supplied by the PIFSC. The winch and hoses will be provided by PIFSC; the ship will provide hydraulic power and connectors. Hookup to a ship-powered hydraulic system will be required. With the exception of the hydraulic winch hookups and safety apparel, all of the necessary equipment will be supplied and operated by scientific personnel.

Ship Personnel Requirements: Ship personnel are needed to secure the acoustic winch to the deck using ship baxter bolts and then hook up the winch to the ship-powered hydraulic system.

- 6.B. Sonobuoys:** A sonobuoy will be deployed each evening 1 mile before arriving at the CTD station. Sonobuoys also may be deployed periodically from the *Sette* on an opportunistic basis at the discretion of the Chief Scientist.

Ship Speed, Order of Operations: The acoustics personnel will contact the bridge to ask permission to deploy the sonobuoy prior to deployment.

Ship Equipment Required: All of the necessary equipment will be supplied and operated by scientific personnel.

Ship Personnel Requirements: N/A

- 6.C. Compact Acoustic Recording Buoy (CARB):** The CARB may be deployed during small boat operations and opportunistically from the ship at the discretion of the Chief Scientist.

Ship Speed, Order of Operations: For ship deployments, the acoustic personnel will contact the bridge to ask permission to deploy the CARB and to request that the ship slow to 3 kts prior to deployment.

Ship Equipment Required: For ship deployments, the CARB will need to be recovered by a small boat. The boat deck crane will be needed to launch and recover the small boat.

Ship Personnel Requirements: At the time of a CARB deployment from the ship, it is requested the officer on watch make a mark on Nobeltec to record the location. This point will serve as a backup to the scientific party's GPS. For ship deployments, the deck department will be needed to operate the crane and provide line handlers to assist with launching and recovering a small boat.

7. Oceanography

Ship Speed, Order of Operations: A chronological record of oceanographic stations (CTD, XBT, and surface water samples) will be kept by the ship with locations, dates, and times in GMT using SCS. The ship will provide a copy of SCS data and the Weather Log to the Chief Scientist at the completion of the cruise.

Ship Personnel Requirements: The collection of oceanographic samples and their processing will be conducted by the ship's Survey Technician, the Biological Technician, and other designated scientists with assistance from the Deck Department as required.

- 7.A. XBT Drops:** There will be a minimum of three expendable bathythermograph (XBT) drops per day. These drops will be conducted primarily at 0900, 1200 and 1500 local ship time, or as requested by the Chief Scientist. XBT drops may also be conducted at 1800, if sunset occurs after 1900. Additionally, XBTs may be deployed more frequently in pre-determined locations to sample fine-scale thermal structure.

Ship Speed, Order of Operations: If the vessel is stopped at the scheduled launch time, the drop will be delayed until the ship is again underway. If the vessel is not going to move within half an hour, the individual performing the drop should be notified and the drop will be delayed or canceled, at the discretion of the Chief Scientist.

Ship Equipment Required: XBTs will be provided by the PIFSC, the Sippican MK-21 system will be provided by and maintained by the ship, and the ship will provide the launcher and computer.

Ship Personnel Requirements: XBTs will be conducted by the ship's Survey Technician, the Biological Technician, and other designated scientists, while underway during the day.

- 7.B. Surface Water Samples:** A minimum of three surface water samples will be taken each day, primarily at 0900, 1200, and 1500 hours local ship time daily. Samples may be collected at 1800, if sunset occurs after 1900. The 250ml water

samples will be filtered onto GF/F filters, placed in 10ml of 90% acetone, frozen for 24 hours, and then analyzed for chlorophyll *a* concentration using the Turner Designs model 10AU field fluorometer. Surface water samples may also be collected more frequently in pre-determined locations to sample fine-scale structure.

Ship Speed, Order of Operations: N/A

Ship Equipment Required: The ship will provide the water filtration system, the blast freezer for storage of samples, and the fluorometer.

Ship Personnel Requirements: Surface water sampling will be done by the ship's Survey Technician, the Biological Technician, and other designated scientists, while underway during the day.

- 7.C. **Thermosalinograph Sampling (TSG):** The ship's TSG will continuously collect surface water temperature and salinity.

Ship Speed, Order of Operations: N/A

Ship Equipment Required: The ship will provide and maintain a TSG, which is calibrated and in working order, for continuous measurement of surface water temperature and salinity. The TSG needs to be cleaned following Sea-Bird Electronics protocols prior to the start of the cruise to prevent inaccurate salinity measurements. The SCS will serve as the main data collection system.

Ship Personnel Requirements: The Chief Scientist will provide the ship's Operations Officer and Electronics Technician with detailed SCS acquisition information before departure. The SCS data acquisition will be stopped and restarted weekly so the data files can be backed up and checked for errors. All SCS data will be provided to the Chief Scientist following the cruise. Ship personnel will be responsible for cleaning the TSG following Sea-Bird Electronics protocols prior to the cruise.

- 7.D. **CTD Sampling:**

Deck Pressure Test: A deck pressure test is required at the beginning of the cruise.

Ship Speed, Order of Operations: The test takes approximately 30 min to complete.

Ship Equipment Required: The ship will provide the Sea-Bird CTD system.

Ship Personnel Requirements: The ship's Survey Technician should conduct the test before leaving the dock; the CTD should be in its normal at-sea position on the ship.

CTD Stations: Weather permitting, one CTD station will be conducted each morning 1 hour before sunrise, and one each night once visual and acoustic towed array operations have ceased. CTD data and seawater samples will be collected using a SeaBird 9/11+ CTD with rosette and Niskin bottles fitted with silicone tubing and o-rings. Dual Sea-Bird Electronics temperature, conductivity, pressure, and oxygen sensors will also be used to collect data from each cast. The ship's Survey Technician will be responsible for the CTD operations and maintenance.

If the Survey Technician is able, Niskin bottle samples will be collected from 12 standard depths (0, 20, 40, 60, 80, 100, 120, 140, 170, 200, 500, 1000 m) on the upcast on all stations. If the bottom is shallower than 1000 m, trip the first bottle at 20 meters from the bottom then continue with standard depths. Water samples will be collected from all depths and processed onboard for chlorophyll *a* content. The 250-ml water samples will be filtered onto GF/F filters, placed in 10 ml of 90% acetone, frozen for 24 hours, and then analyzed on a Turner Designs model 10AU field fluorometer. The sample collection and analysis will be done by the ship's Survey Technician, the Biological Technician, and other designated scientists, while underway.

Ship Speed, Order of Operations: All casts are to be engaged to a depth range of 1000 m, where bottom depths permit. When bottom depths are too shallow for the 1000-m cast, the Chief Scientist and ship's Survey Technician will determine a safe depth for the cast and notify the bridge prior to operations. Cast descent rates will be 30 m/min for the first 100 m of the cast, then 60 m/min after that, including the upcast between bottles. The evening CTD cast will be conducted no sooner than 1 hour after sunset. The exact time will be determined by the Deck Officer (by 1800 local ship time that day). Cast times are subject to change since sunset will vary during the cruise and the schedule may be modified by the Chief Scientist. Additional CTD stations may be requested by the Chief Scientist in areas of special interest.

Ship Equipment Required: The ship will provide the Sea-Bird CTD system, which will be maintained and operated by the ship's Survey Technician. The crew of the vessel will operate the winch and other deck equipment and will be responsible for the termination (and any necessary reterminations) of the CTD cable pigtail to the conducting cable of the winch. All instruments, their spares, and spare parts provided by the ship must be maintained in working order and, if applicable, have current calibrations (within the previous 12 months). The PIFSC will provide a

second set of sensors to be used on all casts; conducting CTD casts with two temperature and salinity sensors provides immediate feedback about the performance of the sensors and the validity of the data. PIFSC will also provide an oxygen sensor. To ensure longevity of the CTD and bottles, the CTD must be rinsed completely with fresh water after every cast, and the CTD and rosette must then be covered and secured.

Ship Personnel Requirements: The ship's Survey Technician will be responsible for the CTD operations and maintenance. The Biological Technician and other designated scientists can assist with sample collection and analysis. The Deck Department will provide the needed personnel to assist with CTD deployment.

7.E. Prey Fishes and Squids:

Acoustics: The scientific EK60 depth sounder will be operated continuously at 38, 70, and 120 KHz.

Ship Speed, Order of Operations: The vessel's navigational depth sounder may be used at the discretion of the Commanding Officer, but will normally remain off while underway in deep waters. The navigational depth sounder aboard NOAA Ship *Sette* is known to interfere with the EK60 scientific sounder. Since synchronization may not be possible, the navigational sounder should remain off when not in shallow water. The ship's navigational depth sounders will be on when the ship is inshore in depths of 30 fathoms or less. The command will inform the Chief Scientist at any time the navigational depth sounders are used.

Ship Equipment Required: The EK60 will be interfaced to a data acquisition system to estimate micronekton biomass between 0 and 500 m.

Ship Personnel Requirements: N/A

ADCP: The ship's acoustic Doppler current profiler (ADCP) is not needed for this survey.

Ship Speed, Order of Operations: N/A

Ship Equipment Required: N/A

Ship Personnel Requirements: N/A

7.F. Other Net Sampling: Opportunistic sampling may occur as time allows.

8. High-Frequency Acoustic Recording Package (HARP) Deployment: A HARP will be retrieved and deployed on a shoal east of the southeast corner of Pearl and

Hermes Atoll. A HARP will be deployed south of Kauai.

Ship Speed, Order of Operations: Retrieval must occur during daylight hours. Deployment may occur during day or night.

Ship Equipment Required: The ship will provide the crane.

Ship Personnel Requirements: The Deck Department will provide the needed personnel to assist with retrieval and deployment.

9. **End of Operations (Transit at Night):** When scientific operations are complete for the night, the ship will resume course along the trackline, at a speed determined by the Chief Scientist. It is estimated that the ship will need to transit between 50 and 100 nm per night. The Chief Scientist will determine the nightly transit length on a daily basis.

D. Dive Plan: N/A

E. Applicable Restrictions:

1. Unintended "take" of Protected Species
 - a. Under the Marine Mammal Protection Act and Endangered Species Act it is unlawful to take a protected species unless otherwise (e.g., NMFS Permit No. 15240-00 issued to the PIFSC). The MMPA defines take as "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." The ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." An incidental take is one that incidental to, but not the purpose of, otherwise lawful activities.
 - b. In the event of an incidental take of a marine mammal or federally listed threatened or endangered species during the cruise, the chief scientist will report the incident to the PIFSC Director and Deputy Director IMMEDIATELY via IRIDIUM, INMARSAT, and email. Samples should not be collected from any incidentally taken marine mammals, sea turtles, or seabirds.
 - c. PIFSC has developed mitigation measures for our fisheries and ecosystem research cruises to avoid take and comply with the Lecky, Murawski, and Merrick guidance. A copy of these documents is available at <https://sites.google.com/a/noaa.gov/pifsc-science-operations/home/nepa-permits/protected-species-mitigation-measures> and on the ship's bridge.

III. Equipment

A. Equipment and Capabilities Provided by the Ship

Equipment: To successfully meet the project objectives, the scientific complement aboard will need the ship to provide the items listed below. Prior to sailing, the ship's

crew will inspect these items to ensure they are in proper working order for the project:

- Insulated cable running from location site for CPUs (E-lab) to the flying bridge consoles
- Power, ship's GPS, and ship's SCS connections to CPUs running the flying bridge consoles (please note that it is very important that all science computers be connected to the same ship's GPS)
- Canopy on flying bridge
- Small boat, including spare parts, as a backup in the event that *Steel Toe* is inoperable.
- Freezer space for biological and oceanographic samples, and satellite tags (-20° freezer)
- Seabird 9/11+ CTD system including rosette with Niskin bottles (2.5L, 12 each)
- Oceanographic winch with minimum 500 m of .375 in of conducting wire, terminated to CTD
- Bottom depth checking prior to evening operations in depths less than 2000 m.
- SeaBird thermosalinograph (SBE45) and connection to SCS
- Connection of SBE38 to SCS (secondary temperature sensor for TSG)
- Sippican XBT launcher (prefer aft deck location) and connection to Sippican software
- Scientific Computing System for data collection
- Simrad EK60 scientific echo sounder with 38, 70, 120, and 200kHz transducers plus PC with EK60 data logging software and input cables
- Marine Operations and Deck Log (electronic)/Weather Observation sheets, filled out by Deck Officers
- Connection of Micro thermosalinograph to the SBE interface box, including GPS input (append to data string with raw temp, conductivity, and calculated salinity)
- Copy Machine
- Network access to a printer
- Space on aft deck for the acoustic winch
- Two (2) ship's GPS connections to the dry lab for acoustics computers (please note that it is very important that all science computers be connected to the same ship's GPS)
- Space on the aft deck for one pallet of sonobuoys (see item in the Equipment Supplied by PIFSC section)
- Space on the winch and aft decks for three (3) pallet tubs (48 in x 44 in x 30 in) for scientific equipment storage
- Space on the aft deck for one (1) pallet tub (48 in x 44 in x 30 in) for storage of 10 cases of XBTs
- Deck space on the bow for one (1) pallet tub (24 in x 44 in x 30 in) with biopsy equipment

Capabilites: It is requested that the ship provide the following:

- Permission for the scientific party to ready scientific spaces (e.g. set up computer server, acoustic array work station and battery bank, etc.) the week prior to departure.

- Assistance from the ship's deck department with the crane for staging and destaging.
- Periodic lunches provided from the stewards department for small boat operations. This will be coordinated through the Operations Officer to ensure the stewards are given sufficient notice.
- As noted in the operations section of these instructions; it is expected that the Survey Technician assist with processing the oceanographic water samples, and may be asked to work up to 12 hours a day.

B. Equipment and Capabilities Provided by the Scientist

- Eight 7 x 50 hand-held binoculars
- Four 25 x 150 binoculars and stands
- Video camera and SD cards
- Five Digital SLR cameras
- Eight handheld radios
- Two laptop computers for scientific party e-mail use, one laptop for the Chief Scientist, and one desktop for the photo-ID team
- A desktop computer mounted in the E-lab with CAT5 KVM extension units at CPUs and a remote console unit on the flying bridge
- Portable GPS component
- Crossbows, biopsy darts and tips, sample vials
- One liquid nitrogen dewar (34 L) for biopsy sample preservation with MSDS
- One laptop computer for biopsy data entry and one thermal label printer
- XBT probes (Deep Blues) – 10 cases to be stored on the aft deck in a pallet tub
- Permits for specimen collection
- Computer data storage media (external hard drives)
- One pallet of sonobuoys (48 in x 40 in x 60 in, 1200 lbs when full)
- One sonobuoy receiver
- Laptop PC for sonobuoys
- Hydrophone arrays
- Hydraulic winch for hydrophone array
- Hansen Coupling Division male LL6-HKP/LL8-HKP ends to quick connect style connectors on 50-ft hose to hydraulic power supply for acoustic winch
- Acoustics recording equipment, including mixer and recording rack, desktop computers (2), and accessory equipment.
- One pallet tub for deck storage of backup acoustic equipment
- One pallet tub for deck storage of XBTs
- Two external hard drives for EK60 data storage
- 19-ft Safeboat w/ frame and cradle
- Battery bank for hydrophone array
- 2 HARPs and 500lbs of weights
- 1 Compact Acoustic Recording Device (CARB)
- Satellite tagging gear
- Oceanographic gear

- Two pallet tubs (one full-sized and one half-sized) containing parts and equipment for *Steel Toe*

IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and a chemical hygiene plan. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

- A list of hazardous materials by name and anticipated quantity
- A list of neutralizing agents, buffers, and/or absorbents required for these hazardous materials, if they are spilled
- A chemical hygiene plan.

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

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory of hazardous material indicating all materials have been used or 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 scientific chemicals is not permitted during projects aboard NOAA ships.

B. Radioactive Isotopes – N/A

The Chief Scientist is responsible for complying with OMAO 0701-10 Radioactive Material aboard NOAA Ships. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

At least three months in advance of a domestic project and eight months in advance of a foreign project start date the shall submit required documentation to MOC-CO, including:

1. NOAA Form 57-07-02, Request to Use Radioactive Material aboard a NOAA Ship
2. Draft Project Instructions
3. Nuclear Regulatory Commission (NRC) Materials License (NRC Form 374) or a state license for each state the ship will operate in with RAM on board the ship.
4. Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters (NRC Form 241), if only state license(s) are submitted).
5. MSDS
6. Experiment or usage protocols, including spill cleanup procedures.

Scientific parties will follow responsibilities as outlined in the procedure, including requirements for storage and use, routine wipe tests, signage, and material disposal as outline in OMAO 0701-10.

All radioisotope work will be conducted by NRC or State licensed investigators only, and copies of these licenses shall be provided per OMAO 0701-10 at least three months prior to the start date of domestic projects and eight months in advance of foreign project start dates.

C. Inventory (itemized)

Common Name	Concentration	Amount	Notes
Acetone	100%	24 liters	
Cetylcide	100%	TBD	
Isopropyl	70%	TBD	
HCL	100%	TBD	
Bleach	100%	TBD	
Ethanol	70%	TBD	
Gasoline, unleaded		210 gallons	

V. Additional Projects

A. Supplementary (“Piggyback”) Projects – N/A

B. NOAA Fleet Ancillary Projects – N/A

VI. Disposition of Data and Reports

A. Data Responsibilities

All SCS data will be collected by the Survey Technician and handed over to the Chief Scientist at the conclusion of the project. All other data will be collected and maintained by the scientific party.

B. Pre- and Post-Project Meeting

Prior to departure, the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of project objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Project Meeting: Upon completion of the project, a meeting will normally be held at 0900 (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist and members of the scientific party to review the project. Concerns regarding safety, efficiency, and suggestions for improvements for future projects should be discussed. Minutes of the post-project meeting will be distributed to all participants by email, and to the Commanding Officer and Chief of Operations, Marine Operations Center.

C. Ship Operations Evaluation Report

Within 7 days of the completion of the project, a Ship Operations Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via e-mail to OMAO.Customer.Satisfaction@noaa.gov. If e-mail is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations
NOAA Office of Marine and Aviation Operations
8403 Colesville Road, Suite 500
Silver Spring, MD 20910

VII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning two hours before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Some personnel will occasionally miss meals due to conflicts with daytime operations 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 survey.

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

The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

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

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 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 Chief Scientist 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 the form into an email using the contact information below. 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 – Pacific
2002 SE Marine Science Dr.
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.Health-Services@noaa.gov

Prior to departure, the Chief Scientist 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

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. Closed-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide foot wear. Hard hats are also 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.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via e-mail 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 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 *NMAO 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 these requirements prior to boarding the ship is required.

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (<http://deemedexports.noaa.gov>). National Marine Fisheries Service personnel will use the Foreign National Registration System (FNRS) to submit requests

for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated NMFS Deemed Exports point of contact to assist with the process.

The following are basic requirements. Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

1. Provide the Commanding Officer with the e-mail generated by the FRNS granting approval for the foreign national guest's visit. This e-mail will identify the guest's DSN and will serve as evidence that the requirements of NAO 207-12 have been complied with.
2. Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.
3. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.
4. Export Control - Ensure that approved controls are in place for any technologies that are subject to Export Administration Regulations (EAR).

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist or the DSN of the FRNS e-mail granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the project, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA (or DOC) employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National)