



UNITED STATES DEPARTMENT OF
COMMERCE
National Oceanic and Atmospheric
Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Fisheries Science Center
2725 Montlake Blvd E
Seattle, WA 98112

Project Instructions

Date Submitted: May 20, 2016

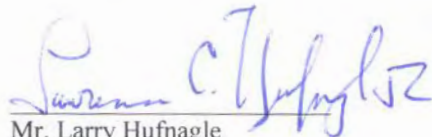
Platform: NOAA Ship *Bell M Shimada*

Project Number: SH 16-10 (NMFS)

Project Title: 2016 California Current Ecosystem (CCE16): Investigations of hake survey methods, life history, and associated ecosystem (Legs I, II & III)

Project Dates: June 30, 2016 to August 14, 2016

Prepared by:



Date: 6-23-16

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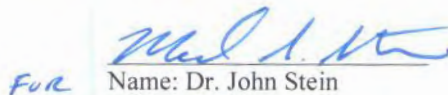
Approved by:



Date: 6/23/16

Name: Dr. Michelle McClure
Division Director
NWFS/FRAM

Approved by:



Date: 6/23/16

Name: Dr. John Stein
Science and Research Director
NWFS

Approved by:

CDR Brian W. Parker, NOAA
Commanding Officer
Marine Operations Center - Pacific

Date: June 28, 2016

I. Overview

A. Brief Summary and Project Period: NWFSC-led investigations of Pacific hake (*Merluccius productus*) and joint survey methods, life history, and associated ecosystem components (trophic structure and oceanography) will be conducted during CCE16 Legs I (30 June to 13 July), Leg II (17 July - 30 July), and Leg III (3 August to 14 August).

B. Days at Sea (DAS): Of the 40 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 40 DAS are funded by a Line Office allocation and 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 (include optional map/figure showing op area)

Survey area will potentially span the West Coast from ~41°N (Trinidad Head area) to ~51°N (the north end of Vancouver Island, Canada). The exact locations will depend on the locations of suitable hake schools with desired densities and age-class characteristics.

The potential waypoints for Legs I and II are described in Figure 1 and Table 1. Newport serves as the inshore starting waypoint for Legs I and II, with a tentative plan of 11 total zig-zag transects (i.e. paired start/stop coastal waypoints) going south from Newport to Trinidad Head on Leg I, and 11 zig-zags going north from Newport to Cape Flattery on Leg II. The transects are determined as follows:

- Inshore, coastal waypoint has a bathymetric depth of 100 m;
- Offshore waypoint has a bathymetric depth of 1500 m;
- Coastal waypoints are 20 nmi apart, with the diagonal's offshore waypoint approximately midway between them;
- Tracklines have been adjusted, as necessary, to account for compliance with any Marine Protected Areas.

Operating area for Leg III will be determined based on observations of hake and/ or rockfish during Leg II: new waypoints may be established if sufficient aggregations have not been observed, extending into Canadian waters, if necessary.

D. Summary of Objectives:

1. Use paired midwater trawls to evaluate potential selectivity of Pacific hake age/size classes by different codend liners (Standard AWT 32 mm versus 7 mm used by DFO on their Cantrawl) in the Aleutian wing trawl 24/20 (AWT). Midwater trawling for this research will take place on all three survey legs.
2. Use paired trawls to evaluate performance of net with and without the marine mammal excluder installed.
3. Test a larger kite on the AWT for stability and ease of use with headrope sensors.

4. Continuously sample multi-frequency acoustic backscatter data using the ship's Simrad EK60, EK80, and ME70 scientific echo sounder systems to estimate the distributions and abundances of hake, myctophids, gelatinous zooplankton, and krill.
5. Conduct research using the EK80 to distinguish between hake, myctophids, and rockfish. Compare EK80 backscatter signature with that of the EK60.
6. Optically observe fish behavior inside daytime trawls using a video or stereo camera and lights mounted inside the net. Test stereo camera system for quantifying fish species and length.
7. Collect a variety of other acoustic, biological, and oceanographic samples to characterize the biotic and abiotic environments and predator-prey interactions of the surveyed species.
8. Investigate near-field calibration techniques.
9. Use night operations time to conduct hydrographic measurements with a CTD. A NWFSC dissolved O₂ sensor will also be mounted on the CTD.
10. Sample profiles of temperature and salinity using an underway conductivity-temperature-depth (CTD) system during daytime operations.
11. Continuously sample air temperature, barometric pressure, and wind speed and direction using the ship's integrated weather station.

E. Participating Institutions

NOAA/NMFS/NWFSC, 2725 Montlake Blvd. E, Seattle, WA 98112

F. Personnel/Science Party: name, title, gender, affiliation, and nationality

Leg I: 30 June to 13 July 2016

Name	Title	Embark	Disembark	Gender	Affiliation	Nationality
Sandy Parker-Stetter	Field Party Chief	6/27/16	7/14/16	F	NWFSC	U.S.
Steve de Blois	Biologist/Acoustician	6/27/16	7/30/16	M	NWFSC	U.S.
Dan Kamikawa	Trawl Lead	6/29/16	7/13/16	M	NWFSC	U.S.
Christa Colway	Biologist	6/29/16	7/13/16	F	NWFSC	U.S.
Nate Jones	Volunteer	6/29/16	7/13/16	M	NWFSC	U.S.

Julia Indivero	Volunteer	6/29/16	7/13/16	F	Wesleyan University	U.S.
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Leg II: 17 July to 30 July 2016

Name	Title	Embark	Disembark	Gender	Affiliation	Nationality
Sandy Parker-Stetter	Field Party Chief	6/27/16	7/30/16	F	NWFSC	U.S.
Steve de Blois	Acoustician	6/27/16	7/30/16	M	NWFSC	U.S.
Dan Kamikawa	Trawl Lead	7/17/16	7/31/16	M	NWFSC	U.S.
Ryan Shama	Biologist	7/17/16	7/31/16	M	NWFSC	U.S.
Melanie Johnson	Biologist	7/17/16	8/14/16	F	NWFSC	U.S.
Cathrine Prenot	Teacher-at-Sea	7/16/16	7/31/16	F	NWFSC	U.S.

Leg III: 3 August to 14 August 2016

Name	Title	Embark	Disembark	Gender	Affiliation	Nationality
Rebecca Thomas	Field Party Chief	8/2/16	8/15/16	F	NWFSC	U.S.
Dezhang Chu	Acoustician	8/2/16	8/15/16	M	NWFSC	U.S.
Melanie Johnson	Trawl Lead	7/17/16	8/14/16	F	NWFSC	U.S.
Bo Whiteside	Biologist	8/2/16	8/14/16	M	NWFSC	U.S.
Jonathan Witmer	Stereo Camera	8/2/16	8/14/16	M	NWFSC	U.S.

	technician					
Joohwan Kim	HABS Technician	8/3/16	8/15/16	M	NWFSC	Korea

G. Administrative

1. Points of Contact

NWFSC: Larry Hufnagle, Survey Lead, 2725 Montlake Blvd. E, Seattle, WA 98112, (206) 860-3346, lawrence.c.hufnagle@noaa.gov

Alternate: Julia Getsiv-Clemons, 2032 SE OSU Drive, Newport, OR 97365, (541) 867-0539, julia.clemons@noaa.gov

Ops Officer Bell M. Shimada:

LT Timothy Sinuefield, 2002 SE Marine Science Drive, Newport, OR 97365, (541) 867-8775, ops.bell.shimada@noaa.gov

2. Diplomatic Clearances:

This project involves Marine Scientific Research in waters under the jurisdiction of Canada. Clearance has been granted for the duration of the survey, under permit F2016-029. No port calls have been authorized.

3. Licenses and Permits:

This project will be conducted under the Scientific Research Permits (U.S.) issued by:

- a. NMFS/NWR on June #, 2016 to Larry Hufnagle (SRP-09-2016)
- b. NOAA/ONMS on June 9, 2016 (CINMS-2016-006)
- c. CDFW on April 27, 2016 to John Stein (SC-11678)
- d. ODFW on January 1, 2016 to Larry Hufnagle (STP 20082)
- e. Extension letter issued by NMFS/NWR to NWFSC on December 21, 2015 (ESA Section 10(a)(1)(A), permit # 16337-2M).
- f. Washington State Scientific Permit to operate within state waters has been requested. *Fishing operations within 3 nm miles off the Washington coast will only occur upon Permit's issuance.*

II. Operations

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

A. Project Itinerary

Hake investigations will be conducted during Legs I, II, & III and rockfish and myctophids will be investigated on Leg III. All Legs occur aboard the NOAA Ship Bell M. Shimada. The project will begin and end at Newport, OR. Between-leg ports of call are indicated below.

Leg	Activity / Location	Start Date	End Date
Staging	Newport, OR	6/28/16	6/30/16
Leg I	Kite, net liner, MMED testing	6/30/16	7/13/16
Inport	Newport, OR	7/13/16	7/17/16
Leg II	Net liner testing	7/17/16	7/30/16
Inport	Seattle, WA	7/30/16	8/3/16
Leg III	Calibrate EK60/EK80 in Elliot Bay, Seattle, WA	8/3/16	8/4/16
	Net liner testing/ EK80 research	8/5/16	8/14/16
Destaging	In Port Newport, OR	8/14/16	8/16/16

B. Staging and Destaging:

Staging will be in Newport, OR on 28-29 June 2016. Destaging will be in Newport, OR on 15-16 August 2016.

C. Operations:

1. Acoustic data collection: Acoustic backscatter data will be collected continuously with EK60s and intermittently with the EK80 and the ME70 throughout the duration of the survey. The 38 kHz frequency may be switched between the EK60 and the EK80 for system comparison purposes.
 - a. The EK60, ADCP, and ME70 transducers will be cleaned during staging for Leg I.
 - b. The EK60, EK80 and ME70 echosounders will be calibrated at the beginning of Leg III using the standard-sphere method while at anchor (single-point, bow) in ~20- to 50-m deep, calm water with low current and biological backscatter. The precise locations of the calibrations will be

determined by the Field Party Chief in consultation with the Operations Officer. Before and after each calibration, CTD casts will be required to determine local sound speed and absorption values.

- c. The ship will run the planned transects during daytime (approximately 14.5 hours per day) at a nominal speed of 11 kts. Acoustic data will be continuously collected using three frequencies on the EK60 (18, 38, and 120 kHz), two frequencies on the EK80 (70 and 200 kHz; intermittent at 38 kHz), and the 75 kHz ADCP. The ME70 may be running intermittently at the discretion of the Field Party Chief. All systems will be synchronized using the K-Sync.
 - d. The split-beam transducers are mounted on the ship's retractable centerboard. We request that the centerboard remain at the fully extended position (9.15 m) for the duration of the survey. Any changes to the centerboard depth will be reported to the Field Party Chief and recorded in the SCS.
 - e. All acoustic systems will be synchronized using the K-Sync.
 - f. The ship's navigational echo sounders and Doppler velocity log (DVL) should be secured as much as possible as they interfere with the signals received on the EK60. When their use is necessary, the crew shall inform the Field Party Chief.
2. Net configuration testing (Legs I and II primary; continue to Leg III, as needed)
- a. Two Aleutian wing trawl (AWT) midwater trawls will be mounted on each net reel of Shimada's trawl deck
 - i. Net #1 = Large kite + 32 mm codend liner
 - ii. Net #2 = Standard kite + 32 mm codend liner
 - b. Comparing fishing stability of modified (large) kite to standard configuration:
 - i. Upon departure for Leg I, operations will begin by towing the net with the large kite, with codend open. While watching the FS70 and ITI data, if the net behaves normally (e.g. normal vertical and horizontal spread), and the ship's crew is satisfied with how it handles, the kite testing may be considered complete.
 - ii. Otherwise, the net with the standard kite may be deployed to compare performance. We anticipate a maximum of six test tows to satisfactorily complete this testing.
 - c. Conduct paired midwater trawls to evaluate potential selectivity of Pacific hake age/size classes by different codend liners (Standard AWT 32 mm versus 7 mm used by DFO on their Cantrawl)
 - i. Upon completion of the kite testing, Net #2 should be removed from the reel and replaced with Net #3 (Large kite + 7 mm codend liner)

- ii. Then, the ship will begin searching for hake aggregations along the pre-planned transects.
 - iii. When a potential hake aggregation is detected, the ship will break from the diagonal transect and, if necessary, conduct a small ad hoc search pattern (to be discussed in the field, accounting for weather conditions and likely fishing direction) to determine if the aggregation is sufficiently large to sample with a paired trawl set.
 - iv. A paired trawl set is comprised of the following elements:
 - 1. After random selection of which AWT to deploy first (7 mm or 32 mm liner), the first tow samples the hake aggregation.
 - 2. The second tow (with the alternate codend liner) will be deployed immediately after recovery of the first net, and while the wet lab begins processing the first catch.
 - a. Weather permitting; second tow should be completed in the opposite direction of the first haul. Otherwise, the ship should transit to sample in the same direction as the first haul.
 - 3. Paired tows should be conducted within close proximity to each other both in time and distance (approximately 0.5 to 1.0 NM).
 - v. After the paired trawls have been completed, the ship will resume the diagonal transect to continue searching for potential hake aggregations. The minimum distance between trawl sampling points along the diagonal transects will be determined by the Field Party Chief.
 - d. Conduct paired midwater trawls to evaluate performance of net and potential selectivity of Pacific hake age/size classes by sampling with and without the marine mammal excluder device installed.
3. EK80 Research (Intermittent on Legs I and II, primary focus of Leg III)
- a. Compare observations of acoustic backscatter attributed to hake, myctophid, and rockfish aggregations (species-specific observations and mix) collected with EK80 and EK60 systems
 - i. Run systems together and separately.
 - ii. Assess interference between the systems.
 - iii. Confirm accuracy of EK80, as compared to EK60; determine if EK80 is better able to distinguish between these aggregations.
 - b. Conduct standard AWT tows to sample aggregations and confirm composition of acoustic backscatter

4. For all AWT deployments:
 - a. Tows will be conducted during day-time (approximately 14.5 hrs per day).
 - b. Performance of the trawl gear will be monitored for depth, net opening, and other parameters via the following sensors and equipment:
 - i. Simrad FS70 third-wire trawl sonar attached to the headrope; data should be recorded
 - ii. Temperature-depth recorder (Sea-Bird SBE39) attached to the headrope, potentially to footrope
 - iii. Digital video camera for tows on Leg I and II
 - iv. Stereo camera system for tows on Leg III.
 1. The Gilson should be available to relieve tension on the net during camera retrieval after the tow.
 - v. ITI sensors (including door sensors)
 - c. Environmental data should be collected through the entirety of the deployment via the ship's standard SCS data streams.
 - d. The NWFSC will follow a standard Marine Mammal Protocol prior to deploying gear, which will be provided to the ship prior to departure.
 - e. The NWFSC will follow standard protocols for interaction with other protected species (i.e. eulachon and salmon) per permit restrictions.
5. Biological data collection:
 - a. All fish and many invertebrates in each catch will be sorted to species, if possible, and the catch weighed. Individuals of certain species will be randomly selected for biological sampling (length, individual weight, sex, otolith collection, ovary, etc) or kept to complete special sampling requests. Some specimens, such as ovaries, will be preserved in 10% formalin, others, such as otoliths, preserved in 50% ethanol, and still others, such as fin clips, preserved in 95% ethanol. A list of the current protocols is available if necessary.
 - b. Large catches: For large catches, the catch will be randomly sub-sampled. The total catch weight will be determined by either weighing the entire catch in multiple dumps into the hopper using the calibrated scale (NWFSC provided) in the Wet Lab, or using a NWFSC provided crane scale and creating sections to either dump or sample using cinching straps.
6. Physical oceanographic data collection:
 - a. An underway CTD (UCTD) will be deployed during the day at locations indicated by the Field Party Chief. The UCTD requires a vessel speed less than or equal to 10 kts. The ship's Survey Tech is needed to assist with the operation and maintenance of this equipment.
 - b. On Legs I, II and III, the CTD rosette will be cast during night operations at stations appropriate for maintaining and enhancing previous ecosystem

work. Water samples will be taken at stations selected for HABS research.

- c. The ship's thermosalinograph (TSG), meteorological sensors, and scientific computing system (SCS) will be used continuously during the survey. These data will be logged via the ship's computers and provided by the Survey Techs to the Field Party Chief at the end of each project leg on an external hard drive.

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 Commanding Officer.

The ship will dive during staging of Leg I to clean the transducers as best as possible. All dives will be conducted in accordance with the NOAA Diving Program requirements.

E. Applicable Restrictions:

Conditions which preclude normal operations: If sea conditions and vessel ride deteriorate to a point where the quality of collected acoustic data is compromised, or in the opinion of the command, the vessel may need to break from running acoustic transects and seek shelter until conditions improve enough for satisfactory collection of acoustic data.

III. Equipment

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

Item #	Item description
1	CTD (main unit plus spare), rosette, carousel, water sampling bottles, computer/deck unit, hydrographic winch
2	ADCP computer/deck unit
3	Underway sensors (SCS) and computer/deck unit
4	FSCS computer system
5	Winches: trawl, third wire, Gilson, oceanographic
6	Ship's computer network (at least 4 static IP addresses on SH)
7	Centerboard-mounted transducers (ADCP, EK60, ME70, ITI)
8	Spaces: Fish Processing Lab, Chem Lab, Acoustics Lab, Dry Lab, Constant Environment Room, and Preservation Alcove
9	Email, telephones, intercom system, handheld radios
10	VHF Radios with NOAA F-Channels
11	Simrad EK60: 18-, 38-, 70-, 120-, and 200-kHz GPTs
12	Simrad ME70 Multibeam echo sounder system
13	Simrad K-Sync

14	FS70 third-wire net sounder
15	ITI Net Sensors
16	Applanix POS MV position and attitude sensor system
17	Freezers (-20 C and -80 C)
18	Fishbuster doors
19	Wet lab conveyer belt and hopper on back-deck
20	Fume hood for sample processing (for HABS)

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

Item #	Item description	Comments/ details/ quantity
1	Computers	Eight laptops
2	Networking	Two 8-port Netgear switches
3	External hard drives	Assorted 250-GB, 750-GB, and 1-TB Western Digital drives with cables
4	Software	Software media
5	Trawl gear	Four midwater (AWT) nets and rigging; one set of Fishbuster 4-m ² doors; two 750-lb tom-weights, spare trawling gear, marine mammal excluder device
6	Video camera	Go-pro cameras (2), light array, cabling, frame, and battery pack
7	Stereo camera	Camera can, battery can, strobe lights, and harness
8	Temperature-depth recorders	Three Sea-Bird SBE39s
9	HOBO Logger	
10	Crane scale	
11	Biological sampling gear	20 fish baskets and 12 tubs; three Scantrol fish measuring boards; two large and three small Marel motion-compensating scales
12	Calibration gear	Four downriggers (with clamps) and 4 battery packs; calibration spheres; ultrasonic cleaner
13	UnderwayCTD system	Request that ship mount uCTD system on stern
14	EK80 WBT	Simrad EK80 WBTs, with center frequency of 70 and 200 kHz; assistance from the ET will be needed to install the WBT boxes
15	EK60 GPTs	Spares for 18,28,70, 200 kHz
16	Personal locator beacons, personal	Current Maintenance logs and

	flotation devices, immersion suits for scientific party use (in lab spaces and on deck)	inventory for all safety gear will be provided to ship prior to departure
17	Harmful Algal Bloom support gear	Sample storage, bucket sampler, vertical plankton net, bench space for suction pump filter
18	Dissolved Oxygen sensors	For deployment on CTD

IV. Hazardous Materials

A. Policy and Compliance

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

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An SDS 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. SDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Formaldehyde solution (4% and 37%)	3 liters in plastic bottles of 37% formaldehyde (100% formalin), 2.5-gallon carboy, 5-gallon bucket or small sample containers of 4% Formaldehyde (10% Formalin)	Bottles of 37% are stored in chem lab; diluted to 10% formalin solution in 2.5 gallon carboys or 5-gallon buckets in fish processing lab or used in small sample containers stored in the hood	Steve de Blois, Dan Kamikawa, Melanie Johnson	F
20% Formalin solution buffered with 5% (w/v) HMT (Hexamethylenetetramine)	200 ml, stored in a 250 ml plastic bottle with leak proof cap	Bottle is stored in the chem lab in the fume hood where the formalin will be added to seawater samples as well	Julia Indivero, Joohwan Kim	F
Ethanol (50 % and 95%)	~6 gallons of 95%, small squirt bottle of 50%	5-gallon carboys of 95% stored in chem lab; small squirt bottle of 50% stored in fish processing lab	Steve de Blois, Dan Kamikawa, Melanie Johnson	E
Clove Oil	100 ml bottle	Bottle stored in chem lab	Dezhang Chu	E
MS-222	2 lbs	Stored in chem lab	Dezhang Chu	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 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.

Inventory of Spill Kit supplies

Product Name	Amount	Chemicals it is useful against	Amount it can clean up
Spill-X-FP	12 lbs	formalin/formaldehyde	13.6 gallons
absorbent pads	5	formalin/ethanol	10x its weight

Other supplies include saline solution for rinsing eyes, safety goggles, trash bags, hazardous waste labels, and SDS for all chemicals.

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

- 1) Harmful algal bloom study (HABS): Space in the dry lab (~4 ft bench space + fume hood) for sample processing is requested. CTDs with sample samples collected at 10m, 5m, and surface will be conducted. Vertical phytoplankton tows (hand-held net) will be deployed at each HABS station.
- 2) Calibration of Ocean Observatory Initiative (OOI) moorings: time permitting, ship should drive at slow speed (4-5 kts) in a 1 km box (box with 1km legs)

centered around the moorings at coordinates identified below. If possible, one night-time pass and one day-time pass should be completed.

Location	Instrument	Coordinates
NH10 (10 NM W of NPT)	EK60	44°38'18"N, 124°18'14"W
Newport offshore	EK60	44°22'6"N, 124°57'10"W
Yaquina Head (2 km off)	Acoustic Zooplankton Fish Profiler (AZFP)	44°39'30.30"N, 124° 5'43.30"W
Gray's Harbor #1	AZFP	47° 7'60"N, 124°16'18"W
Gray's Harbor #2	AZFP	46°59'10"N, 124°33'58"W
Gray's Harbor #3	AZFP	46°51'6"N, 124°58'0"W

EK60s are cabled to the sea floor. AZFPs are mounted on the anchors of surface moorings. Bolded sites are priority. Yaquina Head site should only be surveyed if conditions allow and ship is comfortable with vicinity to shore.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

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

A. Data Classifications: *Under Development*

a. OMAO Data

b. Program Data

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Chief Scientist and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's

Operations Officer usually is delegated to assist the Chief Scientist in arranging this meeting.

B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer. In addition to the standard welcome aboard meeting, the science party requests that a tour of the ship's muster locations and safety equipment is provided to newly embarked scientists.

C. Post-Project Meeting: The Commanding Officer is responsible for conducting 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 Chief Scientist, Field, Party Chiefs, and members of the scientific party and is normally arranged by the Operations Officer and Chief Scientist.

D. Project Evaluation Report: Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Chief Scientist. The form is available at <https://sites.google.com/a/noaa.gov/omao-intranet-dev/operations/marine/customer-satisfaction-survey> and provides a "Submit" button at the end of the form. It is also located at <https://sites.google.com/a/noaa.gov/omao-intranet-dev/operations/marine/customer-satisfaction-survey>. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the project.

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

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

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website <http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf>.

All NHSQs submitted after March 1, 2014 must be accompanied by [NOAA Form \(NF\) 57-10-02](#) - Tuberculosis Screening Document in compliance with [OMAO Policy 1008](#) (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information

should health services require it before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

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

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

Contact information:

Regional Director of Health Services
Marine Operations Center – 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

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of

the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations Officer should be consulted by the Chief Scientist to ensure members of the scientific party report aboard with the proper attire.

D. Communications

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

E. IT Security

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

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

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

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

F. Foreign National Guests Access to OMAO Facilities and Platforms

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

Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated Line Office Deemed Export point of contact to assist with the process.

Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

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

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

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written approval from the Director of the Office of Marine and Aviation Operations and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist or the DSN of the FNRS or Servicing Security Office email granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.

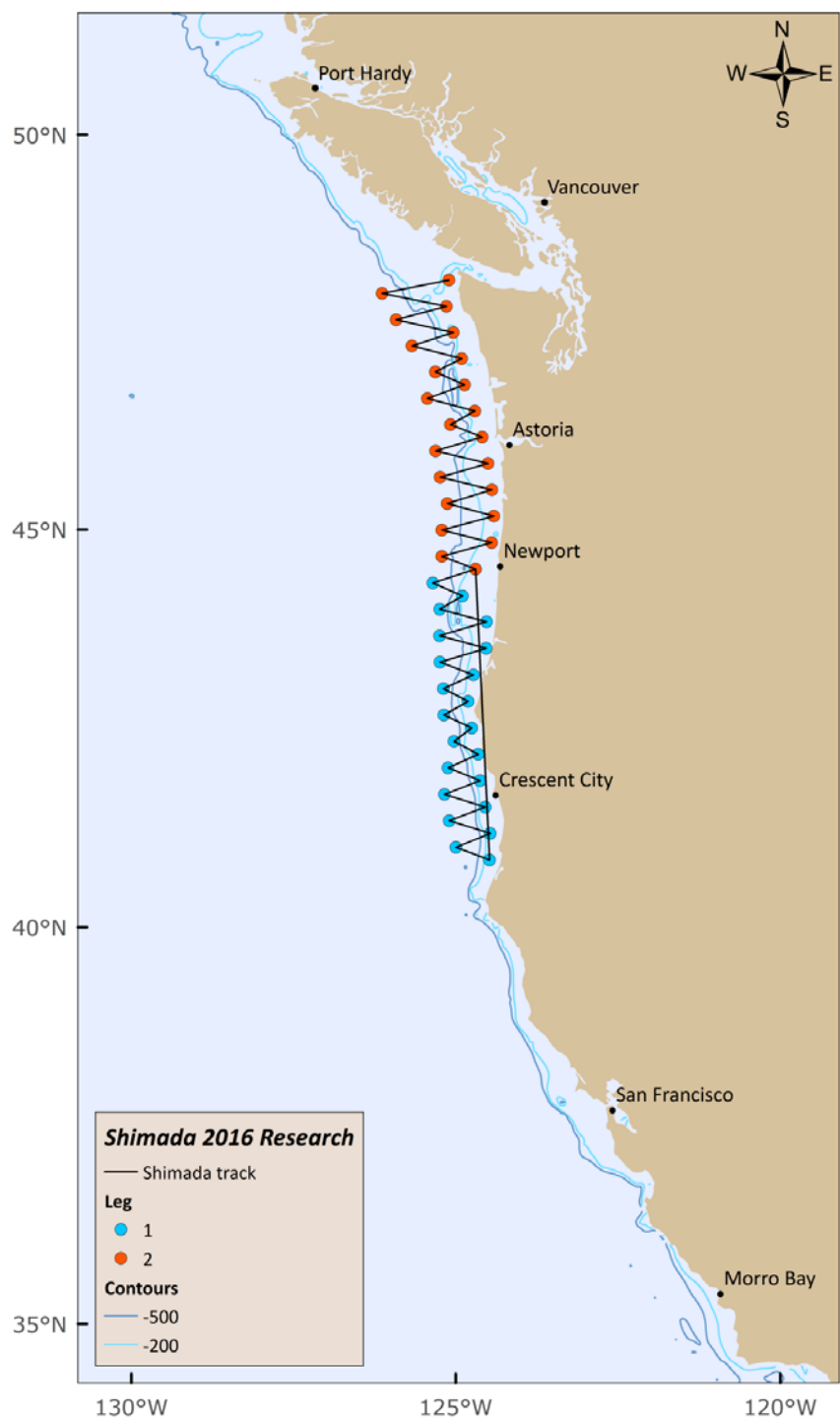
6. Export Control - 8 weeks in advance of the project, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the Servicing Security Office.

Responsibilities of the Foreign National Sponsor:

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

VIII. Appendices

Figure 1: Planned tracklines for Leg I and II of the Summer Research Survey



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

Table 1: Coordinates for transects planned for Legs I and II of the Summer Research Survey

Leg	Waypoint	Longitude	Latitude
1	1.1	- 124.47867	44.6167
1	1.2	- 125.24667	44.4500
1	1.3	- 124.72233	44.2833
1	1.4	- 125.12883	44.1167
1	1.5	- 124.30133	43.9500
1	1.6	- 125.13817	43.7833
1	1.7	- 124.31850	43.6167
1	1.8	- 125.13233	43.4500
1	1.9	- 124.54950	43.2833
1	1.10	- 125.07633	43.1167
1	1.11	- 124.65183	42.9500
1	1.12	- 125.07433	42.7833
1	1.13	- 124.59333	42.6167
1	1.14	- 124.90283	42.4500
1	1.15	- 124.48950	42.2833
1	1.16	- 125.01233	42.1167
1	1.17	- 124.46433	41.9500
1	1.18	- 125.07817	41.7833
1	1.19	- 124.38300	41.6167

1	1.20	- 125.00317	41.4500
1	1.21	- 124.30617	41.2833
1	1.22	- 124.89433	41.1167
1	1.23	- 124.32633	40.9500
2	2.1	- 124.47867	44.6167
2	2.2	- 125.08033	44.7833
2	2.3	- 124.17983	44.9500
2	2.4	- 125.07750	45.1167
2	2.5	- 124.13300	45.2833
2	2.6	- 124.97367	45.4500
2	2.7	- 124.15750	45.6167
2	2.8	- 125.09783	45.7833
2	2.9	- 124.21650	45.9500
2	2.10	- 125.17600	46.1167
2	2.11	- 124.31550	46.2833
2	2.12	- 124.89750	46.4500
2	2.13	- 124.44367	46.6167
2	2.14	- 125.32117	46.7833
2	2.15	- 124.62517	46.9500
2	2.16	- 125.16483	47.1167
2	2.17	- 124.67117	47.2833
2	2.18	- 125.60183	47.4500
2	2.19	- 124.82450	47.6167

2	2.20	- 125.89850	47.7833
2	2.21	- 124.94750	47.9500
2	2.22	- 126.16350	48.1167
2	2.23	- 124.89150	48.2833