I. Overview

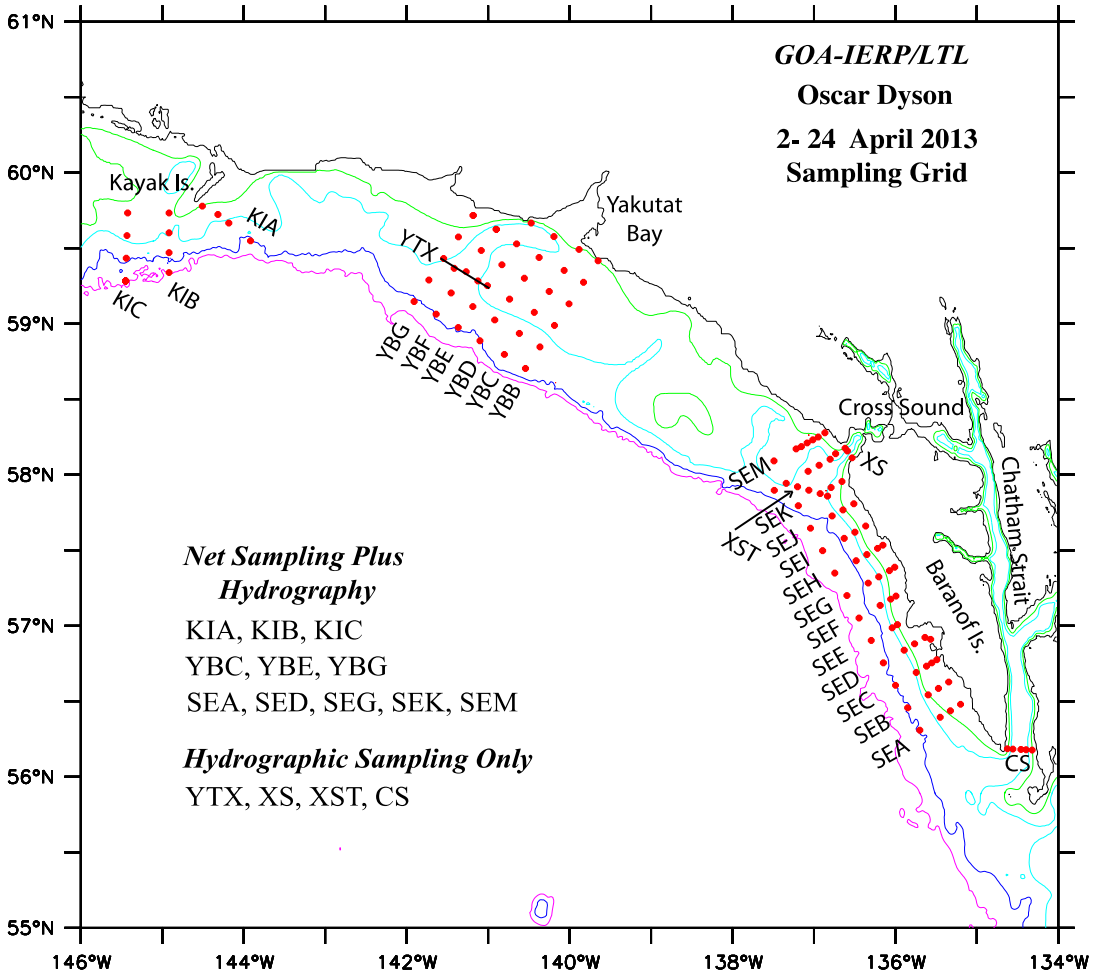
A. April 3-24, 2013 from Seward, AK to Seward, AK

B. Service Level Agreements

Of the 23 DAS scheduled for this project, 0 DAS are funded by the program and 23 DAS are funded by OMAO. This project is estimated to exhibit a high Operational Tempo.

C. Operating Area

Figure 1: Operational area in the Eastern Gulf of Alaska



D. Summary of Objectives

Ecosystems & Fisheries-Oceanography Coordinated Investigations (Eco-FOCI) is an effort by National Oceanic and Atmospheric Administration (NOAA) and associated academic scientists. Eco-FOCI's goal is to understand the effects of abiotic and biotic variability on ecosystems of the North Pacific Ocean and Bering Sea This cruise is in

support of research sponsored by NOAA's North Pacific Climate Regimes & Ecosystem Productivity Program, the North Pacific Research Board (NPRB), and PMEL/AFSC base.

The primary purpose of this cruise is to observe the ecosystem of Southeastern Alaska, including transects near Baranoff Is., Yakutat, and Kayak Island. This is part of the Gulf of Alaska- Integrated Ecosystem Research Program (GOA-IERP) sponsered by NPRB. Operations will primarily consist of zooplankton and larval fish sampling using MARMAP bongo tows and Neuston net operations, MOCNESS tows, accompanied by hydrographic measurements and water sampling on some of the transects. In addition, there will be sampling for iron via special bottles attached to the CTD wire, and continuous towing of a fish to collect near-surface iron on suitably long transits. Eight ARGOS-tracked drifters, drogued at 40m wikll be deployed during this cruise.

E. Participating Institutions

NOAA - Pacific Marine Environmental Laboratory (PMEL)
7600 Sand Point Way N.E., Seattle, Washington 98115-6439

NOAA - Alaska Fisheries Science Center (AFSC)
7600 Sand Point Way N.E., Seattle, Washington 98115-0070

NOAA/NMFS Auke Bay Laboratories, Juneau, AK

Western Washington University (WWaU)

University of Alaska, Fairbanks

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

Name (Last, First)	**Title**	**Date Aboard**	**Date Disembark**	**Gender**	**Affiliation**	**Nationality**
Kachel, Nancy	Dr., Chief Scientist	31 March	23 April	F	PMEL/UW JISAO	USA
Kachel, David	Mr.	31 March	23 April	M	PMEL	USA
Strom, Suzanne	Dr.	31 March	23 April	F	WWU	USA
Aguillar-Islas, Ana	Dr.	31 March	23 April	F	UAF	USA
Stockwell, Dean	Dr.	31 March	23 April	M	UAF	USA
Proctor, Peter	Dr.	1 April	24 April	M	PMEL/UW JISAO	USA
Bright, Kelley	Ms.	31 March	24 April	F	WWU	USA
Busby, Morgan	Mr.	1 April	24 April	M	AFSC	USA
DeForest, Lisa	Ms.	1 April	24 April	F	AFSC	USA
Clark, Jay	Mr.	1 April	24 April	M	AFSC	USA
Jump, Christine	Ms.	1 April	24 April	F	AFSC	USA
Salo, Sigrid	Ms.	1 April	24 April	M	PMEL	USA
Ostendorf, Morgan	Ms.	1 April	24 April	F	PMEL/UW JISAO	USA
Segurat, Marie	Dr.	31 March	24 April	F	UAF	France

G. Administrative

1. Points of Contacts:

Dr. Nancy B. Kachel, PMEL/ UW
7600 Sand Point Way NE
Seattle, WA, 98114
Telephone: (206) 526-6746
E-mail: Nancy.Kachel@noaa.gov

Dr. Phyllis J. Stabeno, PMEL
Telephone: (206) 526-6453
E-mail: Phyllis.Stabeno@noaa.gov

Dr. Jeffrey Napp, AFSC
Telephone: (206) 526-4148
E-mail: Jeff.Napp@noaa.gov

2. Diplomatic Clearances –N/A

3. Licenses and Permits: N/A.

II. Operations

A. Project Itinerary

March 29, 2013 Load RAD van in Seward, AK

March 30-31, 2013 Load gear in Seward, AK

Departure- April 3, 2013 Seward, AK

April 3-21 conduct CTD, net and trace metal surveys in southeast Alaska

Arrival April 24, 2013- Seward, AK and begin de-staging.

April 26, offload RAD van in Seward under direction of William Floering

B. Staging and De-staging

Some equipment for this cruise was aboard the *Oscar Dyson* as it traveled north from Seattle. Other equipment and supplies will be shipped to Kodiak in a container of mooring equipment prior to the cruise. Bill Floering will load it in Kodiak, along with the mooring equipment in Kodiak, for the transit to Seward.

A UNOLS radiation van is being shipped to Seward. The delivery date March 10-12. It will be stored at the Seward Marine Center. We plan for it to be delivered to the railroad pier on March 29, after the Dyson arrives in Seward and loaded by a rented crane onto the ship. Bill Floering will be aboard to oversee this process for us.

On March 31, 8 members of the science party, including the chief scientist want to arrive in Seward. If possible, the science party would like to stay aboard the ship after their arrival. Equipment arriving from the University of Alaska, Fairbanks with them on that day can be hand-carried onto the ship.

The scientists from WWaU and NOAA/AFSC will ship their gear on ~12 pallets to the Seward Marine Center prior to the arrival of the *Dyson*.
The scientific party needs to retrieve 9-11 pallets of the gear from storage at the Seward Marine Center and get it loaded aboard the Dyson on Monday, April 1. The availability of a crane operator from the ship during this time period (morning) would be very helpful. The scientific party will be responsible for arranging vehicles for moving their equipment to the railroad pier from its storage site.

The remaining 6 members of the science party will arrive on April 1. Total number in the science party is 14.

On April 24th, when the ship is scheduled to arrive back to Seward, the science party, in conjunction with the ship's crew will offload the science equipment and samples onto trucks. They will need the support of a crane opeator during this time period. The scientific party will be responsible for arranging vehicles for moving their equipment from the docks.

It is scheduled that the radiation van will be removed from the ship by crane, arranged by the science party on March 26. Bill Floering form PMEL, the chief scientist on the next cruise will oversee this operation.

C. Operations to be conducted

A map of the planned station grid is shown in Fig 1. A PI meeting is scheduled March 19-21, 2013, where the grid might be modified. Such modifications might include seaward extensions of some of the lines and elimination of other lines depending on scientific needs to be determined by the PI and Chief Scientist. Elimination of lines would depend on time constraints caused by weather or equipment problems. All changes will be made in coordination with the ship.

This cruise will primarily be a hydrographic cruise and, collecting CTD data and zooplankton and larval fish samples. MARMAP Bongo nets and Neuston nets will occur at each station on ~23 transects. CTDS will be conducted on every second or third trasect. Details on the transects are provided in Fig1 in the Appendix. We will use the ship's CTD with the 12 place rosette and 10-L Niskin bottles, but will bring our own bongo and neuston nets. The bongo uses a SeaCat profiler in real-time mode to determine depth and measure hydrographic properties and therefore needs to be on a 0.322mm conducting cable. We anticipate that at 6 deep stations to be identifiedd by the chief scientists we will conduct multinet tows to take stratified zooplankton samples. These will be selected opportunistically.
Sea water hoses will be needed to wash down the nests from the MARMAP, neuston and multicore net tows.

We plan to collect Winkler oxygen, nutrient and fractionated chlorophyll and salinity samples from the CTD casts, as well as collecting water for growth experiments and incubations. Nutrient samples will be frozen at -80°C and processed back at PMEL. Winkler oxygen samples and fractionated chlorophyll samples will be analyzed aboard the ship.
Dr. Suzanne Strom from Western Washington University will work in the RAD van for C-14 phytoplankton growth experiments. She plans to do incubations inside the van.

Dean Stockwell form University of Alaska Fairbanks will collect water for deck incubations. His experiments will have additions of Fe compounds, and involve filtration of chlorophyll samples.
Dr. Ana Aguillar-Islas will be collecting water for trace metal analyses by two methods on this cruise. Her team will deploy special self-contained vane samplers attached to the CTD wire. See attached photo (Fig. 2). These bottles are programmed to open up to sample at pre-set times. The vanes attach to the CTD wire using stainless steel cable clamps. The CTD wire is wrapped with electric tape where the clamps attach to the wire. The CTD rosette is kept at the end of the wire during this operation. This operation does not need a Kevlar line or special winch.

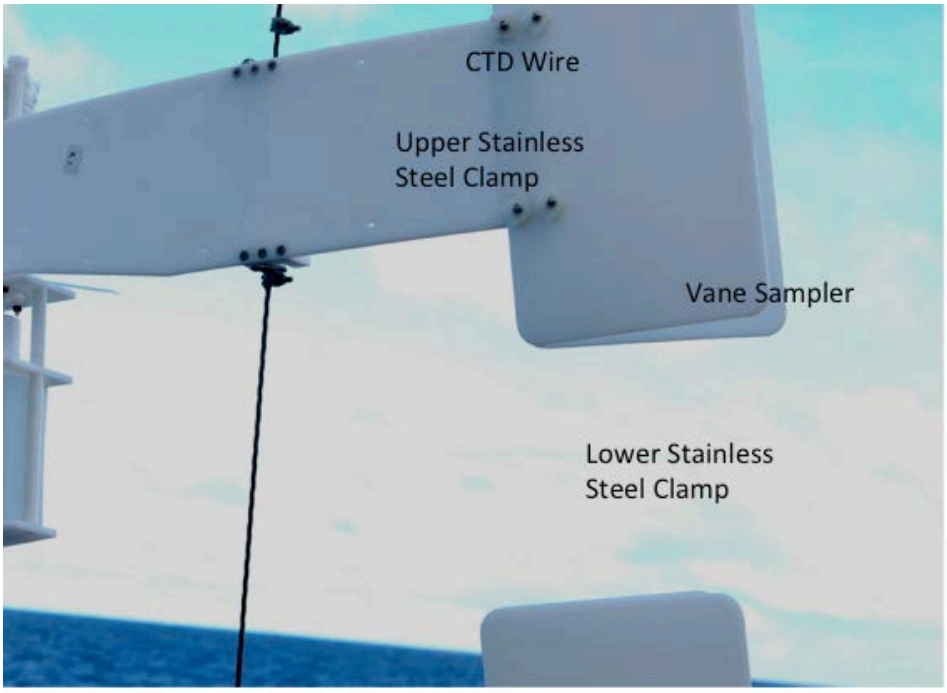


Figure 2. Trace metal sampling bottles. These bottles hang on the CTD wire.

Dr. Aguillar-Islas also plans to tow a trace-metal surface sampling fish (torpedo and vane) off the starboard side to collect surface trace metal data on the longer transits. On our visit to the *Oscar Dyson* in October, it was decided that the starboard A-frame could be used for this operation. Under fair conditions the trace-metal fish being used can be operated at cruising speeds of 12 knots. (See attached photos for rigging set up). Compressed air will be needed to run the diaphram pump that is used to pump trace metal clean water from the fish assembly onto the ship. Teflon tubing will be routed into a sink area inside the ship. This area will be issolated by building a plastic sheet enclosure.
In addition, we shall deploy 6-8 ARGOS-tracked drifters, at some times to be determined, during each of the transects.
We plan to attach another Fluorometer to the flow-through seawater systen. The data from the extra instruments will be collected on a PC that we bring aboard.
Eight ARGOS-tracked drifter deployments will occur at times and places to be chosen

during the cruise by the chief scientist.
See Table 1 in the appendices for the cruise itinerary with proposed operations for each station.

D. Dive Plan N/A

E. Applicable Restrictions

Conditions that preclude normal operations:

We are requesting a second CTD to be provided as a backup to the main ship's CTD in case of equipment failure. A backup SeaCat for the MARMAP tows will be brought by the scientists. In case of bad weather, we may use the time for transiting, or need to hide and wait, depending on where we are if and when it occurs. The Trace-metal fish needs good weather to be deployed.

III. Equipment

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

- Oceanographic winch with slip rings and 3-conductor cable terminated for CTD,
- 12 Khz hull mounted Edgetech Acoustic release transducer,
- Oceanographic winch with slip rings and 3-conductor cable terminated for the SBE 19plus for net tow operations,
- Two Sea-Bird Electronics' SBE 911*plus* CTD system with stand, each CTD system should include underwater CTD, weights, and pinger. There should be a deck units for the systems,
- Conductivity and temperature sensor packages need to provide dual sensors on the CTD (primary),
- 5 or 10-liter Niskin sampling bottles for use with rosette (10 plus 4 spares),
- Sea-Bird Electronics' SBE-19 SEACAT system for plankton tows,
- Wire speed indicators and read-out for oceanographic winches,
- For meteorological observations: 2 anemometers (one R. M. Young system interfaced to the SCS), calibrated air thermometer (wet-and dry-bulb, if possible) and a calibrated barometer and/or barograph,
- Freezer space for storage of biological and chemical samples (blast and storage freezers, -20° C and -80°C), turned on and operating,
- SIMRAD ES-60 and EK-60 echosounders,
- SIMRAD ME-70 Downward-Facing Multi-Beam Sonar,
- RD Instruments' ADCP written to disk,
- Use of PCs for data analysis,
- Scientific Computer System (SCS),
- Minimum of 2 computers with internet and e-mail access,
- Laboratory space with storage spaces,
- Sea-water hoses and nozzles to wash nets,
- Adequate deck lighting for night-time operations,
- Navigational equipment including GPS and radar,
- Safety harnesses for working on hero deck and fantail,
- Ship's crane(s) used for loading and/or deploying.

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

- Sea-Bird Electronics' SBE-19 or 25 SEACAT system, with its own deck unit and data-collection computer
- Multinet sampling array,
- ACS muti-frequency fluorometer to attach to the CTD,
- Winkler Oxygen titration equipment and chemicals,
- PMEL PC with SEASOFT software for CTD processing,
- Spare oxygen sensor for CTD (from FOCI at start of season),
- Salinity sample bottles,
- Fluorometer (spare) to be mounted to the Uncontaminated Scientific Seawater System (USSS),
- Cruise Operations Database (COD) and forms,
- Marine Observation Abstract (MOA) log,
- PMEL CTD and Weather Observation Logs,
- CTD Cast Information/Rosette Log,
- Spill kits for scientists' HazMat,
- Miscellaneous laboratory and sampling equipment (NMFS),
- Miscellaneaous office supplies,
- Float coats, mustang suits, rubber gloves (lined and unlined),
- Trace metal sampling vanes (UAF)
- Miscellaneous scientific sampling and processing equipment for trace metal analyses,
- Underway trace metal sampling fish system (UAF)
- Incubator and growth sampling equipment (Stockwell) 350lbs
- Another fluorometer
- Filtration rigs for chlorophyll samples,
- Sampling jars for phytoplankton, 1 box,~30lbs
- 4 tool boxes
- 2 empty carboys
- miscillaneous phytoplankton sampling gear
- Water bath
- Water circulator for water bath
- 8 ARGOS-tracked drifters (300lbs total)
- Lumber and plastic sheeting to construct a positive pressure tent over the fish-sorting trough
- 4'x1' plexiglass incubator and light source
- Water bath
- Filtration rack and seawater waste trap (for filtering 14C-containing seawater)
- Waste drum (to store 14C-containing waste seawater onboard)
- Scintillation counter (for assessing 14C uptake by phytoplankton and checking for contamination)
- 3 pallet size boxes of sampling and analysis equipment for trace-metal experiments – total weight 1400lbs
- 5 wooden crates (42 x 30 x 31) with empty sample jars
- 3 collapsible totes (48 x 40 x 40) with nets, lab equipment, flowmeters, tools, etc.
- 2 pallets with bongo frames, buckets, etc.

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. The Chief of Operations, Marine Operations Center, will provide documentation regarding those requirements 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
- Include a chemical spill plan the addresses all of the chemicals the program is bringing aboard. This shall include: Procedures on how the spilled chemicals will be contained and cleaned up.
- A complete inventory (including volumes/amounts) of the chemical spill supplies and equipment brought aboard by the program. This must be sufficient to clean and neutralize all of the chemicals brought aboard by the program.
- A list of the trained personnel that will be accompanying the project and the training they've completed.

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

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program.

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.

IV-A. Hazardous Materials List

IV-A.1.1 Trace- metal sampling –Ana Aguillar-Islas and Marie Segurat

User Name: Ana M. Aguilar-Islas | Cruise Number: | Cruise Dates From: Apr 1, 2013 To: May 10, 2013

			Container Information					Spill Response Materials		Shipboard Use			Degree of Hazard			
Common Name of Material	Chemical Composition	UN ID Number	Type	Size	Qty	MSDS?	Storage Hazard	Type	Qty Loaded	Stored Location	Used?	Amount Offloaded	Health	Flammability	Reactivity	Special
Hydrochloric Acid	6M HCl 50% v/v	1789	plastic	500 ml	1	☑	Corrosive				☐		2	0	2	
						☐	Corrosive				☐		0	0	0	

52.03 g of baking soda are needed to neutralize 0.5 L of 6 N HCl but we will bring 1 kg**.**

I-A.1.2 Spills/Leaks Response Plan for Aguillar-Islar/ Segurat

Hydrochloric Acid:

52.03 g of baking soda are needed to neutralize 0.5 L of 6 N HCl but we will bring 1 kg.

Large spills may be neutralized with dilute alkaline solutions of soda ash (sodium carbonate, Na_2CO_3), or lime (calcium oxide, CaO). Avoid runoff into storm sewers and ditches leading to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water. We will cover any spill with baking soda and if the spill is too large, absorbent pads will be used to dam any spillage before its neutralization.

Any spill will be neutralized with baking soda (Sodium Bicarbonate $NaHCO_3$) spread over it that will react with the acid to form water and carbon dioxide following this reaction:
$NaHCO_3 + HCl \rightarrow NaCl + H_2CO_3 \rightarrow H_2O + CO_2$

IV-A.2.1 Hazmat for Phytoplankton Sampling and Growth Experiments – Suzanne Strom/Kelley Bright

Chemical	Composition	Size	Quantity
Acetone	CH_3CHO	4L	3
Formalin	HCHO and CH_3OH	0.1L	50
Gluteraldehyde	$OHCCH_2CH_2CH_2O$	1L	1
Hydrochloric Acid	HCl	1L	2
Sodium Bicarbonate	$NaHCO_3$	1 ml	39
Sodium Hydroxide	NaOH	1L	2

IV-A2.2. Chemical Spill Response Plan-Suzanne Strom and Kelly Bright

Acetone:

- Ventilate area of leak or spill. Remove all sources of ignition.
- Contain and recover liquid when possible. Use non-sparking tools and equipment.
- Absorb spills with absorbent pads and place in heavy-duty plastic bags.

Formalin:

- Ventilate area of leak or spill. Remove all sources of ignition.
- Absorb spills with absorbent pads and place in heavy-duty plastic bags.

Glutaraldehyde:

- Ventilate area of leak or spill.
- Absorb spill with absorbent pads and place in heavy-duty plastic bags.
- Small spills can be flushed with large quantities of water.

Hydrochloric Acid:

- Contain and recover liquid when possible.
- Neutralize with alkaline material (NaOH).
- Absorb neutralized residue with absorbent pads and place in heavy-duty plastic bags.

Sodium Bicarbonate:

- Absorb spill with absorbent pads and place in heavy-duty plastic bags.
- Decontamination with RBS detergent will be performed.

Sodium Hydroxide:

- Ventilate area of leak or spill.
- Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.
- Residues from spills can be diluted with water.
- Absorb neutralized caustic residue with absorbent pads and place in heavy-duty plastic bags.

IV-A.2.3 Chemical hygiene plan for Strom and Bright

Previous sections of the Project Instructions include a list of hazardous materials by name and anticipated quantity. Chemicals will be transported, stored and used in a manner that will avoid any spills and adequate containment; absorbents and cleanup materials will be available in the event of a chemical spill.

The scientific chemicals to be used for this project are: (1) ethyl alcohol (100%) and (2) formaldehyde (37%). Other chemicals brought aboard are consumer products in consumer quantities. Dilutions of the scientific chemicals will be used to preserve infaunal organisms collected with benthic grab samplers, as described in the Operations section of these Project Instructions. Use of these chemicals and the specified dilutions will only occur in exterior locations on the ship away from air intakes. Scientific chemicals shall not be disposed over the side.

Standard Operating Procedures and Information Sheets are provided here for the scientific chemicals. Included are details concerning personal protective equipment, work area precautions, special handling and storage requirements, spill and accident procedures/first aid, waste disposal and other pertinent information. Both small and large spills are of particular concern. In both cases, the spill response is intended to first contain the spill and then neutralize it. This may be easily accomplished for small spills depending on the degree of vessel motion and the prevailing environmental conditions. In all cases, the first responder should quickly evaluate the risks of personal exposure versus the potential impacts of a delayed response to the spill and act accordingly. For example, if the spill is small and it is safe to do so, a neutralizing agent should be rapidly applied to encircle/contain the spill and then cover it. However, a large formaldehyde spill (> 1 L) is extremely hazardous and individuals at risk of exposure should immediately leave the

area. The CO or OOD should be notified immediately so that a response team with self-contained breathing apparatus (SCBA) can be deployed to complete the cleanup operation or dispense the hazard with a fire hose directed overboard. The vessel's course should be adjusted to minimize exposure of personnel to wind-driven vapors and to limit spread of the spill due to vessel motion. The reportable quantity (RQ) of formaldehyde is 1,000 pounds and the RQ for ethyl alcohol is 5,000 pounds, which greatly exceed the quantities brought aboard for this project.

IV-A.3.1 Oxygen Chemicals and Spill Response– Peter Proctor and Morgan Osterdorf

Spill Response

Common Name of Material	Chemical Composition	Type	Size	Qty	Total Amount	MSDS	Storage Hazard	Type	Procedure	Qty Loaded	Health	Flammability	Reactivity	Other Spill response
Manganese (II) Chloride	$MnCl_2 \cdot 4H_2O$ TOXIC SOLID, INORGANIC, N.O.S.	amber glass	500 ml.	2		x	None specified	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.	Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.	1 dustpan, 150 ziplok bags, 20 lbs kitty litter, 10 liters 10% HCl, 1 dustpan, 50 garbage bags	2	0	0	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Potassium Iodate Solution and concentrate	KIO_3	g	0	7	0	x	Keep container tightly closed in a dry and well ventilated place.	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.	Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.	1 dustpan, 150 ziplok bags, 20 lbs kitty litter, 10 liters 10% HCl, 1 dustpan, 50 garbage bags	2	0	0	Use personal protective equipment. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.
Sodium Hydroxide Solution 10N	NaOH SODIUM HYDROXIDE SOLN	ml	125	2	250	x	None Specified	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.	Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.	1 dustpan, 150 ziplok bags, 20 lbs kitty litter, 10 liters 10% HCl, 1 dustpan, 50 garbage bags	3	0	1	Absorb material with dri-zorb, kitty litter, or paper towels
Sodium Iodide	NaI	g	15	2	30	x	Flammable	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.	Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.	1 dustpan, 150 ziplok bags, 20 lbs kitty litter, 10 liters 10% HCl, 1 dustpan, 50 garbage bags	1	0	1	Use non-sparking equipment and collect in ziplock
Sodium Thiosulfate pentahydrate, p.a.	$Na_2S_2O_3 \cdot 5H_2O$	ml	500	2	##	x	None Specified	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.	Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.	1 dustpan, 150 ziplok bags, 20 lbs kitty litter, 10 liters 10% HCl, 1 dustpan, 50 garbage bags	0	0	0	Control spill. Characterize liquid and use absorbents on residual liquid; dispose apropriately. Wash and let dry. For spills of multiple products, responders should evluate the MSDS'sof the products for incompatibility with sodium hypochlorite. Breathing protection should be worn in enclosed, and/or poorly ventilated areasuntil the hazard assesment is complete.
Sulfuric Acid	H_2SO_4 SULFURIC ACID	g	5	3	15	x	None Specified	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Do not get in eyes, on skin, or on clothing.	Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.	20 lbs kitty litter, 10 liters 10% HCl, 1 dustpan, 50 garbage bags	3	0	2	Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

IV-A.4.1 Hazmat for NMFS/AFSC- Zooplankton and Larval Fish Sampling –J. Clark/ M. Busby

Chemical	Size	Quantity
37% Formaldehyde	5-gallon barrels	6
Ethanol (200 proof)	1-gallon jugs	4
Sodium borate solution	5-gallon	1
Sodium borate powder	500grams	1
Spill kit		

IV-A.4.2 The spill kit loaded for FOCI-Biological work contains:

1.5 gallons Formalex (formaldehyde neutralizer)
1 roll (50 sheets) FanPads (formaldehyde neutralizer)
3M Sorbent pads (ethanol spills)
nitrile gloves (S, M, L, XL)
eye shields (goggles)
lab coats
plastic bags for used chemical pads
syringes, valves, and tubing for dispensing system

IV-A.4.3 Chemical Hygiene Plan (FOCI)

Appendix 1 contains the Standard Operating instructions for FOCI for the hazmat above.

Previous sections of the Project Instructions include a list of hazardous materials by name and anticipated quantity. Chemicals will be transported, stored and used in a manner that will avoid any spills and adequate containment. Absorbents and cleanup materials will be available in the event of a chemical spill.

The scientific chemicals to be used for this project are: (1) ethyl alcohol (100%) and (2) formaldehyde (37%). Other chemicals brought aboard are consumer products in consumer quantities. Dilutions of the scientific chemicals will be used to preserve infaunal organisms collected with benthic grab samplers, as described in the Operations section of these Project Instructions. Use of these chemicals and the specified dilutions will only occur in exterior locations on the ship away from air intakes. Scientific chemicals shall not be disposed over the side.

Standard Operating Procedures and Information Sheets are provided here for the scientific chemicals. Included are: details concerning personal protective equipment, work area precautions, special handling and storage requirements, spill and accident procedures, first aid, waste disposal, and other pertinent information. Both small and large spills are of particular concern. In both cases, the spill response is intended to first contain the spill and then neutralize it. This may be easily accomplished for small spills depending on the degree of vessel motion and the prevailing environmental conditions. In all cases, the first responder should quickly evaluate the risks of personal exposure versus the potential impacts of a delayed response to the spill and act accordingly. For example, if the spill is small and it is safe to do so, a neutralizing agent should be rapidly applied to encircle/contain the spill and then cover it. However, a large formaldehyde spill (> 1 L) is extremely hazardous and individuals at risk of exposure should immediately leave the area. The CO or OOD should be notified immediately so that a response team with self-contained breathing apparatus (SCBA) can be deployed to complete the cleanup operation or dispense the hazard with a fire hose directed overboard. The vessel's course should be adjusted to minimize exposure of personnel to wind-driven vapors and to limit spread of the spill due to vessel motion. The reportable quantity (RQ) of formaldehyde is 1,000 pounds and the RQ for ethyl alcohol is 5,000 pounds, which greatly exceed the quantities brought aboard for this project.

IV-B. Radioactive Isotopes

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

The RAM Authorization was sent to the Chief Scientist and to others on Feb 15, 2013.

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
2. 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 only by investigators licensed by NRC or State, 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.

IV-B.1 Inventory (itemized) of Radioactive Materials

Common Name Radioactive Material	Concentration	Amount	Notes
sodium bicarbonate 14C	400µCi	8 1-ml ampoules	
sodium bicarbonate 14C	200 µCi	31 1-ml ampoules	

14C Amounts:

- We anticipate using 9.4 milliCuries of 14C while on board the Dyson (April 2013). This 14C will be in the form of sodium bicarbonate dissolved in water, and will be stored in a small refrigerator in small ampules of the following:

- 8 1-ml ampoules of 400 µCi sodium bicarbonate 14C
- 31 1-ml ampoules of 200 µCi sodium bicarbonate 14C

- Approximately 25 gallons of 14C-containing seawater will be generated as ‘waste’. This will be stored in a drum for disposal on shore after the cruise. The specific activity of this seawater will be no greater than 0.1 microCurie per ml and will likely be less than this.
- A trace amount of waste will be associated with solids (e.g. pipette tips, glass vials)

IV-B.2 Dyson 14C Use Plan

Research Objective:

The use of 14C-labeled sodium bicarbonate (14C) allows us to determine primary productivity and photosynthetic performance of phytoplankton in the GOA, and determine if these parameters vary with time (season, year) and location (cross-shelf, WGOA versus EGOA). These data can be used with concurrent irradiance and chlorophyll data to estimate integrated water column production. For these experiments, 14C is added to seawater in trace amounts to track and measure the incorporation of the much larger amount of naturally occurring inorganic carbon during photosynthesis.

Experimental Procedures:

Water samples for experiments will be collected using Niskin bottles on the CTD rosette. Water will be subsampled into 300 ml polycarbonate bottles, and then each will be inoculated with approximately 0.04 ml (10 microCurie [µCi]) 14C-labeled sodium bicarbonate. Bottles will be tightly capped, then placed in a sealed 4’ x 1’ Plexiglas incubator cooled with a recirculating water bath, and incubated under a range of light levels for <2 hours. (The recirculating water will not be in contact with the 14C.) The experiment will be terminated by dividing the contents of each bottle into 2 portions, measuring the volume of each (~150 ml), then filtering one through a glass fiber filter and the other through polycarbonate filter. Filters will be placed in 20 ml plastic scintillation vials with 0.5 ml 0.5 N HCl and allowed to acidify in a fume hood for 24 h. Scintillation cocktail will then added to each vial for measurement of 14C content as disintegrations per minute (dpm). This basic procedure was used successfully on the R/V Alpha Helix in 2003 and R/V Thomas G. Thompson in 2011.

Precautions:

--All activities involving handling of 14C (addition of 14C stock to incubation bottles, filtration of seawater at end of incubations) will be conducted in a plastic bin so that any possible spill will be contained in the bin.
--All 14C use will be strictly accounted for so that the ultimate whereabouts of all isotopes is known.
--The work area will be thoroughly cleaned according to standard procedures and then wipe-tested for any potential residual 14C at the end of the cruise.
--Liquid waste (seawater) will be stored in a sealed drum. Solid waste (e.g. pipette tips, glass vials) will be stored in double heavy-duty plastic bags inside of a heavy cardboard box.
--The work area and the 2 waste containers will be labeled with yellow ‘radioactive materials’ label tape according to standard practice.
--All work with 14C will utilized standard laboratory safety practices (e.g. wearing gloves, lab coats, no food or drink in the area, clean up materials at hand).

--It is important to recognize that the amount of 14C being used in these experiments is relatively small, and the 14C itself is a beta emitter (low energy radioactivity source), from which individuals can be effectively shielded by taking simple, common sense precautions (e.g. wearing gloves).

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

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 0830 (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 Operation Evaluation Report

Within seven days of the completion of the project, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to omao.customer.satisfaction@noaa.gov. If email 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 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 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 that 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. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. 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. The ship will provide hard-hats and work vests.

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 (FRNS) 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.

Foreign National access must be sought not only for access to the ship involved in the project, it must also be sought and approved for the dates of any DOC facilities (marine centers or port offices) that foreign nationals might have to traverse to access to and from the ship.

Necessary forms have been submitted for Marie Segurat to have access to the Dyson. Her NOAA sponsor is David Kachel, who will be aboard. These were submitted to Dan Simon at PMEL and Michael Shearin at Office of Security, Western Region Security Office in Seattle, WA and Ann Murphy has sent an approval.

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:

David G. Kachel will be responsible for the foreign national, Marie Segurat, from France. All required permissions and paperwork have been approved.

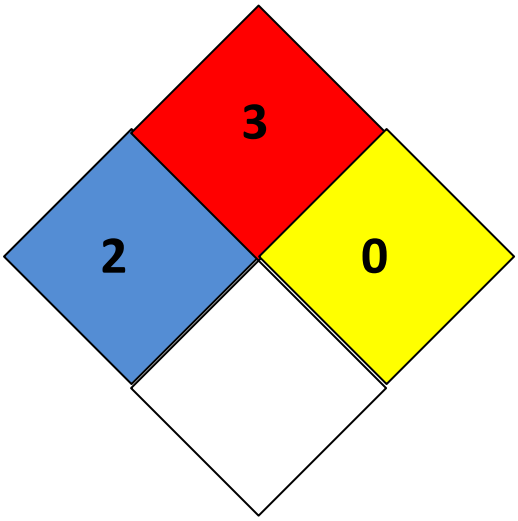
1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN 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

Table 1.

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

See accompanying file for the proposed itinerary.

Appendix 1. Standard Operating Procedures - At Sea –AFSC Hazmat Information and Procedures



Chemical Name: 100% Alcohol

UN Number: 1170
Hazard Ratings: (on a scale of 0 to 4)
Health (blue): 2 Flammability (red): 3
Reactivity (yellow): 1 Special (white):
Personal Protection Gear Needed
*gloves
*goggles or face shield when pouring

Special Handling Instructions
* Keep away from heat, flame, and other potential ignition sources.
* Store in a well ventilated area or in a flammable cabinet
First Aid
* If swallowed, give large amounts of drinking water and induce vomiting.
* If vapors inhaled, get out into fresh air immediately. Give oxygen if breathing is difficult.

* If spilled on skin or splashed in eyes, flush with water for at least 15 minutes.

Spill Cleanup Procedures

Absorb ethanol with 3M Sorbent Pads and allow to dry in a well-ventilated area away from ignition source.

Deactivation/Disposal Procedures At Sea

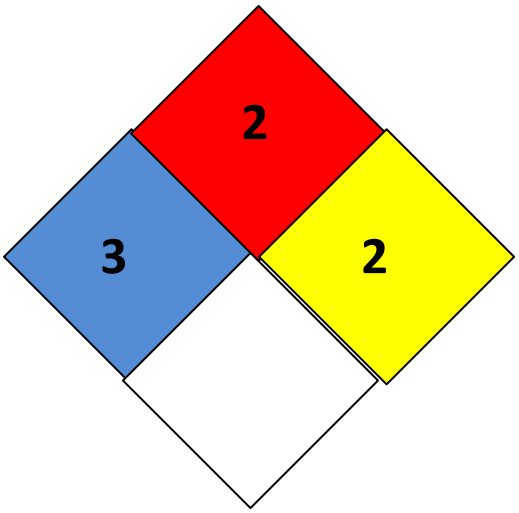
Use 3M Sorbent Pads to absorb the ethanol. Put used pads outside to dry (secure from blowing overboard and exposure to flame). Once dry, the pads may be reused or burned.

Shipping Procedures and Restrictions

Due to the flammability rating of 95% ethanol, this chemical cannot be shipped by air. Transportation by barge or land vehicle will require the ethanol container to be over-packed with absorbent materials such as clumping kitty litter or shredded paper. Include MSDSs and the UN number with the shipment for reference in the event of a spill.

Chemical Name: 37% Formaldehyde

UN Number: 119



Hazard Ratings: (on a scale of 0 to 4)

Health (blue): 3 Flammability (red): 2

Reactivity (yellow): 2 Special (white):

Personal Protection Gear Needed

*gloves

*respirator (half-mask)

*goggles or face shield

Special Handling Instructions

* If a ventilation hood is not available, then pouring of chemical must be done outside. At least two people should be involved with large chemical transfers in case of an emergency.

* Chemical must be stored at temperatures above 15^{o} c to prevent polymerization of paraformaldehyde

First Aid

* If swallowed, give large amounts of drinking water and induce vomiting.

*If vapors inhaled, get out into fresh air immediately. Give oxygen if breathing is difficult.

* If spilled on skin or splashed in eyes, flush with water for at least 15 minutes.

Spill Cleanup Procedures

For small spills (500-1000 mls):

Cover spill quickly with a pile of Polyform-F or absorb liquid with a Fan Pad and spray on extra Formalex to deactivate and absorb chemical. Let material sit for 10 - 15 minutes. Sweep up and dispose of materials in garbage.

For large spills (1000 mls - ?):

Use a combination of Fan Pads and Formalex as quickly as possible to contain spill and deactivate it. Vacate area and try to ventilate room, if possible.

Deactivation/Disposal Procedures At Sea

*Polyform-F comes in bead form and should be used in a 1:1 ratio to insure proper chemical deactivation of small spills.

*Formalex is a pink liquid that is to be used in a 1:1 ratio to insure proper chemical deactivation. Formalex should also be used in conjunction with Fan Pads to stop and deactivate large spills.

*Fan Pads may be used to absorb small spills alone but these pads work best when used with Formalex to immediately control the vapor layer.

Shipping Procedures and Restrictions

37% formaldehyde cannot be ship by air due to its flammability rating.

All quantities should be over-packed with absorbency material in case the original container is damaged. When shipping by barge or land, labels are not required for quantities under 110 gallons by D.O.T. but the container should have MSDSs and the UN number readily available.