FINAL CRUISE INSTRUCTIONS
ECO-FOCI

NOAA Ship *FAIRWEATHER*, Cruise FA-05-01
July 18 – July 28, 2005
Chief Scientist – Janet T. Duffy-Anderson, NOAA/AFSC

1.0 FINAL CRUISE INSTRUCTIONS

1.1 Cruise Title – Ecosystem and Fisheries-Oceanography Coordinated Investigations (Eco-FOCI).

1.2 Cruise Numbers

1.2.1 Cruise Number – FA-05-01

1.2.2 Eco-FOCI Number – 1FA05

1.3 Cruise Dates

1.3.1 Departure – Depart Kodiak, Alaska, at 1500 ADT on Monday, July 18, 2005.

1.3.2 Arrival – Arrive Dutch Harbor, Alaska, at 0800 ADT on Thursday, July 28, 2005.

1.4 Operating Area – Gulf of Alaska, in the vicinity of Kodiak Island.

2.0 CRUISE OVERVIEW

2.1 Cruise Objectives – We will conduct an ichthyoplankton survey in the Gulf of Alaska in the vicinity of Kodiak Island, Alaska. This area is a known nursery ground for a variety of species of fish – walleye pollock, Pacific cod, rock sole, and Pacific halibut. Work is needed to describe larval fish and zooplankton assemblages in summer, and to examine the movement of water and associated biota from the slope onto the shelf. We will also conduct some trawling to describe abundances of juvenile groundfishes and small forage fishes in selected canyons and in the vicinity of Kodiak Island. Six satellite-tracked drifters will be released to study current trajectories in the vicinity of Port Lock Bank. Conductivity, Temperature, and Depth profiler casts will be made to characterize water column properties, collect nutrient and chlorophyll information, and to use to evaluate the flow field.

2.2 Applicability – These instructions, with ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN*** – provided to the ship separately – dated March 1, 2005, present complete information for this cruise.

2.3 Participating Organizations

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

University of Washington (UW)
1122 N.E. Boat Street
Seattle, Washington 98105

2.4 Personnel

2.4.1 Chief Scientist

Name	Gender	Affiliation	E-mail Address
Janet T. Duffy-Anderson (206) 526-6465	Female	AFSC	Janet.Duffy-Anderson@noaa.gov

2.4.2 Participating Scientists

Name	Gender	Affiliation	E-mail Address
Janet T. Duffy-Anderson	Female	AFSC	Janet.Duffy-Anderson@noaa.gov
Colleen E. Harpold	Female	AFSC	Colleen.Harpold@noaa.gov
Matthew T. Wilson	Male	AFSC	Matt.Wilson@noaa.gov
Miriam J. Doyle	Female	AFSC	Miriam.Doyle@noaa.gov
Jennifer Mitsuyo Nomura	Female	UW	jmnomura@u.washington.edu
Sigrid A. Salo	Female	PMEL	Sigrid.A.Salo@noaa.gov
Dylan Righi	Male	PMEL	Dylan.Righi@noaa.gov
David G. Kachel	Male	PMEL	Dave.Kachel@noaa.gov
TBA	TBA	PMEL	

2.5 Administration

2.5.1 Ship Operations

Marine Operations Center, Pacific
1801 Fairview Avenue East
Seattle, Washington 98102-3767
Telephone: (206) 553-4548
Fax: (206) 553-1109

Commander Mark P. Ablondi, NOAA
Chief, Operations Division, Pacific (MOP1)
Telephone: (206) 553-8705
Cellular: (206) 390-7527
E-mail: Mark.Ablondi@noaa.gov

Larry Mordock
Deputy Chief, Operations Division (MOP1x1)
Telephone – Work: (206) 553-4764
Home: (206) 365-3567
Cellular: (206) 465-9316
E-mail: Larry.Mordock@noaa.gov

2.5.2 Scientific Operations

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

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

3.0 OPERATIONS

3.1 Data To Be Collected – A goal of the Eco-FOCI program is to identify the physical and biological factors that underlie ecosystem change, and to understand how those factors interact. One focus is the effects of perturbations at lower trophic levels. To this end, we will collect ichthyoplankton using a 1-m^2 Tucker net with a Clarke Bumpus net strung inside the mouth of the drogue (Net 0). We will collect juvenile gadids and small forage fishes using a Methot net at selected stations. Sea-Bird Electronics SBE 911*plus* Conductivity, Temperature, and Depth (CTD) casts will be deployed at all stations to collect physical data as well as water samples for nutrients and chlorophyll. Satellite-tracked drifters will be deployed at six locations to study currents. Data on the physical environment will be used to relate larval and juvenile abundance and assemblage structure to abiotic variables.

3.1.1 Scientific Computer System (SCS) – The ship's SCS shall operate throughout the cruise, acquiring and logging data from navigation, meteorological, oceanographic, and fisheries sensors. See ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN***, Section 5.2 for specific requirements. It is recognized that only one SCS systems is available onboard **NOAA Ship *FAIRWEATHER***.

3.2 Staging Plan – The U-Tow winch and CTD array will be sent to Homer, Alaska. The U-Tow winch and the DWS winch will be installed in Homer, Alaska, during the July 1 through July 6, 2005 in port. One scientist, William J. Floering, will travel to Homer, Alaska, to oversee the installation of the U-Tow winch. All other necessary equipment will be sent to Kodiak, Alaska. Equipment will be sent to the United States Coast Guard facility and we will arrange to have equipment delivered to the dock. Equipment will then be loaded onto **NOAA Ship *FAIRWEATHER***. We request that someone from the Deck Department be available to assist with loading, and that the ship's FOO, ET, and Survey Technician be available for consultations for field operations, assisting in setting up electronics, and configuring the equipment.

3.3 **De-staging Plan** – Samples and gear – including the U-Tow winch – will be offloaded in Dutch Harbor, Alaska, on Thursday, July 28, 2005. We request some assistance from the Deck Department and use of the ship's crane for offloading.

3.4 **Cruise Plan** – The ship will depart from Kodiak, Alaska, at 1500 ADT on Monday, July 18, 2005 and occupy a series of approximately 100 stations in the Kodiak Island vicinity west of Amatuli Trough to Trinity Bank. See Section 9.2 Cruise FA-05-01 Station Locations and Section 9.3 Cruise FA-05-01 Chartlet for the list of station locations and the chart of the proposed operations. At every station, a CTD cast will be deployed first and water samples (nutrients, chlorophyll) will be collected from the Niskin bottles. Afterwards, a 1-m^2 Tucker trawl will be deployed – SEACAT profiler mounted on top of the array – and samples will be taken. At selected stations, a Methot tow will be conducted after the Tucker trawl. Selected transects will be designated for CTD and Tucker trawl only operations – MA Line, GP Line. A third CTD transect has been designated across Stevensons' Trough to collect data over a single phase of a tidal cycle – PBA Line. Occupation of these three transects may occur twice.

3.5 **Station Locations** – It is likely that only a subset of the grid stations listed will be occupied due to time constraints. Amendments will be made at sea by the Chief Scientist and with the consent of the Commanding Officer. See Section 9.2 Cruise FA-05-01 Station Locations.

3.6 **Station Operations** – The following are operations to be conducted on this cruise. The procedures for these operations are listed in the ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN*** (SOI).

3.6.1 **CTD/Water Sample Operations** – The Conductivity, Temperature, and Depth (CTD) will be used to collect physical data, and the rosette will be used to collect nutrients and chlorophyll data. A MOA button should be set up to mark the at-depth position, date, time, and bottom depth (e.g., 1-1, CTD at depth, etc). A Sea-Bird Electronics' SBE 911*plus* CTD profiler with dual temperature and conductivity sensors will be the primary system. Samples will be collected using PMEL's 10-liter Niskin bottles. Once the CTD has been deployed, it should be lowered to 10 meters, and then the deck unit should be turned on. After 45 seconds, the CTD can be returned to just below the surface. The data acquisition program should then be started. The CTD should descend at a rate of 30 meters per minute for the first 200 meters and 45-50 meters per minute below that. The ascent rate should be 50 meters per minute. An entry in the Marine Observation Abstract (MOA) should be made for each CTD cast at the maximum cast depth. The CTD will be deployed to either 10 meters off the bottom or 200 meters maximum depth, whichever is shallowest.

Scientists will keep the ***CTD Cast Information/Rosette Log*** that will be brought aboard by the scientists. Pressure, primary salinity, secondary salinity, primary temperature, secondary temperature, fluorescence, and light levels will be recorded on the ***CTD Cast Information/Rosette Log*** for all water bottle samples.

3.6.1.1 **CTD Calibration** – Salinity samples will be taken on selected casts as specified by the Chief Scientist. The CTD systems will be equipped with dual temperature and conductivity sensors. Salinity samples will be returned to Seattle for analysis.

3.6.2 **Methot Trawls** – The Methot trawl will be towed off the stern and fished obliquely. Following standard procedures, a flow meter and ScanMar depth sensor will be fixed to the frame. The trawl will be deployed at 40 meters per minute. Once equilibrium is achieved – either 10 meters off the bottom or 200 meters maximum depth, whichever is shallowest – as determined by the fishing officer or scientist, the trawl will be retrieved at a wire rate of about 20 meters per minute. Three MOA buttons are required:

1. Surface,
2. At depth, and
3. Surface.

From each haul, a representative sub-sample of age-0 pollock and age-1 capelin – up to 20 individuals of each species – will be counted, their standard lengths measured, and weighed individually. Ten individuals of each species will be preserved in 10% formalin, and ten will be dissected to remove the otoliths. Otoliths will either be frozen or stored in 95% ethanol (EtOH) in centrifuge tubes. The remainder of the tow will be preserved in 5% formalin, and the number of removed fish will be noted on the COD sheets. If sample is large, several jars may be needed. If the sample is too large to be easily preserved at sea, the sample may be split and documented at sea and the split preserved.

3.6.3 **Tucker Trawls** – The Tucker trawl will be deployed to a depth of either 200 meters or 10 meters off the bottom, whichever is shallowest. The Tucker nets will be rigged with 333-µm mesh (Nets 0, 1, 2). A Clarke Bumpus net will be rigged with 153-µm mesh and will be deployed in the mouth of Net 0 on the Tucker trawl to collect associated small zooplankton on the downcast. When the Tucker net is at depth, the first messenger, which opens Net 1, will be sent down the wire. The second messenger, which closes Net 1 and opens Net 2, will be sent when the net is at 40 meters. Depth of opening and closing may be altered at specific sites to be chosen at sea. In all cases, the wire out rate will be 40 meters per minute, the ship speed will be 1.5-2 knots to achieve a 45° towing angle, and the retrieval rate will be 20 meters per minute. The Sea-Cat profiler may be attached to the wire above the Tucker and used to position the net in real time and to obtain profiles of water temperature and salinity. If clearance is limiting, a NetMind depth profiler will be used instead. Four MOA buttons are needed to mark:

1. Surface,
2. Net 1 open,
3. Net 2 open, and
4. Surface.

(e.g., 12-1 Net 1 open, etc.) In this example, 12-1 refers to Station 12 Haul 1. All consecutive operations within 0.5 nautical miles of a pre-designated point are assigned the same station number. Haul number indicates operation sequence at each station. Tucker Nets 0 (LG-CB), 1, and 2 will be preserved in 5% buffered formaldehyde in their entirety.

3.6.4 Chlorophyll Sampling Operations – Chlorophyll samples will be collected simultaneously with Conductivity, Temperature, and Depth (CTD) profiler casts from the 10-liter Niskin bottles. The scientists will be responsible for collection, filtration, and preservation of samples. Sampling depths depend on the fluorescence profile. A typical strategy would be samples at 0, 10, 20, 30, 40, and 50 or 60 meters, depending upon which of the latter two depths is closest to the fluorescence maximum. If the maximum is deeper than 60 meters, sampling should be moved deeper with fewer samples in the mixed layer. Nutrient samples will be collected from all Niskin bottles, both near-surface and from depth.

A -20° Celsius freezer is required for sample storage of the chlorophyll filters and frozen nutrient samples, which will be provided by the scientists.

3.6.5 ARGOS Satellite Tracked Drifter Buoy Deployments – One to two working days before deployment, the Chief Scientist, or designee, will secure the drifters on the back deck. The drifter buoy is then turned on, usually by removing a magnet, and an e-mail message will be sent by the Chief Scientist, or designee, to Dr. Phyllis Stabeno at Phyllis.Stabeno@noaa.gov, stating the serial number that is stamped on the drifter and the time that it was turned on. This lead-time is necessary to ensure that telemetry from the buoy is being received and transmitted by the Advanced Research and Global Observation Satellite (ARGOS). The method of deployment of the drifter is dependent upon the particular make of drifter and is to be directed by the Chief Scientist, or designee.

3.7 Underway Operations – The following are underway operations to be conducted on this cruise. The procedures for these operations are listed in the ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN*** (SOI). Operations not addressed in the SOI and changes to standard procedures are addressed below. **E-MOA was provided.**

- Scientific Computer System (SCS) Data Acquisition (SOI 5.2) and
- Thermosalinograph monitoring (SOI 5.3).

3.8 Applicable Restrictions – None.

3.9 Small Boat Operations – None.

4.0 FACILITIES

4.1 Equipment and Capabilities Provided by Ship

- Wire speed indicators and readout for winches,
- For meteorological observations: anemometers, calibrated air thermometer (wet-and dry-bulb) and a calibrated barometer and/or barograph,
- Scientific Computer System (SCS),
- Laboratory space with sink, lab tables, and storage space,
- 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 quarterdeck and fantail,

- Ship's crane(s) used for loading and/or deploying
- Oceo winch with slip rings and 3-conductor cable terminated for CTD, and
- DWS winch terminated for use with Methot trawl.

4.2 **Equipment and Capabilities Provided by Scientists** – See Section 9.1 Cruise FA-05-01 Equipment Inventory for weights and dimensions.

- U-Tow winch with slip rings and 3-conductor cable terminated for the SBE SEACAT, for net tow operations,
- Sea-Bird Electronics' SBE 911*plus* CTD system,
- Sea-Bird Electronics' SBE-19 SEACAT system,
- PMEL PC with SEASOFT software for CTD and Sea-Bird software for SEACAT data collection and processing,
- AFSC PC for sample archiving,
- Fluorometer and light meter to be mounted on CTD,
- CTD stand modified for attachment of fluorometer,
- Conductivity and temperature sensor package to provide dual sensors on the CTD,
- CTD rosette sampler,
- IAPSO standard water,
- Large Clarke-Bumpus array,
- ScanMar array,
- Netmind array,
- Meter block for plankton tows,
- Wire angle indicator,
- Tucker trawl, complete 1-m^2 sampling array,
- Methot trawl,
- Large Clarke-Bumpus array,
- ARGOS tracked drifter buoys with optical sensors,
- Miscellaneous scientific sampling and processing equipment,
- Sorting tables and baskets for processing trawl catches,
- Scientific freezer for storing nutrients, and
- Cruise Operations Database (COD).

5.0 DISPOSITION OF DATA AND REPORTS

5.1 The following data products will be included in the cruise data package:

- **NOAA Form 77-13d, *Deck Log – Weather Observation Sheets*,**
- Electronic Marine Operations Abstracts (template provided by scientists),
- SCS backup – recordable compact diskette (CD),
- Calibration Sheets for all ship's instruments used,
- PMEL CTD Weather Observation Logs, and
- CTD Cast Information/Rosette Log

5.2 **Pre and Post-cruise Meetings** – Cruise meetings may be held in accordance with ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN*** (SOI 5.5).

6.0 ADDITIONAL PROJECTS

6.1 Definition – Ancillary and piggyback projects are secondary to the objectives of the cruise and should be treated as additional investigations. The difference between the two types of secondary projects is that an ancillary project does not have representation aboard and is accomplished by the ship's force.

6.2 Ancillary Projects – None.

6.3 Piggyback Projects

6.3.1 Northern Rock Sole Larvae Collections – At selected stations in the vicinity of Middle and Monashka Bays – exact locations to be determined at sea by Chief Scientist and Commanding Officer – approximately 10 to 12 oblique Tucker trawls will be conducted. Only one net (Net1) will be opened, and the tow will be from approximately 10 meters off bottom to the surface or 200 meters maximum depth. The wire out rate will be 40 meters per minute, the ship speed will be 1.5-2 knots to achieve a 45° towing angle, and the retrieval rate will be 20 meters per minute. The sample will be sorted and all fish larvae removed and stored in 95% ethanol (EtOH) for use in ageing (otolith) studies. Samples and any remaining ethanol will be offloaded in Dutch Harbor, Alaska.

7.0 HAZARDOUS MATERIALS

7.1 Responsibilities – The Chief Scientist shall be responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, ***Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists***, released July 2002. 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, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought aboard and a chemical hygiene plan. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Chief Scientist.

7.2 Inventory – See Section 9.4 FA-05-01 HAZMAT Inventory for a complete listing of HAZMATS brought onboard the vessel. Spill kit contains materials for cleanup of formaldehyde, ethanol, and sodium borate. All scientific staff onboard are trained to handle spills.

7.3 Material Safety Data Sheet (MSDS) – All MSDSs can be found on the ***OERD HAZMAT Emergency Guidelines – MSDS*** compact diskette dated January 25, 2005, which will be supplied to the ship. A copy of all required MSDS will also be delivered with the chemicals when ship is loaded.

8.0 MISCELLANEOUS

8.1 Communications – Specific information on how to contact the **NOAA Ship *FAIRWEATHER*** and all other fleet vessels can be found at:

http://www.moc.noaa.gov/phone.htm

8.2 Important Telephone and Facsimile Numbers and E-mail Addresses

8.2.1 Pacific Marine Environmental Laboratory (PMEL):

FOCI – Ocean Environmental Research Division (OERD2):
- (206) 526-4700 (voice)
- (206) 526-6485 (fax)

Administration:
- (206) 526-6810 (voice)
- (206) 526-6815 (fax)

E-Mail: FirstName.LastName@noaa.gov

8.2.2 Alaska Fisheries Science Center (AFSC):

FOCI – Resource Assessment and Conservation Engineering (RACE):
- (206) 526-4171 (voice)
- (206) 526-6723 (fax)

E-Mail: FirstName.LastName@noaa.gov

8.2.3 NOAA Ship *FAIRWEATHER* – Telephone methods listed in order of increasing expense:

In Port: USCG Facility, Ketchikan, Alaska:
- (907) 228-0381 (Voice)
- (907) 228-0382 (Voice)
- (907) 228-0383 (Fax)

Cellular:
- (907) 254-2842

WaveTalk:
- (800) 331-4764 (Voice)

Iridium:
- 9-011-8816-7631-0054
- 808-659-0054

INMARSAT B
011-872-336-990-710 (Voice)
011-872-336-990-711 (Fax)

E-Mail: NOAA.Ship.Fairweather@noaa.gov (mention the person's name in SUBJECT field)

8.2.4 Marine Operations Center, Pacific (MOP):

Operations Division (MOP1):

- (206) 553-4548 (voice)
- (206) 553-1109 (facsimile)

E-Mail: FirstName.LastName@noaa.gov

E-Mail to Radio Room: Radio.Room@noaa.gov

9.0 APPENDICES

9.1 Cruise FA-05-01 Equipment Inventory

Equipment	Qty	Dimension	Weight	Total Weight
Larval Supply Trunks	1	20"x22"x36"	80 LBS	80 LBS
Fluorometer Supply Trunk	1	20"x22"x36"	50 LBS	50 LBS
Formaldehyde Containers	3	20-L	40 LBS	120 LBS
Carboy, 95% Reagent Alcohol	1	20-L	40 LBS	40 LBS
Miscellaneous Gear Trunks	4	20"x22"x36"	80 LBS	320 LBS
1-m^2 Tucker Array (frame and depressor)	1		100 LBS	100 LBS
Clarke-Bumpus Net	1	10”	25 LBS	25 LBS
Methot Net (frame and depressor)	1	7.5’x7.5’	250 LBS	250 LBS
Cases, Glass Jars, 32-oz	30	8"x 12"x15"	75 LBS	2,250 LBS
Cases, Glass Jars, 8-oz	10	4"x 6"x 8"	8 LBS	80 LBS
Satellite-tracked drifters	6			
U-Tow winch	1		3,000 LBS	3,000 LBS
CTD array	1			
Freezer, -20°C	3	3’x3’x3’	60 LBS	180 LBS

9.2 Cruise FA-05-01 Station Locations

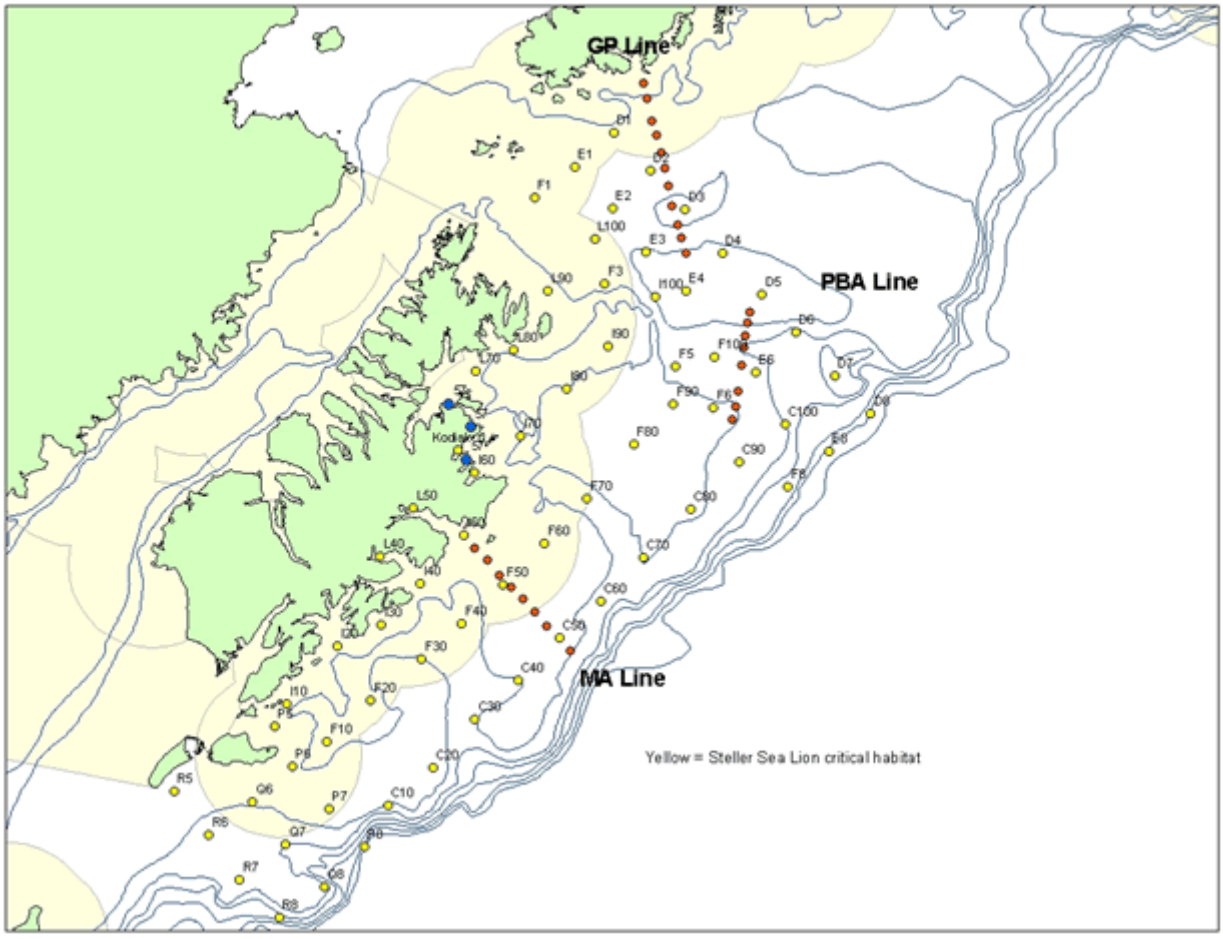
Operation	Latitude	Longitude	DecLat	DecLong
D8	57° 48.00' N	149° 25.80' W	57.80	-149.43
D7	57° 57.60' N	149° 40.80' W	57.96	-149.68
D6	58° 08.40' N	149° 57.00' W	58.14	-149.95
D5	58° 18.00' N	150° 11.40' W	58.30	-150.19
D4	58° 28.20' N	150° 28.20' W	58.47	-150.47
D3	58° 39.00' N	150° 44.40' W	58.65	-150.74
D2	58° 48.60' N	150° 59.40' W	58.81	-150.99
D1	58° 58.20' N	151° 15.60' W	58.97	-151.26
GP11	59° 09.60' N	151° 00.60' W	59.16	-151.01

Operation	Latitude			Longitude			DecLat	DecLong
GP10	59°	06.00'	N	150°	59.40'	W	59.10	-150.99
GP9	59°	00.60'	N	150°	57.60'	W	59.01	-150.96
GP8	58°	57.00'	N	150°	55.80'	W	58.95	-150.93
GP7	58°	52.80'	N	150°	54.00'	W	58.88	-150.90
GP6	58°	49.20'	N	150°	52.80'	W	58.82	-150.88
GP5	58°	45.00'	N	150°	51.60'	W	58.75	-150.86
GP4	58°	40.20'	N	150°	50.40'	W	58.67	-150.84
GP3	58°	35.40'	N	150°	48.00'	W	58.59	-150.80
GP2	58°	32.40'	N	150°	46.80'	W	58.54	-150.78
GP1	58°	28.80'	N	150°	45.00'	W	58.48	-150.75
E1	58°	50.40'	N	151°	34.20'	W	58.84	-151.57
E2	58°	40.20'	N	151°	17.40'	W	58.67	-151.29
L100	58°	33.00'	N	151°	26.40'	W	58.55	-151.44
E3	58°	29.40'	N	151°	03.00'	W	58.49	-151.05
I100	58°	18.60'	N	151°	00.00'	W	58.31	-151.00
E4	58°	19.80'	N	150°	45.60'	W	58.33	-150.76
F100	58°	03.60'	N	150°	34.20'	W	58.06	-150.57
E6	57°	59.40'	N	150°	16.20'	W	57.99	-150.27
C100	57°	46.80'	N	150°	04.20'	W	57.78	-150.07
E8	57°	39.60'	N	149°	45.60'	W	57.66	-149.76
F8	57°	31.80'	N	150°	04.80'	W	57.53	-150.08
C90	57°	38.40'	N	150°	25.80'	W	57.64	-150.43
PBA15	57°	48.60'	N	150°	28.20'	W	57.81	-150.47
PBA14	57°	51.60'	N	150°	25.80'	W	57.86	-150.43
PBA13	57°	55.20'	N	150°	24.60'	W	57.92	-150.41
PBA12	58°	01.20'	N	150°	22.20'	W	58.02	-150.37
PBA11	58°	05.40'	N	150°	21.00'	W	58.09	-150.35
PBA10	58°	08.40'	N	150°	19.80'	W	58.14	-150.33
PBA9	58°	11.40'	N	150°	18.60'	W	58.19	-150.31
PBA8	58°	13.80'	N	150°	17.40'	W	58.23	-150.29
F6	57°	51.60'	N	150°	36.00'	W	57.86	-150.60
F90	57°	52.80'	N	150°	54.00'	W	57.88	-150.90
F5	58°	01.80'	N	150°	52.20'	W	58.03	-150.87
I90	58°	07.20'	N	151°	22.20'	W	58.12	-151.37
F3	58°	22.20'	N	151°	22.80'	W	58.37	-151.38
F1	58°	43.20'	N	151°	53.40'	W	58.72	-151.89
L90	58°	21.00'	N	151°	48.60'	W	58.35	-151.81
L80	58°	07.20'	N	152°	04.80'	W	58.12	-152.08
I80	57°	57.60'	N	151°	41.40'	W	57.96	-151.69
F80	57°	43.80'	N	151°	12.60'	W	57.73	-151.21

Operation	Latitude			Longitude			DecLat	DecLong
C80	57°	27.60'	N	150°	48.60'	W	57.46	-150.81
C70	57°	16.80'	N	151°	10.20'	W	57.28	-151.17
F70	57°	31.20'	N	151°	34.20'	W	57.52	-151.57
I70	57°	46.80'	N	152°	03.00'	W	57.78	-152.05
L70	58°	02.40'	N	152°	22.20'	W	58.04	-152.37
TH1	57°	54.60'	N	152°	34.80'	W	57.91	-152.58
TH2	57°	49.20'	N	152°	25.20'	W	57.82	-152.42
TH3	57°	41.40'	N	152°	27.60'	W	57.69	-152.46
I60	57°	38.40'	N	152°	24.00'	W	57.64	-152.40
F60	57°	21.00'	N	151°	54.00'	W	57.35	-151.90
C60	57°	06.60'	N	151°	30.00'	W	57.11	-151.50
MA10	56°	55.20'	N	151°	43.80'	W	56.92	-151.73
MA9	56°	58.20'	N	151°	48.60'	W	56.97	-151.81
MA8	57°	01.20'	N	151°	54.00'	W	57.02	-151.90
MA7	57°	04.80'	N	151°	58.80'	W	57.08	-151.98
MA6	57°	07.80'	N	152°	04.20'	W	57.13	-152.07
MA5	57°	10.80'	N	152°	09.00'	W	57.18	-152.15
MA4	57°	13.80'	N	152°	14.40'	W	57.23	-152.24
MA3	57°	17.40'	N	152°	19.20'	W	57.29	-152.32
MA2	57°	20.40'	N	152°	24.60'	W	57.34	-152.41
MA1	57°	23.40'	N	152°	29.40'	W	57.39	-152.49
C50	56°	58.20'	N	151°	48.60'	W	56.97	-151.81
F50	57°	11.40'	N	152°	12.60'	W	57.19	-152.21
I50	57°	23.40'	N	152°	29.40'	W	57.39	-152.49
L50	57°	30.00'	N	152°	51.60'	W	57.50	-152.86
L40	57°	18.60'	N	153°	06.60'	W	57.31	-153.11
I40	57°	12.00'	N	152°	49.20'	W	57.20	-152.82
F40	57°	02.40'	N	152°	31.20'	W	57.04	-152.52
C40	56°	48.60'	N	152°	07.20'	W	56.81	-152.12
C30	56°	39.60'	N	152°	26.40'	W	56.66	-152.44
F30	56°	54.00'	N	152°	49.20'	W	56.90	-152.82
I30	57°	02.40'	N	153°	06.60'	W	57.04	-153.11
I20	56°	57.60'	N	153°	25.80'	W	56.96	-153.43
F20	56°	44.40'	N	153°	11.40'	W	56.74	-153.19
C20	56°	28.20'	N	152°	45.00'	W	56.47	-152.75
C10	56°	19.20'	N	153°	04.80'	W	56.32	-153.08
F10	56°	34.80'	N	153°	30.60'	W	56.58	-153.51
I10	56°	43.80'	N	153°	48.00'	W	56.73	-153.80
P5	56°	38.40'	N	153°	53.40'	W	56.64	-153.89
P6	56°	28.80'	N	153°	45.60'	W	56.48	-153.76

Operation	Latitude			Longitude			DecLat	DecLong
P7	56°	18.60'	N	153°	30.00'	W	56.31	-153.50
P8	56°	09.60'	N	153°	15.00'	W	56.16	-153.25
Q8	56°	00.00'	N	153°	32.40'	W	56.00	-153.54
Q7	56°	10.20'	N	153°	48.60'	W	56.17	-153.81
Q6	56°	20.40'	N	154°	03.00'	W	56.34	-154.05
R5	56°	22.80'	N	154°	36.60'	W	56.38	-154.61
R6	56°	12.60'	N	154°	21.60'	W	56.21	-154.36
R7	56°	01.80'	N	154°	08.40'	W	56.03	-154.14
R8	55°	52.80'	N	153°	51.60'	W	55.88	-153.86

9.3 Cruise FA-05-01 Chartlet



9.4 Cruise FA-05-01 HAZMAT Inventory

Chemical	CAS Number	Qty	H	F	R	Storage Color Code	Hazard Class	Packing Group Number	UN	Reportable Quantity	Response Indices
Alcohol, Reagent, 95%	mixture	20-L	3	3	1	Flammable	3	II	1987	350 LBS	1
Formaldehyde, 37%	50-00-0	60-L	3	2	2	Flammable	3 & 8	III	1198	100 LBS	2
Sodium Borate	1330-43-4	500-g	1	0	0	General	Not regulated				3
Sodium Borate Solution, Saturated	mix	20-L	1	0	0	General	Not regulated				3

Spill Response 1: Ventilate area of leak or spill. Wear appropriate personal protective equipment. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then 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. Do not flush to sewer! U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

Spill Response 2: 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, or earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

Spill Response 3: Ventilate area of leak or spill. Wear appropriate personal protective equipment. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.