

DRAFT CRUISE INSTRUCTIONS

FOCI

NOAA Ship *MILLER FREEMAN*, Cruise MF-04-06
May 9, 2004 – May 19, 2004
Chief Scientist – Deborah M. Blood, NOAA/AFSC

1.0 DRAFT CRUISE INSTRUCTIONS

1.1 **Cruise Title** – Fisheries-Oceanography Coordinated Investigations (FOCI).

1.2 **Cruise Numbers:**

1.2.1 **Cruise Number** – MF-04-06

1.2.2 **FOCI Number** – 4MF04

1.3 **Cruise Dates:**

1.3.1 **Departure** – Depart Dutch Harbor, Alaska, at 1500 hours on Sunday, May 9, 2004.

1.3.2 **Arrival** – Arrive Dutch Harbor, Alaska, at 0800 hours on Wednesday, May 19, 2004.

1.4 **Operating Area** – Southeast Bering Sea.

2.0 CRUISE OVERVIEW

2.1 **Cruise Objectives** – We will conduct an ichthyoplankton survey in the Bering Sea in the vicinity of Unimak Island, Alaska. This work is needed to describe larval fish and zooplankton assemblages in the Bering Sea (outer shelf, middle shelf) in spring. In particular, this area is a known spawning ground for walleye pollock, and abundances of pollock larvae at this time of year are high. Zooplankton data and data on physical characteristics of the water column will also be collected.

2.2 **Applicability** – These instructions, with **FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN**, dated October 6, 2003, present complete information for this cruise.

2.3 **Participating Organizations**

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

2.4 Personnel

2.4.1 Chief Scientist

Name	Gender	Affiliation	E-mail Address
Deborah M. Blood (206) 526-4178	Female	AFSC	Debbie.Blood@noaa.gov

2.4.2 Participating Scientists

Name	Gender	Affiliation	E-mail Address
Deborah M. Blood	Female	AFSC	Debbie.Blood@noaa.gov
Andre Buchheister	Male	AFSC	Andre.Buchheister@noaa.gov
Christina M. Deliyianides	Female	AFSC	Christina.Deliyanides@noaa.gov
Colleen E. Harpold	Female	AFSC	Colleen.Harpold@noaa.gov
Morgan S. Busby	Male	AFSC	Morgan.Busby@noaa.gov
Ann Matarese	Female	AFSC	Ann.Matarese@noaa.gov

2.5 Administration

2.5.1 Ship Operations

Marine Operations Center, Pacific
1801 Fairview Avenue East
Seattle, Washington 98102-3767
Telephone: (206) 553-4548
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Commander Michele G. Bullock, NOAA
Chief, Operations Division, Pacific (MOP1)
Telephone: (206) 553-8705
Cellular: (206) 390-7527
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Telephone – Work: (206) 553-4764
Home: (206) 365-3567
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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 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 and zooplankton data using 60-cm Bongo nets (60BON) and 20-cm Bongo nets (20BON), and a Neuston net. If time permits, we may also employ a Multiple Opening/Closing Net and Environmental Sensing System (MOCNESS). We expect to spend 1-3 days testing the ship's CUFES (Continuous Underway Fish Egg Sampler). We intend to deploy up to three ARGOS satellite-tracked drifters in patches of Alaska plaice to study movement of Alaska plaice larvae. Finally, we will collect data on the physical environment using the Sea-Bird Electronics SBE 19 SEACAT Profiler to relate larval assemblage structure to environmental variables (temperature and salinity).

Sea-Bird Electronics SBE 911*plus* Conductivity, Temperature, and Depth (CTD) profiler casts will collect physical data as well as data on microzooplankton concentrations. This cruise will provide new information on walleye pollock egg and larval distribution and on larval fish assemblages in general, on the southeast Bering Sea shelf in the spring. Samples will be collected from a grid of approximately 75 stations.

We also anticipate running the SIMRAD EK 500 Scientific Echosounder Monitoring system to collect ancillary data on adult fish aggregations during the entire cruise.

3.2 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* (SOI 5.2) for specific requirements.

3.3 Staging Plan – The majority of the equipment necessary for the cruise will be loaded onto NOAA Ship MILLER FREEMAN before the ship's departure from Seattle, Washington. We request that we be allowed to set up equipment, including the MOCNESS hardware and doing the MOCNESS termination, on Friday, May 7, and Saturday, May 8, 2004. We anticipate sending three scientists up the evening of Thursday, May 6, 2004, for this purpose, and we request that these two persons be allowed to stay on board the ship on the evenings of May 7 and May 8 if space is available. We will use the chemistry lab, the rough lab, and the slime lab for sample and equipment preparation and request as much counter and cabinet space as possible. We will also be using DataPlot for CTD, MOCNESS, CUFES, and SEACAT operations.

3.4 De-staging Plan – Samples and gear will remain on board the ship until the completion of Cruise MF-04-07, where the samples will be then offloaded in Kodiak, Alaska, on Monday, May 31, 2004. Additional sampling equipment will remain on board, in the hold, for use during Cruise MF-04-10.

3.5 Cruise Plan – The cruise will depart from Dutch Harbor, Alaska, at 1500 hours on Sunday, May 9, 2004, and occupy a series of approximately 85 stations on the Bering Sea FOCI grid. The first station is located immediately outside of Dutch Harbor, Alaska. Station positions of the working area and figures are located in Sections [9.2 Cruise MF-04-06 Station Locations](#) and [9.3 Cruise MF-04-06 Chartlet](#), respectively.

At every station, a Sameoto Neuston net will be deployed first to collect fish larvae in the surface layer. Samples from the Neuston net gear will be preserved in 1.8% buffered formaldehyde.

Following completion of the Neuston tow, a Marine Assessment Monitoring and Prediction (MARMAP) Bongo tow (SOI 3.2.2) will be conducted. The SBE 19 SEACAT, the 20-cm Bongo net with 0.150-mm mesh netting and the 60-cm Bongo net with 0.505-mm mesh netting (Net 1) and 0.333-mm mesh netting (Net 2) will all be mounted together for this tow. Bongo tows will be to a depth of 300 meters, or to 10 meters off bottom, whichever is shallower. The sample from 60BON Net 1 will be preserved in its entirety in 1.8% buffered formaldehyde. The sample from 60BON Net 2 will be sorted for Alaska plaice larvae, larvae will then be returned to the sample, and the whole sample will be preserved in 1.8% buffered formaldehyde for quantitative ichthyoplankton and zooplankton estimates. The sample from 20BON Net 1 will be preserved in its entirety in 1.8% buffered formaldehyde; the sample from Net 2 will be discarded.

When it is determined that sufficient numbers of Alaska plaice larvae have been located, satellite-tracked drifters will be deployed. In addition, a series of MOCNESS tows (0.505-mm mesh) may be performed (time permitting) to determine vertical distribution of larvae. It is anticipated that MOCNESS towing will occur in the same general vicinity as the drifter release over at least one 36-hour period across a transect of stations (to be determined at sea based on larval catch). CTDs will be conducted prior to each MOCNESS tow to collect physical data and microzooplankton samples.

The CUFES system will be tested over a period of 1-3 days. Specific days of testing will be determined at sea at the discretion of the Chief Scientist and Commanding Officer. In this system, water is continuously pumped at ca. 600-700 liters per minute from 5-m depth to the concentrator. Particles are concentrated by an oscillating net (500 micron Nitex mesh) in approximately 3% of the flow. The filtrate is discharged overboard. The concentrate passes to the sample collector where particles are retained over sequential sampling intervals (e.g. 5-30 min) on a cod end of the same size mesh as used in the concentrator. Fish eggs will be counted at sea prior to preserving the sample. The sample will be preserved in formalin. Simultaneously, ancillary data are continuously collected for date, time, position, temperature, salinity, and chlorophyll *a* fluorescence.

3.6 Station Locations – Please see Section [9.2 Cruise MF-04-06 Station Locations](#).

3.7 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). Operations not addressed in the SOI and changes to standard procedures are addressed below.

- CTD/Water Sample Operations (SOI 3.2.1),
- MARMAP Bongo Tows (SOI 3.2.2),
- MOCNESS Tows (SOI 3.2.5),
- Chlorophyll Sampling Operations (SOI 3.2.10),
- ARGOS Satellite Tracked Drifter Buoy Deployments (SOI 3.2.11), and
- SIMRAD EK 500 Scientific Echosounder Monitoring (SOI 3.2.12).

3.7.1 Neuston Net Tows

3.7.1.1 Description – Neuston nets are used for sampling the upper few centimeters of the water column. There are many frame styles that may be used; however, we use a Sameoto sampler made of stainless steel. The mouth opening is 30-cm x 50-cm, and is designed to fish half in and half out of the water.

3.7.1.2 Rates/Fishing – The vessel should be moving slowly ahead, about 1.5 to 2.0 knots so that the net is fishing half in and half out of the water. The exact speed is a learning process and may vary with sea conditions. Lower the Neuston net to the surface and pay out 10 to 15 meters of wire. It may be necessary to adjust the ship's speed to maintain the proper skimming action. Start the stopwatch when the net starts to fish and tow the net for approximately 9.5 minutes (unless otherwise instructed). After 9.5 minutes, the vessel should decrease speed so that the net can be hauled in. Advise winch operator when time is nearly up and retrieve when ready. Read and record flow meter revolutions, time of tow, and any comments.

3.7.1.3 Preservation – The Neuston sample should be preserved immediately, as specified in the FOCI Field Manual or sample collection request forms.

3.7.1.4 Maintenance – Check net for holes and fill flow meter with water.

3.8 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.

- Scientific Computer System (SCS) data acquisition (SOI 5.2),
- Fluorometer monitoring (SOI 5.3), and
- Thermosalinograph monitoring (SOI 5.3).

3.8.1 Continuous Underway Fish Egg Sampler (CUFES)

3.8.1.1 Description – The CUFES is used to map the distribution of fish eggs in the surface waters. In the Southeast Bering Sea, most pollock eggs are believed to be in the upper 10 meters of the water column and the CUFES system may be an important tool to examine abundance, transport, and interannual variability. The intake of the CUFES system on the **NOAA Ship MILLER FREEMAN** is about five to seven meters below the surface. Particles are concentrated into a 0.505-mm mesh cod end.

3.8.1.2 Methods – The Chief Scientist will work with the ship's command to establish a track line in the area of high abundance of fish eggs and larvae. The track should be oriented across the current that flows along the 50-meter isobath into Bristol Bay. We will attempt to take a new sample every 15 minutes (every 4.6 km or 2.5 nm). The ship speed should be at 10 knots (18.5 km/hr). The sampling frequency may need to be modified depending on the amount of plankton retained by the mesh. During the sampling, the data acquisition system (DAS) will acquire time and GPS position from a

dedicated GPS unit or from the ship's GPS signal fed to the DAS. If the ship's GPS signal is used we need a user programmable output that will give us a single NEMA string that is compatible with eth EDAS software.

3.8.1.3 Preservation – Each CUFES egg sample should be preserved immediately with 1.8% formaldehyde and labeled according to methods to be supplied before the cruise.

3.8.1.4 Maintenance – The sample cups should be checked after each use for holes. In addition the shaker apparatus should be checked frequently for clogging.

3.9 Applicable Restrictions – None

3.10 Small Boat Operations – None

4.0 FACILITIES

4.1 Equipment and Capabilities Provided by Ship

- Oceanographic winch with slip rings and 3-conductor cable terminated for CTD,
- Manual wire-angle indicator,
- Oceanographic 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 with stand, each CTD system should include underwater CTD, weights, and pinger. There should be one deck unit and tape recorder for the two systems,
- 10-liter Niskin sampling bottles for use with rosette (10 plus 4 spares),
- AUTOSAL salinometer, for CTD field corrections,
- Sea-Bird Electronics' SBE-19 SEACAT system,
- Meter block for plankton tows,
- Wire speed indicators and readout for quarterdeck and Rowe winches ,
- For meteorological observations: 2 anemometers (one R. M. Young system interfaced to the SCS), calibrated air thermometer (wet-and dry-bulb) and a calibrated barometer and/or barograph,
- Freezer space for storage of biological and chemical samples (both blast and storage freezers, -20°C and -80°C) turned on and operating,
- SIMRAD EQ-50 echosounder,
- Bench space in DataPlot for PCs, monitor, and printer to fly MOCNESS,
- Use of Pentium PC in DataPlot for data analysis,
- Scientific Computer System (SCS),
- Aft Rowe winch with 8-conductor cable and slip rings for MOCNESS,
- Electrical connection between Rowe winch and DataPlot,
- Removable stern platform in place,
- Laboratory space with exhaust hood, sink, lab tables and storage space,
- Sea-water hoses and nozzles to wash nets (quarterdeck and aft deck),

- 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, and
- Ship's egg pump system.

4.2 Equipment and Capabilities Provided by Scientists

- Programmable output from ship's GPS available in DataPlot for single string input into either the MOCNESS (\$GPGLL) or CUFES (TBD) data acquisition computer,
- Sea-Bird Electronics' SBE 911plus CTD system to be used with PMEL stand ,
- Sea-Bird Electronics' SBE-19 SEACAT system,
- PMEL PC with SEASOFT software for CTD data collection and processing,
- 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 primary CTD,
- CTD rosette sampler,
- 60-cm bongo sampling arrays,
- 20-cm bongo arrays,
- Spare wire angle indicator,
- MOCNESS,
- ARGOS satellite tracked drifter buoys with optical sensors,
- Miscellaneous scientific sampling and processing equipment,
- Scientific ultra-cold freezer,
- Cruise Operations Database (COD), and
- CUFES EDAS, computer, software, sample cups.

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,
- SCS backup – recordable compact diskette (CD-RW),
- Calibration Sheets for all ship's instruments used,
- PMEL CTD Weather Observation Logs,
- CTD Cast Information/Rosette Log,
- Autosalinometer Logs, and
- Ultra-cold Freezer Temperature Daily Log (SOI 5.4).

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 – Any ancillary work done during this project will be accomplished with the concurrence of the Chief Scientist and on a not-to-interfere basis with the programs described in these instructions and in accordance with the NOAA Fleet Standing Ancillary Instructions.

6.3 Piggyback Projects – None

7.0 HAZARDOUS MATERIALS

7.1 HAZMAT Inventory – See Section [9.4 Cruise MF-04-06 HAZMAT Inventory](#).

7.2 Material Safety Data Sheet (MSDS) – All MSDSs can be found on the OERD HAZMAT Emergency Guidelines – MSDS compact diskette dated January 8, 2004, supplied to the ship.

8.0 MISCELLANEOUS

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

<http://www.pmc.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 MILLER FREEMAN – Telephone methods listed in order of increasing expense:

Homeport – Seattle, Washington:

- (206) 553-4589
- (206) 553-4581
- (206) 553-8344

United States Coast Guard – Kodiak, Alaska

- (907) 487-9752
- (907) 487-9753
- (907) 487-4397
- (907) 487-4398

Cellular:

- (206) 660-7167

INMARSAT Mini-M

- 011-872-761-267-346 (voice/PBX)
- 011-872-761-267-347 (voice)
- 011-872-761-267-348 (fax)

INMARSAT B

- 011-872-330-394-120 (voice)
- 011-872-330-394-121 (fax)

E-Mail: NOAA.Ship.Miller.Freeman@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 MF-04-06 Equipment Inventory

Equipment	Quantity	Dimension	Weight	Total Weight
Larval Supply Trunks	1	20" x 22" x 36"	80 lbs	80 lbs
Microzooplankton Supply Trunks	2	20" x 22" x 36"	90 lbs	180 lbs
Formaldehyde Containers	3	20-1	40 lbs	120 lbs
Carboy, 95% Reagent Alcohol	1	20-1	40 lbs	40 lbs
Miscellaneous Gear Trunks	4	20" x 22" x 36"	80 lbs	320 lbs
60-cm Bongo Frame	1	8" x 26" x 60"		
20-cm Bongo Frame	1	8" x 14" x 16"		
MOCNESS Frame	1	45" x 120"	250 lbs	250 lbs
Cases, Glass Jars, 32-oz	30	8" x 12" x 15"	50 lbs	1,500 lbs
Cases, Glass Jars, 8-oz	10	4" x 6" x 8"	8 lbs	80 lbs
			TOTAL:	2,570 lbs

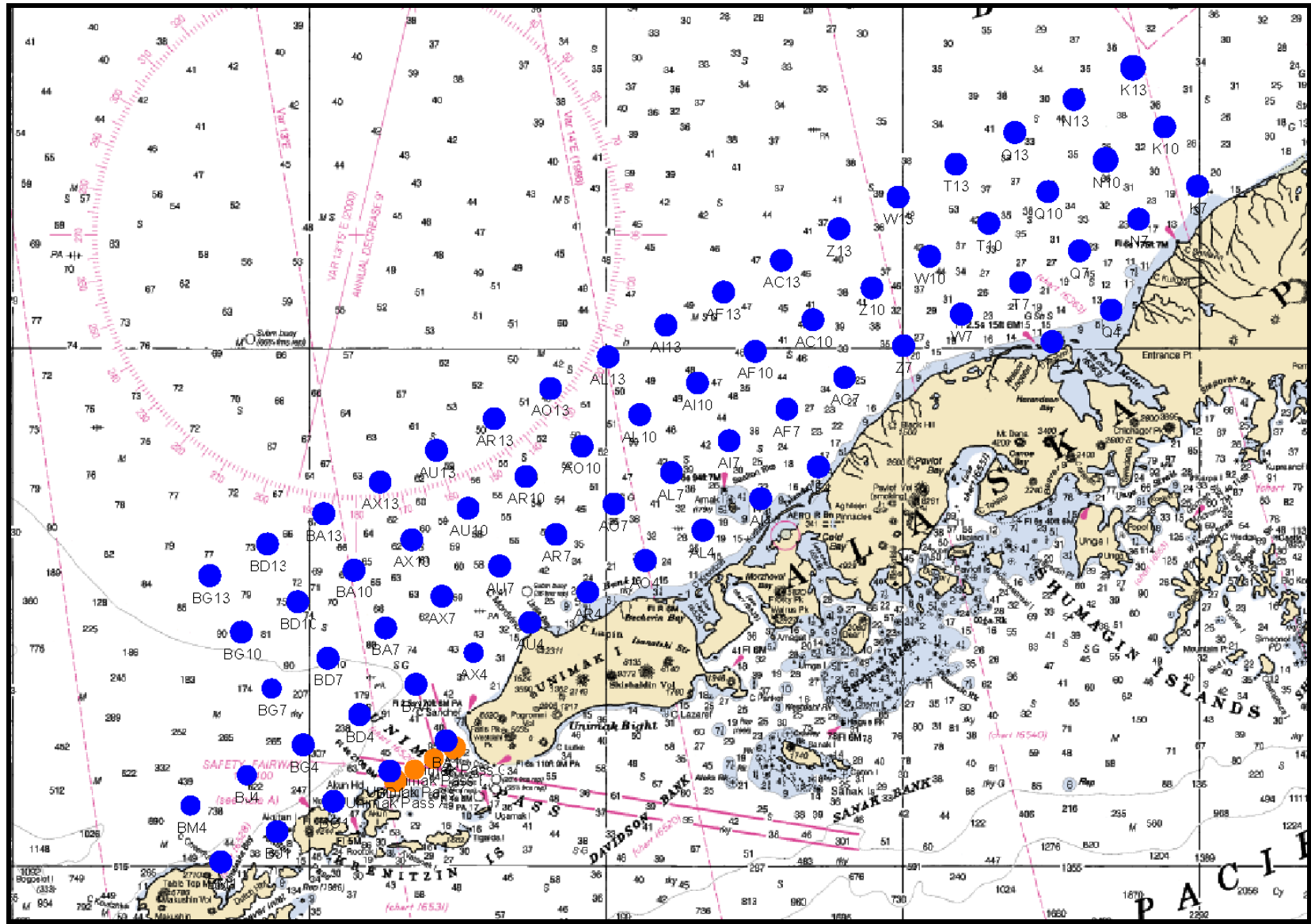
9.2 Cruise MF-04-06 Station Locations (Tentative order of station occupation. May be altered at discretion of Chief Scientist and Commanding Officer.)

Stations	Latitude	Longitude	DecLat	DecLon
BM1	54° 00.661' N	166° 35.418' W	54.01101	-166.59030
BM4	54° 13.850' N	166° 47.634' W	54.23083	-166.79390
BJ4	54° 21.011' N	166° 24.882' W	54.35018	-166.41470
BJ1	54° 07.822' N	166° 12.624' W	54.13036	-166.21040
BG1	54° 14.983' N	165° 49.770' W	54.24971	-165.82950
BG4	54° 28.172' N	166° 02.058' W	54.46953	-166.03430
BD4	54° 35.333' N	165° 39.174' W	54.58888	-165.65290
BD1	54° 22.144' N	165° 26.844' W	54.36906	-165.44740
Unimak Pass A	54° 19.782' N	165° 24.432' W	54.32970	-165.40720
Unimak Pass C	54° 22.290' N	165° 17.058' W	54.37150	-165.28430
Unimak Pass E	54° 24.900' N	165° 09.012' W	54.41500	-165.15020
Unimak Pass G	54° 27.642' N	165° 00.828' W	54.46070	-165.01380
BA1	54° 29.305' N	165° 03.852' W	54.48841	-165.06420
BA4	54° 42.494' N	165° 16.218' W	54.70823	-165.27030
AX4	54° 49.655' N	164° 53.190' W	54.82758	-164.88650
AU4	54° 56.816' N	164° 30.096' W	54.94693	-164.50160
AR4	55° 03.977' N	164° 06.936' W	55.06628	-164.11560
AO4	55° 11.138' N	163° 43.704' W	55.18563	-163.72840
AL4	55° 18.299' N	163° 20.400' W	55.30499	-163.34000
AI4	55° 25.460' N	162° 57.024' W	55.42434	-162.95040

Stations	Latitude	Longitude	DecLat	DecLon
AF4	55° 32.621' N	162° 33.582' W	55.54369	-162.55970
AF7	55° 45.810' N	162° 46.272' W	55.76350	-162.77120
AC7	55° 52.971' N	162° 22.794' W	55.88285	-162.37990
Z7	56° 00.132' N	161° 59.244' W	56.00220	-161.98740
W7	56° 07.294' N	161° 35.622' W	56.12156	-161.59370
T7	56° 14.455' N	161° 11.922' W	56.24091	-161.19870
T4	56° 01.265' N	160° 59.070' W	56.02109	-160.98450
Q4	56° 08.426' N	160° 35.262' W	56.14044	-160.58770
Q7	56° 21.616' N	160° 48.150' W	56.36026	-160.80250
N7	56° 28.777' N	160° 24.306' W	56.47961	-160.40510
K7	56° 35.938' N	160° 00.384' W	56.59896	-160.00640
K10	56° 49.127' N	160° 13.428' W	56.81878	-160.22380
N10	56° 41.965' N	160° 37.308' W	56.69942	-160.62180
Q10	56° 34.804' N	161° 01.116' W	56.58007	-161.01860
T10	56° 27.643' N	161° 24.846' W	56.46072	-161.41410
W10	56° 20.482' N	161° 48.504' W	56.34137	-161.80840
Z10	56° 13.321' N	162° 12.084' W	56.22202	-162.20140
AC10	56° 06.160' N	162° 35.598' W	56.10267	-162.59330
AF10	55° 58.999' N	162° 59.034' W	55.98332	-162.98390
AI10	55° 51.838' N	163° 22.404' W	55.86397	-163.37340
AI7	55° 38.649' N	163° 09.678' W	55.64415	-163.16130
AL7	55° 31.488' N	163° 33.018' W	55.52480	-163.55030
AL10	55° 44.677' N	163° 45.702' W	55.74462	-163.76170
AO10	55° 37.516' N	164° 08.928' W	55.62527	-164.14880
AO7	55° 24.327' N	163° 56.280' W	55.40545	-163.93800
AR7	55° 17.166' N	164° 19.476' W	55.28610	-164.32460
AR10	55° 30.355' N	164° 32.088' W	55.50592	-164.53480
AU10	55° 23.194' N	164° 55.176' W	55.38657	-164.91960
AU7	55° 10.005' N	164° 42.600' W	55.16675	-164.71000
AX7	55° 02.844' N	165° 05.658' W	55.04740	-165.09430
AX10	55° 16.033' N	165° 18.192' W	55.26722	-165.30320
BA10	55° 08.872' N	165° 41.142' W	55.14787	-165.68570
BA7	54° 55.683' N	165° 28.644' W	54.92805	-165.47740
BD7	54° 48.522' N	165° 51.564' W	54.80870	-165.85940
BG7	54° 41.361' N	166° 14.412' W	54.68935	-166.24020
BG10	54° 54.550' N	166° 26.838' W	54.90917	-166.44730
BD10	55° 01.711' N	166° 04.020' W	55.02852	-166.06700
BG13	55° 07.739' N	166° 39.330' W	55.12899	-166.65550
BD13	55° 14.900' N	166° 16.548' W	55.24834	-166.27580
BA13	55° 22.061' N	165° 53.706' W	55.36769	-165.89510

Stations	Latitude	Longitude	DecLat	DecLon
AX13	55° 29.222' N	165° 30.798' W	55.48704	-165.51330
AU13	55° 36.383' N	165° 07.812' W	55.60639	-165.13020
AR13	55° 43.544' N	164° 44.766' W	55.72574	-164.74610
AO13	55° 50.705' N	164° 21.648' W	55.84509	-164.36080
AL13	55° 57.866' N	163° 58.458' W	55.96444	-163.97430
AI13	56° 05.027' N	163° 35.202' W	56.08379	-163.58670
AF13	56° 12.188' N	163° 11.874' W	56.20314	-163.19790
AC13	56° 19.349' N	162° 48.474' W	56.32249	-162.80790
Z13	56° 26.510' N	162° 25.002' W	56.44184	-162.41670
W13	56° 33.671' N	162° 01.458' W	56.56119	-162.02430
T13	56° 40.832' N	161° 37.842' W	56.68054	-161.63070
Q13	56° 47.993' N	161° 14.154' W	56.79989	-161.23590
N13	56° 55.154' N	160° 50.394' W	56.91924	-160.83990
K13	57° 02.315' N	160° 26.556' W	57.03859	-160.44260

9.3 Cruise MF-04-06 Chartlet



9.4 Cruise MF-04-06 HAZMAT Inventory

Chemical	CAS Number	Respondee	Organization	Quantity	H	F	R	Storage Color Code	Hazard Class	Packing Group Number	UN	Reportable Quantity	Response Indices
Ethanol	64-17-5	Blood	AFSC		3	4	2	Flammable	3	II	1170	5,000-LBS	1
Formaldehyde	mix	Blood	AFSC		3	2	2	Flammable	3 & 8	III	1198	100-LBS	1
Sodium Borate	1330-43-4	Blood	AFSC		2	0	0	General	Not regulated			None	2
<p>Spill Response 1: 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 sawdust. 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.</p>													
<p>Spill Response 2: 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.</p>													