

# FINAL CRUISE INSTRUCTIONS

## *FOCI*

NOAA Ship *MILLER FREEMAN*, Cruise MF-04-07  
May 23, 2004 – June 03, 2004  
Chief Scientist – Annette Dougherty, NOAA/AFSC

### 1.0 FINAL CRUISE INSTRUCTIONS

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

1.2 **Cruise Numbers**

1.2.1 **Cruise Number** – MF-04-07

1.2.2 **FOCI Number** – 5MF04

1.3 **Cruise Dates**

1.3.1 **Departure** – Depart Sunday, May 23, 2004, at 1500 hours from Kodiak, Alaska.

1.3.2 **Arrival** – Arrive Thursday, June 03, 2004, at 0800 hours in Kodiak, Alaska.

1.4 **Operating Area** – Unimak Pass to Shelikof Strait, ending at Kodiak Island, Alaska.

### 2.0 CRUISE OVERVIEW

2.1 **Cruise Objectives** – The objectives of this cruise are to conduct an ichthyoplankton survey and process oriented studies in the region between Unimak Pass, the Shumagin Islands, and through Shelikof Strait to Kodiak Island, Alaska, so that we may estimate the abundance, transport, and factors influencing the survival of young walleye pollock larvae. We will also occupy stations on Line 8 to continue our 19 year time series of environmental and biological conditions in Shelikof Strait.

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
Annette Dougherty (206) 526-6523	Female	AFSC	<a href="mailto:Annette.Dougherty@noaa.gov">Annette.Dougherty@noaa.gov</a>

### 2.4.2 Participating Scientists

Name	Gender	Affiliation	E-mail Address
Annette Dougherty	Female	AFSC	<a href="mailto:Annette.Dougherty@noaa.gov">Annette.Dougherty@noaa.gov</a>
Jay B. Clark	Male	AFSC	<a href="mailto:Jay.Clark@noaa.gov">Jay.Clark@noaa.gov</a>
Steven Porter	Male	AFSC	<a href="mailto:Steve.Porter@noaa.gov">Steve.Porter@noaa.gov</a>
Matthew T. Wilson	Male	AFSC	<a href="mailto:Matt.Wilson@noaa.gov">Matt.Wilson@noaa.gov</a>

## 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 Michele G. Bullock, NOAA  
Chief, Operations Division, Pacific (MOP1)  
Telephone: (206) 553-8705  
Cellular: (206) 390-7527  
E-mail: [Michele.Bullock@noaa.gov](mailto:Michele.Bullock@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](mailto:Larry.Mordock@noaa.gov)

### 2.5.2 Scientific Operations

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

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

### 3.0 OPERATIONS

#### 3.1 Data To Be Collected

**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* (SOI 5.2) for specific requirements.

**3.2 Staging Plan** – NOAA Ship *MILLER FREEMAN* was loaded with FOCI gear while the ship was in port at Marine Operations Center, Pacific (MOP) in Seattle, Washington.

**3.3 De-staging Plan** – Plankton sample collected during the survey will be off-loaded in Kodiak, Alaska, upon completion of the cruise and shipped to Seattle, Washington. AFSC will off-load FOCI gear from NOAA Ship *MILLER FREEMAN* during October 2004 while the ship is alongside Marine Operations Center, Pacific (MOP) in Seattle, Washington. The hold will need to be opened and the loading crane will be required to remove all FOCI gear from the vessel's hold. The scientific party off-loading the vessel will supply vehicles from AFSC for transportation of the gear from the vessel.

**3.4 Cruise Plan** – An ichthyoplankton survey will be conducted from Unimak Pass through the Shumagin Islands and Shelikof Strait, ending at Kodiak Island. The standard gear for this survey will be 60-cm bongos with 0.505-mm mesh netting. Tows will be to 100 meters or 10 meters off the bottom where water depth is shallower. See Sections [9.2.1 Cruise MF-04-07 Potential Station Locations](#) and [9.2.2 Cruise MF-04-07 Station Locations – Line 8](#) for locations and Sections [9.3.1 Cruise MF-04-07 Potential Station Locations Figure](#) and [9.3.2 Cruise MF-04-07 Line 8 Station Locations Figure](#) for chartlets of the possible station locations. Approximately 170 stations from the list will be chosen for occupation from the potential stations listed. Live tows may be conducted with the Bongos to examine larval walleye pollock condition if larvae 8-mm or less are found. While we are working up the grid toward Kodiak Island, Alaska, we will occupy Line 8. Line 8 sampling will include 20-cm and 60-cm Bongos and Conductivity, Temperature, and Depth (CTD) profiles with Niskin bottle samples taken for chlorophyll, microzooplankton, and nutrients. Net tows at Line 8 are to 10 meters off the bottom. The 60-cm Bongo will be fitted with 0.505-mm and 0.333-mm mesh nets for Line 8 sampling. In the event of a storm, the Chief Scientist may call for a break in the survey operations in order to opportunistically monitor before and after storm conditions. Storm monitoring will include CTDs (nutrients, chlorophyll, and microzooplankton), Tucker, and Bongo tows.

**3.5 Station Locations** – See Sections [9.2.1 Cruise MF-04-07 Potential Station Locations](#) and [9.2.2 Cruise MF-04-07 Station Locations – Line 8](#) for 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). 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),
- Bongo Larval Condition Tows (SOI 3.2.3),

- Tucker Trawls (SOI 3.2.9),
- Chlorophyll Sampling Operations (SOI 3.2.10), and
- SIMRAD EK 500 Scientific Echosounder Monitoring (SOI 3.2.12).

**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.

- Radiometer Operations (SOI 3.2.14),
- Scientific Computer System (SCS) data acquisition (SOI 5.2),
- Fluorometer monitoring (SOI 5.3), 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**

- 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),
- Conductivity and temperature sensor package to provide dual sensors on the CTD (primary),
- 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, Rowe, and Marco 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 (blast and storage freezers, indicate desired temperatures),
- SIMRAD EQ-50 echosounder,
- JRC JFV-200R color sounder recorder,
- RD Instruments' ADCP written to Iomega Zip drive,
- Use of Pentium PC in DataPlot for data analysis,
- Scientific Computer System (SCS),
- 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, and
- Ship's crane(s) used for loading and/or deploying.

#### **4.2 Equipment and Capabilities Provided by Scientists**

- Sea-Bird Electronics' SBE 911*plus* CTD system,
- 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 CTD (backup),
- CTD rosette sampler,
- IAPSO standard water,
- XBTs for project,
- 60-cm Bongo sampling arrays,
- 20-cm Bongo arrays,
- Spare wire angle indicator,
- Tucker trawl, complete 1-M sampling array,
- Miscellaneous scientific sampling and processing equipment,
- Scientific ultra-cold freezer, 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:

**5.1.1** To be completed by the ship:

- **NOAA Form 77-13d – Deck Log – Weather Observation Sheets,**
- SCS Event log,
- SCS backup - compact diskette (CD),
- Calibration Sheets for all ship's instruments used,
- Autosalinometer Logs, and
- Ultra-cold Freezer Temperature Daily Log (SOI 5.4).

**5.1.2** To be completed by the scientists:

- 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** – 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 [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. 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 **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](mailto: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](mailto: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](mailto:FirstName.LastName@noaa.gov)

E-Mail to Radio Room: [Radio.Room@noaa.gov](mailto:Radio.Room@noaa.gov)

## 9.0 APPENDICES

### 9.1 Cruise MF-04-07 Equipment Inventory

Equipment	Quantity	Dimension	Weight	Total Weight
Larval supply trunk	1	20" x 22" x 36"	80.0 lbs	80.0 lbs
Microzooplankton supply trunks	2	20" x 22" x 36"	90.0 lbs	180.0 lbs
Miscellaneous gear trunks	4	20" x 22" x 36"	80.0 lbs	320.0 lbs
Tucker frame and weights	1	14" x 20" x 48"	200.0 lbs	200.0 lbs
Bongo frame, 60-cm	1	8" x 26" x 60"		
Bongo frame, 20-cm	1	8" x 14" x 16"		
Glass jars, 32-oz, case	20	8" x 12" x 15"	2.5 lbs	50.0 lbs
Glass jars, 8-oz, case	6	4" x 6" x 8"	1.3 lbs	7.8 lbs
Formaldehyde, 37%	3	20-L container	40.0 lbs	120.0 lbs
Ethanol, 95%	1	20-L container	40.0 lbs	40.0 lbs
Sodium Borate solution	1	20-L container	40.0 lbs	40.0 lbs
Spill Kit	1	8" x 12" x 14"	1.5 lbs	1.5 lbs
<b>TOTAL WEIGHT:</b>				<b>1039.3 lbs</b>

### 9.2 Cruise MF-04-07 Station Locations

9.2.1 Cruise MF-04-07 Potential Station Locations – Listed in order of potential occupation.

Station	X	Y	Latitude	Longitude	Decimal Latitude	Decimal Longitude	XY
1	u	1	54° 28.980' N	165° 18.000' W	54.48300	-165.30000	u1
2	u	2	54° 24.000' N	165° 06.996' W	54.40000	-165.11660	u2
3	gd	103	54° 16.903' N	164° 42.630' W	54.28172	-164.71050	gd103
4	gd	101	54° 09.646' N	164° 54.408' W	54.16076	-164.90680	gd101
5	gf	101	54° 02.759' N	164° 39.636' W	54.04598	-164.66060	gf101
6	gf	103	54° 10.016' N	164° 27.888' W	54.16693	-164.46480	gf103
7	gh	103	54° 03.129' N	164° 13.194' W	54.05215	-164.21990	gh103
8	gj	105	54° 03.499' N	163° 46.836' W	54.05832	-163.78060	gj105
9	gh	105	54° 10.387' N	164° 01.446' W	54.17311	-164.02410	gh105
10	gf	105	54° 17.273' N	164° 16.104' W	54.28789	-164.26840	gf105
11	gf	107	54° 24.531' N	164° 04.290' W	54.40885	-164.07150	gf107
12	gh	107	54° 17.644' N	163° 49.662' W	54.29406	-163.82770	gh107
13	gj	107	54° 10.757' N	163° 35.088' W	54.17928	-163.58480	gj107
14	gl	107	54° 03.870' N	163° 20.562' W	54.06450	-163.34270	gl107
15	gl	109	54° 11.127' N	163° 08.808' W	54.18545	-163.14680	gl109
16	gj	109	54° 18.014' N	163° 23.304' W	54.30024	-163.38840	gj109
17	gh	109	54° 24.901' N	163° 37.842' W	54.41502	-163.63070	gh109
18	gf	109	54° 31.788' N	163° 52.440' W	54.52980	-163.87400	gf109
19	gh	111	54° 32.159' N	163° 25.992' W	54.53598	-163.43320	gh111



Station	X	Y	Latitude	Longitude	Decimal Latitude	Decimal Longitude	XY
20	gj	111	54° 25.271' N	163° 11.484' W	54.42119	-163.19140	gj111
21	gj	113	54° 32.529' N	162° 59.628' W	54.54215	-162.99380	gj113
22	gl	111	54° 18.385' N	162° 57.024' W	54.30641	-162.95040	gl111
23	gn	111	54° 11.497' N	162° 42.612' W	54.19162	-162.71020	gn111
24	gp	125	54° 55.412' N	161° 05.226' W	54.92353	-161.08710	gp125
25	gr	125	54° 48.525' N	160° 51.144' W	54.80875	-160.85240	gr125
26	gt	125	54° 41.638' N	160° 37.110' W	54.69397	-160.61850	gt125
27	gv	125	54° 34.751' N	160° 23.124' W	54.57918	-160.38540	gv125
28	gv	127	54° 42.008' N	160° 11.220' W	54.70014	-160.18700	gv127
29	gt	127	54° 48.895' N	160° 25.176' W	54.81492	-160.41960	gt127
30	gr	127	54° 55.783' N	160° 39.174' W	54.92971	-160.65290	gr127
31	gp	127	55° 02.669' N	160° 53.220' W	55.04449	-160.88700	gp127
32	gn	127	55° 09.557' N	161° 07.314' W	55.15928	-161.12190	gn127
33	gl	127	55° 16.444' N	161° 21.456' W	55.27406	-161.35760	gl127
34	B4		55° 21.780' N	161° 38.340' W	55.36300	-161.63900	B4
35	B2		55° 20.700' N	161° 02.160' W	55.34500	-161.03600	B2
36	go	133	55° 30.000' N	160° 19.980' W	55.50000	-160.33300	go133
37	gp	135	55° 31.699' N	160° 04.848' W	55.52832	-160.08080	gp135
38	gp	137	55° 38.956' N	159° 52.662' W	55.64927	-159.87770	gp137
39	gr	135	55° 24.812' N	159° 50.940' W	55.41353	-159.84900	gr135
40	gt	135	55° 17.925' N	159° 37.080' W	55.29875	-159.61800	gt135
41	gx	135	55° 04.151' N	159° 09.486' W	55.06918	-159.15810	gx135
42	gz	135	54° 57.264' N	158° 55.758' W	54.95440	-158.92930	gz135
43	hb	135	54° 50.377' N	158° 42.072' W	54.83961	-158.70120	hb135
44	gz	139	55° 11.779' N	158° 31.698' W	55.19631	-158.52830	gz139
45	gx	139	55° 18.665' N	158° 45.360' W	55.31109	-158.75600	gx139
46	gv	139	55° 25.553' N	158° 59.064' W	55.42588	-158.98440	gv139
47	gt	139	55° 32.440' N	159° 12.810' W	55.54066	-159.21350	gt139
48	gv	143	55° 40.067' N	158° 34.716' W	55.66779	-158.57860	gv143
49	gx	143	55° 33.181' N	158° 21.078' W	55.55301	-158.35130	gx143
50	gz	143	55° 26.293' N	158° 07.494' W	55.43822	-158.12490	gz143
51	hb	143	55° 19.406' N	157° 53.946' W	55.32344	-157.89910	hb143
52	hb	141	55° 12.149' N	158° 06.036' W	55.20248	-158.10060	hb141
53	hd	143	55° 12.519' N	157° 40.440' W	55.20865	-157.67400	hd143
54	hf	147	55° 20.147' N	157° 02.838' W	55.33578	-157.04730	hf147
55	hd	147	55° 27.034' N	157° 16.230' W	55.45057	-157.27050	hd147
56	hb	147	55° 33.921' N	157° 29.664' W	55.56535	-157.49440	hb147
57	gz	147	55° 40.808' N	157° 43.134' W	55.68013	-157.71890	gz147
58	gx	147	55° 47.695' N	157° 56.652' W	55.79492	-157.94420	gx147
59	gv	147	55° 54.582' N	158° 10.212' W	55.90970	-158.17020	gv147
60	gr	151	56° 22.871' N	158° 12.666' W	56.38118	-158.21110	gr151
61	gt	151	56° 15.984' N	157° 59.094' W	56.26640	-157.98490	gt151
62	gv	151	56° 09.097' N	157° 45.564' W	56.15162	-157.75940	gv151
63	gx	151	56° 02.210' N	157° 32.076' W	56.03683	-157.53460	gx151
64	gz	151	55° 55.323' N	157° 18.630' W	55.92205	-157.31050	gz151
65	hb	151	55° 48.436' N	157° 05.226' W	55.80726	-157.08710	hb151
66	hd	151	55° 41.549' N	156° 51.864' W	55.69248	-156.86440	hd151

Station	X	Y	Latitude	Longitude	Decimal Latitude	Decimal Longitude	XY
67	hf	151	55° 34.661' N	156° 38.544' W	55.57769	-156.64240	hf151
68	hh	151	55° 27.775' N	156° 25.266' W	55.46291	-156.42110	hh151
69	hh	153	55° 35.032' N	156° 13.098' W	55.58387	-156.21830	hh153
70	hf	153	55° 41.919' N	156° 26.340' W	55.69865	-156.43900	hf153
71	hd	153	55° 48.806' N	156° 39.630' W	55.81343	-156.66050	hd153
72	hb	153	55° 55.693' N	156° 52.956' W	55.92822	-156.88260	hb153
73	gz	153	56° 02.580' N	157° 06.318' W	56.04300	-157.10530	gz153
74	gx	153	56° 09.467' N	157° 19.728' W	56.15779	-157.32880	gx153
75	gv	153	56° 16.354' N	157° 33.180' W	56.27257	-157.55300	gv153
76	gt	153	56° 23.242' N	157° 46.674' W	56.38736	-157.77790	gt153
77	gt	155	56° 30.499' N	157° 34.212' W	56.50831	-157.57020	gt155
78	gv	155	56° 23.612' N	157° 20.754' W	56.39353	-157.34590	gv155
79	gx	155	56° 16.724' N	157° 07.344' W	56.27874	-157.12240	gx155
80	gz	155	56° 09.838' N	156° 53.970' W	56.16396	-156.89950	gz155
81	hd	155	55° 56.063' N	156° 27.354' W	55.93439	-156.45590	hd155
82	hf	155	55° 49.177' N	156° 14.100' W	55.81961	-156.23500	hf155
83	hh	155	55° 42.289' N	156° 00.894' W	55.70482	-156.01490	hh155
84	hf	157	55° 56.434' N	156° 01.824' W	55.94056	-156.03040	hf157
85	hd	157	56° 03.321' N	156° 15.036' W	56.05535	-156.25060	hd157
86	hb	157	56° 10.208' N	156° 28.290' W	56.17013	-156.47150	hb157
87	gz	157	56° 17.095' N	156° 41.580' W	56.28492	-156.69300	gz157
88	gx	157	56° 23.982' N	156° 54.918' W	56.39970	-156.91530	gx157
89	gu	158	56° 40.002' N	157° 13.002' W	56.66670	-157.21670	gu158
90	gv	159	56° 38.126' N	156° 55.788' W	56.63544	-156.92980	gv159
91	gx	159	56° 31.240' N	156° 42.450' W	56.52066	-156.70750	gx159
92	gz	159	56° 24.352' N	156° 29.154' W	56.40587	-156.48590	gz159
93	hb	159	56° 17.465' N	156° 15.900' W	56.29109	-156.26500	hb159
94	hd	159	56° 10.578' N	156° 02.682' W	56.17630	-156.04470	hd159
95	hf	159	56° 03.691' N	155° 49.506' W	56.06152	-155.82510	hf159
96	hd	161	56° 17.836' N	155° 50.292' W	56.29726	-155.83820	hd161
97	hb	161	56° 24.722' N	156° 03.468' W	56.41204	-156.05780	hb161
98	gz	161	56° 31.610' N	156° 16.686' W	56.52683	-156.27810	gz161
99	gx	161	56° 38.497' N	156° 29.946' W	56.64161	-156.49910	gx161
100	gv	161	56° 45.384' N	156° 43.248' W	56.75640	-156.72080	gv161
101	gt	163	56° 51.000' N	156° 45.000' W	56.85000	-156.75000	gt163
102	gv	163	56° 52.641' N	156° 30.666' W	56.87735	-156.51110	gv163
103	gx	163	56° 45.754' N	156° 17.400' W	56.76257	-156.29000	gx163
104	gz	163	56° 38.867' N	156° 04.182' W	56.64779	-156.06970	gz163
105	hb	163	56° 31.980' N	155° 51.000' W	56.53300	-155.85000	hb163
106	hd	163	56° 25.093' N	155° 37.860' W	56.41822	-155.63100	hd163
107	hd	165	56° 32.350' N	155° 25.386' W	56.53917	-155.42310	hd165
108	hb	165	56° 39.238' N	155° 38.490' W	56.65396	-155.64150	hb165
109	gz	165	56° 46.124' N	155° 51.636' W	56.76874	-155.86060	gz165
110	gx	165	56° 53.012' N	156° 04.818' W	56.88353	-156.08030	gx165
111	gv	165	56° 59.899' N	156° 18.042' W	56.99831	-156.30070	gv165
112	gv	167	57° 07.156' N	156° 05.376' W	57.11927	-156.08960	gv167
113	gx	167	57° 00.269' N	155° 52.188' W	57.00448	-155.86980	gx167

Station	X	Y	Latitude	Longitude	Decimal Latitude	Decimal Longitude	XY
114	gz	167	56° 53.382' N	155° 39.048' W	56.88970	-155.65080	gz167
115	hb	167	56° 46.495' N	155° 25.944' W	56.77491	-155.43240	hb167
116	hd	167	56° 39.608' N	155° 12.876' W	56.66013	-155.21460	hd167
117	hd	169	56° 46.865' N	155° 00.324' W	56.78109	-155.00540	hd169
118	hb	169	56° 53.752' N	155° 13.350' W	56.89587	-155.22250	hb169
119	gz	169	57° 00.639' N	155° 26.418' W	57.01065	-155.44030	gz169
120	gx	169	57° 07.526' N	155° 39.522' W	57.12544	-155.65870	gx169
121	gv	169	57° 14.413' N	155° 52.668' W	57.24022	-155.87780	gv169
122	gt	169	57° 21.300' N	156° 04.998' W	57.35500	-156.08330	gt169
123	gt	171	57° 27.000' N	155° 46.002' W	57.45000	-155.76670	gt171
124	gv	171	57° 21.671' N	155° 39.918' W	57.36118	-155.66530	gv171
125	gx	171	57° 14.784' N	155° 26.814' W	57.24640	-155.44690	gx171
126	gz	171	57° 07.897' N	155° 13.746' W	57.13161	-155.22910	gz171
127	hb	171	57° 01.010' N	155° 00.720' W	57.01683	-155.01200	hb171
128	hd	171	56° 54.122' N	154° 47.736' W	56.90204	-154.79560	hd171
129	hb	173	57° 08.267' N	154° 48.048' W	57.13778	-154.80080	hb173
130	gz	173	57° 15.154' N	155° 01.038' W	57.25257	-155.01730	gz173
131	gx	173	57° 22.041' N	155° 14.064' W	57.36735	-155.23440	gx173
132	gv	173	57° 28.928' N	155° 27.126' W	57.48214	-155.45210	gv173
133	gt	173	57° 37.002' N	155° 28.002' W	57.61670	-155.46670	gt173
134	gv	175	57° 36.185' N	155° 14.298' W	57.60309	-155.23830	gv175
141	gz	175	57° 22.411' N	154° 48.282' W	57.37352	-154.80470	gz175
142	gx	177	57° 36.556' N	154° 48.438' W	57.60926	-154.80730	gx177
143	gv	177	57° 43.443' N	155° 01.422' W	57.72405	-155.02370	gv177
144	gv	179	57° 50.701' N	154° 48.498' W	57.84501	-154.80830	gv179
145	gx	179	57° 43.813' N	154° 35.562' W	57.73022	-154.59270	gx179
146	gx	181	57° 51.071' N	154° 22.638' W	57.85118	-154.37730	gx181
147	gz	181	57° 44.183' N	154° 09.774' W	57.73639	-154.16290	gz181
148	gz	183	57° 51.441' N	153° 56.850' W	57.85735	-153.94750	gz183
149	gx	183	57° 58.328' N	154° 09.672' W	57.97213	-154.16120	gx183
150	gx	185	58° 05.585' N	153° 56.664' W	58.09309	-153.94440	gx185
151	gz	185	57° 58.699' N	153° 43.884' W	57.97831	-153.73140	gz185
152	gz	189	58° 13.213' N	153° 17.820' W	58.22022	-153.29700	gz189
153	gx	189	58° 20.100' N	153° 30.516' W	58.33500	-153.50860	gx189
154	gv	189	58° 26.987' N	153° 43.248' W	58.44979	-153.72080	gv189
155	gv	193	58° 41.502' N	153° 16.830' W	58.69170	-153.28050	gv193
156	gx	193	58° 34.615' N	153° 04.182' W	58.57692	-153.06970	gx193
157	gz	193	58° 27.728' N	152° 51.576' W	58.46213	-152.85960	gz193
158	gz	197	58° 42.242' N	152° 25.146' W	58.70404	-152.41910	gz197
159	gx	197	58° 49.130' N	152° 37.674' W	58.81883	-152.62790	gx197
160	gv	197	58° 56.017' N	152° 50.232' W	58.93361	-152.83720	gv197
161	gt	197	59° 02.904' N	153° 02.826' W	59.04840	-153.04710	gt197
162	gv	201	59° 10.532' N	152° 23.448' W	59.17553	-152.39080	gv201
163	gx	201	59° 03.644' N	152° 10.974' W	59.06074	-152.18290	gx201
164	hb	203	58° 57.128' N	151° 32.808' W	58.95213	-151.54680	hb203
165	hd	203	58° 50.241' N	151° 20.484' W	58.83735	-151.34140	hd203
166	hd	201	58° 42.983' N	151° 33.774' W	58.71639	-151.56290	hd201

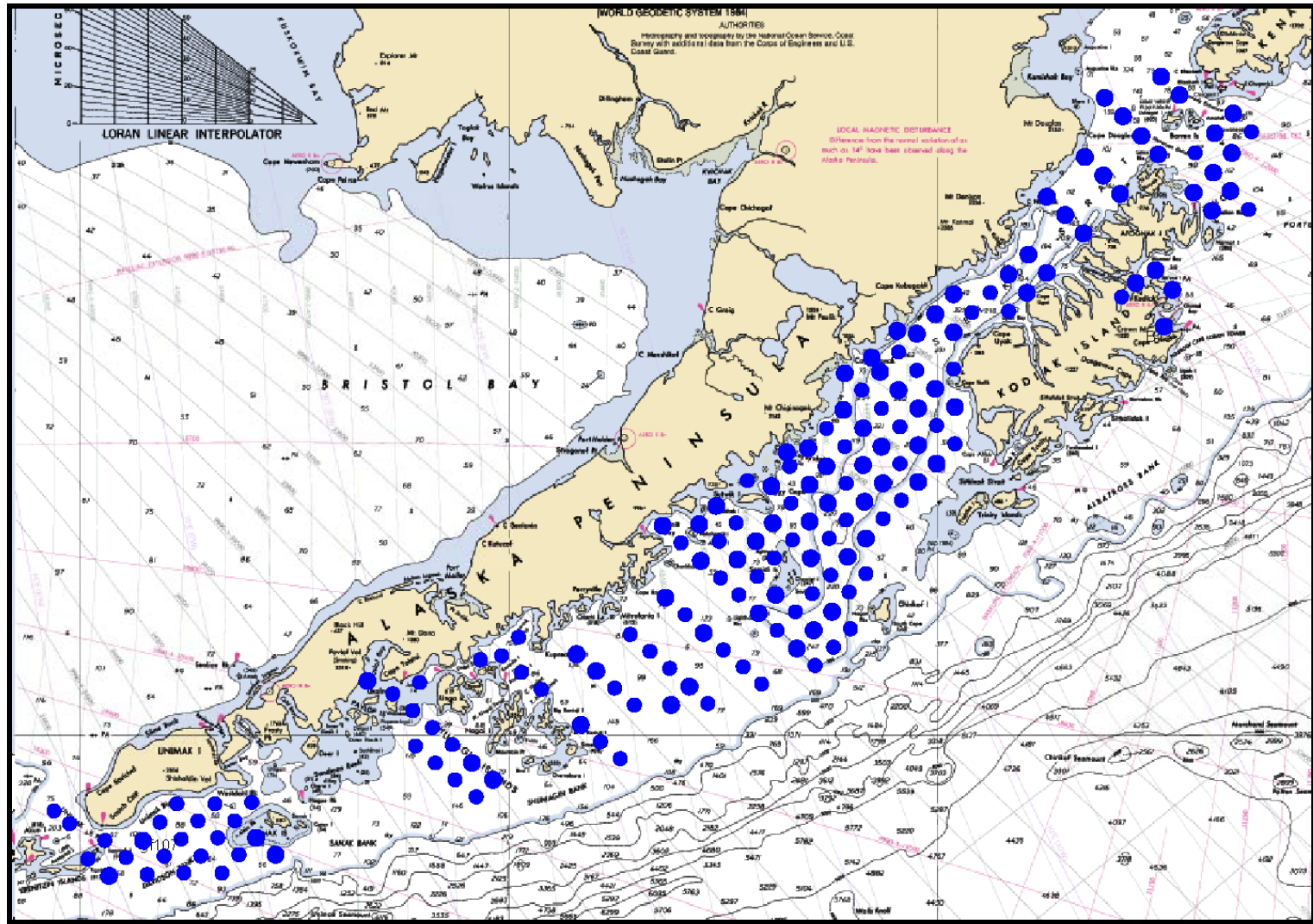
Station	X	Y	Latitude	Longitude	Decimal Latitude	Decimal Longitude	XY
167	hb	201	58° 49.870' N	151° 46.134' W	58.83117	-151.76890	hb201
168	hb	199	58° 42.613' N	151° 59.418' W	58.71022	-151.99030	hb199
169	hd	199	58° 35.726' N	151° 47.010' W	58.59543	-151.78350	hd199
170	hd	197	58° 28.469' N	152° 00.204' W	58.47448	-152.00340	hd197
171	hf	197	58° 21.581' N	151° 47.784' W	58.35969	-151.79640	hf197
172	hf	199	58° 28.839' N	151° 34.632' W	58.48065	-151.57720	hf199
173	hh	199	58° 21.952' N	151° 22.290' W	58.36586	-151.37150	hh199
174		B12	57° 38.760' N	152° 21.720' W	57.64600	-152.36200	B12
175		B13	57° 43.440' N	152° 25.140' W	57.72400	-152.41900	B13
176		B14	57° 52.500' N	152° 15.720' W	57.87500	-152.26200	B14
177	hf	191	57° 59.809' N	152° 26.970' W	57.99682	-152.44950	hf191
178		B15	57° 55.200' N	152° 41.340' W	57.92000	-152.68900	B15
179		B16	57° 49.500' N	152° 51.240' W	57.82500	-152.85400	B16

**9.2.2 Cruise MF-04-07 Station Locations – Line 8**

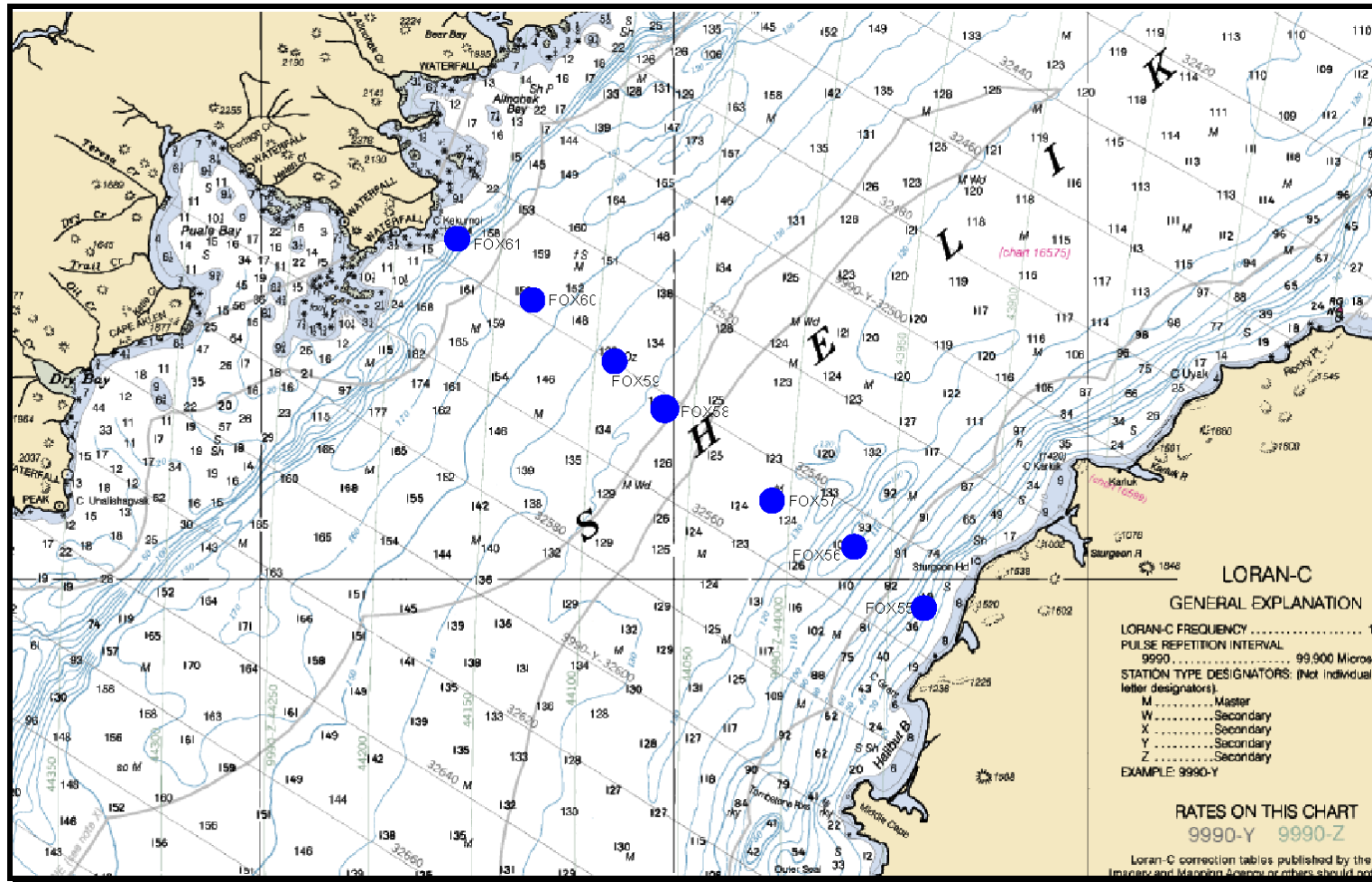
Station	Latitude	Longitude	DecLat	DecLon	CTDB	Chlor.	Nuts	MZ	Bongo
FOX61	57° 43.200' N	155° 15.600' W	57.72	-155.26	x	x	x	x	x
FOX60	57° 40.800' N	155° 10.200' W	57.68	-155.17	x	x	x	x	x
FOX59	57° 38.400' N	155° 04.200' W	57.64	-155.07	x	x	x	x	x
FOX58	57° 36.600' N	155° 00.600' W	57.61	-155.01	x	x	x	x	x
FOX57	57° 33.000' N	154° 52.800' W	57.55	-154.88	x	x	x	x	x
FOX56	57° 31.200' N	154° 46.800' W	57.52	-154.78	x	x	x	x	x
FOX55	57° 28.800' N	154° 42.000' W	57.48	-154.70	x	x	x	x	x

### 9.3 Cruise MF-04-07 Figures

#### 9.3.1 Cruise MF-04-07 Potential Station Locations Figure



9.3.2 Cruise MF-04-07 Line 8 Station Locations Figure



**9.4 Cruise MF-04-07 HAZMAT Inventory**

Chemical	CAS Number	Respondee	Org.	Quantity	H	F	R	Storage Color Code	Hazard Class	Packing Group Number	UN	Reportable Quantity	Response Indices
Ethanol, 95%	64-17-5	Dougherty	AFSC	20-l	3	4	2	Flammable	3	II	1170	5,000-LBS	1
Formaldehyde, 37%	mix	Dougherty	AFSC	60-l	3	2	2	Flammable	3 & 8	III	1198	100-LBS	1
Sodium Borate	1330-43-4	Dougherty	AFSC	1-kg	2	0	0	General	Not regulated			None	2
Sodium Borate Solution, Saturated	mix	Dougherty	AFSC	20-l	2	0	0	General	Not regulated			None	2
Zinc-Formalin, 10%, (Z-Fix)	mix	Dougherty	AFSC	1-l	2	1	0	General	9		3334	None	None
<p><b>Spill Response 1:</b> 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. <b>Do not flush to sewer!</b> 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><b>Spill Response 2:</b> 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>													