FINAL CRUISE INSTRUCTIONS
FOCI

NOAA Ship *MILLER FREEMAN*, MF-02-07
May 23 – June 1, 2002
Chief Scientist: Annette Brown

1.0 DRAFT CRUISE INSTRUCTIONS

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

1.2 Cruise Numbers:

1.2.1 Cruise Number – MF-02-07

1.2.2 FOCI Number – 3MF02

1.3 Cruise Dates:

1.3.1 Departure – Depart Dutch Harbor, Alaska, on Thursday, May 23, 2002.

1.3.2 Arrival – Arrive Kodiak Island, Alaska, on Saturday, June 1, 2002.

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, to estimate the abundance of young walleye pollock larvae, their transport, and factors influencing their survival. We also intend to occupy stations on Line 8 to continue our 17-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 April 8, 2002, present complete information for this cruise.

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

2.4 Participating Organizations

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

2.5 Personnel

2.5.1 Chief Scientist

Annette Brown (206) 526-6523	F	AFSC	Annette.Brown@noaa.gov

2.5.2 Participating Scientists

Jay Clark	M	AFSC	Jay.Clark@noaa.gov
Steve Porter	M	AFSC	Steve.Porter@noaa.gov
Matt Wilson	M	AFSC	Matt.Wilson@noaa.gov

2.6 Administrative

2.6.1 Ship Operations

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

Commander Timothy B. Wright, NOAA
Chief, Operations Division (MOP1)
Telephone: (206) 553-8705, Cellular: (206) 390-7527
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Larry Mordock
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2.6.2 Scientific Operations

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

Dr. Jeffrey Napp, AFSC
Telephone: (206) 526-4148
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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*** will be loaded with FOCI gear during the week of April 15, 2002, while the ship is docked at Marine Operations Center, Pacific (MOP) in Seattle, Washington. There will be no special requirements for loading the gear besides access to the loading crane, storage hold, and laboratory spaces. All vehicles used to load the vessel will be provided by AFSC under the responsibility of the scientific party.

3.3 **De-staging Plan** – AFSC will offload FOCI gear from **NOAA Ship *MILLER FREEMAN*** during the week of November 18, 2002, while the ship is docked at 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 offloading the vessel will supply vehicles from AFSC for transportation of the gear from the ship. Samples preserved in 1.8% Formaldehyde will be removed in Kodiak, Alaska, on Saturday, June 1, 2002, for shipment by barge.

3.4 **Cruise Plan** – An ichthyoplankton survey will be conducted from Unimak Pass through Shelikof Strait and Kennedy Entrance. 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. Chartlets and tables of potential stations and station positions are in Appendices 9.1 and 9.2. Approximately 120 stations from the list will be chosen for occupation from the potential stations. While we are working up the grid toward Kodiak Island, Alaska, we will occupy Line 8. Line 8 sampling will include 20- and 60-cm Bongos and Conductivity, Temperature, and Depth (CTD) profiles with Niskin bottle samples taken for chlorophyll, microzooplankton, and nutrients. Line 8 station positions are shown in Appendices 9.1.2 and 9.2.2. Net tows at Line 8 are to 10 meters off the bottom. The 60-cm Bongo will be fitted with 0.505- 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 above operations in order to opportunistically monitor before and after storm conditions. Storm monitoring will include CTDs (nutrients, chlorophyll, and microzooplankton), Tucker, and Bongo tows. Live tows will be conducted with the Bongos to examine larval condition.

3.5 **Station Locations** – See Appendix **9.1 Tables** 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), and
- Chlorophyll Sampling Operations (SOI 3.2.10).

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 at this time.

3.9 **Small Boat Operations** – None at this time.

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, 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, storage freezers, -20° Celsius for slime lab),
- SIMRAD EQ-50 echosounder,
- JRC JFV-200R color sounder recorder,
- Use of Pentium PC in DataPlot for data analysis,
- Scientific Computer System (SCS),
- 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, 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 to be used with PMEL stand (**primary system**)
- Sea-Bird Electronics' SBE-19 SEACAT system (**primary 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,
- IAPSO standard water,
- 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:

- **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 VHS videocassettes,
- CTD Cast Information/Rosette Log,
- Autosalinometer Logs,
- Electronic Navigation suite's export files on diskette, 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 – All scientific staff on board **NOAA Ship *MILLER FREEMAN*** have been properly trained for spill response and may be contacted in the event of an accidental spill.

7.1 **Inventory**

Chemical	Amount	Neutralizer	Contact
37 % Formaldehyde	3 x 20-Liter Buckets	Spill Kit	Brown
37% Formaldehyde (see Note 1)	1 x 4-Liter Package 1 x 20-Liter Bucket	Spill Kit	Brown
1.8% Formaldehyde	120 jars	Spill Kit	Brown
Sodium Borate	500-g	Dust Pan	Brown
Sodium Borate (see Note 2)	500-g	Dust Pan	Brown
Saturated Sodium Borate Solution	1 x 20-Liter Carboy	See Note 3	Brown

Chemical	Amount	Neutralizer	Contact
95% Ethanol	1 x 20-Liter Carboy	3-M Sorbent Pads	Brown
10% Zinc-Formalin (Z-Fix)	1-Liter	See Note 3	Brown

Note 1 – One 20 liter bucket and one 4-liter container of 37% Formaldehyde is HAZMAT packaged for shipping. These containers will be transferred to the University-National Oceanographic Laboratory System (UNOLS) vessel **R/V *MAURICE EWING*** by Carol DeWitt on May 12, 2002.

Note 2 – One 500-g container of Sodium Borate will be transferred to **R/V *MAURICE EWING*** by Carol DeWitt on May 11, 2002.

Note 3 – Saturated Sodium Borate Solution and 10% Zinc-Formalin (Z-Fix) are non-regulated substances by the Department of Transportation (DOT) and do not have Material Data Safety Sheets (MSDS).

7.2 Material Safety Data Sheet (MSDS) – Submitted separately.

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
- 011-872-330-394-113 (voice)
- 011-872-330-394-114 (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 (FAX)

E-Mail: FirstName.LastName@noaa.gov

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

9.0 APPENDICES

9.1 Tables

9.1.1 Potential Station Locations for MF-02-07

X	Y	Lat (dd)	Lon (dd)	Lat (Deg)	Lat (Min)	Lon (Deg)	Lon (Min)	XY
gd	103	54.2817	-164.7105	54	16.902	164	42.630	gd103
gf	103	54.1669	-164.4648	54	10.014	164	27.888	gf103
gf	105	54.2879	-164.2684	54	17.274	164	16.104	gf105
gf	107	54.4089	-164.0715	54	24.534	164	4.290	gf107
gf	109	54.5298	-163.8740	54	31.788	163	52.440	gf109
gh	103	54.0522	-164.2199	54	3.132	164	13.194	gh103
gh	105	54.1731	-164.0241	54	10.386	164	1.446	gh105
gh	107	54.2941	-163.8277	54	17.646	163	49.662	gh107
gh	109	54.4150	-163.6307	54	24.900	163	37.842	gh109
gj	107	54.1793	-163.5848	54	10.758	163	35.088	gj107
gj	109	54.3002	-163.3884	54	18.012	163	23.304	gj109
gl	107	54.0645	-163.3427	54	3.870	163	20.562	gl107
gp	125	54.9235	-161.0871	54	55.410	161	5.226	gp125
gp	127	55.0445	-160.8870	55	2.670	160	53.220	gp127
gp	135	55.5283	-160.0808	55	31.698	160	4.848	gp135
gr	125	54.8088	-160.8524	54	48.528	160	51.144	gr125
gr	127	54.9297	-160.6529	54	55.782	160	39.174	gr127
gr	135	55.4135	-159.8490	55	24.810	159	50.940	gr135
gr	151	56.3812	-158.2111	56	22.872	158	12.666	gr151
gt	125	54.6940	-160.6185	54	41.640	160	37.110	gt125
gt	127	54.8149	-160.4196	54	48.894	160	25.176	gt127
gt	135	55.2988	-159.6180	55	17.928	159	37.080	gt135
gt	139	55.5407	-159.2135	55	32.442	159	12.810	gt139
gt	151	56.2664	-157.9849	56	15.984	157	59.094	gt151
gt	153	56.3874	-157.7779	56	23.244	157	46.674	gt153
gt	155	56.5083	-157.5702	56	30.498	157	34.212	gt155
gt	163	56.8500	-156.7500	56	51.000	156	45.000	gt163
gt	169	57.3550	-156.0833	57	21.300	156	4.998	gt169
gt	171	57.4500	-155.7667	57	27.000	155	46.002	gt171
gt	173	57.6167	-155.4667	57	37.002	155	28.002	gt173
gt	197	59.0484	-153.0471	59	2.904	153	2.826	gt197
gu	158	56.6667	-157.2167	56	40.002	157	13.002	gu158
gv	125	54.5792	-160.3854	54	34.752	160	23.124	gv125
gv	127	54.7001	-160.1870	54	42.006	160	11.220	gv127

X	Y	Lat (dd)	Lon (dd)	Lat (Deg)	Lat (Min)	Lon (Deg)	Lon (Min)	XY
gv	139	55.4259	-158.9844	55	25.554	158	59.064	gv139
gv	143	55.6678	-158.5786	55	40.068	158	34.716	gv143
gv	147	55.9097	-158.1702	55	54.582	158	10.212	gv147
gv	151	56.1516	-157.7594	56	9.096	157	45.564	gv151
gv	153	56.2726	-157.5530	56	16.356	157	33.180	gv153
gv	155	56.3935	-157.3459	56	23.610	157	20.754	gv155
gv	159	56.6354	-156.9298	56	38.124	156	55.788	gv159
gv	161	56.7564	-156.7208	56	45.384	156	43.248	gv161
gv	163	56.8774	-156.5111	56	52.644	156	30.666	gv163
gv	165	56.9983	-156.3007	56	59.898	156	18.042	gv165
gv	167	57.1193	-156.0896	57	7.158	156	5.376	gv167
gv	169	57.2402	-155.8778	57	14.412	155	52.668	gv169
gv	171	57.3612	-155.6653	57	21.672	155	39.918	gv171
gv	173	57.4821	-155.4521	57	28.926	155	27.126	gv173
gv	175	57.6031	-155.2383	57	36.186	155	14.298	gv175
gv	177	57.7241	-155.0237	57	43.446	155	1.422	gv177
gv	179	57.8450	-154.8083	57	50.700	154	48.498	gv179
gv	189	58.4498	-153.7208	58	26.988	153	43.248	gv189
gv	191	58.5707	-153.5011	58	34.242	153	30.066	gv191
gv	193	58.6917	-153.2805	58	41.502	153	16.830	gv193
gv	195	58.8127	-153.0593	58	48.762	153	3.558	gv195
gv	197	58.9336	-152.8372	58	56.016	152	50.232	gv197
gv	199	59.0546	-152.6144	59	3.276	152	36.864	gv199
gv	201	59.1755	-152.3908	59	10.530	152	23.448	gv201
gx	127	54.5854	-159.9552	54	35.124	159	57.312	gx127
gx	135	55.0692	-159.1581	55	4.152	159	9.486	gx135
gx	139	55.3111	-158.7560	55	18.666	158	45.360	gx139
gx	143	55.5530	-158.3513	55	33.180	158	21.078	gx143
gx	147	55.7949	-157.9442	55	47.694	157	56.652	gx147
gx	151	56.0368	-157.5346	56	2.208	157	32.076	gx151
gx	153	56.1578	-157.3288	56	9.468	157	19.728	gx153
gx	155	56.2787	-157.1224	56	16.722	157	7.344	gx155
gx	157	56.3997	-156.9153	56	23.982	156	54.918	gx157
gx	159	56.5207	-156.7075	56	31.242	156	42.450	gx159
gx	161	56.6416	-156.4991	56	38.496	156	29.946	gx161
gx	163	56.7626	-156.2900	56	45.756	156	17.400	gx163
gx	165	56.8835	-156.0803	56	53.010	156	4.818	gx165
gx	167	57.0045	-155.8698	57	0.270	155	52.188	gx167
gx	169	57.1254	-155.6587	57	7.524	155	39.522	gx169

X	Y	Lat (dd)	Lon (dd)	Lat (Deg)	Lat (Min)	Lon (Deg)	Lon (Min)	XY
gx	171	57.2464	-155.4469	57	14.784	155	26.814	gx171
gx	173	57.3674	-155.2344	57	22.044	155	14.064	gx173
gx	175	57.4883	-155.0212	57	29.298	155	1.272	gx175
gx	177	57.6093	-154.8073	57	36.558	154	48.438	gx177
gx	179	57.7302	-154.5927	57	43.812	154	35.562	gx179
gx	181	57.8512	-154.3773	57	51.072	154	22.638	gx181
gx	183	57.9721	-154.1612	57	58.326	154	9.672	gx183
gx	185	58.0931	-153.9444	58	5.586	153	56.664	gx185
gx	187	58.2141	-153.7269	58	12.846	153	43.614	gx187
gx	189	58.3350	-153.5086	58	20.100	153	30.516	gx189
gx	191	58.4560	-153.2895	58	27.360	153	17.370	gx191
gx	193	58.5769	-153.0697	58	34.614	153	4.182	gx193
gx	195	58.6979	-152.8492	58	41.874	152	50.952	gx195
gx	197	58.8188	-152.6279	58	49.128	152	37.674	gx197
gx	199	58.9398	-152.4058	58	56.388	152	24.348	gx199
gx	201	59.0607	-152.1829	59	3.642	152	10.974	gx201
gz	135	54.9544	-158.9293	54	57.264	158	55.758	gz135
gz	139	55.1963	-158.5283	55	11.778	158	31.698	gz139
gz	143	55.4382	-158.1249	55	26.292	158	7.494	gz143
gz	145	55.5592	-157.9222	55	33.552	157	55.332	gz145
gz	147	55.6801	-157.7189	55	40.806	157	43.134	gz147
gz	149	55.8011	-157.5150	55	48.066	157	30.900	gz149
gz	151	55.9221	-157.3105	55	55.326	157	18.630	gz151
gz	153	56.0430	-157.1053	56	2.580	157	6.318	gz153
gz	155	56.1640	-156.8995	56	9.840	156	53.970	gz155
gz	157	56.2849	-156.6930	56	17.094	156	41.580	gz157
gz	159	56.4059	-156.4859	56	24.354	156	29.154	gz159
gz	161	56.5268	-156.2781	56	31.608	156	16.686	gz161
gz	163	56.6478	-156.0697	56	38.868	156	4.182	gz163
gz	165	56.7687	-155.8606	56	46.122	155	51.636	gz165
gz	167	56.8897	-155.6508	56	53.382	155	39.048	gz167
gz	169	57.0107	-155.4403	57	0.642	155	26.418	gz169
gz	171	57.1316	-155.2291	57	7.896	155	13.746	gz171
gz	173	57.2526	-155.0173	57	15.156	155	1.038	gz173
gz	181	57.7364	-154.1629	57	44.184	154	9.774	gz181
gz	183	57.8574	-153.9475	57	51.444	153	56.850	gz183
gz	185	57.9783	-153.7314	57	58.698	153	43.884	gz185
gz	187	58.0993	-153.5145	58	5.958	153	30.870	gz187
gz	189	58.2202	-153.2970	58	13.212	153	17.820	gz189

X	Y	Lat (dd)	Lon (dd)	Lat (Deg)	Lat (Min)	Lon (Deg)	Lon (Min)	XY
gz	191	58.3412	-153.0786	58	20.472	153	4.716	gz191
gz	193	58.4621	-152.8596	58	27.726	152	51.576	gz193
gz	197	58.7040	-152.4191	58	42.240	152	25.146	gz197
gz	199	58.8250	-152.1978	58	49.500	152	11.868	gz199
hb	139	55.0815	-158.3014	55	4.890	158	18.084	hb139
hb	143	55.3234	-157.8991	55	19.404	157	53.946	hb143
hb	145	55.4444	-157.6971	55	26.664	157	41.826	hb145
hb	147	55.5654	-157.4944	55	33.924	157	29.664	hb147
hb	149	55.6863	-157.2911	55	41.178	157	17.466	hb149
hb	151	55.8073	-157.0871	55	48.438	157	5.226	hb151
hb	153	55.9282	-156.8826	55	55.692	156	52.956	hb153
hb	157	56.1701	-156.4715	56	10.206	156	28.290	hb157
hb	159	56.2911	-156.2650	56	17.466	156	15.900	hb159
hb	161	56.4120	-156.0578	56	24.720	156	3.468	hb161
hb	163	56.5330	-155.8500	56	31.980	155	51.000	hb163
hb	165	56.6540	-155.6415	56	39.240	155	38.490	hb165
hb	167	56.7749	-155.4324	56	46.494	155	25.944	hb167
hb	169	56.8959	-155.2225	56	53.754	155	13.350	hb169
hb	171	57.0168	-155.0120	57	1.008	155	0.720	hb171
hb	199	58.7102	-151.9903	58	42.612	151	59.418	hb199
hd	143	55.2087	-157.6740	55	12.522	157	40.440	hd143
hd	147	55.4506	-157.2705	55	27.036	157	16.230	hd147
hd	151	55.6925	-156.8644	55	41.550	156	51.864	hd151
hd	153	55.8134	-156.6605	55	48.804	156	39.630	hd153
hd	155	55.9344	-156.4559	55	56.064	156	27.354	hd155
hd	157	56.0554	-156.2506	56	3.324	156	15.036	hd157
hd	159	56.1763	-156.0447	56	10.578	156	2.682	hd159
hd	161	56.2973	-155.8382	56	17.838	155	50.292	hd161
hd	163	56.4182	-155.6310	56	25.092	155	37.860	hd163
hd	165	56.5392	-155.4231	56	32.352	155	25.386	hd165
hd	167	56.6601	-155.2146	56	39.606	155	12.876	hd167
hd	169	56.7811	-155.0054	56	46.866	155	0.324	hd169
hd	197	58.4745	-152.0034	58	28.470	152	0.204	hd197
hd	199	58.5954	-151.7835	58	35.724	151	47.010	hd199
hf	147	55.3358	-157.0473	55	20.148	157	2.838	hf147
hf	151	55.5777	-156.6424	55	34.662	156	38.544	hf151
hf	153	55.6987	-156.4390	55	41.922	156	26.340	hf153
hf	155	55.8196	-156.2350	55	49.176	156	14.100	hf155
hf	157	55.9406	-156.0304	55	56.436	156	1.824	hf157

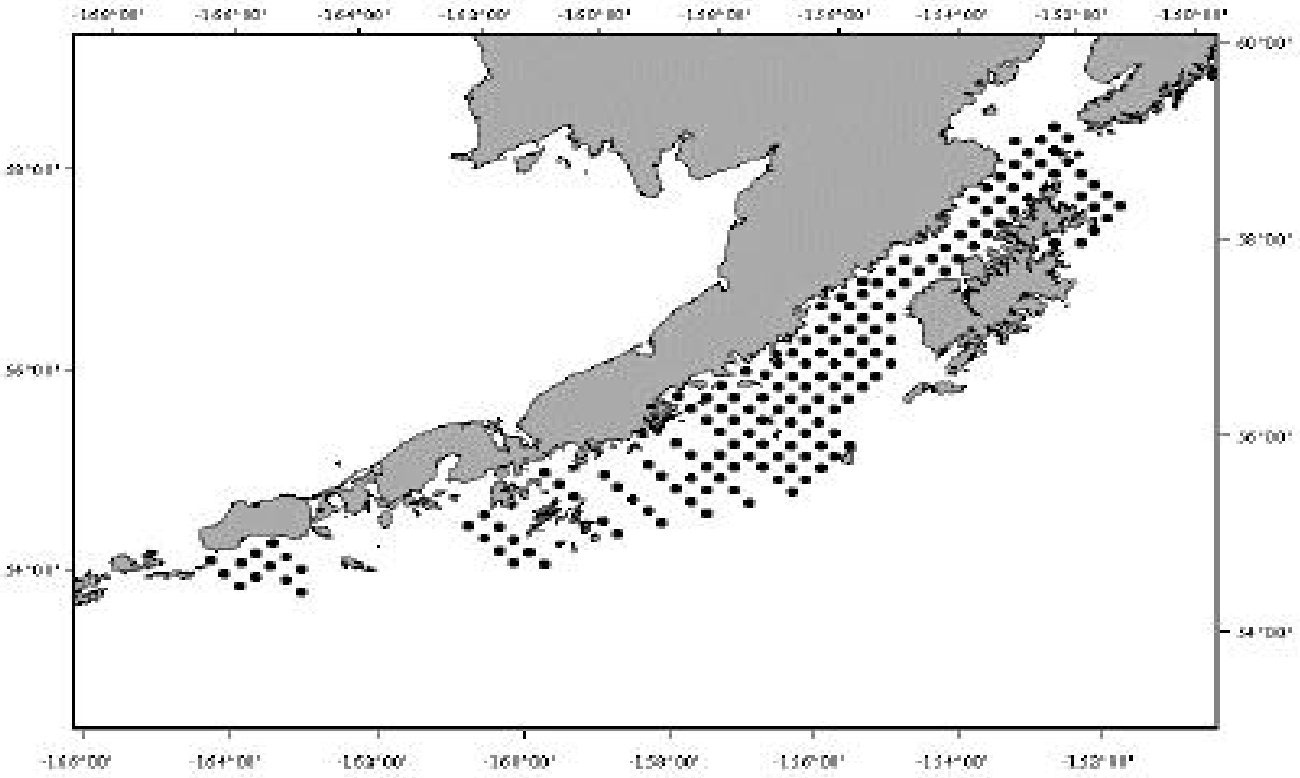
X	Y	Lat (dd)	Lon (dd)	Lat (Deg)	Lat (Min)	Lon (Deg)	Lon (Min)	XY
hf	159	56.0615	-155.8251	56	3.690	155	49.506	hf159
hf	191	57.9968	-152.4495	57	59.808	152	26.970	hf191
hf	197	58.3597	-151.7964	58	21.582	151	47.784	hf197
hf	199	58.4807	-151.5772	58	28.842	151	34.632	hf199
hh	151	55.4629	-156.4211	55	27.774	156	25.266	hh151
hh	153	55.5839	-156.2183	55	35.034	156	13.098	hh153
hh	155	55.7048	-156.0149	55	42.288	156	0.894	hh155
hh	157	55.8258	-155.8109	55	49.548	155	48.654	hh157
hh	159	55.9467	-155.6062	55	56.802	155	36.372	hh159
hh	193	58.0030	-152.0247	58	0.180	152	1.482	hh193
hh	195	58.1240	-151.8077	58	7.440	151	48.462	hh195
hh	197	58.2449	-151.5900	58	14.694	151	35.400	hh197
hh	199	58.3659	-151.3715	58	21.954	151	22.290	hh199

9.1.2 Station Positions and Activities at Line 8

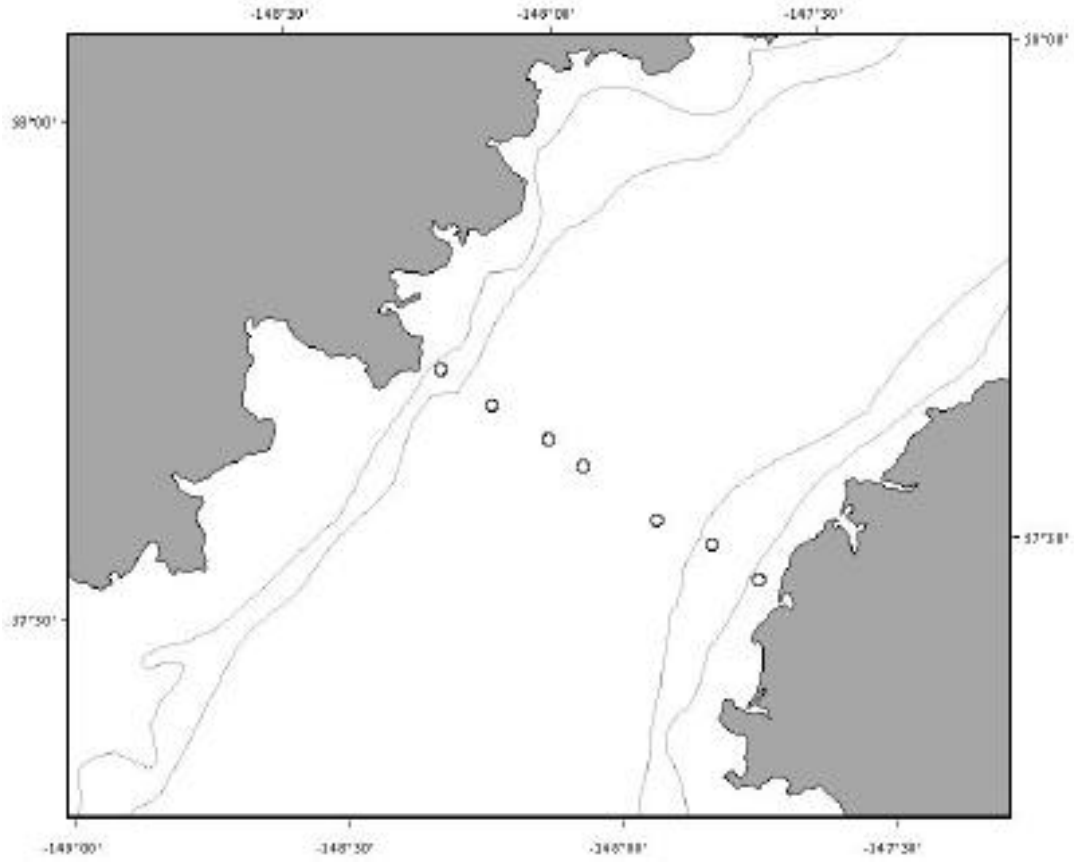
Station	Lat (dd)	Lon (dd)	Lat (Deg)	Lat (Min)	Lon (Deg)	Lon (Min)	CTDB	Chlor.	Nuts	MZ	20/60 Bongo
FOX61	57.72	-155.26	57	43.200	155	15.600	x	x	x	x	x
FOX60	57.68	-155.17	57	40.800	155	10.200	x	x	x	x	x
FOX59	57.64	-155.07	57	38.400	155	4.200	x	x	x	x	x
FOX58	57.61	-155.01	57	36.600	155	0.600	x	x	x	x	x
FOX57	57.55	-154.88	57	33.000	154	52.800	x	x	x	x	x
FOX56	57.52	-154.78	57	31.200	154	46.800	x	x	x	x	x
FOX55	57.48	-154.70	57	28.800	154	42.000	x	x	x	x	x

9.2 Figures

9.2.1 MF-02-07 Potential Station Positions



9.2.2 Line 8 Station Positions



9.3 Equipment Inventory

Equipment	Quantity	Dimension	Weight
Larval Supply Trunks	1	20" x 22" x 36"	80-lbs
Microzooplankton Supply Trunks	2	20" x 22" x 36"	90-lbs (ea)
Formaldehyde Containers	3 x 20-Liter		40-lbs (ea)
Carboy, 95% Ethanol	1 x 20-Liter		40-lbs
Miscellaneous Gear Trunks	4	20" x 22" x 36"	80-lbs (ea)
Tucker Frame and Weights	1	14" x 20" x 48"	200-lbs
60-cm Bongo Frame	1	8" x 26" x 60"	
20-cm Bongo Frame	1	8" x 14" x 16"	
Cases, Glass Jars, 32-oz	15	8" x 12" x 15"	50-lbs (ea)
Cases, Glass Jars, 8-oz	4	4" x 6" x 8"	8-lbs