

FINAL CRUISE INSTRUCTIONS

FOCI

NOAA Ship *MILLER FREEMAN*, MF-03-02
February 13 – February 22, 2003
Chief Scientist: Morgan S. Busby

1.0 FINAL CRUISE INSTRUCTIONS

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

1.2 **Cruise Numbers:**

1.2.1 **Cruise Number** – MF-03-02

1.2.2 **FOCI Number** – 1MF03

1.3 **Cruise Dates:**

1.3.1 **Departure** – Depart Kodiak, Alaska, at 1500 hrs. on Thursday, February 13, 2003.

1.3.2 **Arrival** – Arrive Kodiak, Alaska, at 0800 hrs. on Saturday, February 22, 2003.

2.0 CRUISE OVERVIEW

2.1 **Cruise Objectives** – We will conduct an ichthyoplankton survey in the waters contiguous to Kodiak Island, Alaska. This work is needed to describe larval fish assemblages on the shelf and slope in winter, and to study the transport and early life history of larval fishes. Data on physical characteristics of the water column will also be collected. In addition, bottom trawls will be conducted in several areas on the upper slope off Kodiak Island and near the Shumagin Islands to collect ripe adult arrowtooth flounder (*Atheresthes stomias*). We will strip eggs and milt from the adults, and then fertilize the eggs aboard ship for rearing in the laboratory.

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** – Gulf of 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

<u>Name</u>	<u>Gender</u>	<u>Affiliation</u>	<u>E-mail Address</u>
Morgan Busby (206) 526-4113	Male	AFSC	Morgan.Busby@noaa.gov

2.5.2 Other Participating Scientists

<u>Name</u>	<u>Gender</u>	<u>Affiliation</u>	<u>E-mail Address</u>
Debbie Blood	Female	AFSC	Debbie.Blood@noaa.gov
Christina Deliyianides	Female	AFSC	Christina.Deliyanides@noaa.gov
William Floering	Male	PMEL	William.Floering@noaa.gov
Jennifer Lanksbury	Female	AFSC	Jennifer.Lanksbury@noaa.gov
Erin MacDonald	Female	UW	Emac@u.washington.edu
Ann Matarese	Female	AFSC	Ann.Matarese@noaa.gov

2.6 Administration

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

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2.6.2 Scientific Operations

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3.0 OPERATIONS

- 3.1 Data To Be Collected** – An objective of the FOCI program is to identify seasonal ichthyoplankton assemblages and the physical and biological factors that influence their structure, composition, and change over time. To this end, we will collect ichthyoplankton using 60-cm bongo nets (60BON).

Ichthyoplankton samples will be collected from the surface waters on a grid of approximately 50 stations in the waters contiguous to Kodiak Island, Alaska. In addition, deep net samples for ichthyoplankton will be taken at approximately 9 stations on the outer continental shelf and upper slope at depths of 200, 400, and 600 meters. We will collect data on the physical environment using the Sea-Bird Electronics SBE-19 SEACAT Profiler to relate larval fish assemblage structure to environmental variables (temperature and salinity). Bottom trawls will be conducted to collect data on lengths, sex, and maturity states of arrowtooth flounder (ATF) in addition to collections of live eggs fertilized at sea. Sea-Bird Electronics SBE 911*plus* Conductivity, Temperature, and Depth (CTD) Profiler casts will collect physical data at select stations where spawning adult ATF flounder are found. This cruise will provide new information on larval fish assemblages on the shelf off Kodiak Island during winter.

- 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** – The majority of the equipment necessary for the cruise will be loaded onto the **NOAA ship MILLER FREEMAN** when the ship is in port in Seattle, Washington, in January 2003. We will require dedicated use of the chemistry lab, rough lab, and slime lab for sample and equipment preparation and request as much counter and cabinet space as possible. We will use DataPlot for CTD and SEACAT operations. The constant temperature refrigerator in the slime lab will be used for keeping live arrowtooth flounder eggs and will need to be working and set at 3° C.
- 3.3 De-staging Plan** – We will offload the live arrowtooth flounder eggs upon return to Kodiak Island on February 22, 2003. We will offload remaining gear and plankton samples after the ship returns to Marine Operations Center – Pacific in Seattle, Washington, in April, 2003.
- 3.4 Cruise Plan** – The cruise will depart from Kodiak, Alaska, at 1500 hrs. on Thursday, February 13, 2003, and occupy a series of approximately 60 stations. Station positions and a map of the working area are located in Sections [9.2 Tables](#), [9.3 Figures](#), and [9.3.2 Charts](#) respectively.
- 3.4.1 Grid Survey** – During the grid survey, a Marine Assessment Monitoring and Prediction (MARMAP) bongo tow (SOI 3.2.2) with two, 0.505-mm mesh nets will be conducted first at most stations. At grid stations, the bongo net will be deployed to a depth of 200 meters, or to 10 meters off bottom, whichever is shallower. The SBE-19 SEACAT, will be attached to the wire above the net frame. The sample from bongo Net 1 will be preserved in its entirety in 1.8% buffered Formaldehyde solution (5% formalin) and the sample from Net 2, whenever time allows, will be rough sorted, contents identified, and then discarded.

Selected grid stations have been chosen for Sameoto neuston tows (see Section [3.6.1 Neuston Net Tows](#)) to collect surface ichthyoplankton at night. At these stations, the neuston tow and/or CTD cast will precede the MARMAP Bongo tow. CTD casts will be made to 200 meters or to 10 meters off bottom, whichever is shallower.

3.4.2 Arrowtooth Flounder Egg Collections (ATF Stations) – At these stations, bongo tows will be deployed to 10-m off bottom at depths of approximately 200, 400, and 600 meters. At stations with depths greater than 600 meters, bongo tows will be deployed to 600 meters. At stations where high numbers of arrowtooth flounder eggs are collected in deep bongo tows, a poly Nor’ eastern bottom trawl with roller gear will be used to collect live adult ATF to spawn on board ship to obtain live fertilized eggs. These operations will require availability of a fishing crew pending examination of the catch in deep bongo tows. The Furuno net sounder will be attached to the net before deployment to monitor depth and mouth opening. After deployment and settling of the net on bottom, it will be towed for 15 minutes at a speed of 3.0 nautical miles per hour (1.5 m/s). Location and duration of trawls, however, may be altered, if necessary. ATF will be the only species processed from the catch. Other species will be noted and quantities estimated. In the event of a large catch, only subsamples of ATF will be processed. In certain areas, it may be necessary to hold live adult ATF in holding tanks for several hours. Eggs will be stripped from gravid ATF females and mixed with milt from ripe males and then counted and placed in gallon jars in constant temperature refrigerators at 3.0°, 4.5°, and 6.0° C until the end of the cruise. Niskin bottles (10 liters) will be deployed on the CTD rosette to collect culture water for the eggs.

3.5 Station Locations – See Section [9.2 Tables](#).

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), and
- MARMAP Bongo Tows (SOI 3.2.2).

3.6.1 Neuston Net Tows

3.6.1.1 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.

3.6.1.2 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 rope. 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, decrease vessel speed so that the net can be hauled in easier. Advise winch operator when time is nearly up and retrieve when ready. Read and record flow meter revolutions, duration of tow, and any comments.

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

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

3.6.2 Poly Nor'eastern Bottom Trawls

3.6.2.1 Description – Bottom trawls are used primarily to sample fish just above or on the bottom. There are many designs and styles that may be used; however, we use a Nor'eastern style net made of polyester with roller gear mounted on the foot rope. The average area swept (width) during a tow is approximately 45 feet and will be fished using standard (6' x 9', 2,200 lbs. each) or "Fish Buster" trawl doors.

3.6.2.2 Rates/Fishing – The vessel should be moving slowly ahead, about 2.5 to 3.0 knots prior to deployment at which time the Furuno net sounder will be attached to the net to monitor bottom depth and mouth opening. After deployment and settling of the net on bottom, it will be towed for 15 minutes at a speed of 3.0 knots and then retrieved.

3.6.2.3 Preservation – Only selected dissected ATF pieces and organs will be preserved in 3.6% buffered Formaldehyde (10% formalin) solution, if necessary.

3.6.2.4 Maintenance – Check net for holes and repair if necessary. Also periodically check status of Furuno battery and recharge or replace if necessary.

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:

- Scientific Computer System (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

- 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-19 SEACAT, for net tow operations,
- Sea-Bird Electronics' SBE-19 SEACAT system,
- 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 for the two systems.
- 10-liter Niskin sampling bottles for use with rosette (10 plus 4 spares),
- AUTOSAL salinometer, for CTD field corrections,
- 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,

- Constant temperature refrigerator (in slime lab) turned on and set to 3° C,
- SIMRAD EQ-50 and SIMRAD EK-500 echosounders,
- 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,
- Stern platform removed for trawl ramp use,
- Furuno net sounder,
- Sorting table,
- Safety harnesses for working on quarterdeck and fantail, and
- Ship's crane(s) used for loading and/or deploying gear and supplies.

4.2 Equipment and Capabilities Provided by Scientists – See Section [9.1 Equipment Inventory](#) for weights and dimensions.

- Sea-Bird Electronics' SBE 911*plus* 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,
- Sameoto neuston net and frame,
- Spare wire angle indicator,
- Miscellaneous scientific sampling and processing equipment,
- Poly Nor' eastern bottom trawl with roller gear and standard trawl doors,
- Baskets for processing trawl catches,
- Motion compensating scale,
- Scientific ultra-cold freezer,
- Two small auxiliary refrigerators
- Microscope for examining, sorting, and measuring fish eggs and larvae,
- Haul position and catch composition forms, and
- Cruise Operations Database (COD) software and forms.

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 and scientific instruments used,
- CTD VHS videocassettes,
- CTD Cast Information/Rosette Log,
- Autosalinometer Logs,

- Electronic Navigation suite's export files on diskette,
- 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 Inventory – See Section **9.4 HAZMAT Inventory**.

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)

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 (facsimile)

E-Mail: FirstName.LastName@noaa.gov

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

9.0 APPENDICES

9.1 Equipment Inventory

Equipment	Quantity	Dimension	Weight
Larval Supply Trunk	1	20" x 22" x 36"	80-lbs
Egg Spawning Supply Trunk	1	20" x 22" x 36"	80-lbs
Formaldehyde Containers	2 x 20-Liter		40-lbs (ea.)
Carboy, Saturated Sodium Borate	1 x 20-Liter		40-lbs
Miscellaneous Gear Trunks	4	20" x 22" x 36"	80-lbs (ea.)
60-cm Bongo Frame	1	8" x 26" x 60"	10-lbs
Sameoto neuston frame	1	24" x 48" x 12"	20-lbs
Poly Nor'eastern bottom trawl	1	8' x 5' x 5'	3,500-lbs
Trawl doors	2	6' x 9'	2,200-lbs (ea.)
Auxiliary refrigerators	2	22" x 24" x 36"	50-lbs (ea.)
Cases, Glass Jars, 32-oz	30 cases	8" x 12" x 15"	50-lbs
Cases, Glass Jars, 8-oz	10 cases	4" x 6" x 8"	8-lbs

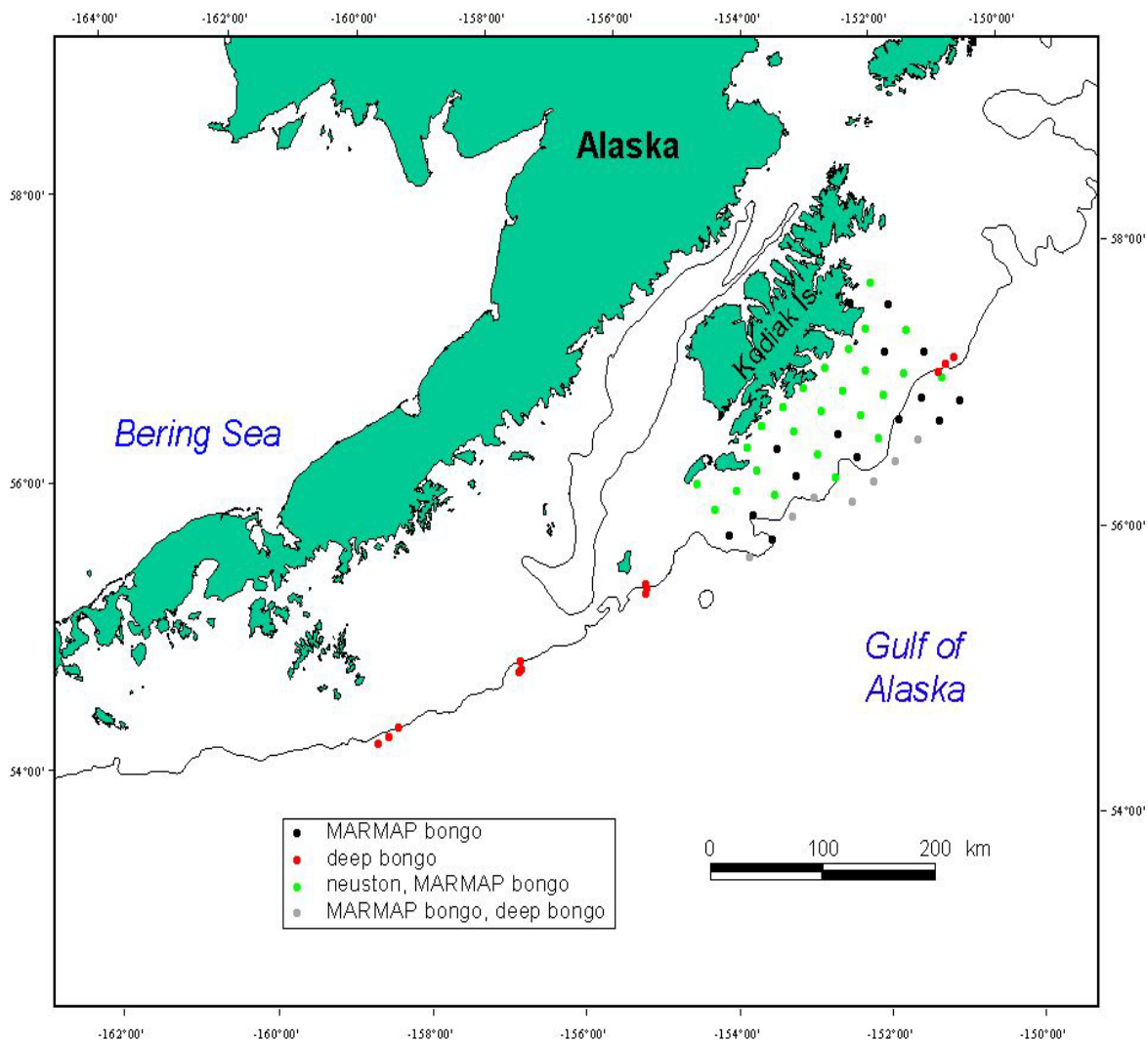
9.2 Tables

Stn	Operation	Activity	Latitude	Longitude	Declat	Declong
	Depart Kodiak, Alaska	Departure	57° 43.620' N	152° 31.080' W	57.7270	-152.5180
1	GRID	Bongo	57° 38.760' N	152° 21.720' W	57.6460	-152.3620
2	GRID	Neuston/Bongo	57° 47.400' N	152° 02.700' W	57.7900	-152.0450
3	GRID	Bongo	57° 37.698' N	151° 47.700' W	57.6283	-151.7950
4	GRID	Neuston/Bongo	57° 26.598' N	151° 32.700' W	57.4433	-151.5450
5	GRID	Bongo	57° 17.598' N	151° 17.400' W	57.2933	-151.2900
6	GRID	Neuston/Bongo	57° 06.198' N	151° 02.202' W	57.1033	-151.0367
7	ATF-1	Deep Bongo	57° 14.562' N	150° 50.328' W	57.2427	-150.8388
8	ATF-2	Deep Bongo	57° 08.298' N	151° 04.872' W	57.1383	-151.0812
9	ATF-3	Deep Bongo	57° 11.532' N	150° 58.050' W	57.1922	-150.9675
10	GRID	Bongo	56° 56.400' N	150° 46.698' W	56.9400	-150.7783
11	GRID	Bongo	56° 48.198' N	151° 06.102' W	56.8033	-151.1017
12	GRID	Bongo	56° 58.002' N	151° 20.400' W	56.9667	-151.3400
13	GRID	Neuston/Bongo	57° 08.400' N	151° 35.598' W	57.1400	-151.5933
14	GRID	Bongo	57° 18.198' N	151° 51.702' W	57.3033	-151.8617
15	GRID	Neuston/Bongo	57° 27.753' N	152° 08.652' W	57.4626	-152.1442
16	GRID	Neuston/Bongo	57° 19.500' N	152° 23.898' W	57.3250	-152.3983
17	GRID	Neuston/Bongo	57° 10.602' N	152° 09.102' W	57.1767	-152.1517
18	GRID	Neuston/Bongo	57° 00.102' N	151° 53.898' W	57.0017	-151.8983
19	GRID	Bongo	56° 49.602' N	151° 40.698' W	56.8267	-151.6783
20	GRID, ATF-4	Bongo/Deep Bongo	56° 40.398' N	151° 25.200' W	56.6733	-151.4200
21	GRID, ATF-5	Bongo/Deep Bongo	56° 31.998' N	151° 45.402' W	56.5333	-151.7567
22	GRID	Neuston/Bongo	56° 41.802' N	151° 58.998' W	56.6967	-151.9833
23	GRID	Neuston/Bongo	56° 51.900' N	152° 14.298' W	56.8650	-152.2383
24	GRID	Neuston/Bongo	57° 01.902' N	152° 29.298' W	57.0317	-152.4883

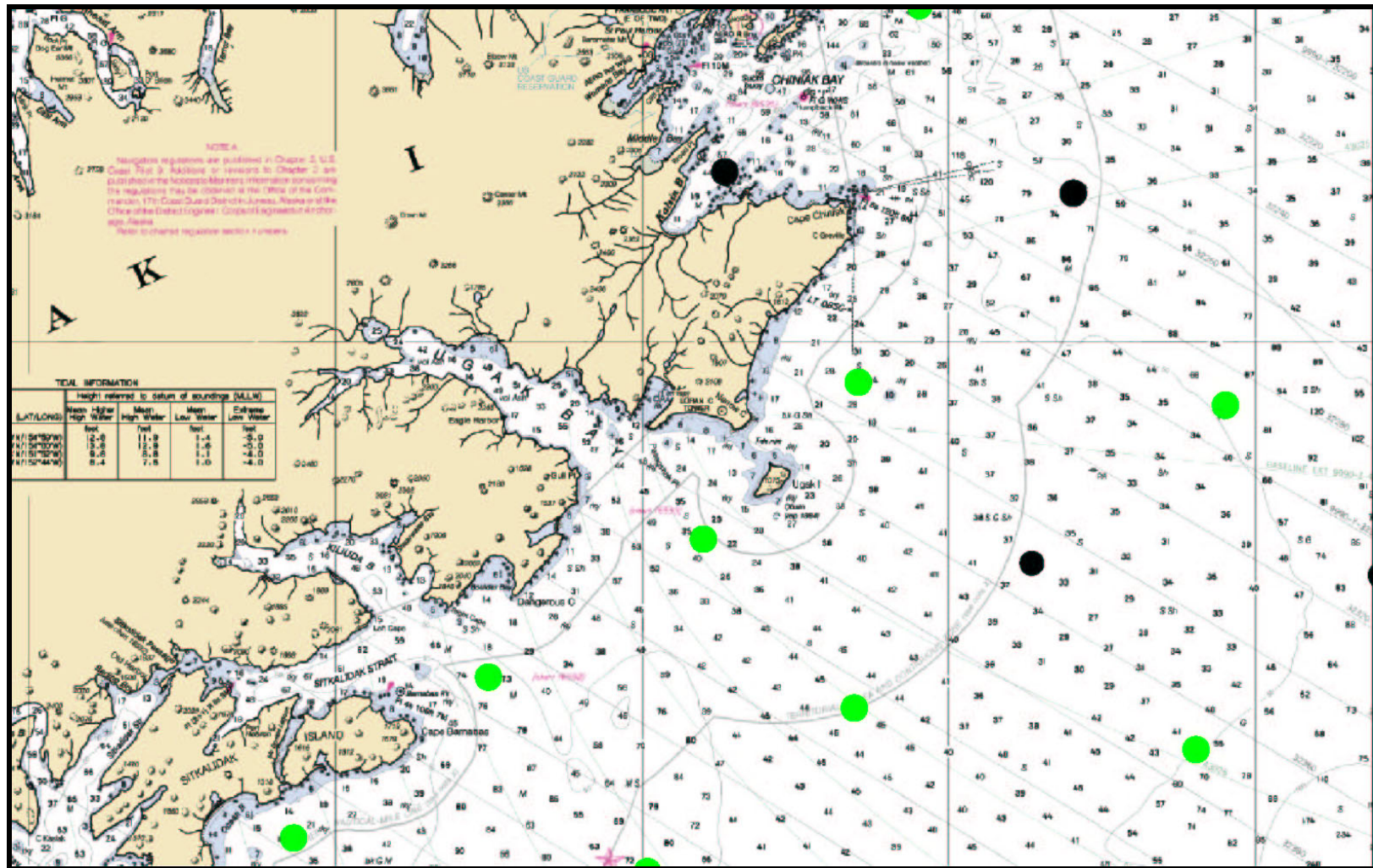
Stn	Operation	Activity	Latitude			Longitude			DecLat	DecLong
25	GRID	Neuston/Bongo	57°	12.198'	N	152°	44.898'	W	57.2033	-152.7483
26	GRID	Neuston/Bongo	57°	03.702'	N	153°	03.900'	W	57.0617	-153.0650
27	GRID	Neuston/Bongo	56°	54.000'	N	152°	48.402'	W	56.9000	-152.8067
28	GRID	Bongo	56°	44.100'	N	152°	34.500'	W	56.7350	-152.5750
29	GRID	Bongo	56°	33.900'	N	152°	18.702'	W	56.5650	-152.3117
30	GRID, ATF-6	Bongo/Deep Bongo	56°	23.598'	N	152°	03.798'	W	56.3933	-152.0633
31	GRID, ATF-7	Bongo/Deep Bongo	56°	15.498'	N	152°	22.902'	W	56.2583	-152.3817
32	GRID	Neuston/Bongo	56°	25.902'	N	152°	37.602'	W	56.4317	-152.6267
33	GRID	Neuston/Bongo	56°	35.502'	N	152°	52.500'	W	56.5917	-152.8750
34	GRID	Neuston/Bongo	56°	45.600'	N	153°	13.302'	W	56.7600	-153.2217
35	GRID	Neuston/Bongo	56°	55.800'	N	153°	22.302'	W	56.9300	-153.3717
36	GRID	Neuston/Bongo	56°	47.700'	N	153°	41.100'	W	56.7950	-153.6850
37	GRID	Bongo	56°	38.202'	N	153°	27.300'	W	56.6367	-153.4550
38	GRID	Bongo	56°	26.400'	N	153°	11.502'	W	56.4400	-153.1917
39	GRID, ATF-8	Bongo/Deep Bongo	56°	17.400'	N	152°	55.998'	W	56.2900	-152.9333
40	GRID, ATF-9	Bongo/Deep Bongo	56°	09.798'	N	153°	15.000'	W	56.1633	-153.2500
41	GRID	Neuston/Bongo	56°	18.798'	N	153°	29.898'	W	56.3133	-153.4983
42	GRID	Neuston/Bongo	56°	28.902'	N	153°	45.402'	W	56.4817	-153.7567
43	GRID	Neuston/Bongo	56°	38.598'	N	153°	53.502'	W	56.6433	-153.8917
44	GRID	Neuston/Bongo	56°	20.598'	N	154°	03.000'	W	56.3433	-154.0500
45	GRID	Bongo	56°	10.200'	N	153°	48.300'	W	56.1700	-153.8050
46	GRID	Bongo	56°	00.000'	N	153°	32.298'	W	56.0000	-153.5383
47	GRID, ATF-10	Bongo/Deep Bongo	55°	52.602'	N	153°	51.498'	W	55.8767	-153.8583
48	GRID	Bongo	56°	01.998'	N	154°	08.400'	W	56.0333	-154.1400
49	GRID	Neuston/Bongo	56°	12.798'	N	154°	21.600'	W	56.2133	-154.3600
50	GRID	Neuston/Bongo	56°	23.052'	N	154°	36.402'	W	56.3842	-154.6067
51	ATF-11	Deep Bongo	55°	40.968'	N	155°	19.092'	W	55.6828	-155.3182
52	ATF-12	Deep Bongo	55°	38.880'	N	155°	18.102'	W	55.6480	-155.3017
53	ATF-13	Deep Bongo	55°	36.960'	N	155°	18.888'	W	55.6160	-155.3148
54	ATF-14	Deep Bongo	55°	06.648'	N	157°	02.808'	W	55.1108	-157.0468
55	ATF-15	Deep Bongo	55°	03.102'	N	157°	01.452'	W	55.0517	-157.0242
56	ATF-16	Deep Bongo	55°	01.572'	N	157°	03.108'	W	55.0262	-157.0518
57	ATF-17	Deep Bongo	54°	34.968'	N	158°	40.500'	W	54.5828	-158.6750
58	ATF-18	Deep Bongo	54°	30.780'	N	158°	48.240'	W	54.5130	-158.8040
59	ATF-19	Deep Bongo	54°	27.468'	N	158°	56.238'	W	54.4578	-158.9373
	Arrive Kodiak, Alaska	Arrival	57°	43.620'	N	152°	31.080'	W	57.7270	-152.5180

9.3 Figures

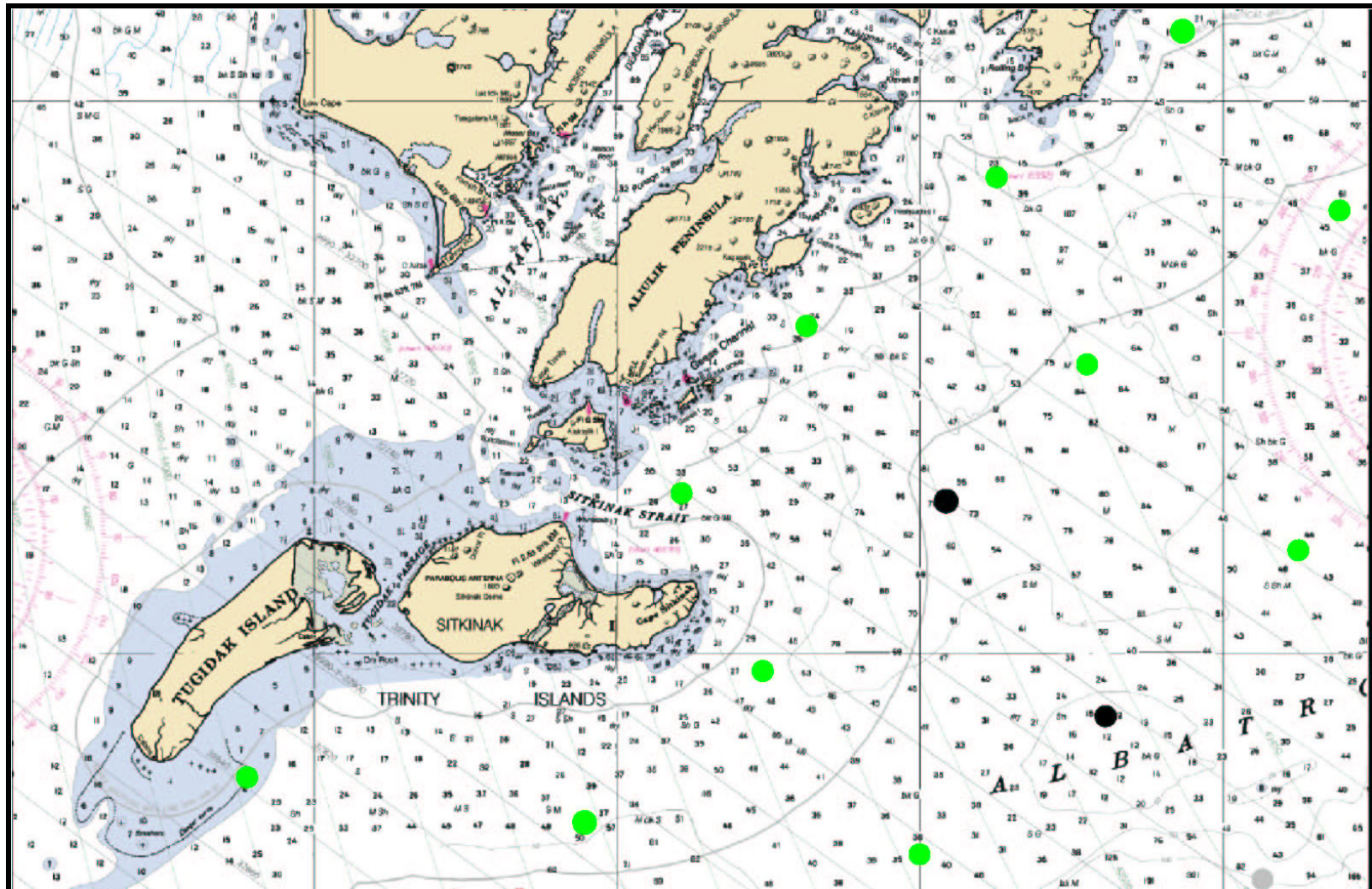
9.3.1 MF-03-02 Station Locations



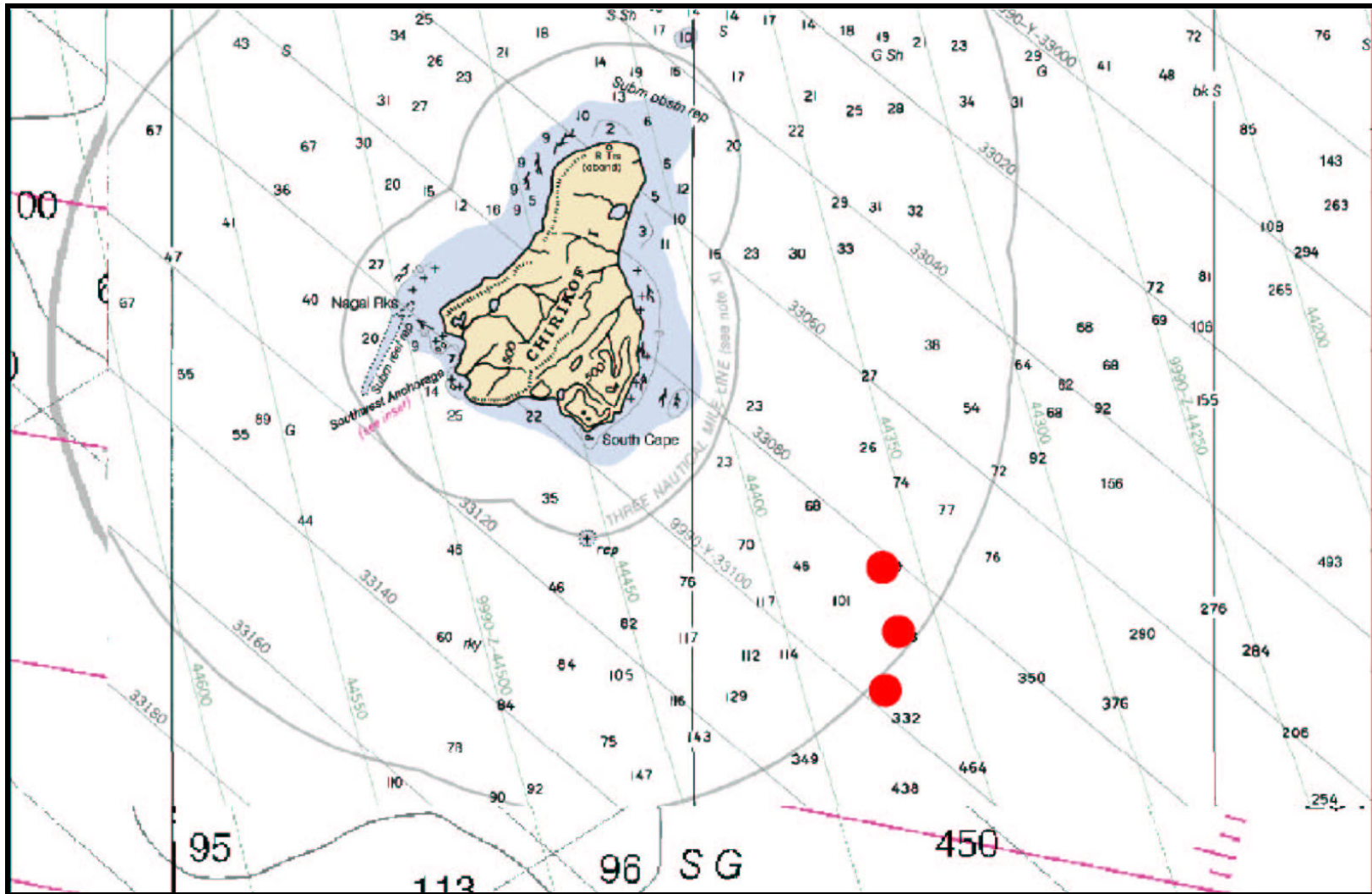
9.3.3 Cape Chiniak, Alaska, Detail (NOAA Chart 16580)



9.3.4 Trinity Islands, Alaska, Detail (NOAA Chart 16580)



9.3.5 Chirikof Island, Alaska, Detail (NOAA Chart 16580)



9.4 HAZMAT Inventory

Chemical	CAS Number	Respondee	Organization	Quantity	H	F	R	C	Storage Color Code	Hazard Class	Packing Group Number	UN	Reportable Quantity	Response Indices
Formaldehyde, 37%	mix	Busby	AFSC	3 x 20-l	3	2	2	3	Flammable	3 & 8	III	1198	100 Lb	1
Sodium Borate	1330-43-4	Busby	AFSC	500-g	2	0	0	1	General	Not regulated			None	2
Sodium Borate Solution, Saturated	mix	Busby	AFSC	1 x 20-l	2	0	0	1	General	Not regulated			None	2
Stockard's Solution	mix	Busby	AFSC						Corrosive	9	III	2209	None	3

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 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 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.

Spill Response 3: In case of a spill, shut off all possible sources of ignition. Wear gloves and goggles. Dike any liquid to prevent its spread to public water sources. Mop up with plenty of water and treat with dilute ammonia solution. Run to waste diluting greatly with running water. Ventilate the contaminated area well to dispel any vapour. If formaldehyde solution enters sewers or drains inform local authorities. 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.