

FINAL CRUISE INSTRUCTIONS

FOCI

NOAA Ship *MILLER FREEMAN*, Cruise MF-05-13
September 21 – October 4, 2005
Chief Scientist – William J. Floering, NOAA/PMEL

1.0 FINAL CRUISE INSTRUCTIONS

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

1.2 **Cruise Numbers**

1.2.1 **Cruise Number** – MF-05-13

1.2.2 **FOCI Number** – 8MF05

1.3 **Cruise Dates**

1.3.1 **Departure** – Depart from Dutch Harbor, Alaska, at 1200 ADT, on Wednesday, September 21, 2005

1.3.2 **Arrival** – Arrive Dutch Harbor, Alaska, at 0900 ADT, on Tuesday, October 4, 2005.

1.4 **Operating Area** – Bering Sea, Amukta Pass, and South of the Aleutian Islands.

2.0 CRUISE OVERVIEW

2.1 **Cruise Objectives** – To recover and deploy several oceanographic moorings. To complete Conductivity, Temperature, and Depth (CTD) profiler casts, California Cooperative Oceanic Fisheries Investigation (CalCOFI) Vertical Egg Tow (CalVET) and Marine Assessment Monitoring and Prediction (MARMAP) Bongo tows near the mooring sites and along the 70-meter isobath in the Bering Sea.

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

2.3 **Participating Organizations**

NOAA – Pacific Marine Environmental Laboratory (PMEL)
7600 Sand Point Way N.E.

Seattle, Washington 98115-6439

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

University of Alaska – Fairbanks
Department of Oceanography
200 O’Neill
Fairbanks, Alaska 99775-1080

2.4 Personnel

2.4.1 Chief Scientist

Name	Gender	Affiliation	E-mail Address
William J. Floering (206) 526-6480	Male	PMEL	William.Floering@noaa.gov

2.4.2 Participating Scientists

Name	Gender	Affiliation	E-mail Address
William J. Floering	Male	PMEL	William.Floering@noaa.gov
Carol L. DeWitt	Female	PMEL	Carol.Dewitt@noaa.gov
Dylan Righi	Male	PMEL	Dylan.Righi@noaa.gov
Michael Dunlap	Male	PMEL	Michael.Dunlap@noaa.gov
Peter Proctor	Male	PMEL	Peter.Proctor@noaa.gov
Steve A. Smith	Male	PMEL	Stephen.A.Smith@noaa.gov
Sarah Thornton	Female	UAF	
Lisa Munger	Female	Scripps	

2.5 Administration

2.5.1 Ship Operations

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

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

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

2.5.2 **Scientific Operations**

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

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

3.0 OPERATIONS

- 3.1 Data To Be Collected** – The standard suite of Scientific Computer System (SCS) sensor data to include, but not limited to, thermosalinograph, fluorometer, weather sensors, corrected depth, a minimum of two GPS positions recorded, Speed Over Ground (SOG), Course Over Ground (COG), and gyro.
- 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** – Mooring equipment and instrumentation will be shipped to Dutch Harbor, Alaska, in a container. The facilities available at the pier will determine how the equipment will arrive at the ship. If a 5,000-lb capacity fork lift is available we will offload the container at the pier. Otherwise, if a fork lift is not available the container will be offloaded and the equipment placed on a flatbed truck for delivery to the ship. Equipment will arrive in Dutch Harbor, Alaska, prior to September 21, 2005.
- 3.3 De-staging Plan** – Upon completion of this cruise it is our intention to leave the equipment and supplies aboard **NOAA Ship MILLER FREEMAN**. All equipment will be offloaded in Seattle, Washington, when the ship returns in October.
- 3.4 Cruise Plan** – Depart Dutch Harbor and steam to Bering Sea Site BS-2. One surface mooring and one subsurface mooring will be recovered at this site and two subsurface moorings deployed in their place. The standard suite of sampling around this mooring site will include a Conductivity, Temperature, and Depth (CTD) profiler, a Marine Assessment Monitoring and Prediction (MARMAP) Bongo tow, and three California Cooperative Oceanic Fisheries Investigation (CalCOFI) Vertical Egg Tow (CalVET) net tows at the center and at the four corners around the site.

From Site BS-2 we will travel north to Site BS-4. Two subsurface moorings will be recovered and deployed at this site. The four corner box and center station will be sampled as before, CTD, Bongo, and triplicate CalVET tows.

The next station will be Site BS-5 where we will recover and deploy two subsurface moorings and complete the CTD, Bongo, and CalVET sampling at the five locations around the moorings. There is a lost mooring at or near Site BS-5. An acoustic release search may be conducted if time allows.

We will then transit north along the 70-meter isobath conducting CTD casts approximately 10 nautical miles apart. The number and spacing of CTDs will be determined by the time remaining in the cruise.

If time allows we may also continue north to Site BS-8 to recover and deploy two subsurface moorings and complete the CTD, Bongo, and CalVET sampling at the locations around the moorings. We will also recover two subsurface Marine Mammal moorings, 05MM4A and 05MM3A (see spreadsheet for locations) on the way south from site 8.

After completion of the work in the Bering Sea we will then proceed to a lost mooring site in the Alaska Stream to conduct a search and drag operation.

If time allows at the end of the cruise we will also deploy four subsurface moorings across Amukta Pass. There are no recoveries at this site. CTD casts will be completed prior to recovery and following deployment of all moorings.

- 3.5 Station Locations** – Please see [Section 9.4 Cruise MF-05-13 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)
 - CalVET Net Tows (SOI 3.2.6)
 - 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.
- Acoustic Doppler Current Profiler (ADCP) Operations (SOI 3.2.13)
 - Radiometer Operations (SOI 3.2.14)
 - Scientific Computer System (SCS) data acquisition (SOI 5.2)
 - Fluorometer monitoring (SOI 5.3)
 - Thermosalinograph monitoring (SOI 5.3)
- 3.8 Applicable Restrictions** – None
- 3.9 Small Boat Operations** – Small boat operations may be required for recovery of the surface mooring at Bering Sea Site BS-2.

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 (5-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 removable disk or CD,
- Bench space in DataPlot for PCs, monitor, printer and VCR to fly MOCNESS,
- 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,
- 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,
- 60-cm Bongo sampling arrays, 333- μ m primary net, 505- μ m backup,
- 20-cm Bongo arrays,
- Spare wire angle indicator,
- CalVET net array,
- Surface moorings: 1 recovery,
- Subsurface moorings: recover 8, deploy 10,
- 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 edited and corrected,
- SCS backup,
- Calibration Sheets for all ship's instruments used,
- PMEL CTD Weather Observation Logs,
- CTD Cast Information/Rosette Log,
- Autosalinometer Logs,
- ADCP Log Sheets,
- ADCP underway data, 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 Responsibilities** – The Chief Scientist shall be responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, **Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists**, released July 2002. By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought aboard and a chemical hygiene plan. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Chief Scientist.
- 7.2 Inventory** – See [Section 9.5 Cruise MF-05-13 HAZMAT Inventory](#) for a complete listing of HAZMATs brought onboard the vessel. Spill kit contains materials for cleanup of formaldehyde and sodium borate. All scientific staff on board are trained to handle spills.
- 7.3 Material Safety Data Sheet (MSDS)** – All MSDSs can be found on the **OERD HAZMAT Emergency Guidelines – MSDS** compact diskette dated January 25, 2005.

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) 790-7594

Iridium:

- (808) 659-5684

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-05-13 Equipment Inventory – Itemized inventory and weights will be forwarded when available.

CONTAINER # TOLU 370763 7

<u>ITEM</u>	<u>QTY</u>	<u>WT (#)</u>	<u>COMMENTS</u>
ANCHORS, 1600#	6 EA	9990	ON PALLETS (1650# EA)
RELEASES	12 EA	1440	(120# EA)
STEEL FLOATS			
28"	1 EA	180	
30"	5 EA	900	(180# EA)
41"	4 EA	1600	(400# EA)
SYNTAC. FLOATS 36"	4 EA	2000	(500# EA)
SCRIPPS BOXES	2 EA	400	(200# EA)
MF BOXES FROM			
PMC	8 EA	100	FOR MILLER FREEMAN ENGINEERING
NILSPIN	4 REELS	2720	(680# EA)
MOORINGS	4 REELS	1720	BS-2C, BS-4B, BS-5B, BS-8B (430# EA)
ADCP BOXES	4 EA	100	EMPTY FOR RECOVERY
RELEASE BOXES	3 EA	60	EMPTY FOR RECOVERY
RCM-9 BOXES	3 EA	30	EMPTY FOR RECOVERY
ADCP FLOAT	1 EA	1200	WITHOUT ADCP

TOTAL
WT: 22,440

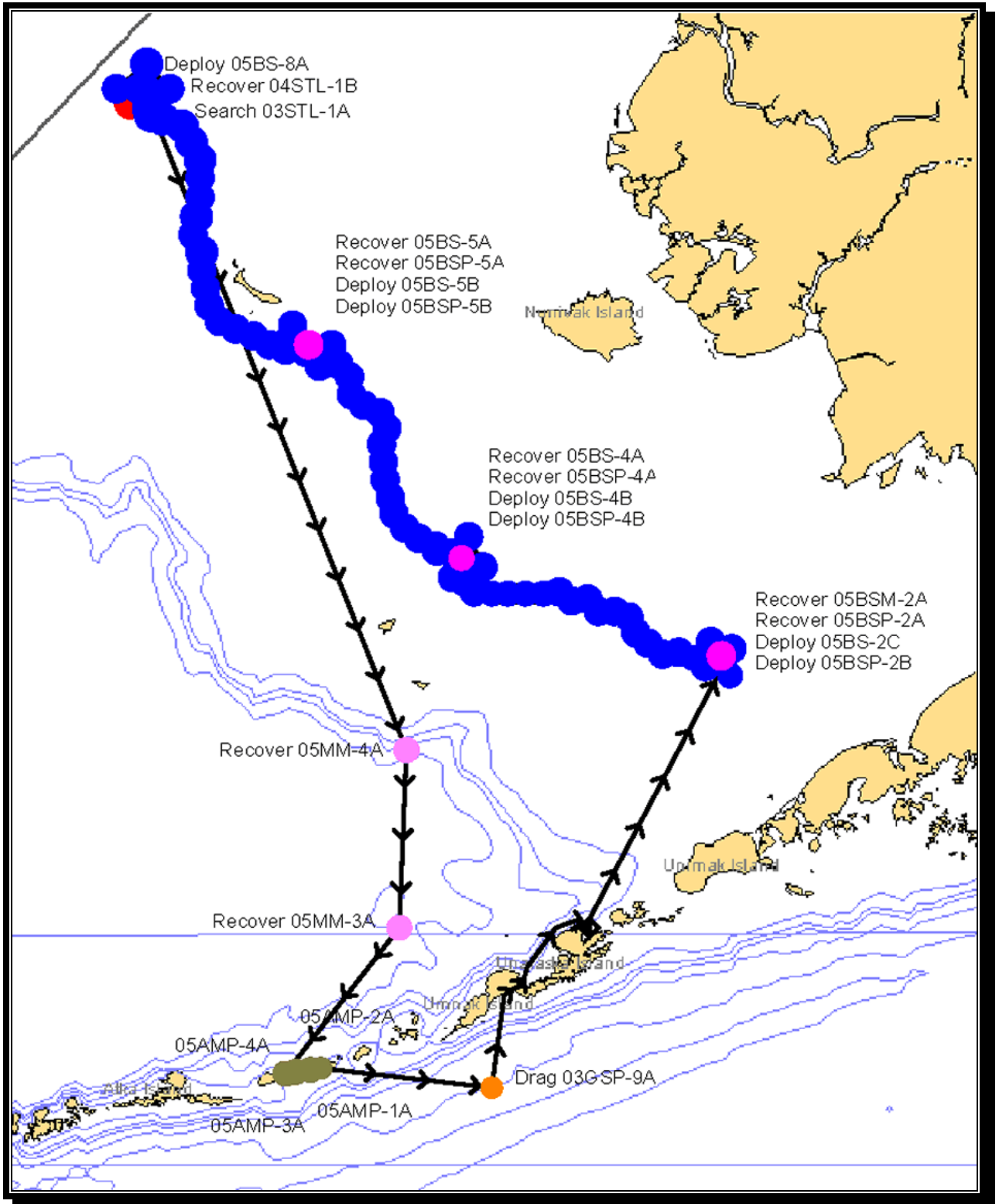
CONTAINER # TOLU 370763 7

<u>ITEM</u>	<u>QTY</u>	<u>WT (#)</u>	<u>COMMENTS</u>
ANCHORS			
2500#	4 EA	10200	ON PALLETS (2550#EA)
1600#	2 EA	3300	ON PALLETS (1650#EA)
30" STEEL FLOATS	7 EA	1260	(180# EA)
ALUM FRAME	1 SET	100	FOR MF FROM PMC
MORDY BOXES	3 EA	100	
SMITH BOXES	2 EA	75	PERSONAL GEAR
ADCP FLOAT	1 EA	1200	W/OUT ADCP
ADCP FLOAT	2 EA	3000	W/ADCP (1500# EA)
TOOL CART	1 EA	150	
ADCP BOX	1 EA	150	
BLACK TOTE	1 EA	150	DEWITT CABLES
COOLER	1 EA`	20	EMPTY
MORDY FRIDGE	1 EA	30	
RCM 9 BOX	1 EA	50	
GREY TOES	3 EA	1900	
HARDWARE BOX	1 EA	500	
WIRE BASKET	1 EA	650	W/ INSTRUMENT BOXES
WIRE BASKET	1 EA	850	W/ CAGES AND INSTRUMENTS

<u>ITEM</u>	<u>QTY</u>	<u>WT (#)</u>	<u>COMMENTS</u>
NITRATE METER	1 EA	250	IN CAGE
WOOD BOX	1 EA	400	W/ EMPTY BOXES
DRAG GEAR	1 SET	500	
FOLDED TOTE	1 EA	230	
	TOTAL		
	WT:	25,065	

9.2 Cruise MF-05-13 Mooring Figures – Mooring drawings will be forwarded when available.

9.3 Cruise MF-05-13 Chartlet



9.4 Cruise MF-05-13 Station Locations

Activity	Latitude	Longitude	Dist (nm)	Spd (kts)	Trans (hrs)	Depth (m)	On Sta (hrs)	Arrive (Local) Date/Time	Depart (local) Date/Time
Depart Dutch Harbor, Alaska	53° 54.00' N	166° 31.20' W							21-Sep-2005 12:00
CTD - Site 2/East (chlor at: 0, 10, 20, 30, 40, 50m)	56° 56.50' N	163° 50.01' W	204.1	10	20.4	69	0.4	22-Sep-2005 08:24	22-Sep-2005 08:49
20/60cm Bongo (150/333 nets) - Site 2/East	56° 56.50' N	163° 50.01' W	0.0	10	0.0	69	0.3	22-Sep-2005 08:49	22-Sep-2005 09:04
CTD at Site 2 (chlor at: 0, 12(x3), 20, 24(x3), 30, 40, 50m; nuts ???)	56° 52.50' N	164° 03.00' W	8.1	10	0.8	71	0.4	22-Sep-2005 09:53	22-Sep-2005 10:18
CalVET (triplicate)	56° 52.50' N	164° 03.00' W	0.0	10	0.0	71	0.5	22-Sep-2005 10:18	22-Sep-2005 10:48
20/60cm Bongo (150/333 nets)	56° 52.50' N	164° 03.00' W	0.0	10	0.0	71	0.5	22-Sep-2005 10:48	22-Sep-2005 11:18
Recover 05BSM-2A	56° 52.03' N	164° 03.06' W	0.5	10	0.0	72	4.0	22-Sep-2005 11:21	22-Sep-2005 15:21
Recover 05BSP-2A	56° 51.62' N	164° 03.52' W	0.5	10	0.0	72	1.0	22-Sep-2005 15:24	22-Sep-2005 16:24
Deploy 05BS-2C	56° 52.03' N	164° 03.06' W	0.5	10	0.0	72	2.0	22-Sep-2005 16:27	22-Sep-2005 18:27
Deploy 05BSP-2B	56° 51.62' N	164° 03.52' W	0.5	10	0.0	72	1.0	22-Sep-2005 18:30	22-Sep-2005 19:30
CTD at Site 2 (chlor at: 0, 11(x3), 20, 30, 40, 50m; nuts ???)	56° 52.50' N	164° 03.00' W	0.9	10	0.1	72	0.4	22-Sep-2005 19:35	22-Sep-2005 20:00
CTD - Site 2/South (chlor at: 0, 10, 20, 30, 40, 50m)	56° 40.00' N	163° 52.00' W	13.9	10	1.4	75	0.4	22-Sep-2005 21:23	22-Sep-2005 21:48
20/60cm Bongo (150/333 nets) - Site 2/South	56° 40.00' N	163° 52.00' W	0.0	10	0.0	75	0.3	22-Sep-2005 21:48	22-Sep-2005 22:04
CTD - Site 2/West (chlor at: 0, 10, 20, 30, 40, 50m)	56° 46.00' N	164° 20.00' W	16.5	10	1.6	75	0.4	22-Sep-2005 23:43	23-Sep-2005 00:08
20/60cm Bongo (150/333 nets) - Site 2/West	56° 46.00' N	164° 20.00' W	0.0	10	0.0	75	0.3	23-Sep-2005 00:08	23-Sep-2005 00:24
CTD - Site 2/North (chlor at: 0, 10, 20, 30, 40, 50m)	57° 01.00' N	164° 13.00' W	15.5	10	1.5	69	0.4	23-Sep-2005 01:57	23-Sep-2005 02:22
20/60cm Bongo (150/333 nets) - Site 2/North	57° 01.00' N	164° 13.00' W	0.0	10	0.0	69	0.3	23-Sep-2005 02:22	23-Sep-2005 02:38
CTD	56° 54.00' N	164° 01.98' W	9.2	10	0.9	70	0.4	23-Sep-2005 03:33	23-Sep-2005 03:58
CTD	56° 49.92' N	164° 18.66' W	10.0	10	1.0	70	0.4	23-Sep-2005 04:58	23-Sep-2005 05:22
CTD	56° 51.00' N	164° 34.26' W	8.6	10	0.9	70	0.4	23-Sep-2005 06:14	23-Sep-2005 06:38

Activity	Latitude	Longitude	Dist (nm)	Spd (kts)	Trans (hrs)	Depth (m)	On Sta (hrs)	Arrive (Local) Date/Time	Depart (local) Date/Time
CTD	56° 54.54' N	164° 50.10' W	9.4	10	0.9	70	0.4	23-Sep-2005 07:35	23-Sep-2005 07:59
CTD	56° 53.64' N	165° 08.22' W	9.9	10	1.0	70	0.4	23-Sep-2005 08:59	23-Sep-2005 09:24
CTD	57° 00.00' N	165° 22.74' W	10.2	10	1.0	70	0.4	23-Sep-2005 10:24	23-Sep-2005 10:49
CTD	57° 06.48' N	165° 36.78' W	10.0	10	1.0	70	0.4	23-Sep-2005 11:49	23-Sep-2005 12:14
CTD	57° 15.72' N	165° 44.82' W	10.2	10	1.0	70	0.4	23-Sep-2005 13:15	23-Sep-2005 13:40
CTD	57° 19.20' N	166° 00.60' W	9.2	10	0.9	70	0.4	23-Sep-2005 14:35	23-Sep-2005 15:00
CTD	57° 19.20' N	166° 19.56' W	10.2	10	1.0	70	0.4	23-Sep-2005 16:01	23-Sep-2005 16:26
CTD	57° 26.58' N	166° 31.38' W	9.7	10	1.0	70	0.4	23-Sep-2005 17:24	23-Sep-2005 17:49
CTD	57° 25.44' N	166° 48.42' W	9.2	10	0.9	70	0.4	23-Sep-2005 18:44	23-Sep-2005 19:09
CTD	57° 31.32' N	167° 02.40' W	9.5	10	1.0	70	0.4	23-Sep-2005 20:06	23-Sep-2005 20:31
CTD	57° 30.00' N	167° 20.94' W	10.0	10	1.0	70	0.4	23-Sep-2005 21:31	23-Sep-2005 21:56
CTD	57° 30.00' N	167° 40.02' W	10.3	10	1.0	70	0.4	23-Sep-2005 22:58	23-Sep-2005 23:22
CTD	57° 30.00' N	167° 59.10' W	10.3	10	1.0	70	0.4	24-Sep-2005 00:24	24-Sep-2005 00:48
CTD	57° 30.00' N	168° 18.18' W	10.3	10	1.0	70	0.4	24-Sep-2005 01:50	24-Sep-2005 02:15
CTD	57° 31.38' N	168° 36.72' W	10.1	10	1.0	70	0.4	24-Sep-2005 03:15	24-Sep-2005 03:40
CTD	57° 37.68' N	168° 49.32' W	9.2	10	0.9	70	0.4	24-Sep-2005 04:35	24-Sep-2005 05:00
CTD	57° 47.82' N	168° 51.78' W	10.2	10	1.0	70	0.4	24-Sep-2005 06:01	24-Sep-2005 06:26
CTD at Site 4 (chlor at: 0, 10.5(x3), 20, 30, 40, 50m; nuts ???)	57° 51.00' N	168° 51.25' W	3.2	10	0.3	72	0.4	24-Sep-2005 06:45	24-Sep-2005 07:10
Recover 05BS-4A	57° 51.22' N	168° 52.20' W	0.6	10	0.1	72	1.0	24-Sep-2005 07:13	24-Sep-2005 08:13
Recover 05BSP-4A	57° 51.53' N	168° 51.51' W	0.5	10	0.0	72	1.0	24-Sep-2005 08:16	24-Sep-2005 09:16
Deploy 05BS-4B	57° 51.22' N	168° 52.20' W	0.5	10	0.0	72	2.0	24-Sep-2005 09:19	24-Sep-2005 11:19
Deploy 05BS-4B	57° 51.53' N	168° 51.51' W	0.5	10	0.0	72	2.0	24-Sep-2005 11:22	24-Sep-2005 13:22
CTD at Site 4 (chlor at: 0, 11(x3), 20, 30, 40, 50m; nuts ???)	57° 51.00' N	168° 51.25' W	0.5	10	0.1	72	0.4	24-Sep-2005 13:25	24-Sep-2005 13:50
CalVET (triplicate)	57° 51.00' N	168° 51.25' W	0.0	10	0.0	72	0.5	24-Sep-2005 13:50	24-Sep-2005 14:20
20/60cm Bongo (150/333 nets)	57° 51.00' N	168° 51.25' W	0.0	10	0.0	72	0.3	24-Sep-2005 14:20	24-Sep-2005 14:36
CTD - Site 4/South (chlor at: 0, 10, 20, 30, 40, 50m)	57° 39.20' N	169° 01.20' W	12.9	10	1.3	71	0.4	24-Sep-2005 15:53	24-Sep-2005 16:18
20/60cm Bongo - Site 4/South	57° 39.20' N	169° 01.20' W	0.0	10	0.0	71	0.3	24-Sep-2005 16:18	24-Sep-2005 16:34
CTD - Site 4/West (chlor at: 0, 10, 20, 30, 40, 50m)	57° 55.60' N	169° 19.30' W	19.0	10	1.9	71	0.4	24-Sep-2005 18:28	24-Sep-2005 18:53
20/60cm Bongo - Site 4/West	57° 55.60' N	169° 19.30' W	0.0	10	0.0	71	0.3	24-Sep-2005 18:53	24-Sep-2005 19:09

Activity	Latitude	Longitude	Dist (nm)	Spd (kts)	Trans (hrs)	Depth (m)	On Sta (hrs)	Arrive (Local) Date/Time	Depart (local) Date/Time
CTD - site 4 east (chlor at: 0, 10,20,30,40,50 m)	57° 46.00' N	168° 28.00' W	28.9	10	2.9	71	0.4	24-Sep-2005 22:02	24-Sep-2005 22:27
20/60cm Bongo - Site 4/East	57° 46.00' N	168° 28.00' W	0.0	10	0.0	71	0.3	24-Sep-2005 22:27	24-Sep-2005 22:43
CTD - Site 4/North (chlor at: 0, 10, 20, 30, 40, 50m)	58° 04.00' N	168° 43.80' W	19.9	10	2.0	71	0.4	25-Sep-2005 00:42	25-Sep-2005 01:07
20/60cm Bongo - Site 4/North	58° 04.00' N	168° 43.80' W	0.0	10	0.0	71	0.3	25-Sep-2005 01:07	25-Sep-2005 01:22
CTD	57° 54.54' N	169° 03.66' W	14.2	10	1.4	70	0.4	25-Sep-2005 02:47	25-Sep-2005 03:12
CTD	57° 58.44' N	169° 21.54' W	10.3	10	1.0	70	0.4	25-Sep-2005 04:14	25-Sep-2005 04:38
CTD	58° 02.82' N	169° 39.00' W	10.2	10	1.0	70	0.4	25-Sep-2005 05:40	25-Sep-2005 06:04
CTD	58° 08.70' N	169° 54.84' W	10.2	10	1.0	70	0.4	25-Sep-2005 07:06	25-Sep-2005 07:30
CTD	58° 16.98' N	170° 05.28' W	9.9	10	1.0	70	0.4	25-Sep-2005 08:30	25-Sep-2005 08:55
CTD	58° 26.82' N	170° 10.80' W	10.3	10	1.0	70	0.4	25-Sep-2005 09:56	25-Sep-2005 10:21
CTD	58° 36.66' N	170° 16.26' W	10.2	10	1.0	70	0.4	25-Sep-2005 11:22	25-Sep-2005 11:47
CTD	58° 46.98' N	170° 17.58' W	10.3	10	1.0	70	0.4	25-Sep-2005 12:49	25-Sep-2005 13:14
CTD	58° 57.06' N	170° 19.56' W	10.1	10	1.0	70	0.4	25-Sep-2005 14:15	25-Sep-2005 14:39
CTD	59° 06.60' N	170° 14.40' W	9.9	10	1.0	70	0.4	25-Sep-2005 15:39	25-Sep-2005 16:03
CTD	59° 15.54' N	170° 22.62' W	9.9	10	1.0	70	0.4	25-Sep-2005 17:03	25-Sep-2005 17:27
CTD	59° 19.74' N	170° 39.96' W	9.8	10	1.0	70	0.4	25-Sep-2005 18:26	25-Sep-2005 18:51
CTD	59° 25.92' N	170° 53.34' W	9.2	10	0.9	70	0.4	25-Sep-2005 19:46	25-Sep-2005 20:11
CTD	59° 35.88' N	170° 55.02' W	10.0	10	1.0	70	0.4	25-Sep-2005 21:11	25-Sep-2005 21:35
CTD	59° 43.14' N	171° 08.34' W	9.9	10	1.0	70	0.4	25-Sep-2005 22:35	25-Sep-2005 22:59
CTD	59° 46.86' N	171° 27.06' W	10.1	10	1.0	70	0.4	26-Sep-2005 00:00	26-Sep-2005 00:25
CTD	59° 49.80' N	171° 46.20' W	10.1	10	1.0	70	0.4	26-Sep-2005 01:25	26-Sep-2005 01:50
CTD	59° 50.76' N	172° 06.30' W	10.1	10	1.0	70	0.4	26-Sep-2005 02:51	26-Sep-2005 03:15
CTD - Site 5/West (chlor at: 0, 10, 20, 30, 40, 50m)	59° 53.88' N	172° 10.00' W	3.6	10	0.4	70	0.4	26-Sep-2005 03:37	26-Sep-2005 04:02
20/60cm Bongo - Site 5/West	59° 53.88' N	172° 10.00' W	0.0	10	0.0	70	0.3	26-Sep-2005 04:02	26-Sep-2005 04:18
CTD at Site 5 (chlor at: 0, 12(x3), 20, 30, 40, 50m)	59° 53.50' N	171° 41.50' W	14.3	10	1.4	72	0.4	26-Sep-2005 05:43	26-Sep-2005 06:08
20/60cm Bongo (150/333 nets)	59° 53.50' N	171° 41.50' W	0.0	10	0.0	72	0.3	26-Sep-2005 06:08	26-Sep-2005 06:24
CalVET (triplicate)	59° 53.50' N	171° 41.50' W	0.0	10	0.0	72	0.5	26-Sep-2005 06:24	26-Sep-2005 06:54
Recover 05BS-5A	59° 54.32' N	171° 42.38' W	0.9	10	0.1	70	1.0	26-Sep-2005 07:00	26-Sep-2005 08:00
Recover 05BSP-5A	59° 53.93' N	171° 42.91' W	0.5	10	0.0	71	0.5	26-Sep-2005 08:03	26-Sep-2005 08:33
Deploy 05BS-5B	59° 54.32' N	171° 42.38' W	0.5	10	0.0	70	2.0	26-Sep-2005 08:35	26-Sep-2005 10:35
Deploy 05BSP-5B	59° 53.93' N	171° 42.91' W	0.5	10	0.0	71	1.0	26-Sep-2005 10:38	26-Sep-2005 11:38

Activity	Latitude	Longitude	Dist (nm)	Spd (kts)	Trans (hrs)	Depth (m)	On Sta (hrs)	Arrive (Local) Date/Time	Depart (local) Date/Time
CTD at Site 5 (chlor at: 0, 12(x3), 20, 30, 40, 50m; duplicate nuts (UAF & PMEL) at nitrate meter depths)	59° 53.40' N	171° 42.50' W	0.6	10	0.1	72	0.4	26-Sep-2005 11:42	26-Sep-2005 12:06
Search for 04BS-5A	59° 53.84' N	171° 42.19' W	0.5	10	0.0	72	9.0	26-Sep-2005 12:09	26-Sep-2005 21:09
CTD - Site 5/South (chlor at: 0, 10, 20, 30, 40, 50m)	59° 42.00' N	171° 30.00' W	13.3	10	1.3	70	0.4	26-Sep-2005 22:29	26-Sep-2005 22:54
20/60cm Bongo - Site 5/South	59° 42.00' N	171° 30.00' W	0.0	10	0.0	70	0.3	26-Sep-2005 22:54	26-Sep-2005 23:10
CTD - Site 5/East (chlor at: 0, 10, 20, 30, 40, 50m)	59° 53.88' N	171° 15.50' W	13.9	10	1.4	70	0.4	27-Sep-2005 00:33	27-Sep-2005 00:58
20/60cm Bongo - Site 5/East	59° 53.88' N	171° 15.50' W	0.0	10	0.0	70	0.3	27-Sep-2005 00:58	27-Sep-2005 01:14
CTD - Site 5/North (chlor at: 0, 10, 20, 30, 40, 50m)	60° 04.50' N	172° 00.00' W	24.7	10	2.5	70	0.4	27-Sep-2005 03:42	27-Sep-2005 04:06
20/60cm Bongo - Site 5/North	60° 04.50' N	172° 00.00' W	0.0	10	0.0	70	0.3	27-Sep-2005 04:06	27-Sep-2005 04:22
CTD	59° 54.30' N	172° 25.38' W	16.3	10	1.6	70	0.4	27-Sep-2005 06:00	27-Sep-2005 06:24
CTD	59° 59.10' N	172° 43.32' W	10.2	10	1.0	70	0.4	27-Sep-2005 07:26	27-Sep-2005 07:50
CTD	60° 03.00' N	173° 01.62' W	9.9	10	1.0	70	0.4	27-Sep-2005 08:50	27-Sep-2005 09:15
CTD	60° 07.02' N	173° 19.68' W	9.9	10	1.0	70	0.4	27-Sep-2005 10:14	27-Sep-2005 10:38
CTD	60° 15.36' N	173° 31.38' W	10.2	10	1.0	70	0.4	27-Sep-2005 11:39	27-Sep-2005 12:04
CTD	60° 25.26' N	173° 35.70' W	10.1	10	1.0	70	0.4	27-Sep-2005 13:05	27-Sep-2005 13:29
CTD	60° 35.22' N	173° 39.54' W	10.1	10	1.0	70	0.4	27-Sep-2005 14:30	27-Sep-2005 14:55
CTD	60° 45.48' N	173° 39.84' W	10.3	10	1.0	70	0.4	27-Sep-2005 15:57	27-Sep-2005 16:21
CTD	60° 54.48' N	173° 49.08' W	10.1	10	1.0	70	0.4	27-Sep-2005 17:22	27-Sep-2005 17:46
CTD	61° 04.56' N	173° 46.14' W	10.2	10	1.0	70	0.4	27-Sep-2005 18:47	27-Sep-2005 19:12
CTD	61° 14.64' N	173° 42.78' W	10.2	10	1.0	70	0.4	27-Sep-2005 20:13	27-Sep-2005 20:38
CTD	61° 24.84' N	173° 42.00' W	10.2	10	1.0	70	0.4	27-Sep-2005 21:39	27-Sep-2005 22:04
CTD	61° 35.10' N	173° 42.00' W	10.3	10	1.0	70	0.4	27-Sep-2005 23:05	27-Sep-2005 23:30
CTD	61° 44.22' N	173° 51.48' W	10.2	10	1.0	70	0.4	28-Sep-2005 00:31	28-Sep-2005 00:56
CTD	61° 52.68' N	174° 02.58' W	10.0	10	1.0	70	0.4	28-Sep-2005 01:55	28-Sep-2005 02:20
CTD	61° 56.58' N	174° 22.68' W	10.2	10	1.0	70	0.4	28-Sep-2005 03:22	28-Sep-2005 03:46
CTD	62° 02.16' N	174° 39.96' W	9.8	10	1.0	70	0.4	28-Sep-2005 04:45	28-Sep-2005 05:10
CTD	62° 12.00' N	174° 45.00' W	10.1	10	1.0	70	0.4	28-Sep-2005 06:11	28-Sep-2005 06:35
CTD - Site 8/South (chlor at: 0, 10, 20, 30, 40, 50m)	61° 58.50' N	174° 37.00' W	14.0	10	1.4	72	0.4	28-Sep-2005 07:59	28-Sep-2005 08:24

Activity	Latitude	Longitude	Dist (nm)	Spd (kts)	Trans (hrs)	Depth (m)	On Sta (hrs)	Arrive (Local) Date/Time	Depart (local) Date/Time
20/60cm Bongo (150/333 nets) - Site 8/South	61° 58.50' N	174° 37.00' W	0.0	10	0.0	72	0.3	28-Sep-2005 08:24	28-Sep-2005 08:40
CTD - Site 8/West (chlor at: 0, 10, 20, 30, 40, 50m)	62° 11.66' N	175° 14.30' W	21.9	10	2.2	79	0.4	28-Sep-2005 10:51	28-Sep-2005 11:17
20/60cm Bongo (150/333 nets) - Site 8/West	62° 11.66' N	175° 14.30' W	0.0	10	0.0	79	0.3	28-Sep-2005 11:17	28-Sep-2005 11:33
CTD - Site 8/North (chlor at: 0, 10, 20, 30, 40, 50m)	62° 25.30' N	174° 42.00' W	20.3	10	2.0	72	0.4	28-Sep-2005 13:35	28-Sep-2005 14:00
20/60cm Bongo (150/333 nets) - Site 8/North	62° 25.30' N	174° 42.00' W	0.0	10	0.0	72	0.3	28-Sep-2005 14:00	28-Sep-2005 14:16
CTD - Site 8/East (chlor at: 0, 10, 20, 30, 40, 50m)	62° 11.66' N	174° 16.00' W	18.2	10	1.8	64	0.4	28-Sep-2005 16:05	28-Sep-2005 16:29
20/60cm Bongo (150/333 nets) - Site 8/East	62° 11.66' N	174° 16.00' W	0.0	10	0.0	64	0.3	28-Sep-2005 16:29	28-Sep-2005 16:44
CTD at 04STL-1B (chlor at: 0, 10, 21(x3), 30, 40, 50m)	62° 11.66' N	174° 51.32' W	16.5	10	1.6	78	0.4	28-Sep-2005 18:23	28-Sep-2005 18:48
20/60cm Bongo (150/333 nets)	62° 11.66' N	174° 51.32' W	0.0	10	0.0	78	0.3	28-Sep-2005 18:48	28-Sep-2005 19:05
CalVET (triplicate)	62° 11.66' N	174° 51.32' W	0.0	10	0.0	78	0.5	28-Sep-2005 19:05	28-Sep-2005 19:35
Search for 03STL-1A	62° 04.88' N	175° 00.12' W	7.9	10	0.8	80	9.0	28-Sep-2005 20:22	29-Sep-2005 05:22
Recover 05BS-8A	62° 11.66' N	174° 51.32' W	7.9	10	0.8	78	1.0	29-Sep-2005 06:10	29-Sep-2005 07:10
Recover 05BSP-8A	62° 11.66' N	174° 51.32' W	0.0	10	0.0	78	0.5	29-Sep-2005 07:10	29-Sep-2005 07:40
Deploy 05BS-8B	62° 11.66' N	174° 45.00' W	2.9	10	0.3	72	2.0	29-Sep-2005 07:58	29-Sep-2005 09:58
Deploy 05BSP-8B	62° 11.66' N	174° 45.00' W	0.0	10	0.0	72	0.5	29-Sep-2005 09:58	29-Sep-2005 10:28
CTD at 05BS-8A (chlor at: 0, 11(x3), 15, 20, 30, 40, 50, 59m)	62° 11.66' N	174° 45.00' W	0.0	10	0.0	72	0.4	29-Sep-2005 10:28	29-Sep-2005 10:52
Recover 05MM4A	55° 54.06' N	169° 52.01' W	406.3	11	36.9	1590	1.5	30-Sep-2005 23:49	01-Oct-2005 01:19
Recover 05MM3A	54° 00.00' N	170° 00.00' W	114.2	12	9.5	1870	1.5	01-Oct-2005 10:49	01-Oct-2005 12:19
Drag for 03GSP-9A	52° 09.93' N	168° 12.37' W	127.6	13	9.8	4348	20.0	01-Oct-2005 22:08	02-Oct-2005 18:08
Deploy 05AMP-4A	52° 23.00' N	172° 07.00' W	144.1	10	14.4	200	1.5	03-Oct-2005 08:33	03-Oct-2005 10:03
CTD at Amukta Pass 4	52° 23.00' N	172° 07.00' W	0.0	10	0.0	200	0.5	03-Oct-2005 10:03	03-Oct-2005 10:34
Deploy 05AMP-3A	52° 24.00' N	171° 55.00' W	7.4	10	0.7	200	1.5	03-Oct-2005 11:18	03-Oct-2005 12:48
CTD at Amukta Pass 3	52° 24.00' N	171° 55.00' W	0.0	10	0.0	200	0.5	03-Oct-2005 12:48	03-Oct-2005 13:19
Deploy 05AMP-2A	52° 25.00' N	171° 40.00' W	9.2	10	0.9	200	1.5	03-Oct-2005 14:14	03-Oct-2005 15:44
CTD at Amukta Pass 2	52° 25.00' N	171° 40.00' W	0.0	10	0.0	200	0.5	03-Oct-2005 15:44	03-Oct-2005 16:15
Deploy 05AMP-1A	52° 26.00' N	171° 27.00' W	8.0	10	0.8	200	1.5	03-Oct-2005 17:03	03-Oct-2005 18:33

Activity	Latitude	Longitude	Dist (nm)	Spd (kts)	Trans (hrs)	Depth (m)	On Sta (hrs)	Arrive (Local) Date/Time	Depart (local) Date/Time
CTD at Amukta Pass 1	52° 26.00' N	171° 27.00' W	0.0	10	0.0	200	0.5	03-Oct-2005 18:33	03-Oct-2005 19:03
Arrive Dutch Harbor, Alaska	53° 54.00' N	166° 31.20' W	197.9	10	19.8	200		04-Oct-2005 14:51	

9.5 Cruise MF-05-13 HAZMAT Inventory

Chemical	CAS Number	Quantity	H	F	R	Storage Color Code	Hazard Class	Packing Group Number	UN	Reportable Quantity	Response Indices
Battery, Lithium	mixture	18 D-cells	1	1	2	General	9	II	3090	35 KG	1
Battery, Lithium	mixture	72 9V Sticks	1	1	2	General	9	II	3090	35 KG	1
Battery, Lithium	mixture	40 9V Cells	1	1	2	General	9	II	3090	35 KG	1
Formaldehyde, 37%	50-00-0	5-Gal	3	2	0	Flammable	3 & 8	III	1198	475 LBS	2
Sodium Borate Solution, Saturated	mixture	5-Gal	1	0	0	General	Not regulated				3
Tributyltin Oxide	56-35-9	5 Pairs	3	1	0	Poison	Not regulated				4
<p>Spill Response 1: Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Do not touch or walk through spilled material. Stop leak if you can do it without risk. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. DO NOT GET WATER on spilled substance or inside containers. Cover with DRY earth, DRY sand, or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain. Dike for later disposal; do not apply water unless directed to do so. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.</p>											
<p>Spill Response 2: Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements, or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb with earth, sand or other non-combustible material and transfer to containers (except for Hydrazine). Use clean non-sparking tools to collect absorbed material.</p>											
<p>Spill Response 3: Ventilate area of leak or spill. Wear appropriate personal protective equipment. Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.</p>											
<p>Spill Response 4: Shut off source of spill if it is safe to do so. Eliminate sources of ignition. Scoop or shovel spilled material into suitable labeled containers with a tight fitting lid. Secure the drum cover and move the container to a safe holding area. Check area for residual material and repeat clean up if detected. Decontaminate or dispose of all protective clothing and equipment. The United States Environmental Protection Agency (USEPA) has not established a Reportable Quantity (RQ) for release of this material. Report all releases which are likely to endanger the public health, harm the environment, or cause complaint to the appropriate State or Local officials.</p>											