

CRUISE REPORT

Cruise Number: MF05-06

Vessel: NOAA Ship Miller Freeman**Area of Operations:** Bering Sea**Itinerary:** Depart Kodiak, Alaska: 16 April 2005
Arrive Dutch Harbor, Alaska: 7 May 2005**Participating Organizations:** NOAA/PMEL/FOCI**Chief Scientist:** Carol DeWitt
NOAA/PMEL/OERD2/FOCI
206-526-6808
Carol.DeWitt@noaa.gov**Other Participating Scientists:**

Name	Gender	Affiliation	E-mail Address
Carol L. DeWitt	Female	PMEL	Carol.DeWitt@noaa.gov
William J. Floering	Male	PMEL	William.Floering@noaa.gov
Hendrick V. Miller	Male	PMEL	Hendrick.V.Miller@noaa.gov
Sarah J. Thornton	Female	UAF	sarahjt@imsuaf.edu
Lisa Munger	Female	SIO	lmunger@ucsd.edu
Christopher Garsha	Male	SIO	cgarsha@ucsd.edu
Jim Jenkins	Male	Teacher-at-Sea	jenkinsj@earthlink.net

Cruise Objectives: The primary objective of the cruise was the recovery and deployment of moorings in the Bering Sea. The second objective was physical oceanographic property sampling at and near the mooring locations.

Summary of Operations and Samples Collected:

Bongo tows, 20/60 cm	17
CalVET casts	43
CTD Casts	57
Moorings Recovered	9
Moorings Deployed	10
Chlorophyll Samples	116
Nutrient Samples (PMEL)	152
Nutrient Samples (UAF)	73
Salinity Samples	60
Satellite-tracked drifter, ARGOS	1
ARGOS APEX buoys	2
Sonobuoys	3

Cruise Summary:

On April 16th NOAA Ship MILLER FREEMAN departed Kodiak, Alaska for the Bering Sea. Due to weather forecasts predicting gale force winds, the cruise track was altered from the Kodiak Crab moorings to the moorings at Bering Sea site 2. We hoped to get the two moorings recovered and the surface mooring deployed before bad weather set in. We were only able to recover one of the two moorings, 04BS-2C, before the weather significantly deteriorated and night set in. We were able to complete a CTD with chlorophylls and nutrients, bongo and triplicate CalVETs at the mooring site. CAL001 was completed with the Seacat rigged incorrectly (Seacat above CalVET). Prior to CAL002 the Seacat was rigged below CalVET. We then proceeded to the eastern site 2 station and completed triplicate CalVETs, a CTD with chlorophylls and nutrients, and a bongo. We then headed toward the Kodiak Crab moorings in hopes of getting some shelter from the storm.

The next morning we were able to begin mooring operations at the Kodiak Crab site. We completed a CTD cast. The first mooring, 04KC-1A, did not respond and we did not recover the mooring. We deployed 05KC-1A. We then proceeded to 04KC-2A. A CTD was completed, 04KC-2A was recovered, and 05KC-2A was deployed.

We then headed back to Bering Sea site 2. We conducted operations at the remaining stations surrounding the mooring site, and in the morning were able to begin mooring operations. We recovered 04BSP-2B and deployed 05BSM-2A (ARGOS ID 13342) and 05BSP-2A. A CTD cast with chlorophylls and nutrients was completed.

Then due to the combination of the ice not retreating from sites 5 and 8 and the forecast for gale force winds, we headed southeast towards the Marine Mammal mooring site outside of Dutch Harbor. The mooring was located and four burn commands were sent to the release, but the mooring did not appear to ascend. It was decided to leave the mooring and hopefully get back to the station at the end of the cruise.

We proceeded towards Samalga Pass. The weather was not as bad as predicted and we were able to attempt to release the mooring at Samalga. Unfortunately the release remained tilted and we were unable to release it. The tide predictions provided by Dave Kachel indicated that we would have a better chance for the release to be upright the next morning. The ship sought shelter during the night, and the next morning, after an hour or two, the release accepted the release command and the mooring surfaced. We then completed a CTD.

We went to the Alaska Stream mooring site, but did not receive a response from 03GSP-9A. A search for the mooring was unsuccessful. A Sonobuoy was launched by the Marine Mammals group.

We proceeded to the CTD lines near Amukta Pass, completing a line east of the pass, a line across the pass and a line west of the pass. During CTD011 (on the eastern line), the CTD wire shorted out at 853 m. The CTD was brought on board and repaired. CTD012 was conducted at the same site and completed to 1500 m.

During the transit from the Amukta Pass CTDs to the MM3 mooring site, a Sonobuoy was launched by the Marine Mammals group. Mooring MM3 was successfully recovered and mooring 05MM3A was deployed. A CTD was completed at the site.

During the transit between 05MM3A and 05MM4A, two ARGOS APEX drifters were launched. Mooring 05MM4A was successfully deployed.

Mooring 04PI-7A was successfully recovered. Two CTDs, one with chlorophylls and nutrients, and a bongo tow were completed at the site.

We did not receive a response from either 04PIP-2A or from the marine mammal mooring nearby.

We proceeded to the south station at Bering Sea site 4. We completed a bongo, a CTD with chlorophylls and nutrients, and triplicate CalVETs. We then went to the mooring site where we did a CTD. Initially we did not get a response from 04BS-4B. We switched deck units and recovered 04BS-4B, deployed 05BS-4A, and did a CalVET. The ship propeller hit the top float of 05BS-4A. We tried to verify that the mooring was still upright (the top of the mooring is approximately 4 meters below the surface). We were unable to locate the mooring from the ship, so a small boat was launched. The small boat personnel were able to locate the mooring and verify that the mooring was still upright. We completed the remaining two CalVETs, deployed mooring 05BSP-4A, completed a bongo cast, and did a CTD with chlorophylls and nutrients. We then completed the remaining three stations surrounding site 4 by doing a CTD cast with chlorophylls and nutrients, a bongo tow and triplicate CalVETs at each station.

We proceeded to Bering Sea site 5 which was in the ice pack. We completed a CTD with chlorophylls and nutrients. There was no response from mooring 04BS-5A. We were able to release mooring 04BSP-5A which, due to the ice conditions, was brought to the ship by small boat. A CTD with chlorophylls and nutrients and triplicate CalVETs were completed; a bongo cast was not feasible due to the ice conditions. Also due to the ice conditions, we were not able

to go to the exact locations of the remaining stations surrounding the mooring. We got as close to the stations as we felt we safely could and then completed the station operations that conditions allowed. We could not get to the northernmost station. At the easternmost station, the 60 cm bongo net sample (BON012) had to be split into five jars. Until this point, we always preserved net 2 of the 60 cm bongo net which had 333 mesh. After BON012 (BON013–BON017), we preserved net 1 which had 505 mesh. The secondary conductivity cell was replaced after CTD044 (BS–5 south). The secondary conductivity appears to have gone bad during this CTD044 only. Salinity samples were taken every 10 meters to verify the functioning of the primary conductivity cell.

A satellite–tracked ARGOS drifter (ARGOS ID 53296) was deployed at the edge of the ice pack.

We attempted to complete the 70–m isobath CTD/bongo line, but were unable to get to the northernmost station. We completed a CTD with chlorophylls and nutrients and a bongo at the remaining three stations (between site 5 and site 4).

With the discovery at site 4 that the deck unit had failed, we returned to 04PIP–2A and the nearby marine mammal mooring. We were unable to communicate with the marine mammal mooring; however, after conducting a search pattern we found 04PIP–2A. This mooring had been dragged by a crab boat and we located it approximately 5 miles from the original deployment site. Once we located the mooring, we spent approximately five hours dragging for it. We recovered the release and the bottom three instruments: a nitrate meter, a Microcat, and an RDI 300 KHz ADCP. We completed a bongo tow and a CTD cast with chlorophylls and nutrients.

We then headed towards the north/south segment of the FOCI CTD “L” line. We completed seven CTDs.

On the way in to Dutch Harbor we stopped at the Marine Mammal mooring site closest to Dutch Harbor. No response was obtained from the mooring. A search pattern was conducted, but was not successful.

Summary of Cruise:

Days lost to weather – 1
Days lost to equipment failure – 0

Acknowledgments:

Once again it was a great pleasure working with Captain John Herring and his crew.

Attachments:Table 1: Cruise Summary MF05-06

Date (GMT)	Time (GMT)	Button	Notes	NSTAR-LAT	NSTAR-LON
04/19/05	5:48:48	CB Down	CB Down	5703.2688N	15243.7825W
		Mooring			
04/21/05	7:10:32	Recover	04BS-2C	5652.4840N	16403.3130W
04/21/05	8:29:49	CTD at Depth	CTD 001	5652.3778N	16403.0628W
		Bongo at			
04/21/05	8:56:41	Depth	BON 001	5652.5668N	16402.9815W
		CalVET at			
04/21/05	9:25:52	Depth	CAL 001	5652.5167N	16403.0937W
		CalVET at			
04/21/05	9:58:55	Depth	CAL 002	5652.5223N	16403.2528W
		CalVET at			
04/21/05	10:16:41	Depth	CAL 003	5652.4778N	16403.2782W
		CalVET at			
04/21/05	11:15:46	Depth	CAL 004	5656.6205N	16350.2678W
		CalVET at			
04/21/05	11:33:34	Depth	CAL 005	5656.4494N	16350.0009W
		CalVET at			
04/21/05	11:42:35	Depth	CAL 006	5656.6164N	16350.1923W
04/21/05	12:14:05	CTD at Depth	CTD 002 (BS2 east)	5656.3141N	16350.1619W
		Bongo at			
04/21/05	12:38:36	Depth	BON 002	5656.7763N	16350.0900W
04/22/05	16:11:17	CB Down	CB Down	5627.2236N	16028.6137W
04/22/05	16:11:18	CB Up	CB Up	5627.2230N	16028.6105W
04/22/05	17:13:28	CTD at Depth	CTD 003	5625.3051N	16013.9746W
		Mooring			
04/22/05	19:40:52	Deploy	05KC-1A	5625.2017N	16013.0920W
04/22/05	21:55:13	CB Down	CB Down	5629.4361N	16055.3131W
04/22/05	22:14:31	CTD at Depth	CTD 004	5629.6909N	16059.3826W
		Mooring			
04/22/05	22:47:44	Recover	04KC-2A	5629.9162N	16100.1700W
		Mooring			
04/22/05	23:14:02	Deploy	05KC-2A	5629.8929N	16059.9514W
		Bongo at			
04/23/05	8:23:26	Depth	BON 003	5639.9431N	16351.3876W
		CalVET at			
04/23/05	8:58:52	Depth	CAL 007	5640.0209N	16351.6733W
		CalVET at			
04/23/05	9:11:05	Depth	CAL 008	5640.0399N	16351.6713W
		CalVET at			
04/23/05	9:23:39	Depth	CAL 009	5639.9803N	16351.9709W
		CalVET at			
04/23/05	9:37:35	Depth	CAL 010	5640.0164N	16352.0276W
04/23/05	9:51:56	CTD at Depth	CTD 005 (BS2 south)	5640.0603N	16352.0196W
		CalVET at			
04/23/05	11:27:42	Depth	CAL 011	5646.0157N	16419.9357W
		CalVET at			
04/23/05	11:39:32	Depth	CAL 012	5646.0850N	16419.9279W

Date (GMT)	Time (GMT)	Button	Notes	NSTAR-LAT	NSTAR-LON
		CalVET at			
04/23/05	11:50:37	Depth	CAL 013	5646.1467N	16419.9105W
04/23/05	12:07:35	CTD at Depth	CTD 006 (BS2 west)	5646.2457N	16419.8745W
		Bongo at			
04/23/05	12:32:23	Depth	BON 004	5646.4370N	16420.1165W
		Bongo at			
04/23/05	14:02:36	Depth	BON 005	5700.7567N	16413.1598W
04/23/05	14:27:35	CTD at Depth	CTD 007 (BS2 north)	5701.1316N	16412.9301W
		CalVET at			
04/23/05	14:46:50	Depth	CAL 014	5701.2976N	16412.7528W
		CalVET at			
04/23/05	14:57:42	Depth	CAL 015	5701.3071N	16412.6546W
		CalVET at			
04/23/05	15:09:59	Depth	CAL 016	5701.4083N	16412.4589W
		Mooring			
04/23/05	16:16:43	Recover	04BSP-2B	5651.5886N	16403.4872W
		Mooring			
04/23/05	20:18:26	Deploy	05BSM-2A	5652.0299N	16403.0592W
		Mooring			
04/23/05	21:44:56	Deploy	05BSP-2A	5651.6120N	16403.5026W
04/23/05	21:57:35	CTD at Depth	CTD 008	5651.6696N	16403.7623W
04/25/05	12:52:50	CB Down	CB Down	5254.8700N	16941.9956W
		Mooring			
04/25/05	16:56:20	Recover	03SG-4A	5240.2335N	16933.9494W
04/25/05	17:31:32	CTD at Depth	CTD 009	5240.8486N	16934.5390W
			Sonobuoy 002		
04/25/05	22:45:12	Notes	Launched	5211.4933N	16816.3869W
04/26/05	11:06:40	CTD at Depth	CTD 010	5113.7685N	17003.7598W
04/26/05	13:57:44	CTD at Depth	CTD 011	5130.8161N	17011.8896W
04/26/05	17:07:22	CTD at Depth	CTD 012	5130.9036N	17011.7920W
04/26/05	20:29:11	CTD at Depth	CTD 013	5145.7309N	17018.5142W
04/26/05	22:54:00	CTD at Depth	CTD 014	5157.1114N	17022.9609W
04/27/05	0:59:17	CTD at Depth	CTD 015	5205.3533N	17028.2684W
04/27/05	2:47:40	CTD at Depth	CTD 016	5212.0635N	17031.7034W
04/27/05	4:31:01	CTD at Depth	CTD 017	5220.0717N	17032.1555W
04/27/05	5:37:01	CTD at Depth	CTD 018	5228.1260N	17033.6706W
04/27/05	10:21:48	CTD at Depth	CTD 019	5227.3084N	17127.1811W
04/27/05	11:50:47	CTD at Depth	CTD 020	5225.4434N	17139.9470W
04/27/05	13:15:09	CTD at Depth	CTD 021	5224.4397N	17155.4420W
04/27/05	14:23:16	CTD at Depth	CTD 022	5222.6362N	17207.6537W
			Sonobuoy 003		
04/27/05	21:21:05	Notes	launched	5155.3714N	17324.7505W
04/27/05	21:55:47	CTD at Depth	CTD 023	5155.0227N	17331.0221W
04/27/05	22:39:01	CTD at Depth	CTD 024	5153.3416N	17332.2061W
04/27/05	23:51:25	CTD at Depth	CTD 025	5150.2622N	17330.2189W
04/28/05	2:08:58	CTD at Depth	CTD 026	5144.8600N	17330.2535W
04/28/05	4:18:17	CTD at Depth	CTD 027	5139.0281N	17331.0456W
04/28/05	6:59:27	CTD at Depth	CTD 028	5129.8038N	17331.2834W
04/28/05	9:57:28	CTD at Depth	CTD 029	5114.0316N	17330.2289W
04/28/05	12:36:03	CTD at Depth	CTD 030	5101.1406N	17329.8357W
04/28/05	15:43:21	CTD at Depth	CTD 031	5043.2737N	17330.2587W

Date (GMT)	Time (GMT)	Button	Notes	NSTAR-LAT	NSTAR-LON
04/28/05	22:25:39	Notes	Sonobuoy 004 launched	5136.0347N	17235.9976W
04/29/05	18:57:09	Mooring Recover	MM3	5359.9505N	17000.0452W
04/29/05	19:41:01	Mooring Deploy	05MM3A	5400.0116N	17000.0344W
04/29/05	20:33:00	CTD at Depth	CTD 032	5400.0152N	16959.8709W
04/30/05	3:34:48	Drifter Deploy	ARGOS APEX 1782	5452.1450N	16934.3919W
04/30/05	8:10:24	Drifter Deploy Mooring	ARGOS APEX 1781	5535.5297N	16959.5735W
04/30/05	10:13:20	Deploy	05MM4A	5554.0371N	16952.0238W
04/30/05	14:52:44	CTD at Depth Mooring	CTD 033	5616.5604N	16941.4032W
04/30/05	17:39:38	Recover	04PI-7A	5616.0001N	16942.6465W
04/30/05	18:45:20	CTD at Depth	CTD 034	5617.0701N	16941.6124W
04/30/05	19:20:26	Bongo at Depth	BON 006	5617.2817N	16941.9196W
05/01/05	13:01:06	Bongo at Depth	BON 007	5738.8279N	16900.9907W
05/01/05	13:23:20	CTD at Depth	CTD 035 (south)	5739.0373N	16900.8461W
05/01/05	13:45:21	CalVET at Depth	CAL 017	5739.3648N	16901.5484W
05/01/05	13:56:56	CalVET at Depth	CAL 018	5739.1738N	16901.5500W
05/01/05	14:10:17	CalVET at Depth	CAL 019	5738.8955N	16901.8150W
05/01/05	15:49:15	CTD at Depth	CTD 036	5750.5750N	16852.5336W
05/01/05	16:31:30	Mooring Recover	04BS-4B	5750.9594N	16852.1546W
05/01/05	19:22:32	Mooring Deploy	05BS-4A	5751.1927N	16852.1834W
05/01/05	20:03:21	CalVET at Depth	CAL 020	5751.1821N	16852.1889W
05/01/05	21:59:55	CalVET at Depth	CAL 021	5751.6766N	16852.1210W
05/01/05	22:12:37	CalVET at Depth	CAL 022	5751.7243N	16852.0323W
05/01/05	22:51:38	Mooring Deploy	05BSP-4A	5751.5258N	16851.5325W
05/01/05	23:04:20	Bongo at Depth	BON 008	5751.4921N	16852.0321W
05/01/05	23:31:19	CTD at Depth	CTD 037	5751.4406N	16851.7911W
05/02/05	1:02:39	Bongo at Depth	BON 009	5745.7187N	16827.9723W
05/02/05	1:24:47	CTD at Depth	CTD 038 (east)	5745.8599N	16827.9716W
05/02/05	1:48:02	CalVET at Depth	CAL 023	5746.0452N	16828.2031W
05/02/05	1:57:25	CalVET at Depth	CAL 024	5745.9966N	16828.4760W
05/02/05	2:09:30	CalVET at Depth	CAL 025	5745.8456N	16828.7241W
05/02/05	4:03:45	CalVET at Depth	CAL 026	5804.0978N	16843.7348W

Date (GMT)	Time (GMT)	Button	Notes	NSTAR-LAT	NSTAR-LON
05/02/05	4:17:46	CalVET at Depth	CAL 027	5803.9956N	16843.8210W
05/02/05	4:27:45	CalVET at Depth	CAL 028	5804.1124N	16844.0105W
05/02/05	4:42:13	CTD at Depth Bongo at	CTD 039 (north)	5803.9151N	16843.9489W
05/02/05	5:02:46	Depth Bongo at	BON 010	5804.1072N	16843.6715W
05/02/05	7:05:01	Depth	BON 011	5755.6602N	16919.4732W
05/02/05	7:24:05	CTD at Depth CalVET at	CTD 040 (west)	5755.6042N	16919.3173W
05/02/05	7:42:29	Depth CalVET at	CAL 029	5755.6902N	16919.5972W
05/02/05	7:53:33	Depth CalVET at	CAL 030	5755.7702N	16919.6411W
05/02/05	8:02:17	Depth	CAL 031	5755.8433N	16919.7033W
05/02/05	22:03:17	CTD at Depth Mooring	CTD 041	5953.9431N	17142.5843W
05/02/05	22:53:48	Recover Mooring	04BSP-5A	5953.8921N	17142.7756W
05/02/05	23:28:08	Deploy Mooring	05BSP-5A	5953.9221N	17142.8888W
05/03/05	2:48:29	Deploy	05BS-5A	5954.3224N	17142.3329W
05/03/05	3:18:59	CTD at Depth CalVET at	CTD 042	5954.5817N	17141.6206W
05/03/05	3:44:04	Depth CalVET at	CAL 032	5954.4529N	17141.4267W
05/03/05	3:51:40	Depth CalVET at	CAL 033	5954.4044N	17141.4345W
05/03/05	3:59:18	Depth	CAL 034	5954.3449N	17141.4546W
05/03/05	6:04:11	CTD at Depth CalVET at	CTD 043 (east)	5952.0596N	17126.7991W
05/03/05	6:21:23	Depth CalVET at	CAL 035	5951.9442N	17127.1088W
05/03/05	6:32:54	Depth CalVET at	CAL 036	5951.8820N	17127.3213W
05/03/05	6:40:11	Depth Bongo at	CAL 037	5951.8459N	17127.4954W
05/03/05	7:06:12	Depth	BON 012	5951.5690N	17128.1567W
05/03/05	16:22:55	CTD at Depth CalVET at	CTD 044 (south)	5941.6302N	17129.7156W
05/03/05	17:02:53	Depth CalVET at	CAL 039	5941.0263N	17130.1257W
05/03/05	17:13:38	Depth CalVET at	CAL 040	5940.8437N	17130.1753W
05/03/05	22:26:13	Depth	CAL 038 AT1649	5939.0793N	17223.1985W
05/04/05	0:10:00	CTD at Depth CalVET at	CTD 045 (west)	5942.9703N	17219.1696W
05/04/05	0:28:36	Depth CalVET at	CAL 041	5942.7303N	17219.1401W
05/04/05	0:39:13	Depth CalVET at	CAL 042	5942.6094N	17219.2893W
05/04/05	0:46:13	Depth	CAL 043	5942.6010N	17219.4794W

Date (GMT)	Time (GMT)	Button	Notes	NSTAR-LAT	NSTAR-LON
		Bongo at			
05/04/05	1:42:02	Depth	BON 013	5942.3575N	17219.9373W
05/04/05	2:50:13	Drifter Deploy	ARGOS 53296	5938.4272N	17220.7352W
05/04/05	3:03:51	CB Down	CB Down	5937.0677N	17219.7861W
		Bongo at			
05/04/05	10:15:04	Depth	BON 014	5919.0838N	17024.3364W
05/04/05	10:41:33	CTD at Depth	CTD 046	5919.0070N	17024.0822W
		Bongo at			
05/04/05	14:36:39	Depth	BON 015	5840.9697N	17011.2200W
05/04/05	14:54:35	CTD at Depth	CTD 047	5840.9644N	17011.0999W
		Bongo at			
5/4/2005	17:58:55	Depth	BON 016	5812.9876N	16951.0569W
5/4/2005	18:17:07	CTD at Depth	CTD 048	5812.8567N	16950.8266W
05/05/05	15:44:57	CTD at Depth	CTD 049	5639.0758N	17004.7970W
05/05/05	15:45:02	CB Down	CB Down	5639.0757N	17004.7947W
		Mooring			
05/05/05	21:32:45	Recover	04PIP-2A	5639.4904N	17004.7268W
		Bongo at			
05/05/05	21:56:46	Depth	BON 017	5639.6994N	17005.3969W
05/05/05	22:23:27	CTD at Depth	CTD 050	5639.3017N	17004.8255W
05/06/05	10:20:26	CTD at Depth	CTD 051	5420.0243N	16949.8056W
05/06/05	13:20:29	CTD at Depth	CTD 052	5402.1687N	16932.8552W
05/06/05	16:07:34	CTD at Depth	CTD 053	5346.6367N	16915.5828W
05/06/05	18:31:10	CTD at Depth	CTD 054	5335.8552N	16903.5234W
05/06/05	20:21:19	CTD at Depth	CTD 055	5330.9140N	16854.9056W
05/06/05	22:05:51	CTD at Depth	CTD 056	5324.6464N	16850.6472W
05/06/05	23:16:31	CTD at Depth	CTD 057	5322.0565N	16841.3902W

Figure 1: Station Map

