

CRUISE REPORT**Cruise: MF-05-13****Vessel: NOAA Ship *Miller Freeman*****Area of Operations:** Bering Sea and Gulf of Alaska**Itinerary:** 21 Sept. 2005, Depart Dutch Harbor, AK.
04 Oct. 2005, Arrive Dutch Harbor, AK.**Participating Organizations:** NOAA/PMEL/OERD
Univ. of Alaska Fairbanks
Scripps Institution of Oceanography**Chief Scientist:** William Floering NOAA/PMEL/OERD**Personnel:** Carol DeWitt (PMEL)
Steve Smith (PMEL)
Peter Proctor (PMEL)
Dylan Righi (PMEL)
Michael Dunlap (PMEL)
Sarah Thornton (Univ. of Alaska Fairbanks)
Allan Sauter (Scripps Institution of Oceanography)**Cruise Objectives:** To recover and deploy oceanographic instrumentation moorings at several Bering Sea locations. To complete CTD casts taking nutrient and chlorophyll samples along the 70 meter isobath in the Bering Sea. To complete Bongo and CalVET sampling in the vicinity of the deployed moorings and to attempt to recover marine mammal hydrophone recorders and the failed release Alaska Stream mooring: GSP-9.**Summary of Operations:**

CTD Casts	77
Chlorophyll Samples	437
Nutrient Samples	578
Salinity Samples	71
Bongo Tows	14
CalVET Tows	24
Sub-Surface Moorings deployed	12
Surface Mooring recovered	1
Sub-Surface moorings recovered	7
Mileage Run	2186

Cruise Summary:

Two 40 foot containers were shipped to Dutch Harbor prior to NOAA Ship *Miller Freeman*'s arrival. The containers were offloaded by FTS in Dutch Harbor and the contents trucked to the ship. Equipment was secured on the ship and we departed Dutch Harbor at 1200 local time on the 21st of Sept., 2005.

NOAA Ship *Miller Freeman* steamed north to the PMEL long term sampling station mooring 05-BS-2. High winds and seas were experienced upon arrival at BS-2, precluding safe conduct of mooring operations. In an effort to remain on schedule we completed CTD casts, Bongo Tows and CalVET tows in the vicinity of mooring BS-2. By the morning of Sept. 23rd the winds had dropped from 40 knots to 20 knots and we were able to begin mooring operations. The ADCP profiler mooring was recovered and replaced with a similar mooring. The surface mooring at BS-2 was recovered and replaced with a subsurface instrumentation mooring for the winter deployment. As per standard operating procedures a CTD cast was completed prior to recovery and following deployment of the moorings. Upon completion of all operations at mooring site BS-2 we headed north along the 70 meter isobath towards PMEL long term sampling location, BS-4. CTD casts with nutrient and chlorophyll samples were taken approximately every 10 nautical miles along the 70 meter isobath contour.

We arrived at mooring site BS-4 mid-day on Sept. 25th. Mooring 05-BS-4A was recovered and replaced with a similar sub-surface instrumentation mooring, 05-BS-4B. Shortly after BS-4A was deployed last spring, *Miller Freeman* accidentally ran over the mooring site, catching the top float in the ship's prop. When the mooring was recovered it showed damage well below the top float. It appears the propeller blade caught under the 30 inch metal float, lifting it up enough for the next couple blades to also hit and damage the mooring. The shock and concussion from the prop blades broke the mounting brackets on a SeaCat and it fell to the ocean bottom. The 30 inch metal float is damaged and can not be deployed again, 3 instrument cages were also damaged. Damage to a Seabird temperature sensor, two SBE39s and the ISUS nitrate meter will be assessed at the lab and or the manufacturer's facility. In addition to the damage to 05-BS-4A, the ADCP profile mooring could not be located. I completed a small search covering the area within 2 miles of the moored location but there was no response from the release. Three possibilities come to mind in an attempt to explain why this mooring could not be located. 1) The release failed, 2) The mooring was moved by a fisherman, or 3) Something between the release and the anchor failed and the mooring drifted away. At this point exactly what happened is just speculation; a more extensive search will take place when we revisit this site in spring 2006. A new 05-BSP-4B ADCP mooring was placed near 05-BS-4B. Following the mooring deployments the CTD, Bongo, and CalVET sampling at the center and the 4 corner sampling stations were completed.

Miller Freeman headed north again to mooring site BS-5. As we proceeded, CTD casts were completed approximately 10 nautical miles apart along the 70 meter contour.

We arrived at mooring site BS-5 the afternoon of Sept. 26th. 05-BSP-5A and 05-BS-5A were successfully recovered. An interesting side note to the recovery of 05-BS-5A; this

mooring was deployed with surface ice coverage in excess of 80 percent at times. At sea a trial break away top float was installed on the mooring with the idea that it would break off if the ice started to move the mooring. When recovered this mooring was 2.8 km from the deployed position and the top float had broken off as planned. Replacement moorings 05-BSP-5B and 05-BS-5B were deployed with shallower top floats to avoid the winter ice. The center CTD and Bongo sampling stations were completed along with 3 of the 4 corner stations. CalVET sampling was halted due to torn nets. The 4th station was dropped due to time lost to weather and expectations for arriving at the next mooring location during daylight hours for recoveries.

Following the corner station sampling, *Miller Freeman* steamed north once again in the direction of mooring site BS-8, south of St. Lawrence Island. En route, CTD casts with nutrient and chlorophyll samples were completed at 10 nautical mile spacing along the 70 meter contour.

The ship arrived at mooring site BS-8 the evening of Sept. 28th. Moorings 05-BSP-8A and 05-BS-8A were successfully recovered. Replacement moorings with shallower top floats to avoid the winter ice were deployed (05-BSP-8B and 05-BS-8B). The center CTD/Bongo sampling station was completed along with an unsuccessful search for a lost mooring presumed to have been moved by the ice. This search was conducted southwest of where the original mooring was deployed. Last year aboard R/V *Alpha Helix*, an unsuccessful search was conducted northwest of where the mooring was originally deployed.

This lost mooring search concluded the work at the northern most sampling site. *Miller Freeman* steamed south to mooring location BS-5 to conduct a search for another missing mooring presumed to have been taken by the winter ice. Again the search was conducted in the area southwest of where the mooring was originally deployed. The search was unsuccessful in locating this lost mooring.

Miller Freeman steamed south. We passed by the MM4 marine mammal mooring, arriving at the MM3 marine mammal mooring during daylight hours on Sept. 30th. [The representative from Scripps was not willing to try a night recovery at MM4 and we did not have time in the schedule to wait several hours until daylight.] MM3 was located and recovered. From here, *Miller Freeman* steamed southwest to Amukta Pass. Once again we were looking at interruptions and delays due to impending storms. The 4 sub-surface moorings across Amukta pass were successfully deployed and each was followed by a CTD cast. Following the Amukta Pass work we steamed east to the location of the missing GSP-9 mooring. For review, there were 4 deep water moorings placed across the Alaska Stream in 2004. 3 of the 4 came back with no problems. The Benthos release at GSP-9 gave unintelligible readings for enable and ranging during our first attempt to recover. On subsequent recovery attempts there have been no communication at all with the release. During a MACE cruise earlier this year, NOAA Ship *Oscar Dyson* completed a small search hoping to see the top syntactic foam float on the ships acoustic fisheries equipment. On a couple of passes a target was located at approximately 600 meters depth and one half mile from where the last deployment was made. This target

could be seen on subsequent passes over the area but with a failed release it was the only possible location we had to work with. Using this acoustically located position we paid out 2600 meters of 7/16th inch wire terminated in heavy chain and 2 large drag hooks. We spent several hours towing around the point, across the point and near the point but had no luck in snagging the mooring. The weather blew up to 40-50 knots the evening of Oct. 2nd; we hove to into the seas until morning. The forecast indicated the weather would die down early on the 3rd but that was not the case. At noon on Oct. 3rd it was clear we would not see calm enough weather to safely recover the mooring if we did happen to snag it so the decision was made to steam toward Dutch Harbor. On the way to the scheduled arrival in Dutch Harbor the morning of Oct. 4th we traveled to marine mammal mooring site MM2. During the spring PMEL/FOCI cruise, Scripps personnel attempted to release this mooring. They never confirmed a release nor had accurate ranging on this mooring. In hindsight it appears the settings in the acoustic deck set were changed, cutting out the receive function of the set. The purpose of re-visiting this site was to confirm that the mooring was in fact not responding and the release was either dead or the package had been released and drifted away undetected. After a number of attempts to wake the release the representative from Scripps was convinced this mooring was not coming back. From this location slightly north of the Aleutian chain we steamed south to the port of Dutch Harbor arriving around 0700 the morning of Oct. 4th.

This was the last scheduled 2005 Alaska cruise for *Miller Freeman* so all equipment was left aboard the ship for transport to Seattle.

The ship arrived in Seattle on Monday Oct. 10th and was offloaded by PMEL personnel on Tuesday Oct. 11th. Equipment left aboard by Univ. of Alaska Fairbanks and Scripps was shipped from Seattle.

Details of Operations: Times and Dates are GMT

Event:	Date:	Time	Lat. N	Long.W	Depth (M)
Depart DH	9/21	2000			
CTD001	9/22	1406	56 56.45	163 51.04	71
BON001	9/22	1441	56 56.176	163 49.168	71
BON002	9/22	1508	56 56.586	163 50.095	71
CTD002	9/22	1707	56 52.597	164 03.328	72
BON003	9/22	1731	56 52.406	164 03.090	72
CalVet1	9/22	1800	56 52.489	164 03.46	72
CalVet2	9/22	1814	56 52.489	164 03.20	72
CalVet3	9/22	1825	56 52.479	164 03.02	72
CTD003	9/22	2042	56 40.044	163 51.77	71
CalVet4	9/22	2102	56 39.921	163 51.56	71
CalVet5	9/22	2115	56 39.994	163 51.86	71
CalVet6	9/22	2124	56 39.895	163 51.77	71
BON003	9/22	2143	56 39.897	163 51.45	71
CTD004	9/22	2348	56 45.850	164 19.95	71

BON004	9/23	0010	56 46.020	164 19.99	71
CalVet7	9/23	0033	56 45.852	164 19.688	71
CalVet8	9/23	0044	56 46.145	164 20.011	70
CalVet9	9/23	0055	56 46.122	164 19.941	71
CTD005	9/23	0228	57 00.794	164 13.136	71
CalVet10	9/23	0241	57 00.898	164 12.943	72
CalVet11	9/23	0313	57 00.829	164 13.094	71
CalVet12	9/23	0323	57 00.789	164 13.271	71
BON005	9/23	0336	57 00.956	164 13.053	71
CTD006	9/23	0522	56 49.945	164 18.819	70
CTD007	9/23	0629	56 50.969	164 34.150	70
CTD008	9/23	0745	56 54.507	164 50.219	70
CTD009	9/23	0925	56 53.600	165 08.098	70
CTD010	9/23	1044	56 59.995	165 22.962	70
CTD011	9/23	1209	56 06.353	165 36.851	70
Rec05BSP2A	9/23	1741	56 51.741	164 03.63	71
Dep05-BSP.2B	9/23	1855	56 51.628	164 03.53	71
Dep05BS2C	9/23	2115	56 51.786	164 02.903	71
CTD012	9/23	2136	56 51.383	164 02.498	72
REC05BSM2A	9/23	2225	56 52.123	164 03.002	72
CTD013	9/24	0029	56 53.971	164 01.446	71
CTD014	9/24	0620	57 15.757	165 44.964	68
CTD015	9/24	0728	57 19.237	166 00.801	69
CTD016	9/24	0844	57 19.338	166 19.595	69
CTD017	9/24	1004	57 26.610	166 31.360	69
CTD018	9/24	1129	57 25.498	166 48.495	69
CTD019	9/24	1241	57 31.301	167 02.463	69
CTD020	9/24	1405	57 29.995	167 20.992	69
CTD021	9/24	1528	57 30.031	167 40.264	70
CTD022	9/24	1648	57 30.036	167 59.476	70
CTD023	9/24	1807	57 30.116	168 18.301	70
CTD024	9/24	1958	57 31.499	168 36.809	70
CTD025	9/24	2110	57 37.745	168 49.267	70
CTD026	9/24	2220	57 47.824	168 51.569	70
CTD027	9/24	2252	57 50.854	168 50.281	70
Rec05BS4A	9/24	2345	57 51.110	168 51.929	70
Dep05BS4B	9/25	0336	57 51.210	168 52.211	71
Dep05BSP4B	9/25	0434	57 51.649	168 52.624	70
CTD028	9/25	0450	57 51.830	168 53.304	71
BON006	9/25	0526	57 51.613	168 53.016	70
CalVet13	9/25	0548	57 51.719	168 52.956	70
CalVet14	9/25	0614	57 51.361	168 52.890	70
CalVet15	9/25	0623	57 51.194	168 52.937	71
CTD029	9/25	1122	58 03.968	168 43.803	70
Bon007	9/25	1147	58 04.008	168 43.488	69
CalVet16	9/25	1218	58 04.061	168 43.672	69

CalVet17	9/25	1237	58 03.814	168 43 656	70
CalVet18	9/25	1254	58 03.691	168 43.479	69
CTD030	9/25	1447	57 45.989	168 28.237	70
CalVet19	9/25	1510	57 46.040	168 28.413	69
CalVet20	9/25	1529	57 45.848	168 28.565	69
CalVet21	9/25	1543	57 45.645	168 28.514	70
Bon008	9/25	1605	57 45.616	168 28.215	69
CTD031	9/25	1812	57 39.255	169 01.297	69
Bon009	9/25	1835	57 38.947	169 02.026	69
CalVet22	9/25	1901	57 39.404	169 01.410	68
CalVet23	9/25	1918	57 39.360	169 01.449	69
CalVet24	9/25	1931	57 39.348	169 01.449	67
CTD032	9/25	2121	57 55.650	169 19.221	68
Bon010	9/25	2143	57 55.476	169 18.986	66
CTD033	9/25	2218	57 58.449	169 21.483	68
CTD034	9/25	2332	58 02.769	169 38.902	70
CTD035	9/26	0058	58 08.623	169 54.706	70
CTD036	9/26	0207	58 16.894	170 05.258	70
CTD037	9/26	0320	58 26.723	170 10.868	73
CTD038	9/26	0448	58 36.456	170 16.236	71
CTD039	9/26	0606	58 46.832	170 17.788	70
CTD040	9/26	0721	58 57.023	170 19.740	69
CTD041	9/26	0832	59 06.659	170 14.434	68
CTD042	9/26	0938	59 15.572	170 22.648	67
CTD043	9/26	1046	59 19.770	170 39.891	70
CTD044	9/26	1151	59 25.851	170 53.295	71
CTD045	9/26	1300	59 35.810	170 54.914	71
CTD046	9/26	1406	59 43.063	171 08.282	71
CTD047	9/26	1515	59 46.788	171 27.170	71
CTD048	9/26	1622	59 49.670	171 46.332	73
CTD049	9/26	1733	59 50.854	172 06.429	74
CTD050	9/26	1903	59 53.538	171 42.697	70
Bon010	9/26	1924	59 53.681	171 42.477	70
Rec05BS5A	9/26	2003	59 53.365	171 45.131	70
Rec05BSP5A	9/26	2117	59 54.123	171 43.603	70
Dep05BSP5B	9/26	2156	59 53.937	171 42.916	70
Dep05BS5B	9/26	2339	59 54.314	171 42.388	69
CTD051	9/26	2355	59 54.449	171 43.279	69
CTD052	9/27	0123	59 42.107	171 29.817	73
Bon012	9/27	0143	59 42.060	171 30.025	72
CTD053	9/27	0308	59 53.812	171 15.340	70
Bon013	9/27	0328	59 53.799	171 15.849	71
CTD054	9/27	0550	60 04.539	171 59.979	65
Bon014	9/27	0614	60 04.563	172 00.231	63
CTD055	9/27	0730	59 53.879	172 09.878	72
Bon015	9/27	0749	59 53.794	172 10.144	73

CTD056	9/27	0842	59	54.345	172	25.489	73
CTD057	9/27	0946	59	59.194	172	43.521	69
CTD058	9/27	1051	60	03.013	173	01.841	68
CTD059	9/27	1155	60	07.058	173	19.476	70
CTD060	9/27	1304	60	15.411	173	31.194	69
CTD061	9/27	1407	60	25.232	173	35.502	65
CTD062	9/27	1516	60	35.260	173	39.383	69
CTD063	9/27	1630	60	45.609	173	39.796	73
CTD064	9/27	1741	60	54.514	173	48.911	80
CTD065	9/27	1855	61	04.728	173	46.062	77
CTD066	9/27	2004	61	14.562	173	42.799	73
CTD067	9/27	2113	61	24.928	173	41.945	74
CTD068	9/27	2221	61	35.154	173	42.009	72
CTD069	9/27	2324	61	44.354	173	51.217	71
CTD070	9/28	0029	61	52.627	174	02.500	71
CTD071	9/28	0144	61	56.484	174	21.994	73
CTD072	9/28	0329	62	11.310	174	41.287	73
REC5BSP8	9/28						
REC5BS8A	9/28						
DEP5BSP8B	9/28	0650	62	11.731	174	39.599	73
DEP5BS8B	9/28	0817	62	11.644	174	40.040	72
CTD073	9/28	0837	62	11.981	174	40.221	73
Bon016	9/28	0856	62	12.217	174	40.291	73
RECM3A	9/30	2121	53	59.907	170	00.024	1500
DEP5AMP4A	10/01	1635	52	22.998	172	07.014	287
CTD074	10/01	1655	52	23.030	172	07.014	361
DEP5AMP3A	10/01	1811	52	24.003	171	55.006	273
CTD075	10/01	1829	52	23.842	171	55.226	312
DEP5AMP2A	10/01	1954	52	24.991	171	40.009	450
CTD076	10/01	2019	52	24.996	171	40.847	460
DEP5AMP1A	10/01	2134	52	25.992	171	27.023	408
CTD077	10/01	2200	52	26.591	171	28.392	457
Drag Ops GSP9	10/02	1600-2400					4500
Hold for WX	10/03						
Search MM2	10/04	1000-1130					1800
Arrive Dutch Harbor	10/04	1500		End Cruise MF-05-13			

General Observations:

High winds and seas made conditions unsafe for mooring operations during the first 1-2 days of the cruise. By continuing to complete CTD casts, Bongo and CalVET tows in 35 knots of wind we were able to minimize the time lost to weather. The weather blew up again near the end of the cruise leading to the cancellation of a second day of dragging operations at the lost mooring GSP-9A.

It would be helpful if the vessel's OODs could be more consistent and diligent when making entries in the electronic MOA. The MOA record keeping system has been greatly simplified to minimize the impact on the OOD. Often this entry is the only record of time, position and depth associated with a given cruise event.

Overall, the staff of NOAA Ship *Miller Freeman* and the PMEL science party performed at the highly proficient level we have come to expect from one of the hardest working vessels in the NOAA fleet.