

MF-94-01 Cruise Report

NOAA Ship MILLER FREEMAN

NOAA/Pacific Marine Environmental Laboratory (PMEL)

NOAA/Alaska Fisheries Science Center (AFSC)

1.0 INTRODUCTION

1.1 Fisheries-Oceanography Coordinated Investigations (FOCI) is a joint effort by scientists at PMEL and AFSC to understand the biological and physical processes that cause variability of recruitment to commercially valuable fish and shellfish stocks in Alaskan waters. The FOCI program is presently studying the effects of the biotic and abiotic environment on the early life stages of walleye pollock spawned in Shelikof Strait and the Bering Sea, their transport and mortality, and the role of physical oceanographic conditions in maintaining stock structure. There are two aspects to the study: the acquisition and analysis of time-series data, and specific research topics to be covered on a cruise-by-cruise basis.

Cruise MF-94-01 was conducted aboard the NOAA ship MILLER FREEMAN during the period between February 15 - 26, 1994. The following were the objectives for this cruise:

- to deploy 13 current-meter moorings - 9 in the Gulf of Alaska and 4 in the Bering Sea
- to recover 3 current-meter moorings on the Bering Shelf
- to conduct 4 CTD transects
- to conduct 5 bongo tows for microzooplankton
- to test the Simrad EK500 echosounder system

2.0 CHRONOLOGY

Depart Kodiak	15 February
Deploy moorings 9437, 9436, 9434, and 9432, deploy drifter	16-17 February
Deploy moorings 9403, 9402, 9401	17-18 February
Deploy mooring 9443	18 February
Recover/deploy Pavlof Bay mooring	19 February
Recover BSSE-1, bongo	20 February
CTD/bongo on Bering slope	20 February
Deployed PEGGY94, bongos	21 February
Recover BSSE-3, BSSE-4	21-22 February
Deploy drifters	24 February
Weather days	23-25 February
Arrive Dutch Harbor	26 February

3.0 SCIENTIFIC PERSONNEL

<u>Name</u>	<u>Title</u>	<u>Organization</u>
Carol DeWitt	Field Ops Specialist	PMEL/NOAA
Dave Kachel	Computer Programmer	PMEL/NOAA
Rick Miller	Machinist	PMEL/NOAA
Bill Parker	Field Ops Manager	PMEL/NOAA
Dan Twohig	Electronics Technician	AFSC/NOAA

4.0 OPERATIONS

Summary

Acoustic Doppler Current Profiler (ADCP): The ship mounted ADCP was operated during the entire cruise. Due to time and weather limitations, a backtrack-L was not run.

Bongos: During MF-94-01 four bongo casts were taken using both the 60 and 20 cm bongo nets. Mesh size was 153 μm and hard codends were used. A Sea-Bird Seacat was attached to the winch wire above the bongo frames. Bongo casts were taken to within approximately 10 m of the bottom or 400 m, whichever was shallower. The Seacat transmitted pressure, temperature and conductivity in real-time and recorded data internally. The biological samples collected in the bongo were preserved in formalin. The bongo sites were at BSSE-1 (one), the Bering slope (one), and PEGGY94 (two). The bongo at Unimak Pass, listed in the cruise instructions, was cancelled to ensure that the ship arrived at the BSSE-1 mooring recovery site during daylight hours.

CTD Casts: A total of sixteen CTDs were conducted using the PMEL Sea-Bird CTD. Thirteen of the CTD casts were taken with a Biospherical QSR-200L light meter and a Sea Tech FLO500 Fluorometer attached to the CTD. At three stations (9434, 9432, 9403), duplicate CTD casts were done in order to obtain CHLAM (chlorophyll absorption meter) data (no fluorometer data was recorded during these duplicate casts). CTDs were located to calibrate sensors on the moorings. A CTD cast was conducted before the recovery and after the deployment of each mooring (an exception is the Pavlof Bay mooring - the AFSC Kodiak Lab requested XBTs instead of CTDs). CTD casts were taken to within approximately 10 m of the bottom except at PEGGY94 which was taken to 400 m.

Chlorophyll and nutrient samples were collected at stations 9401, 9402, 9443, BSSE-1, Bering Slope and PEGGY94. Spectral absorption samples were taken at BSSE-1 (10 m), Bering Slope CTD station (10 m), and at PEGGY94 (10 and 40 m). In order to obtain calibration data for the CTD, salinity samples were collected at thirteen stations and reversing thermometers at ten stations.

Drifters: Three drifters were deployed - one at Gore Point between moorings 9432 and 9434 and two southeast of Amukta Pass. These were satellite-tracked drifters manufactured by Seimac. They were drogued at 40 m. Deployment of the drifters was complicated by the water/moisture dissolving tape which in theory was suppose to hold the buoy together until deployed in the water, but in practice started falling apart while on deck. However, overall the deployments appeared to be successful.

Moorings: A total of ten moorings were deployed. Four were located in a line off of Gore Point (9432, 9434, 9436, 9437), three in the vicinity of Line 8 (9401, 9402, 9403), one near Sutwik Island (9443), one in Pavlof Bay (for the Kodiak Crab lab), and one near Bristol Canyon (PEGGY94). All deployments occurred without incident. Three additional moorings (94B01, 94B02, 94B03) listed in the cruise instructions were not deployed due to extended adverse weather conditions.

A total of four moorings were recovered. One was recovered from Pavlof Bay. The mooring had been deployed on July 16, 1992 by PMEL/MILLER FREEMAN for the AFSC Kodiak Lab . It had three TempMentor sensors (18, 58, 98 m). The sensors were returned to P. Anderson/AFSC Kodiak Lab. The three remaining moorings had been deployed in mid-September 1993 by PMEL/SURVEYOR for the Bering Shelf/Slope Exchange Experiment. The moorings were originally scheduled to be deployed for one year, but were recovered earlier due to intense fishing pressure in the area. Each of the moorings had one Neil Brown current meter (at approximately 50 m.) and one Aanderaa current meter (at approximately 190 m).

Acknowledgments: My sincere appreciation to the officers and crew of the MILLER FREEMAN under the leadership of Captain Pawlowski.

5.0 CRUISE STATISTICS

Bongo/Seacats, 60/20 cm	4
Chlorophyll samples	39
CTDs w/light meter and fluorometer	13
CTDS w/light meter and CHLAM	3
Drifters	3
Mooring deployments	10
Mooring recoveries	4
Nutrient samples	46
Salinity samples	13
Spectral absorption samples	3

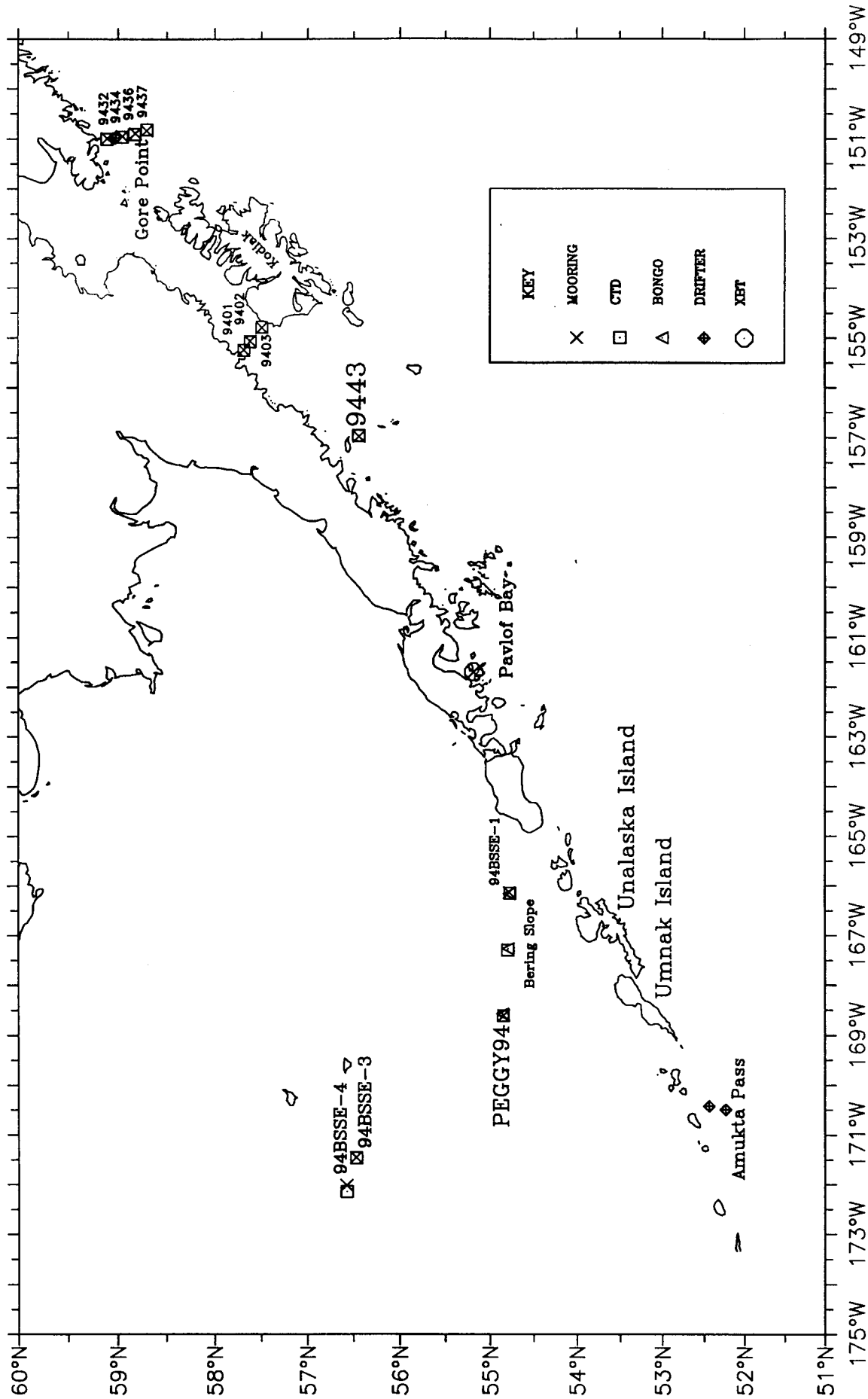


Table 1.
Summary of MF-94-01 Mooring Deployments and Recoveries

	Deployment	Deployment	Deployment	Deployment	Deployment	Deployment
Mooring I.D.	9432	9434	9436	9437	9401	9402
Location	Gore Point 59° 06.34' N 150° 59.49' W	Gore Point 58° 57.31' N 150° 56.57' W	Gore Point 58° 49.41' N 150° 53.35' W	Gore Point 58° 42.42' N 150° 50.14' W	Line 8 57° 41.30' N 155° 14.93' W	Line 8 57° 37.20' N 155° 04.42' W
Duration	2/94 - 10/94	2/94 - 10/94	2/94 - 10/94	2/94 - 10/94	2/94 - 10/94	2/94 - 10/94
Depth (m)	153	142	188	188	296	248
Instruments	Aanderaa 33 m Aanderaa 73 m Aanderaa 113 m Aanderaa 138 m	Aanderaa 32 m Aanderaa 72 m Aanderaa 112 m Aanderaa 127 m	Aanderaa 33 m Aanderaa 73 m Aanderaa 113 m Aanderaa 173 m	Aanderaa 33 m Aanderaa 73 m Aanderaa 113 m Aanderaa 173 m	ChIAM* 6 m Aanderaa 26 m Aanderaa 66 m Aanderaa 106 m Aanderaa 281 m	ChIAM 10 m ChIAM* 15 m Aanderaa 30 m Aanderaa 70 m Aanderaa 110 m Aanderaa 15 m above bottom
Release	one release	one release	one release	one release	two releases	two releases

*Acoustic release placed between ChIAM and first current meter for early recovery

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Summary of MF-94-01 Mooring Deployments and Recoveries

	Deployment	Deployment	Recovery/deployment	Recovery	Recovery	Recovery
Mooring I.D.	9403	9443		BSSE-1	BSSE-3	BSSE-4
Location	Line 8 57° 29.63' N 154° 48.00' W	SW Shelf 56° 26.52' N 156° 58.67' W	Pavlof Bay 55° 11.24' N 161° 41.98' W	Bering Slope Shelf 54° 46.61' N 166° 8.53' W	Bering Slope Shelf 56° 28.30' N 171° 27.53' W	Bering Slope Shelf 56° 34.50' N 172° 1.32' W
Duration	2/94 - 10/94	2/94 - 6/94	9/92 - 2/94	9/93 - 2/94	9/93 - 2/94	9/93 - 2/94
Depth (m)	202	102	101	197	196	210
Instruments	Aanderaa 32 m Aanderaa 72 m Aanderaa 112 m Aanderaa 187 m	ChIAM 12 m Neil Brown 22 m	Temp. sensor 18 m Temp. sensor 58 m Temp. sensor 96 m (deploy 3 temp sensors)	Neil Brown 46 m Aanderaa 181 m	Neil Brown 50 m Aanderaa 185 m	Neil Brown 55 m Aanderaa 190 m
Release	one release	one release	EG&G 8242 Kodiak Crab Lab.	Oceano 191	Oceano RT-121BC	Oceano RT-121BC

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	Deployment	
Mooring I.D.	PEGGY94	
Location	54° 50.50' N 168° 36.35' W	
Duration	2/94 - 9/94	
Depth (m)	2316	
Instruments	ADCP	surface
	Seacat	surface
	SPAAM	10 m
	MTR	10 m
	ACM-2	14 m
	Seacat	15 m
	MTR	22 m
	Seacat	30 m
	ACM-2	38 m
	CHLAM	38 m
	Seacat	39 m
	MTR	50 m
	Seacat	62 m
	MTR	70 m
	ACM-2	78 m
	Seacat	79 m
	Seacat	102 m
	ACM-2	150 m
	Seacat	151 m
	MTR	225 m
	ACM-2	302 m
	Seacat	303 m
	Seacat	500 m
	MTR	700 m
Release	two releases	

NOAA SHIP MILLER FREEMAN R223

MF-94-01

From Seattle, WA

To Dutch Harbor, AK

Date	JD	Time (GMT)	Station	Activity	Latitude	Longitude	Depth (m)
16 FEB	047	1926	001	Deployed mooring 9437	58° 42.42' N	150° 50.14' W	188
16 FEB	047	1952	001	CTD at 9437	58° 42.25' N	150° 49.08' W	194
16 FEB	047	2241	002	Deployed mooring 9436	58° 49.41' N	150° 53.35' W	188
16 FEB	047	2309	002	CTD at 9436	58° 49.77' N	150° 54.39' W	163
17 FEB	048	0127	003	Deployed mooring 9434	58° 57.31' N	150° 56.57' W	142
17 FEB	048	0154	003	CTD at 9434	58° 57.56' N	150° 57.61' W	156
17 FEB	048	0225	003	CTD with CHLAM at 9434	58° 57.45' N	150° 57.13' W	134
17 FEB	048	0257	004	Deployed drifter S/N 7160	59° 01.70' N	150° 58.59' W	171
17 FEB	048	0408	005	Deployed mooring 9432	59° 06.34' N	150° 59.49' W	153
17 FEB	048	0434	005	CTD at 9432	59° 06.50' N	151° 00.11' W	143
17 FEB	048	0457	005	CTD with CHLAM at 9432	59° 06.49' N	151° 00.13' W	144
17 FEB	048	1851	006	Deployed mooring 9403	57° 29.63' N	154° 48.00' W	202
17 FEB	048	1926	006	CTD at 9403	57° 29.70' N	154° 47.43' W	193
17 FEB	048	2009	006	CTD with CHLAM at 9403	57° 29.63' N	154° 47.47' W	192
17 FEB	048	2320	007	Deployed mooring 9402	57° 37.20' N	155° 04.42' W	248
18 FEB	049	0002	007	CTD at 9402	57° 37.08' N	155° 05.30' W	253
18 FEB	049	0320	008	Deployed mooring 9401	57° 41.30' N	155° 14.93' W	296
18 FEB	049	0348	008	CTD at 9401	57° 41.14' N	155° 15.17' W	296
18 FEB	049	1450	009	Deployed mooring 9443	56° 26.52' N	156° 58.67' W	102
18 FEB	049	1528	009	CTD at 9443	56° 26.63' N	156° 57.94' W	095
19 FEB	050	0344		Centerboard raised	55° 29.42' N	160° 21.90' W	164
19 FEB	050	0833	010	XBT at Pavlof Bay	55° 11.08' N	161° 42.01' W	104
19 FEB	050	0900	010	Recovered Pavlof Bay mooring	55° 11.11' N	161° 42.07' W	100
19 FEB	050	1047	010	Deployed Pavlof Bay mooring	55° 11.24' N	161° 41.98' W	101
19 FEB	050	1059	010	XBT at Pavlof Bay	55° 11.13' N	161° 42.00' W	105
19 FEB	050	2030		Centerboard lowered	54° 22.70' N	164° 23.54' W	106
20 FEB	051	0212	011	Bongo at BSSE-1	54° 46.62' N	166° 09.78' W	197
20 FEB	051	0249	011	CTD at BSSE-1	54° 46.10' N	166° 09.27' W	202
20 FEB	051	0340	011	Recovered mooring BSSE-1	54° 46.61' N	166° 08.53' W	197
20 FEB	051	1224	012	Bongo on Bering Slope	54° 47.45' N	167° 16.42' W	436
20 FEB	051	1319	012	CTD on Bering Slope	54° 47.75' N	167° 18.04' W	447
21 FEB	052	0613	013	Deployed mooring PEGGY94	54° 50.50' N	168° 36.35' W	2316
21 FEB	052	0651	013	CTD at PEGGY94	54° 50.83' N	168° 36.81' W	2329
21 FEB	052	0807	013	Bongo at PEGGY94	54° 50.86' N	168° 35.39' W	2318
21 FEB	052	0935	013	Bongo at PEGGY94	54° 51.25' N	168° 34.75' W	2337
21 FEB	052	2119	014	CTD at BSSE-3	56° 28.12' N	171° 28.07' W	216
21 FEB	052	2230	014	Recovered mooring BSSE-3	56° 28.30' N	171° 27.53' W	196
21 FEB	053	0111	015	CTD at BSSE-4	56° 34.30' N	172° 08.76' W	214
22 FEB	053	0130	015	Recovered mooring BSSE-4	56° 34.50' N	172° 01.32' W	210
24 FEB	055	1834	016	Deployed drifter S/N 7233	52° 13.94' N	170° 29.59' W	754
24 FEB	055	2200	017	Deployed drifter S/N 7167	52° 26.24' N	170° 25.52' W	430
26 FEB	057	1800		Arrived Dutch Harbor	53° 51.05' N	166° 34.44' W	007

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