NOAA Data Report ERL PMEL-54

FISHERIES-OCEANOGRAPHY COORDINATED INVESTIGATIONS: 1992 FIELD OPERATIONS REPORT

D.R. Schleiger
C. DeWitt
S.A. Macklin

Pacific Marine Environmental Laboratories
Seattle, Washington
May 1995

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UNITED STATES DEPARTMENT OF COMMERCE

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Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Fisheries-Oceanography Coordinated Investigations: 1992 Field Operations Report

D.R. Schleiger, C. DeWitt, S.A. Macklin

INTRODUCTION

This data report summarizes the goals and accomplishments of the Fisheries-Oceanography Coordinated Investigations (FOCI) field season conducted during fiscal year (FY) 1992 (October 1991–September 1992) in the Gulf of Alaska and the Bering Sea. It is intended that this report be an easy-to-use reference to cruise reports and station positions.

The report is divided into seven sections: one for each of the five 1992 cruises, a section devoted to moorings, and a section discussing a solar radiation measuring network established in Shelikof Strait. Each of the cruise sections begins with a list of scientific personnel, a brief summary of the cruise operations, and a compilation of cruise statistics. This is followed by a list of objectives and a cruise report written by the Chief Scientist. Next, figures depicting the sampling sites are provided for most operations. Finally a summary table of the Marine Operations Abstract (MOA) is provided with date, time, station number, FOCI grid number, depth, latitude, longitude, and gear code. The mooring section has a summary of mooring deployments and recoveries, followed by a diagram of each mooring. The RadNet section contains sensor and data history information.

FOCI FY92 Research Cruises

The 1992 field operations were conducted aboard the NOAA ship *Miller Freeman*. Shipboard operations included trawling, plankton and larval sampling, CTD's, deployment and recovery of moorings, drifter studies, and satellite observations of the sea surface. There were five cruises during FY92, designated as follows:

TABLE 1. 1992 Cruise Summary

Ship cruise no.	FOCI cruise no.	Project	Chief Scientist
MF92-03	FOCI-92-01	Egg Survey	Jay Clark
MF92-04	FOCI-92-02	Egg Survey	Ned Cokelet/Bill Rugen
MF92-05	FOCI-92-03	Larval Patch	Jeff Napp
MF92-06	FOCI-92-04	Larval Survey	Art Kendall
MF92-09	FOCI-92-05	Circulation	Ron Reed

Most cruises addressed the continued acquisition of long-term biological and physical time series through mooring deployment and recovery and by surveying early life stages of pollock. Additional primary objectives of each cruise are:

MF92-03:

- conduct an ichthyoplankton survey in Shelikof Strait to determine the horizontal patterns of distribution and abundance of walleye pollock eggs and locate the area of maximum concentration
- collect adult pollock to obtain eggs for rearing on board and in Seattle/Newport
- investigate vertebrate and invertebrate predation on pollock eggs
- investigate the variation of egg nucleic acid contents as a function of seasonality and female size
- conduct an experiment investigating the relationship between length and yolksac volume at hatching at different temperatures during incubation
- investigate the settling of unfertilized pollock eggs using a sediment trap

MF92-04:

- deploy Peggy Bering Sea, a PROTEUS mooring (PROfile TElemetry of Upper ocean currentS)
- conduct a survey of larval pollock for use in estimating distribution and drift
- collect samples of larval pollock for studies on growth and condition and genetic analysis
- conduct CTD and ADCP transects in areas of interest to transport studies
- collect zooplankton and microzooplankton samples in support of modeling and other biological studies
- continue acquisition of long-term biological and physical time series

MF92-05:

- obtain samples from traditional FOCI time series stations
- attempt to repair a RadNet station on Sutwik Island
- estimate the magnitude of physical dispersion and biological mortality in a patch of larval pollock marked with satellite and RADAR-tracked drifters
- map the distribution of larval pollock between Mitrofania Island and the lower region of Shelikof Strait for estimates of larval mortality
- collect underway surface chlorophyll and PAR measurements for modeling and mapping the timing of the spring bloom
- collect samples of first-feeding larval pollock for age and condition factor analyses
- estimate copepod egg/prey production from shipboard experiments

- collect and bring *Pseudocalanus* spp. females back to the laboratory in Seattle for egg-production experiments

MF92-06:

- continue acquisition of long-term biological and physical time series
- survey larval pollock for use in estimating distribution, drift and mortality rates
- collect samples of larval pollock for studies on growth and condition
- trawl for midwater predators on larval pollock

MF92-09:

- recover Peggy Bering Sea
- recover additional moorings
- conduct CTD studies
- deploy satellite-tracked drifters
- transect the Alaska Stream making current measurements with the vessel-mounted ADCP
- conduct trawl and plankton sampling

Table 2. 1992 Statistics Summary

Operation	Total	MF92-03	MF92-04	MF92-05	MF92-06	MF92-09
ADCP backtrack L	4		1	1		2
ADCP transect	13		4	7		2
Bongo, 20-cm	39	6		18	15	
Bongo, 60-cm	461	95	48	172	146	
CalVET	24			24		
Chlorophyll sample	35	35				
CTD	189	13	39	52	29	56
Drifter buoy deployment	16		4	2		10
Epibenthic sled	3	3				
Fishing trawl	2	2				
Live tow	27			27		
Marinovich trawl	10				5	5
Meteorological station deployed	3					
Meteorological station recovered	1			1		
Methot trawl	6				6	
Microzoo-plankton sample	35	35				
MOCNESS	13		8	5		
MOCNESS (horizontal)	6	6				
Mooring deployment	1		1			
Mooring recovery	8		2			6
Neuston tow	3					3
Nutrient sample	32	32				
Pollock egg sample	45,000	45,000				
Predator sample	350	350				
Stomach sample	40	40				
Tucker trawl	23	11		1	7	4

MF92-03 (FOCI-92-01): 3 April–11 April, 1992

SCIENTIFIC PERSONNEL

Name	Title	Organization
Jay B. Clark	Chief Scientist	NOAA/AFSC
Mike Canino	Watch Chief	NOAA/AFSC
Bill Rugen	Watch Chief	NOAA/AFSC
Stella Spring		NOAA/AFSC
Nazila Merati		NOAA/AFSC
Debbie Blood		NOAA/AFSC
Carol DeWitt		NOAA/PMEL
Leslie Lawrence		NOAA/PMEL

SUMMARY OF OPERATIONS SCHEDULE

Depart Kodiak	3 April
Start field operations	4 April
Complete field operations	10 April
Arrive Kodiak	11 April

CRUISE STATISTICS

Bongo, 20 cm	6
Bongo, 60 cm	95
Chlorophyll sample	35
CTD	13
Epibenthic sled	3
Fishing trawl	2
Microzooplankton sample	35
Nutrient sample	32
Pollock egg sample	45,000
Predator sample	350
Stomach sample	40
Tucker trawl	11

OBJECTIVES

The objectives of this cruise were to:

- continue acquisition of long-term biological and physical time series
- conduct an ichthyoplankton survey in Shelikof Strait to determine the horizontal patterns of distribution and abundance of walleye pollock eggs and locate the area of maximum concentration
- collect adult pollock to obtain eggs for rearing on board and in Seattle/Newport
- investigate vertebrate and invertebrate predation on pollock eggs
- investigate the variation of egg nucleic acid contents as a function of seasonality and female size
- conduct an experiment investigating the relationship between length and yolksac volume at hatching at different temperatures during incubation
- investigate the settling of unfertilized pollock eggs using a sediment trap

CRUISE REPORT

Line 8 time series stations (FOX 55-61) were occupied on April 4–5. CTD's, microzooplankton, chlorophyll, and nutrients were collected on the first pass, 20- and 60-cm bongos with 0.153 and 0.333 mm mesh were used to collect samples on the second pass.
On April 6 a bottom trawl using the Nor'eastern trawl was fished just north of Cape Kekurnoi. Adult pollock were successfully spawned, obtaining fertilized eggs for the shipboard experiments studying the predation of eggs by zooplankton predators, length at hatch and rearing studies. Unfertilized eggs were also collected to study sinking rates and egg nucleic acid contents. Stomach samples of 20 adult pollock were collected, and a CTD was taken.

The egg survey in Shelikof Strait, using 60-cm bongo nets, started on April 6 and was completed on April 9. A SeaCat CTD was incorporated into the bongo array to provide physical data during the tow.

Collection of zooplankton predators on pollock eggs using a 1-meter Tucker trawl were obtained on April 9–10 in areas of high egg abundance and low abundance. Samples were taken from a discrete sample between 250–150 meters during both daylight and nighttime hours. A small plankton net was suspended within the Tucker trawl to verify the presence or absence of eggs.

On April 10, another bottom trawl was fished to provide a fresh batch of fertilized pollock eggs for further studies back in Seattle and Newport, OR. Stomach samples and a CTD were again taken.

The sediment trap, planned to investigate the settling of unfertilized pollock eggs, was not deployed due to the failure of the motor system. Parts were not available on board to fix the problem.

Epibenthic sled tows were attempted on April 7 with limited success. On two of the tows we were not sure if the nets tripped properly, and on another tow the net filled with mud.

SUMMARY

Pollock eggs were found in the traditional areas of high abundance, in the deeper water along the Alaskan Peninsula side of Shelikof Strait. Analysis of the bongo samples will be necessary before further results are available. Spawning of adult pollock was still in progress at the end of the cruise by evidence noticed on the last trawl taken.

The various studies of pollock eggs are still ongoing aboard the ship and in Seattle, with no definitive results.

Table 3. MF92-03 CRUISE SUMMARY

Shelikof Strait Egg Survey 3-11 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
95	4-Apr	2241	G001A	FOX 61	115	57° 43.6' N	155° 15.2' W	CTDB
		2241	G001A	FOX 61	115	57° 43.6' N	155° 15.2' W	CTDB
96	5-Apr	0018	G002A	FOX 60	290	57° 41.1' N	155° 10.1' W	CTDB
		0116	G002A	FOX 60	290	57° 40.9' N	155° 10.2' W	CTDB
		0207	G003A	FOX 59	254	57° 38.3' N	155° 04.8' W	CTDB
		0301	G004A	FOX 58	235	57° 36.2' N	155° 00.6' W	CTDB
		0345	G004A	FOX 58	235	57° 36.4' N	155° 00.6' W	CTDB
		0436	G005A	FOX 57	228	57° 33.1' N	154° 52.5' W	CTDB
		0531	G006A	FOX 56	210	57° 30.9' N	154° 46.9' W	CTDB
		0621	G006A	FOX 56	210	57° 30.9' N	154° 46.9' W	CTDB
		0657	G007A	FOX 55	56	57° 28.3' N	154° 41.9' W	CTDB
		1018	G008A	FOX 56	221	57° 31.0' N	154° 46.9' W	60Bon
		1018	G008A	FOX 56	221	57° 31.0' N	154° 46.9' W	20Bon
		1109	G009A	FOX 57	236	57° 33.2' N	154° 52.7' W	60Bon
		1109	G009A	FOX 57	236	57° 33.2' N	154° 52.7' W	20Bon
		1217	G010A	FOX 58	239	57° 36.4' N	155° 00.5' W	60Bon
		1217	G010A	FOX 58	239	57° 36.4' N	155° 00.5' W	20Bon
		1304	G011A	FOX 59	258	57° 38.1' N	155° 04.5' W	60Bon
		1304	G011A	FOX 59	258	57° 38.1' N	155° 04.5' W	20Bon
		1353	G012A	FOX 60	290	57° 41.0' N	155° 09.8' W	60Bon
		1353	G012A	FOX 60	290	57° 41.0' N	155° 09.8' W	20Bon
		1442	G013A	FOX 61	190	57° 43.1' N	155° 15.6' W	60Bon
		1442	G013A	FOX 61	190	57° 43.1' N	155° 15.6' W	20Bon
		2125	G014A		295	57° 42.7' N	155° 12.4' W	Nor
		2224	G014A		293	57° 42.8' N	155° 12.5' W	CTDB
97	6-Apr	0407	G015A		216	58° 22.2' N	153° 50.0' W	60Bon
		0516	G016A		180	58° 16.3' N	153° 41.2' W	60Bon
		0627	G017A		199	58° 10.7' N	153° 51.7' W	60Bon
		0627	G017A		199	58° 10.7' N	153° 51.7' W	60Bon
		0734	G018A		205	58° 06.4' N	153° 38.6' W	60Bon
		0850	G019A		201	58° 00.8' N	153° 53.9' W	60Bon
		1003	G020A		280	58° 09.2' N	154° 03.2' W	60Bon
		1053	G021A		298	58° 06.3' N	154° 09.2' W	60Bon
		1139	G022A		246	58° 04.7' N	154° 06.9' W	60Bon
		1226	G023A		254	58° 02.2' N	154° 11.3' W	60Bon
		1322	G024A		293	57° 59.2' N	154° 22.1' W	60Bon
		1413	G025A		223	57° 58.1' N	154° 14.2' W	60Bon
		1450	G026A		219	57° 56.7' N	154° 11.7' W	60Bon
		1450	G026A		219	57° 56.7' N	154° 11.7' W	60Bon
		1606	G027A		205	57° 52.8' N	153° 56.2' W	60Bon
		1652	G028A		184	57° 49.5' N	154° 03.8' W	60Bon
		1732	G029A		195	57° 47.1' N	154° 10.0' W	60Bon

Table 3. MF92-03 CRUISE SUMMARY

Shelikof Strait Egg Survey 3-11 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
		1824	G030A		204	57° 43.1' N	154° 19.9' W	60Bon
		1947	G031A		204	57° 48.1' N	154° 21.6' W	60Bon
		1947	G031A		204	57° 48.1' N	154° 21.6' W	60Bon
		2116	G032A		262	57° 55.2' N	154° 29.7' W	60Bon
		2152	G033A		245	57° 54.0' N	154° 31.1' W	60Bon
		2152	G033A		245	57° 54.0' N	154° 31.1' W	60Bon
		2229	G034A		242	57° 52.4' N	154° 34.6' W	60Bon
		2314	G035A		263	57° 55.0' N	154° 39.7' W	60Bon
		2314	G035A		263	57° 55.0' N	154° 39.7' W	60Bon
		2354	G036A		235	57° 56.0' N	154° 43.9' W	60Bon
		2354	G036A		235	57° 56.0' N	154° 43.9' W	60Bon
98	7-Apr	0057	G037A		123	57° 55.2' N	154° 49.5' W	60Bon
		0124	G038A		278	57° 55.2' N	154° 54.8' W	60Bon
		0212	G039A		214	57° 52.2' N	154° 44.8' W	60Bon
		0212	G039A		214	57° 52.2' N	154° 44.8' W	60Bon
		0345	G040A		214	57° 41.0' N	154° 36.7' W	60Bon
		0345	G040A		214	57° 41.0' N	154° 36.7' W	60Bon
		0431	G040A		213	57° 41.0' N	154° 37.0' W	1Tuck
		0504	G040A		213	57° 41.1' N	154° 37.2' W	1Tuck
		0555	G041A		225	57° 42.5' N	154° 47.3' W	60Bon
		0555	G041A		225	57° 42.5' N	154° 47.3' W	60Bon
		0652	G042A		276	57° 48.1' N	154° 52.3' W	60Bon
		0726	G043A		294	57° 49.5' N	154° 54.7' W	60Bon
		0759	G044A		306	57° 51.0' N	154° 57.5' W	60Bon
		0759	G044A		306	57° 51.0' N	154° 57.5' W	60Bon
		0836	G045A		97	57° 52.3' N	155° 00.1' W	60Bon
		0923	G046A		173	57° 48.1' N	155° 07.6' W	60Bon
		1008	G047A		321	57° 46.7' N	155° 00.2' W	60Bon
		1008	G047A		321	57° 46.7' N	155° 00.2' W	60Bon
		1051	G048A		280	57° 45.2' N	154° 57.7' W	60Bon
		1051	G048A		280	57° 45.2' N	154° 57.7' W	60Bon
		1152	G049A		231	57° 39.6' N	154° 52.4' W	60Bon
		1221	G050A		226	57° 38.2' N	154° 49.7' W	60Bon
		1221	G050A		226	57° 38.2' N	154° 49.7' W	60Bon
		1320	G051A		213	57° 34.0' N	154° 42.0' W	60Bon
		1413	G052A		247	57° 32.4' N	154° 49.6' W	60Bon
		1450	G053A		245	57° 31.1' N	154° 52.3' W	60Bon
		1553	G054A		230	57° 33.7' N	154° 57.3' W	60Bon
		1622	G055A		278	57° 35.4' N	154° 55.1' W	60Bon
		1622	G055A		278	57° 35.4' N	154° 55.1' W	60Bon
		1734	G056A		220	57° 41.0' N	155° 05.4' W	60Bon
		1734	G056A		220	57° 41.0' N	155° 05.4' W	60Bon

Table 3. MF92-03 CRUISE SUMMARY

Shelikof Strait Egg Survey 3-11 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
		1807	G057A		290	57° 43.7' N	155° 05.7' W	60Bon
		1859	G058A		284	57° 45.0' N	155° 07.8' W	60Bon
		2103	G059A		288	57° 44.4' N	155° 08.6' W	Sled
		2332	G059A		295	57° 43.4' N	155° 08.1' W	Sled
		2332	G059A		295	57° 43.4' N	155° 08.1' W	Sled
99	8-Apr	0001	G059A		295	57° 43.4' N	155° 08.2' W	Sled
		0001	G059A		295	57° 43.4' N	155° 08.2' W	Sled
		0001	G059A		295	57° 43.4' N	155° 08.2' W	lg-CB
		0001	G059A		295	57° 43.4' N	155° 08.2' W	lg-CB
		0232	G060A		294	57° 43.9' N	155° 10.4' W	60Bon
		0232	G060A		294	57° 43.9' N	155° 10.4' W	60Bon
		0313	G061A		294	57° 42.1' N	155° 12.4' W	60Bon
		0351	G062A		294	57° 40.8' N	155° 15.4' W	60Bon
		0436	G063A		294	57° 39.6' N	155° 12.8' W	60Bon
		0533	G064A		259	57° 35.3' N	155° 10.2' W	60Bon
		0634	G065A		235	57° 34.1' N	155° 02.5' W	60Bon
		0711	G066A		236	57° 32.4' N	155° 05.0' W	60Bon
		0810	G067A		236	57° 28.5' N	154° 57.4' W	60Bon
		0810	G067A		236	57° 28.5' N	154° 57.4' W	60Bon
		0901	G068A		186	57° 27.1' N	154° 49.9' W	60Bon
		1003	G069A		224	57° 22.9' N	154° 57.2' W	60Bon
		1003	G069A		224	57° 22.9' N	154° 57.2' W	60Bon
		1045	G070A		238	57° 21.3' N	154° 60.0' W	60Bon
		1149	G071A		237	57° 27.0' N	155° 05.1' W	60Bon
		1300	G072A		288	57° 35.2' N	155° 15.2' W	60Bon
		1350	G073A		313	57° 36.7' N	155° 17.8' W	60Bon
		1428	G074A		325	57° 38.0' N	155° 20.4' W	60Bon
		1428	G074A		325	57° 38.0' N	155° 20.4' W	60Bon
		1537	G075A		52	57° 36.6' N	155° 28.1' W	60Bon
		1606	G076A		311	57° 33.7' N	155° 23.0' W	60Bon
		1721	G077A		57	57° 31.1' N	155° 38.3' W	60Bon
		1756	G078A		304	57° 29.8' N	155° 30.9' W	60Bon
		1849	G079A		281	57° 25.4' N	155° 20.0' W	60Bon
		1935	G080A		273	57° 22.3' N	155° 27.8' W	60Bon
		2042	G081A		269	57° 25.7' N	155° 23.7' W	60Bon
		2136	G082A		250	57° 27.1' N	155° 15.6' W	60Bon
		2136	G082A		250	57° 27.1' N	155° 15.6' W	60Bon
		2231	G083A		241	57° 24.4' N	155° 11.0' W	60Bon
		2347	G084A		239	57° 21.3' N	155° 10.1' W	60Bon
		2347	G084A		239	57° 21.3' N	155° 10.1' W	60Bon
100	9-Apr	0045	G085A		225	57° 17.1' N	155° 02.1' W	60Bon
		0203	G086A		250	57° 15.5' N	155° 19.9' W	60Bon

Table 3. MF92-03 CRUISE SUMMARY

Shelikof Strait Egg Survey 3-11 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
		0309	G087A		235	57° 09.9' N	155° 10.3' W	60Bon
		0424	G088A		146	57° 01.5' N	155° 00.1' W	60Bon
		0508	G089A		359	56° 57.1' N	156° 02.4' W	60Bon
		0700	G090A		253	57° 07.6' N	155° 20.3' W	60Bon
		0839	G091A		276	57° 08.4' N	155° 38.1' W	60Bon
		0945	G092A		269	57° 11.4' N	155° 48.5' W	60Bon
		1026	G093A		231	57° 12.7' N	155° 50.9' W	60Bon
		1250	G094A		227	57° 18.3' N	155° 55.8' W	60Bon
		1445	G095A		85	57° 02.7' N	156° 08.7' W	60Bon
		1534	G096A		247	57° 01.6' N	155° 55.7' W	60Bon
		1637	G097A		216	56° 57.0' N	156° 03.0' W	60Bon
		1823	G098A		196	56° 50.2' N	156° 11.7' W	60Bon
		1907	G099A		234	56° 48.0' N	156° 03.0' W	60Bon
		2038	G100A		290	56° 53.1' N	155° 45.7' W	60Bon
		2115	G101A		278	56° 55.4' N	155° 35.1' W	60Bon
		2230	G102A		277	56° 55.4' N	155° 35.1' W	60Bon
		0003	G103A		284	57° 01.5' N	155° 40.6' W	60Bon
101	10-Apr	0057	G104A		273	57° 02.9' N	155° 33.0' W	60Bon
		0214	G104A		275	57° 02.4' N	155° 33.5' W	1Tuck
		0214	G104A		275	57° 02.4' N	155° 33.5' W	lg-CB
		0304	G104A		275	57° 02.9' N	155° 33.5' W	1Tuck
		0304	G104A		275	57° 02.9' N	155° 33.5' W	lg-CB
		0628	G105A		236	57° 27.3' N	155° 05.7' W	1Tuck
		0628	G105A		236	57° 27.3' N	155° 05.7' W	lg-CB
		0714	G105A		236	57° 26.7' N	155° 04.9' W	1Tuck
		0714	G105A		236	57° 26.7' N	155° 04.9' W	lg-CB
		0942	G106A		320	57° 44.5' N	155° 08.6' W	1Tuck
		0942	G106A		320	57° 44.5' N	155° 08.6' W	lg-CB
		1037	G106A		320	57° 44.3' N	155° 08.4' W	1Tuck
		1037	G106A		320	57° 44.3' N	155° 08.4' W	lg-CB
		1130	G106A		320	57° 44.3' N	155° 08.5' W	1Tuck
		1130	G106A		320	57° 44.3' N	155° 08.5' W	lg-CB
		1628	G107A		295	57° 44.0' N	155° 07.8' W	Nor
		1730	G107A		290	57° 44.3' N	155° 08.9' W	CTDB
		1854	G108A		294	57° 43.8' N	155° 08.2' W	1Tuck
		1854	G108A		294	57° 43.8' N	155° 08.2' W	lg-CB
		1931	G108A		293	57° 44.0' N	155° 08.1' W	1Tuck
		1931	G108A		293	57° 44.0' N	155° 08.1' W	lg-CB

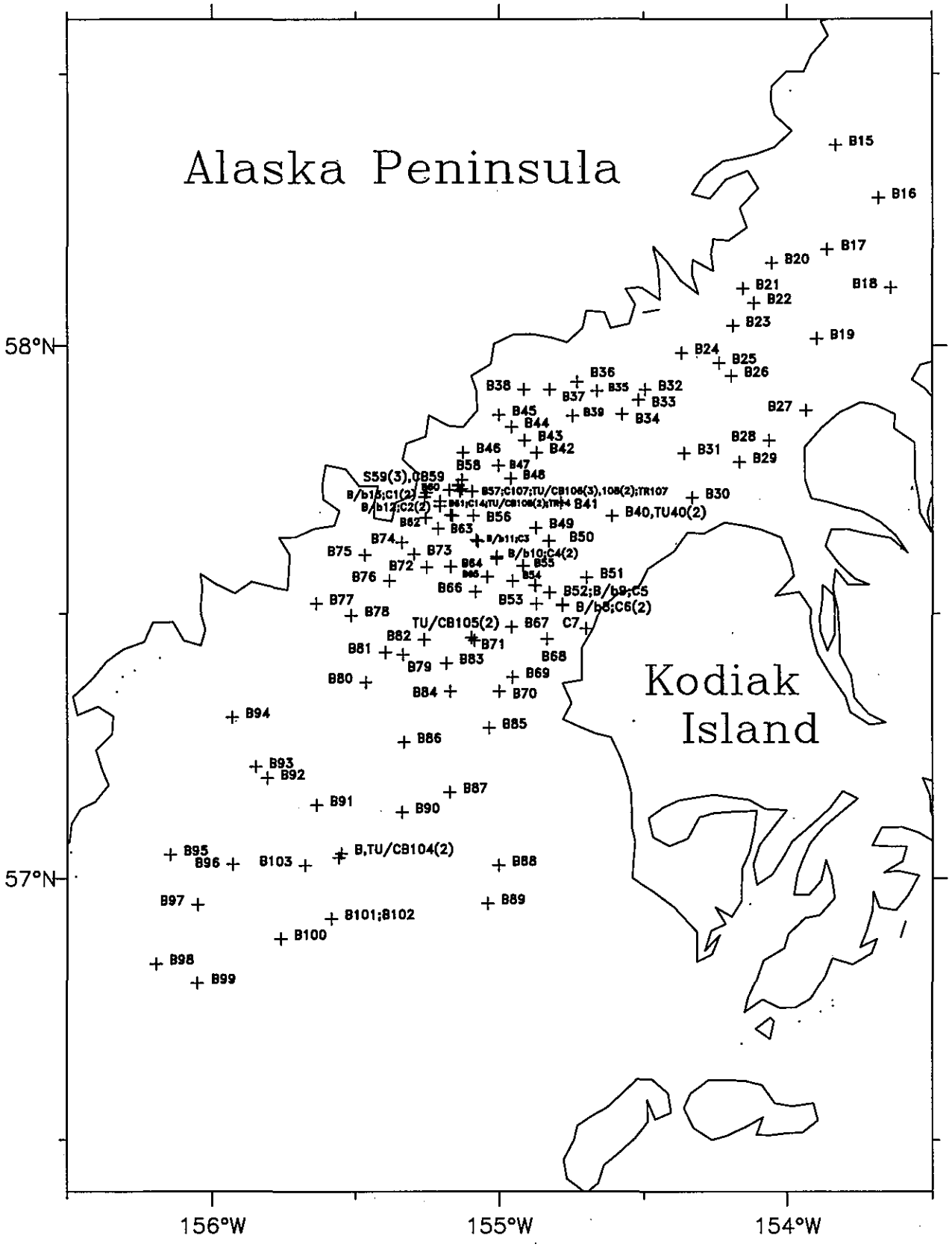


Fig. 1.1. MF92-03 Bongo (B), CTD (C), Tucker (TU), and Nor'eastern Trawl (TR) Stations.

MF92-04 (FOCI-92-02): 12 April–28 April, 1992

SCIENTIFIC PERSONNEL

Name	Title	Organization
E.D. Cokelet	Chief Scientist	NOAA/PMEL
Carol DeWitt		NOAA/PMEL
Bill Flerx		NOAA/AFSC
Nicola Hillgruber		University of Alaska
Carol Lee		Our World Underwater Fellow
Judy McDonald		University of Alaska
Bill Rugen	Acting Chief Scientist	NOAA/AFSC

SUMMARY OF OPERATIONS SCHEDULE

Depart Kodiak	11 April
Start field operations	13 April
TNG Dutch Harbor	15 April
TNG Dutch Harbor	19 April
Complete field operations	25 April
Arrive Kodiak	25 April

CRUISE STATISTICS

ADCP Backtrack L	1
ADCP track	4
Bongo, 60-cm	48
CTD	39
Drifter buoy deployment	4
MOCNESS	8
MOCNESS (horizontal)	6
Mooring deployment	1
Mooring recovery	2
PEGGY buoy deployment	1

OBJECTIVES

The objectives of MF92-04 (FOCI-92-02) were to:

- deploy Peggy Bering Sea, a PROTEUS mooring (PROfile TElemetry of Upper ocean currentS)
- conduct a survey of larval pollock for use in estimating distribution and drift
- collect samples of larval pollock for studies on growth and condition and genetic analysis
- conduct CTD and ADCP transects in areas of interest to transport studies
- collect zooplankton and microzooplankton samples in support of modeling and other biological studies
- continue acquisition of long-term biological and physical time series

CRUISE REPORT

The goal of this cruise was to understand the biological and physical processes that cause variability of recruitment to commercially valuable walleye pollock (*Theragra chalcogramma*) stocks in the Bering Sea. This work is part of the Bering Sea FOCI program (Fisheries-Oceanography Coordinated Investigations) funded by NOAA's Coastal Ocean Program.

The scientific work concentrated on three geographic areas:

- the Gulf of Alaska, where current-meter moorings were recovered,
- the Bering Sea basin where a mooring was deployed and samples taken, and
- near Amukta Pass for two CTD/ADCP transects.

Two subsurface current-meter moorings were recovered in the Gulf of Alaska and CTD casts CM1 and CM2 were taken for calibration purposes. It was planned to deploy the PROTEUS mooring, Peggy Bering Sea, at 54° 14.5′N, 168° 44.4′W in 2200 m of water. However, upon arriving on site to survey the area we found two problems. First, this site had heavy ship traffic because it is on a great-circle route between Seattle–Vancouver and Tokyo. This would put the buoy in danger of being run over. Second, the bottom was very rough with depth changes of 20–40 m in a few hundred meters of horizontal distance. This would give too much uncertainty in cutting the mooring line to within 20 m of its proper length. Therefore, we decided to move the mooring location northwest to another site of comparable depth and within an area previously surveyed for larval pollock. After surveying in a less-traveled area over a flatter bottom we deployed Peggy Bering Sea (Fig. 2) at 0309 17 April 1992 UTC. It settled at 54° 47.53′N, 168° 33.89′W in 2219 m of water (Fig. 1) and began transmitting data back to the lab via satellite.

A grid of 36 stations, 10 nm apart, was sampled for larval pollock using a 60-cm bongo with 333-μm mesh nets and hard plastic codends. The nets were deployed at 40 m/min usually to 100 m,

stopped for 30 s, and retrieved at 20 m/min. A SeaCat was attached to the bongo to measure pressure, temperature and conductivity. Larval rough counts were made on-board after each tow, and they ranged between 1 and 67 when divided by the flow meter difference and multiplied by 1000. In total, 48 bongo tows were made with a few of the grid stations reoccupied and a few isolated tows elsewhere in the basin.

Fourteen sampling and one test MOCNESS tows were made. Three tows were V-tows (M1, M10, M11) in which the MOCNESS descended usually to 400 m with a 505-μm mesh on net 1 whose sample was discarded. 153-μm mesh nets 2–6 fished depth ranges 400–300, 300–200, 200–100, 100–50 and 50–0 m. Net 7 was opened at the surface during retrieval, and its 505-μm sample was discarded. Five MOCNESS's were W-tows (M2, M3, M7–M9) in which 505-μm mesh net 1 was sent down open to the designated depth, usually 450 m, and its sample later discarded. 153-μm mesh nets 2–3 fished the lower and upper half of the depth range. Then the MOCNESS was sent back down to 150 m with net 4 open, its sample being later discarded. 505-μm mesh nets 5–9 each fished one-fifth of the depth range on ascent. There were two horizontal MOCNESS series with three tows each (M4–M6, M12–M14). All nets were 505-μm mesh. For each series, three MOCNESS tows were made with design depths of 70 & 50, 30 & 20, and 10 & 5 m. The MOCNESS was sent down with net 1 open for later discard. At the first design depth, three replicate samples were taken with nets 2–4. Net 5 was open for the transit to the shallower design depth, and its sample later discarded. Upon reaching the shallower design depth, nets 6–8 were opened sequentially for three more replicate samples. Net 9 was open for the ascent to the surface, and its sample discarded.

Thirty-nine CTD casts were taken on this cruise. There was at least one salinity sample per cast for conductivity calibration. Casts CM1 and CM2 were taken prior to current-meter mooring recovery in the Gulf of Alaska. Casts 1 and 2 were pre- and post-deployment casts to 500 m for calibrating Peggy Bering Sea. Three CTD transects were run: one (stns. 3–8) from northwest to southeast to 1500 m to measure the geostrophic flow through the Peggy site that parallels the Aleutians, one (stns. 22–27) across Amukta Pass to 500 m or the bottom, and one (stns. 28–32) to measure the inside portion of the Alaskan Stream just east of Amukta Pass. Three sets of casts (stns. 9–15, 16–21 and 33–37) to 90 m complemented MOCNESS tows and included water samples for microzooplankton and sometimes chemical tracers and chlorophyll.

The RDI 150 kHz Vessel Mounted Acoustic Doppler Current Profiler (VM-ADCP) collected data during the entire cruise. The ensemble length and bin size were 60 s and 8 m, respectively. There were two dedicated ADCP transects, one across Amukta Pass along CTD stations 22–27 and one across the inner Alaskan Stream along CTD stations 28–32. One backtrack-L calibration maneuver was performed.

Four satellite-tracked drifters (7221, 7164, 7168, 7214) were deployed in the Bering basin about 15 nm north of Peggy Bering Sea in an anticyclonic (clockwise) eddy.

Table 4. MF92-04 CRUISE SUMMARY

Bering Sea Larval Survey 12-28 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
104	13-Apr	1718	C001	M9105	138	56° 21.2' N	156° 55.5' W	CTDB
		1740			----	56° 21.5' N	156° 54.6' W	Lowered centerboard
		1930	M9105		132	56° 21.9' N	156° 54.8' W	Moor
105	14-Apr	0118	C002	M9140	93	55° 44.4' N	158° 33.5' W	CTDB
		0209	M9140		90	55° 44.7' N	158° 33.3' W	Moor
106	15-Apr	0915			179	53° 58.7' N	166° 32.1' W	Lowered centerboard
107	16-Apr	0009	C003	PEGGY	2068	54° 47.0' N	168° 32.9' W	CTDB
		0414	G001A		2237	54° 47.6' N	168° 31.6' W	MOC1
		0646	G002A		1989	54° 39.7' N	168° 19.3' W	60Bon
		0842	G003A		1579	54° 44.8' N	168° 05.2' W	60Bon
		1028	G004A		1981	54° 53.1' N	168° 13.1' W	60Bon
		1217	G005A		2018	55° 02.2' N	168° 21.5' W	60Bon
108	17-Apr	0309	PROTEUS2		2245	54° 47.7' N	168° 33.9' W	Moor
		0358	C004		2225	54° 47.1' N	168° 31.1' W	CTDB
		0539	G006A		2187	54° 48.6' N	168° 28.2' W	60Bon
		0753	G007A		1293	54° 36.1' N	167° 57.1' W	60Bon
		0907	G008A		962	54° 27.7' N	167° 48.9' W	60Bon
		1027	G009A		900	54° 18.9' N	167° 40.0' W	60Bon
		1140	G010A		1243	54° 13.8' N	167° 54.9' W	60Bon
		1251	G011A		2303	54° 08.9' N	168° 09.6' W	60Bon
		1409	G012A		2194	54° 03.8' N	168° 24.3' W	60Bon
		1520	G013A		--------	53° 58.9' N	168° 39.1' W	60Bon
		1631	G014A		2500	53° 54.0' N	168° 54.2' W	60Bon
		1742	G015A		2025	54° 02.7' N	169° 02.3' W	60Bon
		1850	G016A		2000	54° 07.6' N	168° 47.6' W	60Bon
		2001	G017A		2200	54° 12.4' N	168° 32.3' W	60Bon
		2143	G018A		1563	54° 17.4' N	168° 18.5' W	60Bon
		2254	G019A		984	54° 22.6' N	168° 03.4' W	60Bon
109	18-Apr	0001	G020A		1645	54° 31.1' N	168° 11.7' W	60Bon
		0102	G021A		1261	54° 26.0' N	168° 26.1' W	60Bon
		0206	G022A		1737	54° 21.2' N	168° 41.2' W	60Bon
		0314	G023A		2141	54° 16.3' N	168° 55.9' W	60Bon
		0509	G024A		2200	54° 11.2' N	169° 11.0' W	60Bon
		0621	G025A		2390	54° 20.1' N	169° 19.2' W	60Bon
		0729	G026A		1800	54° 24.9' N	169° 04.6' W	60Bon
		0842	G027A		1500	54° 30.1' N	168° 49.9' W	60Bon
		0951	G028A		1500	54° 34.7' N	168° 34.9' W	60Bon
		1102	G029A		2004	54° 43.4' N	168° 43.2' W	60Bon
		1217	G030A		1625	54° 38.5' N	168° 58.0' W	60Bon
		1329	G031A		1833	54° 33.7' N	169° 12.9' W	60Bon

Table 4. MF92-04 CRUISE SUMMARY

Bering Sea Larval Survey 12-28 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
		1445	G032A		2535	54° 28.6' N	169° 27.6' W	60Bon
		1554	G033A		2400	54° 37.1' N	169° 36.3' W	60Bon
		1702	G034A		2000	54° 42.2' N	169° 21.4' W	60Bon
		1809	G035A		1800	54° 47.2' N	169° 06.5' W	60Bon
		1916	G036A		2400	54° 52.3' N	168° 51.6' W	60Bon
		2033	G037A		2225	54° 57.3' N	168° 36.2' W	60Bon
		2206	C005	G037A	2200	54° 56.5' N	168° 36.3' W	CTDB
		2340	PROTEUS2		2227	54° 47.3' N	168° 33.9' W	verified PEGGY
110	19-Apr	0054	C006	G006A	2185	54° 48.0' N	168° 28.0' W	CTDB
		0259	C007	G002A	1994	54° 39.8' N	168° 19.8' W	CTDB
		0505	C008	G020A	1535	54° 30.6' N	168° 11.7' W	CTDB
		0706	C009	G019A	1136	54° 22.6' N	168° 03.1' W	CTDB
		0904	C010	G010A	1383	54° 13.9' N	167° 54.7' W	CTDB
		2118			1462	54° 12.6' N	167° 46.0' W	Lowered centerboard
		2226			1316	54° 13.8' N	167° 55.1' W	ADCP
110	20-Apr	0250			2011	54° 57.2' N	168° 36.7' W	ADCP
		0353	G038A		1840	55° 02.2' N	168° 21.7' W	60Bon
		0500	G038A		1800	55° 01.0' N	168° 19.0' W	60Bon
		0532	G038A		1830	55° 01.4' N	168° 20.0' W	MOC1/ net test
		0948	G038A		1940	55° 01.0' N	168° 20.1' W	MOC1,W
		1230	G039A		1942	55° 01.2' N	168° 20.1' W	MOC1,W
		1401	C011		1888	55° 00.6' N	168° 18.8' W	CTDB
		1514	C012		1900	55° 00.7' N	168° 18.6' W	CTDB
		1553	C013		1900	55° 00.9' N	168° 18.2' W	CTDB
		1619	C014		1900	55° 00.9' N	168° 19.2' W	CTDB
		1644	C015		1900	55° 00.9' N	168° 18.7' W	CTDB
		1704	C016		1900	55° 01.0' N	168° 18.2' W	CTDB
		1722	C017		1900	55° 01.0' N	168° 18.1' W	CTDB
		2046	G040A		1900	55° 01.3' N	168° 20.0' W	Horizontal MOC1
		2256	G040A		1900	55° 01.1' N	168° 20.3' W	Horizontal MOC1
111	21-Apr	0058	G040A		1938	55° 01.1' N	168° 20.0' W	Horizontal MOC1
		0400	G041A		1900	55° 01.7' N	168° 21.4' W	MOC1,W
		0526	7221		1920	55° 00.8' N	168° 18.9' W	Drifter
		0545	7164		1920	55° 01.9' N	168° 17.0' W	Drifter
		0603	7168		1920	54° 59.4' N	168° 18.2' W	Drifter
		0623	7214		1900	55° 01.3' N	168° 21.6' W	Drifter

Table 4. MF92-04 CRUISE SUMMARY

Bering Sea Larval Survey 12-28 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
		0650			2000	54° 58.7' N	168° 28.4' W	Raised centerboard
		1830	C018		3139	53° 49.5' N	171° 34.9' W	CTDB
		2025	C019		3201	53° 50.4' N	171° 32.3' W	CTDB
		2135	G042A		3260	53° 50.5' N	171° 34.3' W	MOC1,W
		2310	C020		3260	53° 50.3' N	171° 32.8' W	CTDB
		2334	C021		3255	53° 50.2' N	171° 32.5' W	CTDB
112	22-Apr	0026	G043A		3235	53° 50.0' N	171° 33.8' W	MOC1,W
		0134	C022		3151	53° 49.3' N	171° 35.9' W	CTDB
		0200	C023		3151	53° 49.1' N	171° 36.1' W	CTDB
		0230	Bktrck-L		3155	53° 48.9' N	171° 39.9' W	ADCP
		0430	Bktrck-L		3164	53° 50.1' N	171° 37.9' W	ADCP
		0915	G044A		3153	53° 49.1' N	171° 33.6' W	MOC1
		1200	G045A		3264	53° 50.2' N	171° 33.5' W	MOC1
		2040	C024		531	52° 26.5' N	171° 33.0' W	CTDB
		2142	C025		498	52° 25.3' N	171° 41.1' W	CTDB
		2243	C026		295	52° 24.1' N	171° 48.3' W	CTDB
		2347	C027		313	52° 22.6' N	171° 57.3' W	CTDB
113	23-Apr	0044	C028		391	52° 21.5' N	172° 04.8' W	CTDB
		0141	C029		337	52° 20.2' N	172° 12.9' W	CTDB
		0204			358	52° 20.2' N	172° 12.3' W	ADCP
		0413			525	52° 26.6' N	171° 32.6' W	ADCP
		0602	C030		502	52° 21.4' N	171° 11.9' W	CTDB
		0718	C031		836	52° 16.4' N	171° 08.7' W	CTDB
		0913	C032		1530	52° 11.1' N	171° 07.2' W	CTDB
		1112	C033		2845	52° 07.2' N	171° 03.7' W	CTDB
		1304	C034		3592	52° 02.0' N	171° 02.0' W	CTDB
		1358			3612	52° 02.0' N	171° 01.1' W	ADCP
		1546			531	52° 21.0' N	171° 11.6' W	ADCP
		2309	G046A		266	53° 10.3' N	169° 47.7' W	60Bon
114	24-Apr	0154	G047A		577	53° 02.2' N	169° 09.3' W	60Bon
		0355	G048A		483	53° 11.4' N	168° 56.9' W	60Bon
		0547	G049A		90	53° 23.9' N	168° 34.0' W	60Bon
		0926	G050A		1145	53° 58.8' N	168° 02.7' W	60Bon
		1344	G051A		1937	54° 24.7' N	169° 05.1' W	60Bon
		1550	G052A		--------	54° 38.8' N	168° 57.5' W	60Bon
		1755	G053A		1800	54° 49.7' N	168° 52.7' W	60Bon
		1920	G054A		--------	55° 01.5' N	168° 45.4' W	60Bon
		2112	G053A		2050	54° 49.6' N	168° 53.4' W	Horizontal MOC1
		2244	C035		2039	54° 46.5' N	168° 57.1' W	CTDB

Table 4. MF92-04 CRUISE SUMMARY

Bering Sea Larval Survey 12-28 April 1992

Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
		2351	G053A		2035	54° 46.3' N	168° 57.1' W	Horizontal MOC1
115	25-Apr	0049	C036		2043	54° 46.7' N	168° 57.1' W	CTDB
		0118	C037		2043	54° 46.3' N	168° 57.7' W	CTDB
		0157	G053A		2043	54° 46.1' N	168° 58.0' W	Horizontal MOC1
		0312	C038		2043	54° 46.2' N	168° 57.0' W	CTDB
		0334	C039		2043	54° 46.0' N	168° 57.3' W	CTDB
		0353	G054A		2043	54° 45.9' N	168° 57.4' W	60Bon
		0451			2196	54° 53.0' N	168° 55.5' W	ADCP
		0839			150	55° 40.1' N	168° 39.6' W	ADCP
		0839			150	55° 40.1' N	168° 39.6' W	Raised centerboard

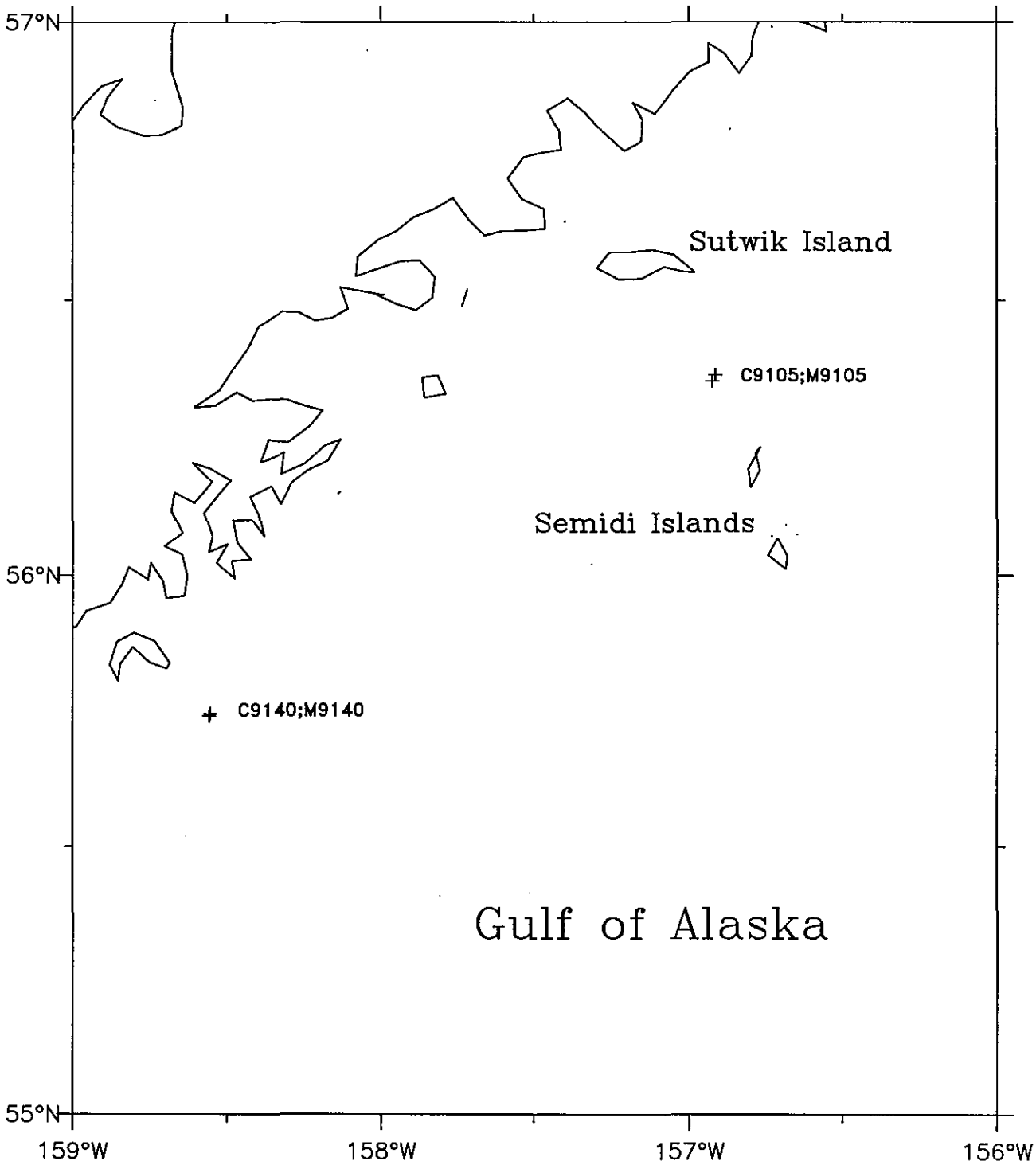


Fig. 2.1. MF92-04 Gulf of Alaska CTD (C) and Mooring (M) Stations.

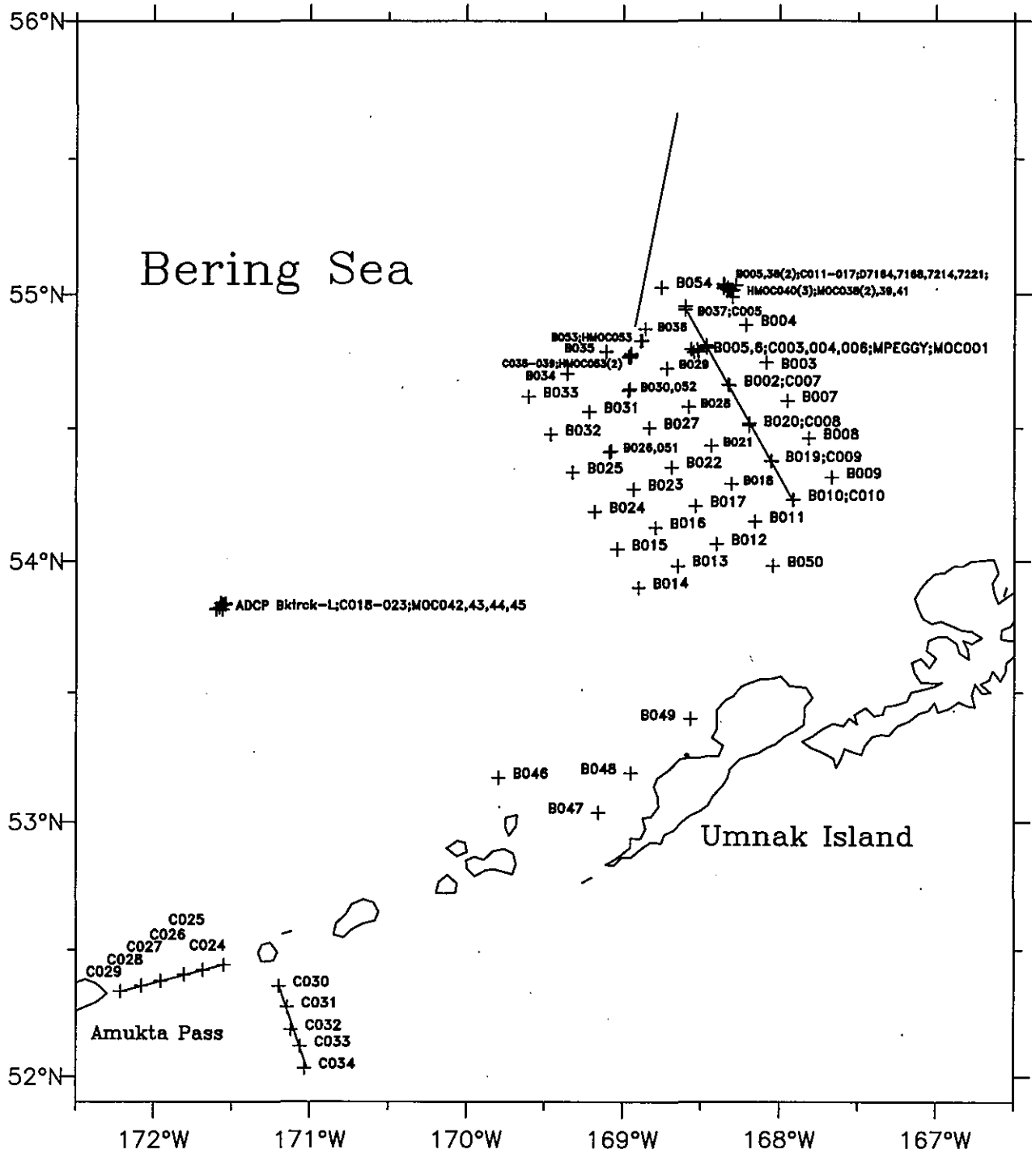


Fig. 2.2. MF92-04 Bering Sea ADCP lines (solid line) and Calibration (ADCP Bctrck-L), Bongo (B), CTD (C), Drifter (D), Horizontal MOCNESS (HMOC), MOCNESS (MOC), and Mooring (M) Stations.

MF92-05 (FOCI 3MF92): 30 April–16 May, 1992

SCIENTIFIC PERSONNEL

Name	Title	Organization
Jeff Napp	Chief Scientist	NOAA/AFSC
Lisa Britt		NOAA/AFSC
Annette Brown		NOAA/AFSC
Morgan Busby		NOAA/AFSC
Richard Davis		NOAA/AFSC
Patricia Dell'Arciprete		Univ. Washington
Leslie Lawrence		NOAA/PMEL
Allen Macklin		NOAA/PMEL
Nazi Merati		NOAA/AFSC
Matt Wilson		NOAA/AFSC

SUMMARY OF OPERATIONS SCHEDULE

Depart Kodiak	30 April
Start field operations	1 May
Complete field operations	14 May
Arrive Kodiak	15 May

CRUISE STATISTICS

ADCP Backtrack-L	1
ADCP transects	7
Bongo, 20 cm	18
Bongo, 60 cm	172
CalVET's	24
CTD's	52
Drifters	2
Live tows	27
MOCNESS	5
Tucker trawls	1

OBJECTIVES

This was the third FOCI cruise of 1992. The major objectives were to:

- obtain samples from traditional FOCI time series stations
- attempt to repair a RadNet station on Sutwik Island
- estimate the magnitude of physical dispersion and biological mortality in a patch of larval pollock marked with satellite and RADAR-tracked drifters
- map the distribution of larval pollock between Mitrofania Island and the lower region of Shelikof Strait for estimates of larval mortality
- collect underway surface chlorophyll and PAR measurements for modeling and mapping the timing of the spring bloom
- collect samples of first-feeding larval pollock for age and condition factor analyses
- estimate copepod egg/prey production from shipboard experiments
- collect and bring *Pseudocalanus* spp. females back to the laboratory in Seattle for egg-production experiments

CRUISE REPORT

All time-series stations along FOCI lines 8, 16, and 17 were occupied during the cruise; however, the lack of a starboard winch meant that we had to transit the lines several times to avoid time-consuming changes of gear on the one working quarter-deck winch. In addition to the suite of measurements normally performed at these stations, we obtained continuous measurements of in situ fluorescence, light, and discrete measurements of extracted chlorophyll. Continuous measurements of surface fluorescence, temperature, and salinity were collected along these lines during the dedicated ADCP transects.

A small boat operation was conducted to land on Sutwik Island to repair a RadNet station deployed earlier in the year. Although the small boat operation went smoothly, the RadNet station had been damaged beyond repair by a bear.

During the large-scale bongo survey there was ample opportunity to collect pollock larvae for feeding condition (brain cell RNA:DNA, whole animal RNA:DNA, gut histology) and age (otolith) analyses. Due to the large numbers of larvae found this year, we were able to take many samples from different hydrographic regimes.

In contrast to last year, it was much easier to locate large concentrations of larval pollock and to identify "discrete patches." This allowed us to conduct a small scale (6 × 8 nm) larval mortality and physical dispersion experiment using satellite drifters and a RADAR-tracked surface buoy drogued at the same depth as the drifters.

A small number of copepod egg-laying experiments using natural particulate matter were conducted, and we collected approximately 260 female *Pseudocalanus* spp. to bring to Seattle for egg-laying experiments under controlled environmental conditions.

For the first time we collected continuous sea surface measurements of temperature, salinity, and chlorophyll fluorescence. In general we were successful, although there remain a few problems to resolve with respect to the ship's sea water delivery system and the interface to the SCS.

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
	122	1-May	0703	G001A			56° 46.5' N	153° 26.3' W	Test
1			1524	G002A	FOX056	209	57° 30.8' N	154° 46.7' W	CTDB
2			1612	G002B	FOX056	208	57° 31.0' N	154° 47.0' W	CTDB
3			1700	G003A	FOX057	226	57° 33.1' N	154° 52.4' W	CTDB
4			1807	G004A	FOX058	235	57° 36.5' N	155° 00.6' W	CTDB
5			1840	G004B	FOX058	235	57° 36.5' N	155° 00.4' W	CTDB
6			1930	G005A	FOX059	255	57° 38.8' N	155° 04.5' W	CTDB
7			2032	G006A	FOX060	290	57° 41.3' N	155° 09.9' W	CTDB
8			2113	G006B	FOX060	290	57° 41.0' N	155° 10.3' W	CTDB
9			2202	GOO7A	FOX061	269	57° 42.6' N	155° 15.4' W	CTDB
10			2240	GOO7B	FOX061	270	57° 43.1' N	155° 15.5' W	CTDB
11			2258				57° 42.7' N	155° 14.0' W	ADCP
12	123	2-May	0248	GOO8A	FOX56	208	57° 30.5' N	154° 47.3' W	20Bon
13			0248	GOO8A	FOX56	208	57° 30.5' N	154° 47.3' W	60Bon
14			0400	G009A	FOX57	227	57° 33.4' N	154° 52.9' W	20Bon
15			0400	GOO9A	FOX57	227	57° 33.4' N	154° 52.9' W	60Bon
16			0510	G010A	FOX58	235	57° 36.6' N	155° 00.7' W	20Bon
17			0510	G010A	FOX58	235	57° 36.6' N	155° 00.7' W	60Bon
18			0612	G011A	FOX59	252	57° 38.6' N	155° 03.9' W	20Bon
19			0612	G011A	FOX59	252	57° 38.6' N	155° 03.9' W	60Bon
20			0720	GO12A	FOX60	289	57° 41.3' N	155° 09.4' W	20Bon
21			0720	G012A	FOX60	289	57° 41.3' N	155° 09.4' W	60Bon
22			0819	G013A	FOX61	227	57° 43.2' N	155° 15.4' W	20Bon
23			0819	G013A	FOX61	227	57° 43.2' N	155° 15.4' W	60Bon
24	124	3-May	0514	G014A	B3	123	55° 51.6' N	158° 23.1' W	60Bon
25			0640	GO15A	D3	121	55° 44.0' N	158° 08.5' W	60Bon
26			0830	G016A	F5	130	55° 45.2' N	157° 40.9' W	60Bon
27			0950	G017A	D5	100	55° 52.2' N	157° 55.1' W	60Bon
28			1142	G018A	B7	135	56° 07.6' N	157° 55.9' W	60Bon
29			1255	G019A	D7	76	56° 00.2' N	157° 42.2' W	60Bon
30			1405	G020A	F7	93	55° 52.9' N	157° 28.0' W	60Bon
31			1518	G021A	H7	80	55° 45.3' N	157° 13.1' W	60Bon
32			1643	G022A	J7	80	55° 38.6' N	156° 59.0' W	60Bon
33			1803	G023A	L7	123	55° 30.5' N	156° 43.4' W	60Bon
34			1916	G024A	N7	165	55° 23.0' N	156° 29.1' W	60Bon
35			2118	G025A	Q7	950	55° 11.9' N	156° 07.1' W	NISKIN
36			2127	G025B-D	Q7	920	55° 12.1' N	156° 07.7' W	NISKIN
37			2152	G025E	Q7	908	55° 12.0' N	156° 07.5' W	60Bon
38			2215	G025F	Q7	900	55° 12.4' N	156° 08.1' W	LIVE
39			2339	G026A	Q9	336	55° 19.9' N	155° 54.4' W	60Bon
40	125	4-May	0030	G027A	P9	200	55° 24.0' N	156° 01.7' W	60Bon
41			0148	G028A	N9	209	55° 31.0' N	156° 15.8' W	60Bon

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey — 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
42			0310	G029A	L9	247	55° 38.3' N	156° 30.1' W	60Bon
43			0429	G030A	J9	190	55° 46.5' N	156° 44.9' W	60Bon
44			0451	G030B	J9	199	55° 46.6' N	156° 44.5' W	LIVE
45			0611	G031B	H9	123	55° 53.7' N	156° 59.0' W	60Bon
46			0727	G032A	F9	112	56° 01.3' N	157° 13.7' W	60Bon
47			0841	G033A	D9	156	56° 07.7' N	157° 27.6' W	60Bon
48			0953	G034A	B9	149	56° 08.2' N	157° 28.0' W	60Bon
49			1110	G035A	B11	120	56° 23.7' N	157° 28.0' W	60Bon
50			1227	G036A	D11	120	56° 16.0' N	157° 14.3' W	60Bon
51			1335	G037A	F11	98	56° 08.9' N	157° 00.2' W	60Bon
52			1606	G038A	H11	190	55° 56.9' N	156° 40.3' W	60Bon
53			1650	G039A	J11	221	55° 54.5' N	156° 32.3' W	60Bon
54			1806	G040A	L11	240	55° 46.7' N	156° 17.3' W	60Bon
55			1924	G041A	N11	235	55° 39.1' N	156° 03.0' W	60Bon
56			2048	G042A	P11	201	55° 32.2' N	155° 49.0' W	60Bon
57			2106	G042B	P11	230	55° 32.4' N	155° 49.0' W	NISKIN
58			2212	G043A	P13	155	55° 38.5' N	155° 35.4' W	60Bon
59	126	5-May	0007	G044A	N13	93	55° 47.1' N	155° 55.4' W	60Bon
60			0107	G045A	FOX152	82	55° 54.1' N	155° 59.5' W	CTDB
61			0122	G045B	FOX152	80	55° 54.2' N	155° 59.0' W	CTDB
62			0234	G046A	FOX153	202	55° 54.9' N	156° 11.4' W	LIVE
63			0252	G046B	FOX153	202	55° 54.8' N	156° 11.4' W	CTDB
64			0343	G047A	FOX154	222	55° 55.6' N	156° 14.9' W	CTDB
65			0435	G047B	FOX154	222	55° 55.5' N	156° 14.9' W	CTDB
66			0520	G048A	FOX155	231	55° 56.3' N	156° 21.0' W	LIVE
67			0544	G048B	FOX155	228	55° 56.5' N	156° 21.1' W	CTDB
68			0632	G048C	FOX155	232	55° 56.3' N	156° 20.9' W	CTDB
69			0718	G049A	FOX156	205	55° 56.9' N	156° 26.1' W	CTDB
70			0807	G049B	FOX156	206	55° 56.6' N	156° 25.3' W	CTDB
71			0858	G050A	FOX157	198	55° 57.7' N	156° 30.8' W	CTDB
72			1009	G051A	FOX158	196	55° 58.0' N	156° 37.5' W	CTDB
73			1243	G052A	FOX147	108	56° 18.0' N	156° 47.8' W	CTDB
74			1333	G053A	FOX148	135	56° 21.5' N	156° 52.0' W	CTDB
75			1412	GO53B	FOX148	129	56° 21.3' N	156° 52.1' W	CTDB
76			1453	GO54A	FOX149	123	56° 24.0' N	156° 55.1' W	CTDB
77			1517	GO54B	FOX149	124	56° 24.0' N	156° 55.4' W	CTDB
78			1601	GO55A	FOX150	97	56° 26.6' N	156° 57.4' W	CTDB
79			1726	G056A	FOX150	102	56° 26.6' N	156° 57.2' W	20B0N
80			1726	G056A	FOX150	102	56° 26.6' N	156° 57.2' W	60BON
81			1801	G057A	FOX149	119	56° 24.1' N	156° 55.2' W	20B0N
82			1801	G057A	FOX149	119	56° 24.1' N	156° 55.2' W	60BON
83			1837	G058A	FOX148	135	56° 21.7' N	156° 52.0' W	20B0N

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
84			1837	G058A	FOX148	135	56° 21.7' N	156° 52.0' W	60BON
85			1919	G059A	FOX147	106	56° 18.2' N	156° 48.0' W	20BON
86			1919	G059A	FOX147	106	56° 18.2' N	156° 48.0' W	60BON
87			2054	G060A	H13	220	56° 09.1' N	156° 32.1' W	20BON
88			2054	G060A	H13	220	56° 09.1' N	156° 32.1' W	60BON
89			2229	G061A	FOX158	192	55° 58.3' N	156° 38.2' W	20BON
90			2229	G061A	FOX158	192	55° 58.3' N	156° 38.2' W	60BON
91			2322	G062A	FOX157	200	55° 57.3' N	156° 31.8' W	20BON
92			2322	G062A	FOX157	200	55° 57.3' N	156° 31.8' W	60BON
93	127	6-May	0010	G063A	FOX156	207	55° 56.7' N	156° 25.8' W	20BON
94			0010	G063A	FOX156	207	55° 56.7' N	156° 25.8' W	60BON
95			0058	G064A	FOX155	233	55° 56.3' N	156° 20.0' W	20BON
96			0058	G064A	FOX155	233	55° 56.3' N	156° 20.0' W	60BON
97			0151	G065A	FOX154	225	55° 55.5' N	156° 15.2' W	20BON
98			0151	G065A	FOX154	225	55° 55.5' N	156° 15.2' W	60BON
99			0242	G066A	FOX153	200	55° 54.9' N	156° 11.2' W	20BON
100			0242	G066A	FOX153	200	55° 54.9' N	156° 11.2' W	60BON
101			0347	G067A-C	FOX152	85	55° 53.6' N	156° 00.6' W	NISKIN
102			0352	G067B	FOX152	85	55° 53.6' N	156° 00.6' W	NISKIN
103			0358	G067C	FOX152	85	55° 53.6' N	156° 00.6' W	NISKIN
104			0457	G067D	FOX152	83	55° 53.8' N	156° 00.1' W	20BON
105			0457	G067D	FOX152	83	55° 53.8' N	156° 00.1' W	60BON
106			0637	G068A	J13	209	56° 01.9' N	156° 18.4' W	60BON
107			0657	G068B	J13	210	56° 01.6' N	156° 19.0' W	LIVE
108			0823	G069A	H13	214	56° 09.3' N	156° 32.4' W	LIVE
109			1035	G070A	D13	130	56° 24.1' N	157° 00.7' W	60BON
110			1158	G071A	D15	116	56° 31.6' N	156° 46.8' W	60BON
111			1331	G072A	F15	206	56° 24.6' N	156° 33.2' W	60BON
112			1511	G073A	H15	280	56° 17.3' N	156° 18.2' W	60BON
113			1636	G074A	J15	239	56° 09.5' N	156° 05.2' W	60BON
114			1251	G075A	L15	61	56° 02.7' N	155° 50.0' W	60BON
115			1844	G076A	N15	31	55° 58.6' N	155° 40.2' W	60BON
116			2006	G077A	N17	35	55° 03.8' N	155° 22.4' W	60BON
117			2016	G077B	N17	35	56° 03.7' N	155° 22.6' W	NISKIN
118			2036	G077C	N17	35	56° 30.7' N	155° 22.5' W	60BON
119			2140	G078A	L17	55	56° 11.0' N	155° 36.8' W	60BON
120			2249	G079A	J17	112	56° 17.9' N	155° 50.9' W	60BON
121	128	7-May	0021	G080A	H17	255	56° 24.7' N	156° 05.7' W	60BON
122			0106	G080B	H17	255	56° 24.7' N	156° 05.3' W	60BON
123			0225	G081A	F17	210	56° 32.2' N	156° 19.8' W	60BON
124			0349	G082A	D17	160	56° 47.2' N	156° 20.8' W	60BON
125			0511	G083A	B17	104	56° 46.0' N	156° 46.4' W	60BON

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey — 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
126			0533	G083B	B17	86	56° 43.2' N	156° 46.5' W	NISKIN
127			0538	G083C	B17	86	56° 43.2' N	156° 46.5' W	NISKIN
128			0555	G083D	B17	122	56° 44.5' N	156° 46.3' W	LIVE
129			0616	G083E	B17	122	56° 44.4' N	156° 45.8' W	NISKIN
130			0746	G084A	B19	68	56° 53.6' N	156° 29.5' W	60BON
131			0813	G084B	B19	74	56° 53.7' N	156° 28.8' W	60BON
132			0917	G085A	D19	178	56° 47.1' N	156° 21.0' W	60BON
133			1007	G085B	D19	180	56° 47.3' N	156° 20.8' W	LIVE
134			1027	GO85C	D19	182	56° 47.4' N	156° 20.2' W	CALVET
135			1152	GO86A	F19	270	56° 40.0' N	156° 06.6' W	60BON
136			1322	GO87A	H19	240	56° 32.8' N	155° 51.7' W	60BON
137			1443	G088A	J19	74	56° 25.6' N	155° 37.2' W	60BON
138			1609	G089A	J21	66	56° 33.4' N	155° 22.9' W	60BON
139			1737	G090A	H21	241	56° 40.6' N	155° 38.3' W	60BON
140			1808	G090B	H21	240	56° 40.7' N	155° 38.3' W	LIVE
141			1831	G090C	H21		56° 40.6' N	155° 38.2' W	CALVET
142			1952	G091A	F21	300	56° 47.7' N	155° 52.2' W	60BON
143			2011	G091B	F21	300	56° 47.6' N	155° 52.8' W	NISKIN
144			2057	G091C	F21	300	56° 47.8' N	155° 51.5' W	LIVE
145			2219	G092A	D21	193	56° 56.0' N	156° 08.0' W	60BON
146			2247	G092B	D21	186	56° 55.1' N	156° 07.1' W	LIVE
147			2304	GO92C	D21	186	56° 55.1' N	156° 07.0' W	CALVET
148	129	8-May	0019	G093A	B21	116	57° 01.9' N	156° 21.1' W	60BON
149			0138	G094A	B23	84	57° 09.2' N	156° 09.2' W	60BON
150			0301	G095A	D23	250	57° 02.1' N	155° 55.6' W	60BON
151			0432	G096A	F23	285	56° 55.0' N	155° 40.1' W	60BON
152			0458	G096B-C	F23	285	56° 55.0' N	155° 39.7' W	NISKIN
153			0514	G096D	F23	285	56° 54.7' N	155° 40.0' W	LIVE
154			0637	G097A	H23	240	56° 47.9' N	155° 25.5' W	60BON
155			0813	G098A	J23	62	56° 40.7' N	155° 10.7' W	60BON
156			1107	G099A	J25	55	56° 49.3' N	154° 56.1' W	60BON
157			1237	G100A	H25	221	56° 56.1' N	155° 11.5' W	60BON
158			1407	G101A	F25	266	57° 03.0' N	155° 26.2' W	60BON
159			1436	G101B	F25	266	57° 03.1' N	155° 26.0' W	60BON
160			1456	G101C	F25	266	57° 03.0' N	155° 26.4' W	CALVET
161			1622	G102A	D25	277	57° 10.2' N	155° 40.8' W	60BON
162			1743	G103A	B25	241	57° 16.5' N	155° 55.1' W	60BON
163			1824	G103B	B25	242	57° 16.4' N	155° 55.2' W	60BON
164			1844	G103C	B25	240	57° 16.4' N	155° 55.1' W	CALVET
165			2002	G104A	B27	280	57° 24.6' N	155° 41.7' W	60BON
166			2018	G104B	B27	279	57° 24.7' N	155° 41.5' W	NISKIN
167			2210	G105A	D27	262	57° 17.8' N	155° 27.8' W	60BON

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey — 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
168			2326	G106A	F27	235	57° 10.9' N	155° 12.8' W	60BON
169	130	9-May	0046	G107A	F29	217	57° 18.3' N	154° 59.7' W	60BON
170			0204	G108A	D29	246	57° 25.3' N	155° 14.1' W	60BON
171			0318	G109A	B29	311	57° 31.1' N	155° 28.4' W	60BON
172			0343	G109B	B29	310	57° 32.5' N	155° 28.5' W	LIVE
173			0416	G109C	B29	310	57° 32.5' N	155° 28.5' W	CALVET
174			0450	G109D	B29	310	57° 32.1' N	155° 28.3' W	LIVE
175			0516	G109E	B29	310	57° 32.5' N	155° 28.3' W	CALVET
176			0636	G110A	B27	280	57° 24.6' N	155° 41.4' W	LIVE
177			0703	G110B	B27	282	57° 24.8' N	155° 41.2' W	CALVET
178			1051	G111A		180	56° 53.9' N	156° 16.0' W	60BON
179			1118	G112A		180	56° 54.3' N	156° 15.3' W	60BON
180			1147	G112B		178	56° 54.5' N	156° 15.5' W	CALVET
181			1124	G112C		184	56° 54.5' N	156° 14.7' W	60BON
182			1302	G112D		180	56° 54.4' N	156° 15.3' W	60BON
183			1539	G111B		141	56° 52.0' N	156° 25.5' W	DRIFTER # 7167
184			1527	G113A		145	56° 53.1' N	156° 25.3' W	60BON
185			1602	G114A		172	56° 52.0' N	156° 23.3' W	60BON
186			1636	G115A		186	56° 50.6' N	156° 20.4' W	60BON
187			1707	G116A		195	56° 48.9' N	156° 17.7' W	60BON
188			1717	G116B		195	56° 49.2' N	156° 18.0' W	DRIFTER # 7228
189			1800	G117A		191	56° 49.3' N	156° 15.2' W	60BON
190			1834	G118A		193	56° 50.8' N	156° 18.3' W	60BON
191			1919	G119A		190	56° 51.8' N	156° 18.9' W	60BON
192			1937	G120A		173	56° 51.8' N	156° 21.4' W	60BON
193			2012	G121A		158	56° 53.3' N	156° 23.9' W	60BON
194			2048	G122A		167	56° 54.2' N	156° 21.9' W	60BON
195			2125	G123A		185	56° 52.7' N	156° 19.4' W	60BON
196			2156	G124A		187	56° 52.7' N	156° 19.3' W	60BON
197			2222	G125A		191	56° 51.1' N	156° 16.9' W	60BON
198			2257	G126A		186	56° 49.6' N	156° 14.3' W	60BON
199			2331	G127A		198	56° 51.1' N	156° 11.9' W	60BON
200	131	10-May	0001	G128A		186	56° 52.3' N	156° 14.3' W	60BON
201			0031	G129A		181	56° 53.7' N	156° 17.5' W	60BON
202			0057	G130A		185	56° 55.1' N	156° 19.9' W	60BON
203			0131	G131A		160	56° 56.2' N	156° 17.8' W	60BON
204			0203	G132A		180	56° 54.8' N	156° 15.2' W	60BON
205			0240	G133A		179	56° 55.1' N	156° 15.3' W	60BON
206			0307	G134A		190	56° 53.9' N	156° 12.9' W	60BON
207			0339	G135A		188	56° 52.7' N	156° 09.8' W	60BON

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey — 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
208			0432	G136A		186	56° 54.7' N	156° 12.7' W	ADCP
209			0815	G137A		169	56° 52.6' N	156° 22.9' W	CALVET
210			0946	G138A		166	56° 52.9' N	156° 23.0' W	TUCK
211			1212	G139A		151	56° 52.9' N	156° 24.8' W	MOC1
212			1327	G140A		155	56° 52.1' N	156° 24.6' W	CALVET
213			1355	G140B		154	56° 52.5' N	156° 24.8' W	CTDB
214			1434	G140C		151	56° 52.7' N	156° 24.7' W	CTDB
215			1515	G141A		176	56° 52.2' N	156° 21.6' W	CTDB
216			1756	G142A		190	56° 49.9' N	156° 21.6' W	CTDB
217			1843	G143A		150	56° 49.9' N	156° 25.9' W	CTDB
218			1927	G144A		158	56° 50.6' N	156° 24.8' W	CTDB
219			1930	G144B		160	56° 50.6' N	156° 24.8' W	CTDB
220			2044	G145A		153	56° 49.2' N	156° 24.9' W	CALVET
221			2111	G146A		190	56° 49.3' N	156° 21.1' W	LIVE (60B)
222			2140	G147A		179	56° 51.2' N	156° 21.5' W	LIVE (60B)
223			2212	G148A		150	56° 51.1' N	156° 25.9' W	LIVE (60B)
224			2259	G149A		147	56° 48.5' N	156° 26.4' W	LIVE (60B)
225			2321	G149B		153	56° 48.5' N	156° 26.1' W	LIVE (60B)
226			2353	G150A		157	56° 49.0' N	156° 25.2' W	LIVE (60B)
227	132	11-May	0009	G150B		153	56° 49.1' N	156° 25.4' W	LIVE (60B)
228			0032	G151A		151	56° 48.5' N	156° 26.7' W	CALVET
229			0446	G152A		104	56° 16.1' N	157° 06.0' W	60BON
230			0531	G153A		169	56° 18.2' N	157° 09.8' W	60BON
231			0558	G153B		168	56° 18.1' N	157° 09.8' W	LIVE (60B)
232			0630	G153C		167	56° 18.1' N	157° 09.9' W	LIVE (60B)
233			0653	G153D		167	56° 18.1' N	157° 09.0' W	CALVET
234			0741	G154A		155	56° 20.5' N	157° 13.9' W	60BON
235			0812	G154B		170	56° 20.6' N	157° 13.6' W	60BON
236			0834	G154C		168	56° 20.3' N	157° 13.6' W	CALVET
237			0848	G154D		173	56° 20.2' N	157° 13.4' W	60BON
238			0943	G155A		166	56° 23.3' N	157° 09.0' W	60BON
239			1035	G156A		159	56° 21.2' N	157° 04.8' W	60BON
240			1057	G156B		160	56° 21.0' N	157° 05.0' W	60BON
241			1118	G156C		166	56° 20.8' N	157° 04.6' W	CALVET

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey — 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
242			1133	G156D		170	56° 20.6' N	157° 04.5' W	60BON
243			1214	G157A		116	56° 18.8' N	157° 01.2' W	60BON
244			1257	G158A		136	56° 21.7' N	156° 56.1' W	60BON
245			1323	G158B		137	56° 21.7' N	156° 56.2' W	60BON
246			1338	G158C		137	56° 21.8' N	156° 56.0' W	CALVET
247			1356	G158D		137	56° 21.7' N	156° 56.2' W	60BON
248			1442	G159A		160	56° 23.9' N	157° 00.1' W	60BON
249			1512	G159B		158	56° 23.9' N	156° 59.8' W	CALVET
250			1543	G160A		80	56° 26.0' N	157° 03.8' W	60BON
251			1604	G160B		68	56° 26.3' N	157° 03.8' W	60BON
252			1626	G160C		83	56° 26.0' N	157° 03.8' W	CALVET
253			1656	G161A		75.4	56° 26.1' N	157° 03.6' W	ADCP
254			2017	G162A		137	56° 21.9' N	156° 55.7' W	CTDB
255			2117	G163A		121	56° 18.9' N	157° 01.1' W	CTDB
256			2205	G164A		104	56° 15.9' N	157° 06.4' W	CTDB
257			2251	G165A		156	56° 18.1' N	157° 10.1' W	CTDB
258	133	12-May	0020	G166A		161	56° 21.3' N	157° 05.5' W	CTDB
259			0119	G167A		160	56° 23.9' N	156° 59.9' W	CTDB
260			0159	G168A		80	56° 25.9' N	157° 03.8' W	CTDB
261			0253	G169A		167	56° 23.2' N	157° 09.0' W	CTDB
262			0403	G170A		167	56° 20.5' N	157° 13.9' W	CTDB
263			0530	G171A		70	56° 25.4' N	157° 04.0' W	MOC1
264			0622	G171B		74	56° 26.2' N	157° 03.6' W	LIVE (60B)
265			0655	G171C		84	56° 26.0' N	157° 03.7' W	LIVE
266			1113	G172A		150	56° 57.3' N	156° 25.3' W	MOC1
267			1224	G173A		150	56° 54.6' N	156° 25.6' W	CALVET
268			1543	G174A		284	56° 32.3' N	156° 08.4' W	ADCP
269			1925	G175A		157	56° 50.5' N	156° 24.6' W	MOC1
270			2100	G176A			56° 48.1' N	156° 27.5' W	FLUOR
271	134	13-May	0331	G177A		150	56° 50.0' N	156° 25.9' W	CTDB/ LIVE
				G177B					omitted
272			0454	G177C		150	56° 51.1' N	156° 26.0' W	CDTB/ CALVET
273			0552	G177D		143	56° 51.8' N	156° 26.4' W	CDTB/ CALVET
274			0652	G177E		153	56° 51.1' N	156° 25.4' W	CDTB/ CALVET
275			0740	G177F		154	56° 51.5' N	156° 25.1' W	CDTB/ CALVET
276			0919	G178A		165	56° 45.3' N	156° 39.5' W	60BON
277			1000	G179A		165	56° 44.4' N	156° 32.5' W	60BON

Table 5. MF92-05 CRUISE SUMMARY

Shelikof Strait Larval Survey — 30 April - 16 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
278			1034	G180A		182	56° 43.3' N	156° 34.6' W	60BON
279			1100	G181A		171	56° 42.2' N	156° 32.3' W	60BON
280			1151	G182A		152	56° 44.4' N	156° 28.7' W	60BON
281			1217	G183A		125	56° 45.4' N	156° 31.0' W	60BON
282			1245	G184A		115	56° 46.2' N	156° 33.6' W	60BON
283			1312	G185A		98	56° 47.2' N	156° 35.7' W	60BON
284			1353	G186A		132	56° 49.4' N	156° 32.5' W	60BON
285			1429	G187A		130	56° 48.4' N	156° 30.4' W	60BON
286			1503	G188A		132	56° 47.4' N	156° 28.9' W	60BON
287			1611	G189A		115	56° 46.7' N	156° 25.5' W	60BON
288			1649	G190A		181	56° 48.4' N	156° 22.4' W	60BON
289			1727	G191A		156	56° 49.5' N	156° 24.3' W	60BON
290			1814	G192A		146	56° 50.1' N	156° 26.3' W	60BON
291			1854	G193A		138	56° 50.6' N	156° 27.1' W	60BON
292			1930	G194A		127	56° 51.6' N	156° 29.0' W	60BON
293			2009	G195A		145	56° 53.5' N	156° 25.9' W	60BON
294			2044	G196A		167	56° 52.6' N	156° 23.8' W	60BON
295			2116	G197A		180	56° 51.4' N	156° 21.5' W	60BON
296			2147	G198A		193	56° 50.7' N	156° 19.3' W	60BON
297			2237	G199A		180	56° 53.1' N	156° 15.3' W	60BON
298			2300	G199B		180	56° 52.7' N	156° 15.5' W	60BON
299			2339	G200A		173	56° 54.8' N	156° 18.9' W	60BON
300	135	14-May	0013	G201A		168	56° 56.3' N	156° 22.3' W	60BON
301			0050	G202A		93	56° 58.7' N	156° 18.6' W	60BON
302			0124	G203A		170	56° 57.2' N	156° 14.9' W	60BON
303			0155	G204A		181	56° 55.8' N	156° 11.5' W	60BON
304			0235	G205A		179	56° 58.4' N	156° 06.2' W	60BON
305			0310	G206A		130	56° 59.8' N	156° 10.9' W	60BON
306			0340	G207A		120	57° 01.2' N	156° 14.6' W	60BON
307			0406	G208A		110	57° 01.8' N	156° 15.7' W	60BON
308			0543	G209A		143	56° 52.0' N	156° 26.4' W	CTDB
309			0643	G210A		151	56° 50.6' N	156° 26.2' W	CTDB
310			0739	G211A		131	56° 50.6' N	156° 29.2' W	CTDB
311			0838	G212A		123	56° 52.2' N	156° 29.1' W	CTDB
312			0942	G213A		127	56° 46.0' N	156° 30.4' W	MOC1
313			1530	G214A		120	56° 49.4' N	156° 31.8' W	RADAR
314			1912	G215A		255	56° 25.2' N	156° 04.9' W	60BON
315			1959	G216A		245	56° 22.7' N	156° 04.9' W	60BON

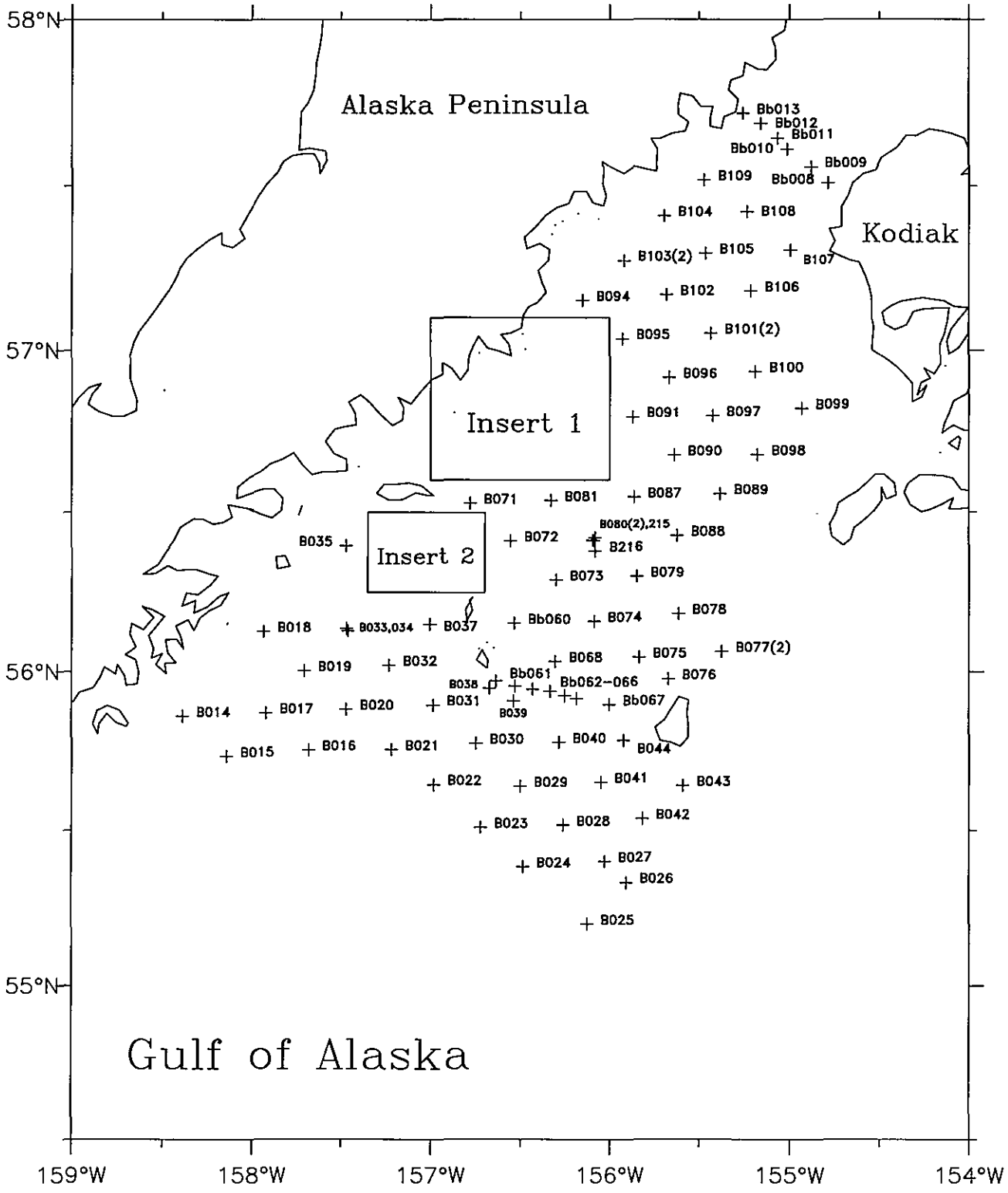


Fig. 3.1. MF92-05 Bongo Stations.

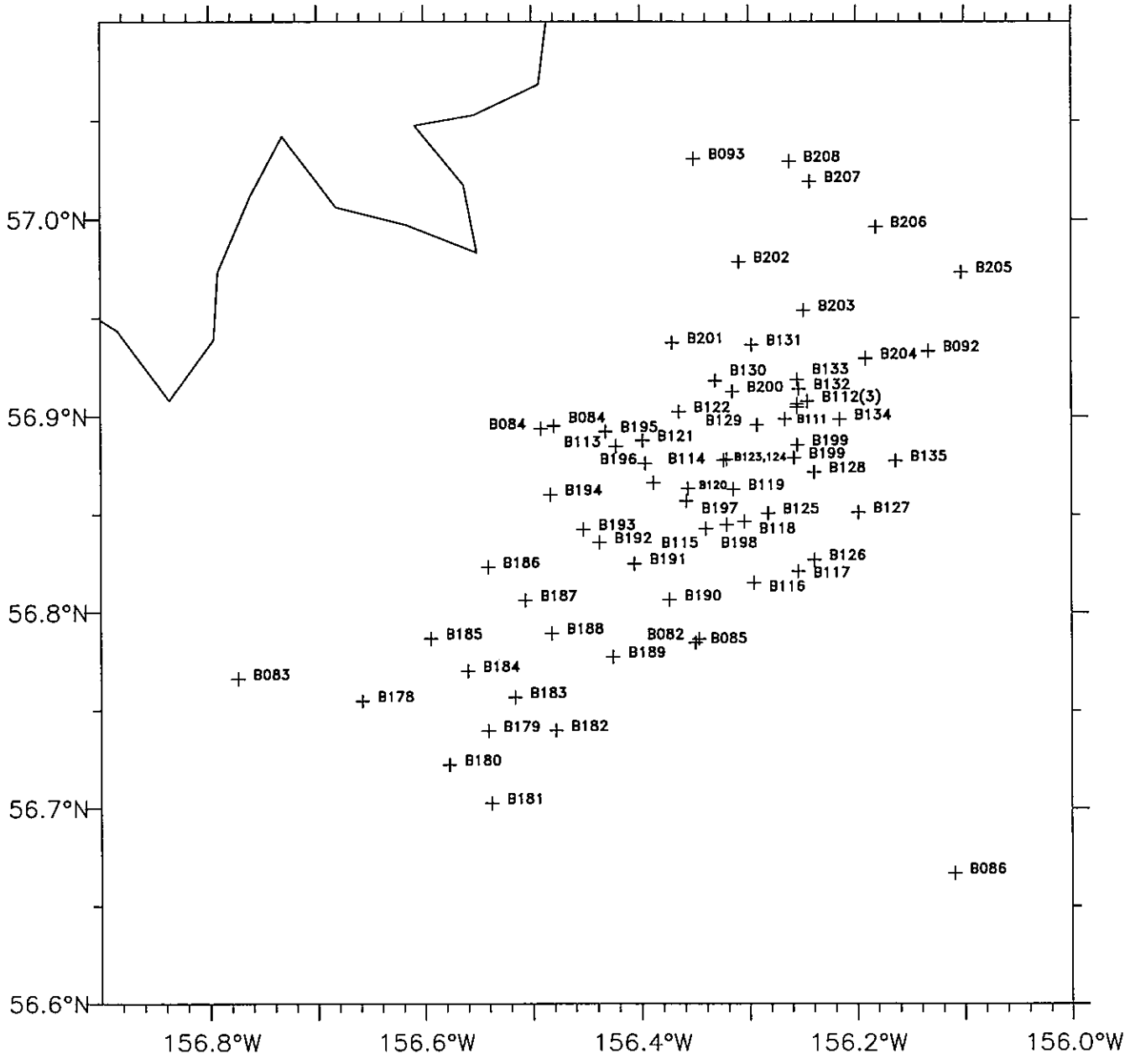


Fig. 3.2. MF92-05 Bongo Insert 1.

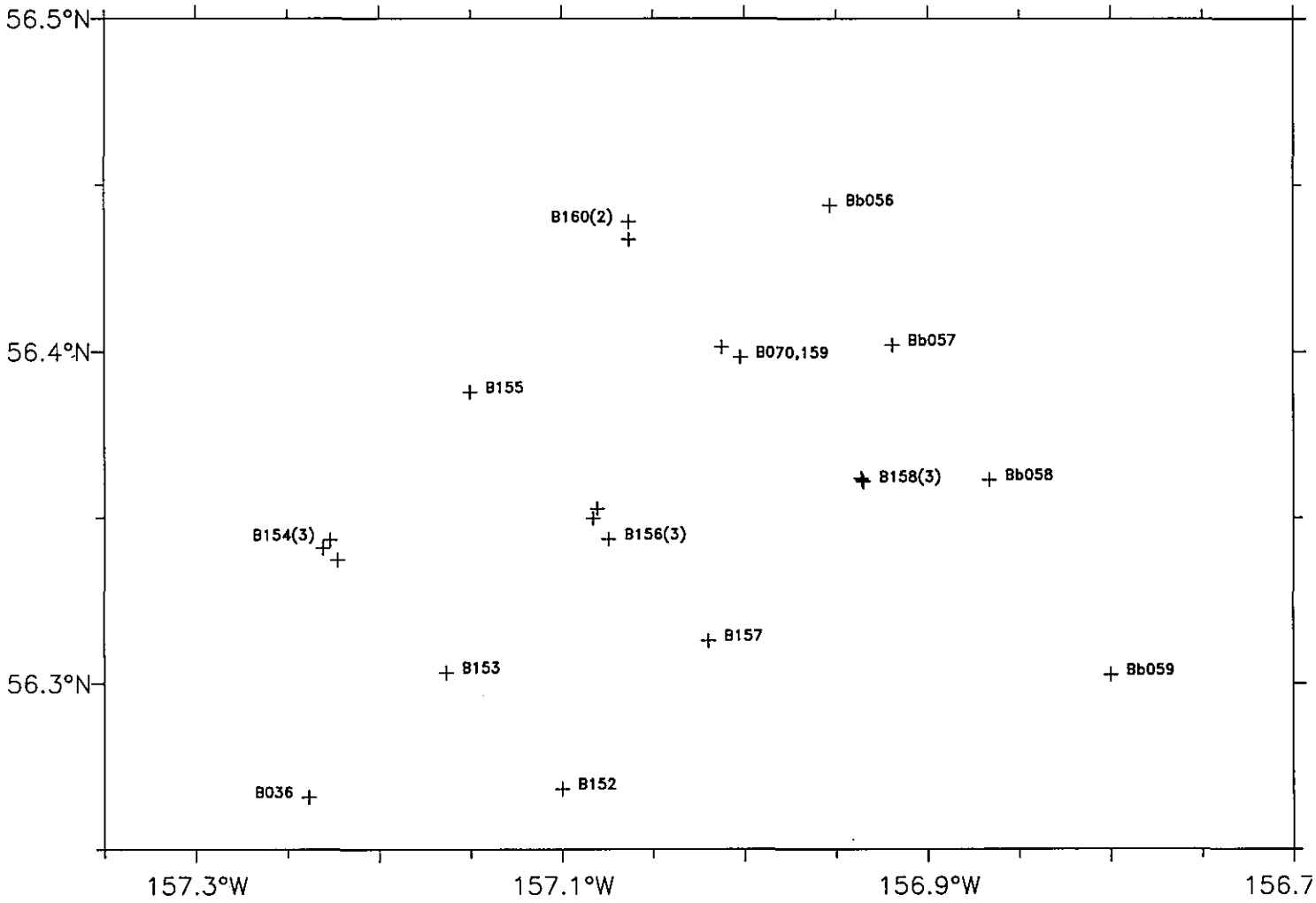


Fig. 3.3. MF92-05 Bongo Insert 2.

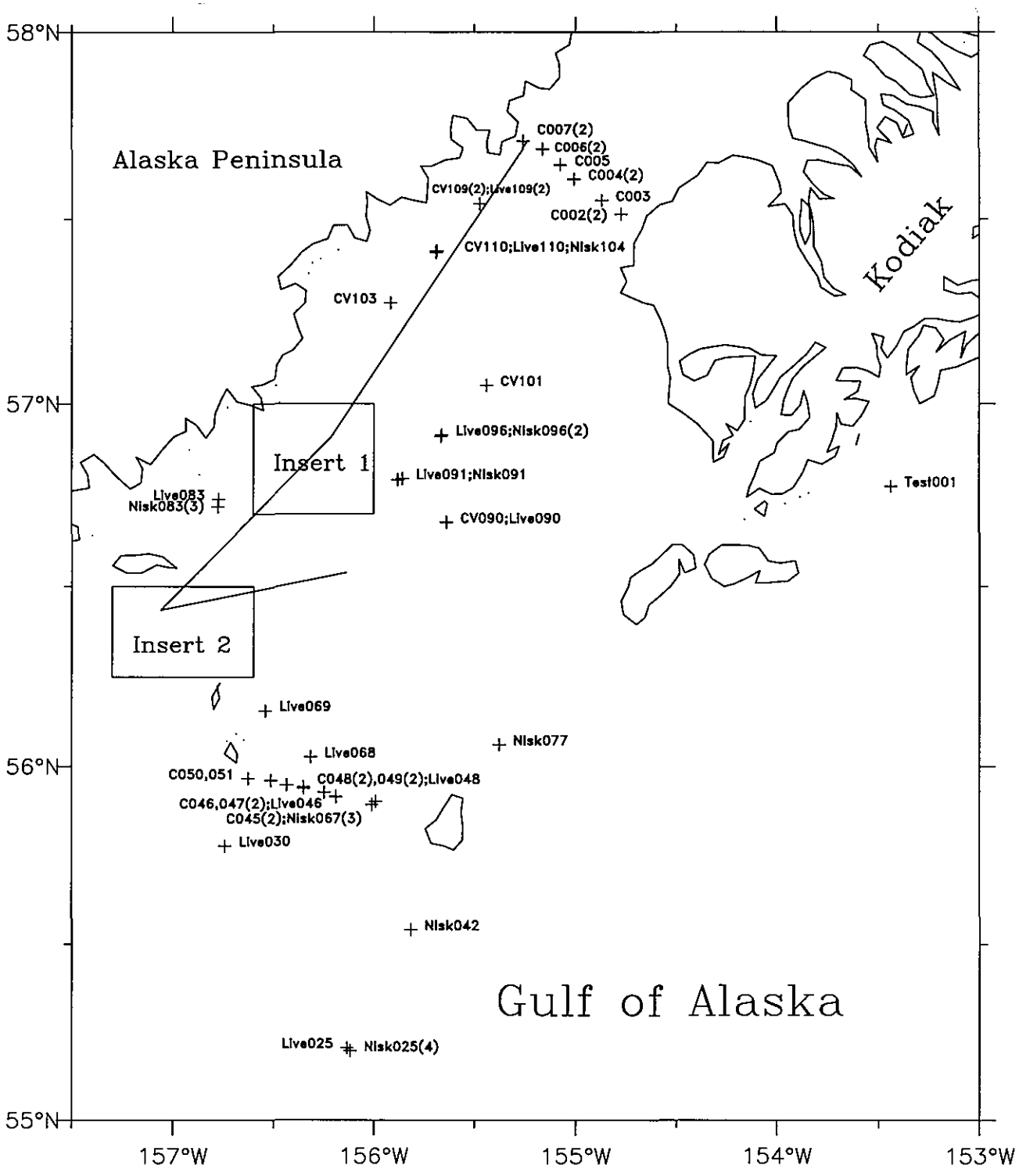


Fig. 3.4. MF92-05 CalVET (CV), CTD (C), Drifter (D), Live Tow (Live), MOCNESS (MOC), Tucker (TU), Radar (Radar), and Niskin™ Bottle Sample (Nisk) Stations.

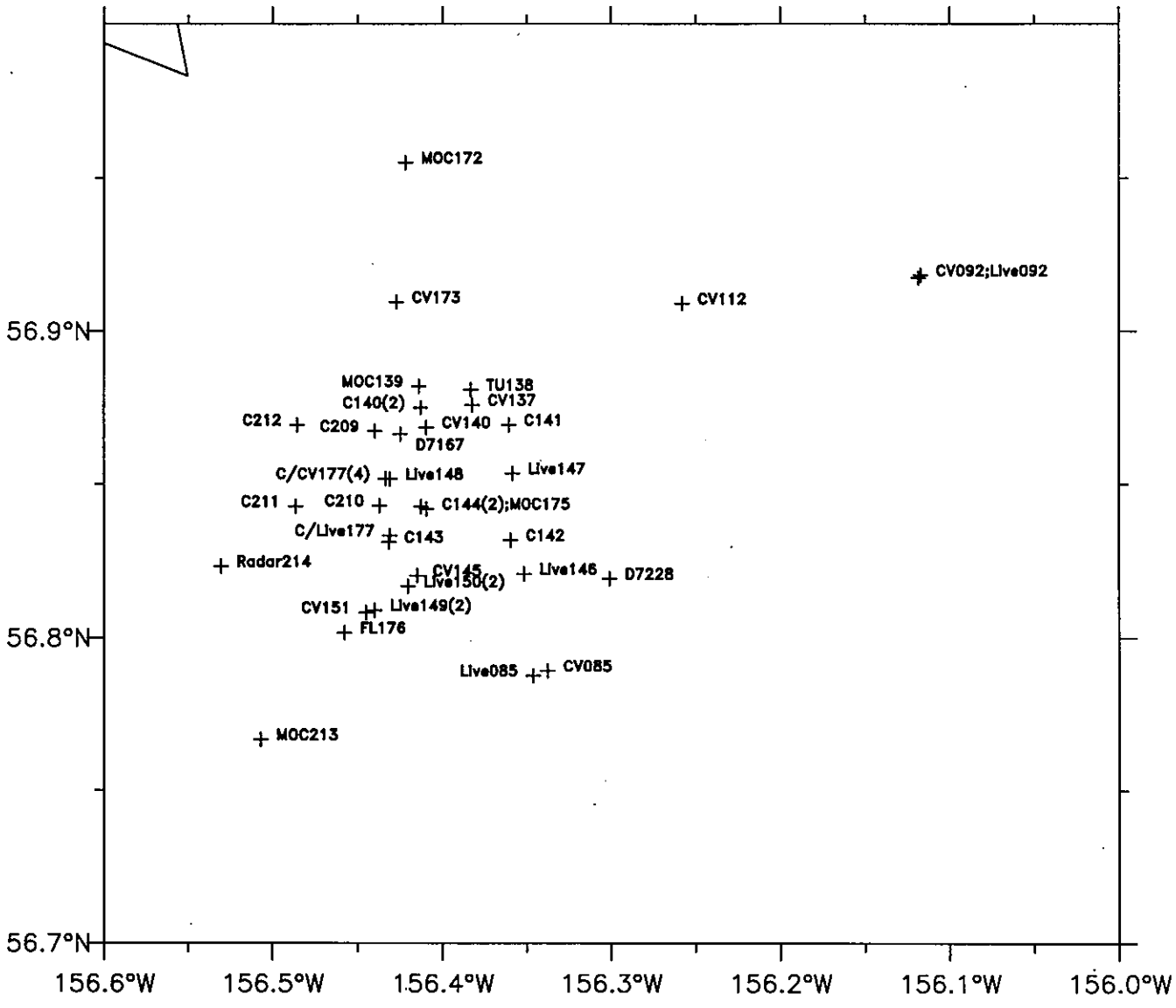


Fig. 3.5. MF92-05 Station Insert 1.

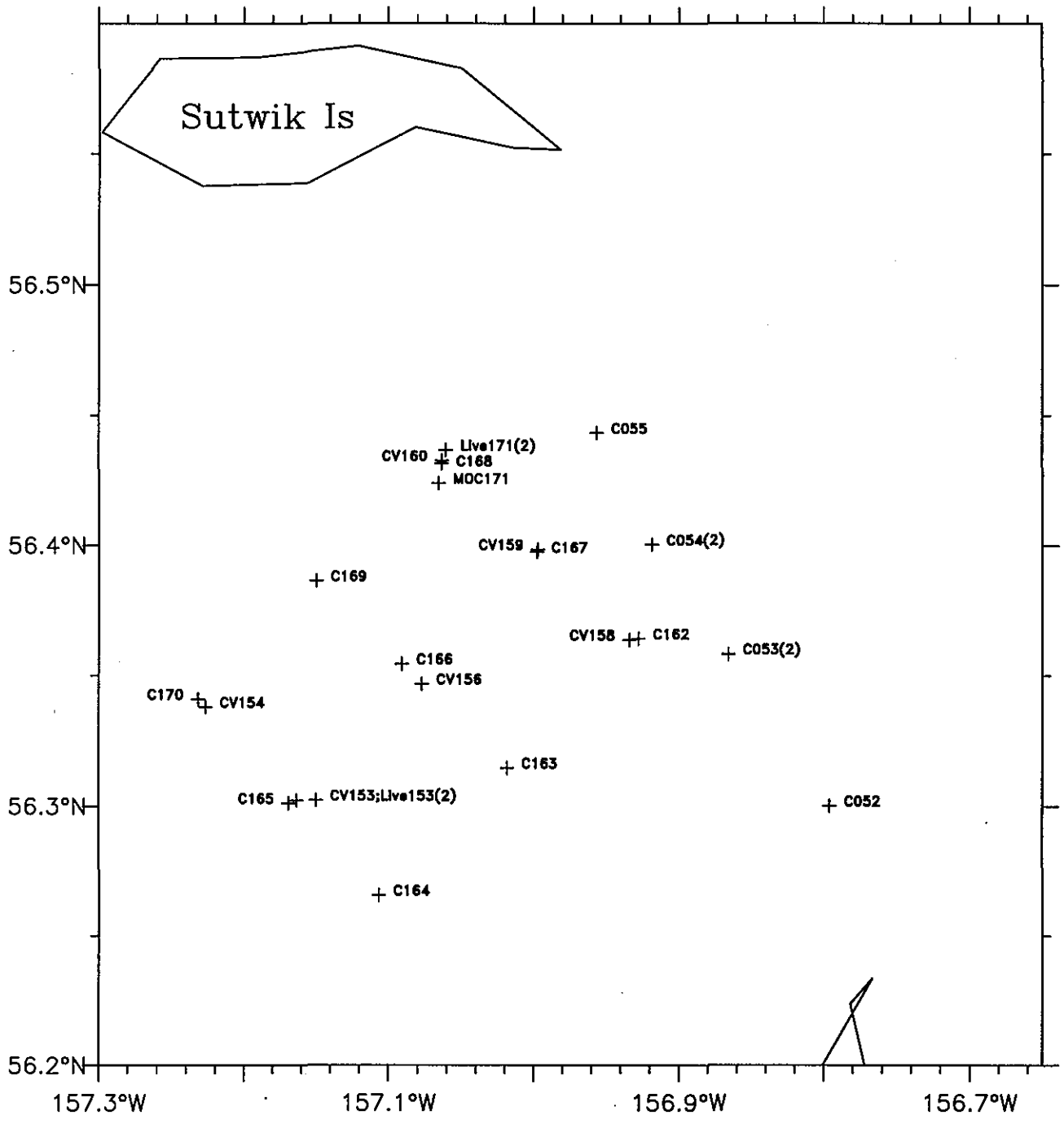


Fig. 3.6. MF92-05 Station Insert 2.

MF92-06 (FOCI 4MF92): 17 May–29 May, 1992

SCIENTIFIC PERSONNEL

Name	Title	Organization
Art Kendall	Chief Scientist	NOAA/AFSC
Rick Brodeur	Watch Leader	NOAA/AFSC
Jay Clark	Watch Leader	NOAA/AFSC
Sue Picquelle		NOAA/AFSC
Trish Brown		NOAA/AFSC
Dave Kachel		NOAA/PMEL
Doug Schleiger		NOAA/PMEL

SUMMARY OF OPERATIONS SCHEDULE

Depart Kodiak	17 May
Start field operations	18 May
Stop field operations	28 May
Arrive Kodiak	29 May

CRUISE STATISTICS

Bongo, 20 cm	15
Bongo, 60 cm	146
CTD's	29
Marinovich trawls	5
Methot trawls	6
Tucker trawls	7

OBJECTIVES

The objectives of this cruise were to:

- continue acquisition of long-term biological and physical time series
- conduct a survey of larval pollock for use in estimating distribution, drift and mortality rates
- collect samples of larval pollock for studies on growth and condition
- trawl for midwater predators on larval pollock

CRUISE REPORT

Scientific operations on this cruise consisted of conducting a survey of lower Shelikof Strait for larvae of walleye pollock, collecting samples in areas of high larval abundance to investigate larval condition, prey concentrations and water properties, collecting zooplankton and water property data at established FOCI stations, and sampling proximate to eddy-like features seen in satellite images. Excellent weather prevailed from the start of the cruise on 16 May through 23 May, after which it became cloudy and moderately windy, although operations were able to continue. All intended operations were completed, but lack of a second hydrographic winch slowed some sampling and compromised the synopticity of some data.

During the first part of the cruise, a bongo/SeaCat grid of 48 stations was occupied using standard FOCI stations southwest of Sutwik and Chirikof Islands. FOCI hydrographic lines 16 and 17 were sampled for water properties, chlorophyll, nutrients, microzooplankton, and net zooplankton toward the end of the first part of the cruise. Fairly high concentrations of larvae were found at station L9, so comparative Tucker and Methot tows were taken there, live larvae for condition studies were collected, water samples were taken for microzooplankton, chlorophyll and nutrients, and a Marinovich trawl was conducted to collect potential predators on larval pollock. Similar collections were made at station D13, where high concentrations of larvae were also found. This station was occupied after sampling at 14 grid stations just southwest of Sutwik Island. Marinovich and Methot tows were also taken at night at station D13, to examine diel effects on catchability of potential predators.

Following these operations, based on a FAX from Dr. Jim Schumacher, we investigated an eddy-like feature that had been identified on SAR and AVHRR satellite images, and had been suggested in an EK500 echointegrator transect run on the previous cruise. Centered at 56° 20.73'N, 156° 00.00'W, EK500 and ADCP transects were run, and bongo tows and CTD casts were made at five points presumably cutting through the feature.

Following the eddy operations a bongo survey of 47 stations between Sutwik-Chirikof Islands and the southwest end of Kodiak Island was conducted. This was followed by an occupation of FOCI line 8 where sampling similar to that conducted at line 16 and 17 was carried out. Sampling

similar to that conducted at L9 and D13 was then conducted at stations B23 (near the Alaska Peninsula shore) and F9 (in the center of the sea valley), where high concentrations of larvae occurred.

At that point we received a FAX that another eddy-like feature had been located by the track of one of the satellite tracked drifters released on the previous cruise, and was centered at 57.18°N 155.75°W. We proceeded to that area, and ran transects and conducted sampling similar to that at the earlier eddy-like feature. Following sampling there we returned to the site of the first eddy-like feature where we ran additional ADCP and EK500 transects, and conducted bongo and Tucker tows, before breaking operations.

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
1	139	18-May	1644	G001A	P11	225	55° 31.2 ' N	155° 48.0'W	60BON
2			1644	G001A	P11	225	55° 31.2 ' N	155° 48.0'W	60BON
3			1751	G002A	P9	200	55° 23.7 ' N	156° 01.8'W	60BON
4			1751	G002A	P9	200	55° 23.7 ' N	156° 01.8'W	60BON
5			1903	G003A	P7	240	55° 16.0 ' N	156° 14.9'W	60BON
6			1903	G003A	P7	240	55° 16.0 ' N	156° 14.9'W	60BON
7			2012	G004A	P5	643	55° 03.1 ' N	156° 27.5'W	60BON
8			2012	G004A	P5	643	55° 03.1 ' N	156° 27.5'W	60BON
9			2031	G004B	P5	625	55° 08.3 ' N	156° 27.7'W	NISKIN
10			2146	G005A	P3	1500	54° 59.7 ' N	156° 40.8'W	60BON
11			2146	G005A	P3	1500	54° 59.7 ' N	156° 40.8'W	60BON
12			2308	G006A	P1	920	54° 51.7 ' N	156° 54.1'W	60BON
13			2308	G006A	P1	920	54° 51.7 ' N	156° 54.1'W	60BON
14	140	19-May	0024	G007A	N1	540	54° 59.5 ' N	157° 09.2'W	60BON
15			0024	G007A	N1	540	54° 59.5 ' N	157° 09.2'W	60BON
16			0138	G008A	L1	87	55° 06.6 ' N	157° 23.9'W	60BON
17			0138	G008A	L1	87	55° 06.6 ' N	157° 23.9'W	60BON
18			0301	G009A	J1	87	55° 14.5 ' N	157° 40.7'W	60BON
19			0301	G009A	J1	87	55° 14.5 ' N	157° 40.7'W	60BON
20			0408	G010A	H1	83	55° 22.2 ' N	157° 52.8'W	60BON
21			0408	G010A	H1	83	55° 22.2 ' N	157° 52.8'W	60BON
22			0524	G011A	F1	127	55° 29.1 ' N	158° 08.4'W	60BON
23			0524	G011A	F1	127	55° 29.1 ' N	158° 08.4'W	60BON
24			0634	G012A	D1	134	55° 36.0 ' N	158° 21.6'W	60BON
25			0634	G012A	D1	134	55° 36.0 ' N	158° 21.6'W	60BON
26			0746	G013A	B1	111	55° 43.3 ' N	158° 36.5'W	60BON
27			0746	G013A	B1	111	55° 43.3 ' N	158° 36.5'W	60BON
28			0903	G014A	B3	127	55° 51.9 ' N	158° 23.1'W	60BON
29			0903	G014A	B3	127	55° 51.9 ' N	158° 23.1'W	60BON
30			1020	G015A	D3	122	55° 44.0 ' N	158° 08.4'W	60BON
31			1020	G015A	D3	122	55° 44.0 ' N	158° 08.4'W	60BON
32			1129	G016A	F3	128	55° 37.2 ' N	157° 55.1'W	60BON
33			1129	G016A	F3	128	55° 37.2 ' N	157° 55.1'W	60BON
34			1257	G017A	H3	95	55° 29.2 ' N	157° 39.3'W	60BON
35			1257	G017A	H3	95	55° 29.2 ' N	157° 39.3'W	60BON
36			1406	G018A	J3	84	55° 22.6 ' N	157° 25.7'W	60BON
37			1406	G018A	J3	84	55° 22.6 ' N	157° 25.7'W	60BON
38			1522	G019A	L3	100	55° 14.7 ' N	157° 09.8'W	60BON
39			1522	G019A	L3	100	55° 14.7 ' N	157° 09.8'W	60BON
40			1631	G020A	N3	253	55° 07.0 ' N	156° 55.6'W	60BON
41			1631	G020A	N3	253	55° 07.0 ' N	156° 55.6'W	60BON
42			1744	G021A	N5	107	55° 14.9 ' N	156° 42.4'W	60BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
43			1744	G021A	N5	107	55° 14.9 ' N	156° 42.4'W	60BON
44			1856	GO22A	L5	88	55° 22.5 ' N	156° 56.8'W	60BON
45			1856	GO22A	L5	88	55° 22.5 ' N	156° 56.8'W	60BON
46			2007	G023A	J5	85	55° 30.5 ' N	157° 12.5'W	60BON
47			2007	G023A	J5	85	55° 30.5 ' N	157° 12.5'W	60BON
48			2121	G024A	H5	96	55° 37.5 ' N	157° 25.9'W	60BON
49			2121	G024A	H5	96	55° 37.5 ' N	157° 25.9'W	60BON
50			2230	G025A	F5	128	55° 45.3 ' N	157° 40.9'W	60BON
51			2230	G025A	F5	128	55° 45.3 ' N	157° 40.9'W	60BON
52			2334	G026A	D5	95	55° 52.2 ' N	157° 54.3'W	60BON
53			2334	G026A	D5	95	55° 52.2 ' N	157° 54.3'W	60BON
54	141	20-May	0050	G027A	B5	100	56° 00.2 ' N	158° 08.4'W	60BON
55			0050	G027A	B5	100	56° 00.2 ' N	158° 08.4'W	60BON
56			0158	G028A	B7	136	56° 07.5 ' N	157° 56.1'W	60BON
57			0158	G028A	B7	136	56° 07.5 ' N	157° 56.1'W	60BON
58			0307	G029A	D7	73	56° 00.2 ' N	157° 41.8'W	60BON
59			0307	G029A	D7	73	56° 00.2 ' N	157° 41.8'W	60BON
60			0410	G030A	F7	84	55° 53.3 ' N	157° 27.7'W	60BON
61			0410	G030A	F7	84	55° 53.3 ' N	157° 27.7'W	60BON
62			0521	G031A	H7	82	55° 45.8 ' N	157° 12.4'W	60BON
63			0521	G031A	H7	82	55° 45.8 ' N	157° 12.4'W	60BON
64			0630	G032A	J7	82	55° 38.5 ' N	156° 58.6'W	60BON
65			0630	G032A	J7	82	55° 38.5 ' N	156° 58.6'W	60BON
66			0743	G033A	L7	118	55° 30.4 ' N	156° 43.7'W	60BON
67			0743	G033A	L7	118	55° 30.4 ' N	156° 43.7'W	60BON
68			0856	G034A	N7	167	55° 23.1 ' N	156° 29.0'W	60BON
69			0856	G034A	N7	167	55° 23.1 ' N	156° 29.0'W	60BON
70			1006	G035A	N9	210	55° 31.3 ' N	156° 15.8'W	60BON
71			1006	G035A	N9	210	55° 31.3 ' N	156° 15.8'W	60BON
72			1114	G036A	N11	237	55° 39.1 ' N	156° 03.0'W	60BON
73			1114	G036A	N11	237	55° 39.1 ' N	156° 03.0'W	60BON
74			1225	G037A	L11	245	55° 46.6 ' N	156° 17.4'W	60BON
75			1225	G037A	L11	245	55° 46.6 ' N	156° 17.4'W	60BON
76			1337	G038A	L9	248	55° 38.6 ' N	156° 30.5'W	60BON
77			1337	G038A	L9	248	55° 38.6 ' N	156° 30.5'W	60BON
78			1454	G039A	J9	200	55° 46.4 ' N	156° 44.7'W	60BON
79			1454	G039A	J9	200	55° 46.4 ' N	156° 44.7'W	60BON
80			1609	G040A	J11	219	55° 54.7 ' N	156° 31.7'W	60BON
81			1609	G040A	J11	219	55° 54.7 ' N	156° 31.7'W	60BON
82			1723	G041A	J13	210	56° 02.5 ' N	156° 17.8'W	60BON
83			1723	G041A	J13	210	56° 02.5 ' N	156° 17.8'W	60BON
84			1944	G042A	L9	245	55° 38.5 ' N	156° 30.1'W	60BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
85			1944	G042A	L9	245	55° 38.5 ' N	156° 30.1'W	60BON
86			2009	G042B	L9	245	55° 38.4 ' N	156° 30.2'W	60BON
87			2009	G042B	L9	245	55° 38.4 ' N	156° 30.2'W	60BON
88			2029	G042C	L9	245	55° 38.4 ' N	156° 29.9'W	60BON
89			2029	G042C	L9	245	55° 38.4 ' N	156° 29.9'W	60BON
90			2049	G042D	L9	246	55° 38.2 ' N	156° 30.2'W	60BON
91			2049	G042D	L9	246	55° 38.2 ' N	156° 30.2'W	60BON
92			2108	G042E	L9	245	55° 38.4 ' N	156° 30.3'W	60BON
93			2108	G042E	L9	245	55° 38.4 ' N	156° 30.3'W	60BON
94			2151	G042F	L9	246	55° 38.3 ' N	156° 30.2'W	60BON
95			2151	G042F	L9	246	55° 38.3 ' N	156° 30.2'W	60BON
96			2214	G042G	L9	245	55° 38.6 ' N	156° 30.0'W	60BON
97			2214	G042G	L9	245	55° 38.6 ' N	156° 30.0'W	60BON
98			2250	G042H	L9	245	55° 38.5 ' N	156° 30.0'W	TUCK1
99			2330	G042I	L9	245	55° 38.9 ' N	156° 29.8'W	METH
100	142	21-May	0202	G042J	L9	243	55° 39.9 ' N	156° 28.5'W	MARIN
101			0258	G042K		246	55° 38.6 ' N	156° 30.0'W	CTD#1 CTDB
102			0525	G043A		192	55° 57.8 ' N	156° 38.6'W	CTD#2 CTDB
103			0632	G044A		197	55° 57.2 ' N	156° 31.4'W	CTD#3 CTDB
104			0724	G045A	FOX156	205	55° 56.6 ' N	156° 26.2'W	CTD#4 CTDB
105			0815	G045B	FOX156	205	55° 56.6 ' N	156° 26.6'W	CTD#5 CTDB
106			0920	G046A	FOX155	230	55° 56.3 ' N	156° 21.4'W	CTD#6 CTDB
107			0952	G046B	FOX155	230	55° 56.3 ' N	156° 21.0'W	CTD#7 CTDB
108			1043	G047A	FOX154	220	55° 55.9 ' N	156° 14.9'W	CTD#8 CTDB
109			1142	G048A	FOX153	198	55° 55.3 ' N	156° 10.8'W	CTD#9 CTDB
110			1229	G048B	FOX153	197	55° 55.3 ' N	156° 10.7'W	CTD#10 CTDB
111			1328	G049A	FOX152	83	55° 54.0 ' N	156° 00.0'W	CTD#11 CTDB
112			1411	G050A	FOX152	84	55° 54.2 ' N	156° 00.1'W	60BON
113			1411	G050A	FOX152	84	55° 54.2 ' N	156° 00.1'W	20BON
114			1506	G051A	FOX153	193	55° 55.0 ' N	156° 10.3'W	60BON
115			1506	G051A	FOX153	193	55° 55.0 ' N	156° 10.3'W	20BON
116			1616	G052A	FOX154	225	55° 55.3 ' N	156° 15.3'W	60BON
117			1616	G052A	FOX154	225	55° 55.3 ' N	156° 15.3'W	20BON
118			1704	G053A	FOX155	225	55° 55.6 ' N	156° 20.8'W	60BON
119			1704	G053A	FOX155	225	55° 55.6 ' N	156° 20.8'W	20BON
120			1754	G054A	FOX156	207	55° 56.2 ' N	156° 26.3'W	60BON
121			1754	G054A	FOX156	207	55° 56.2 ' N	156° 26.3'W	60BON
122			1754	G054A	FOX156	207	55° 56.2 ' N	156° 26.3'W	20BON
123			1837	G055A	FOX157	200	55° 57.0 ' N	156° 31.2'W	60BON
124			1837	G055A	FOX157	200	55° 57.0 ' N	156° 31.2'W	60BON
125			1837	G055A	FOX157	200	55° 57.0 ' N	156° 31.2'W	20BON
126			1924	G056A	FOX158	190	55° 57.8 ' N	156° 38.1'W	60BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
127			1924	G056A	FOX158	190	55° 57.8 ' N	156° 38.1'W	60BON
128			1924	G056A	FOX158	190	55° 57.8 ' N	156° 38.1'W	20BON
129			2058	G057A	H13	214	56° 09.4 ' N	156° 32.0'W	60BON
130			2058	G057A	H13	214	56° 09.4 ' N	156° 32.0'W	60BON
131			2219	G058A	FOX147	132	56° 18.1 ' N	156° 48.0'W	60BON
132			2219	G058A	FOX147	132	56° 18.1 ' N	156° 48.0'W	60BON
133			2219	G058A	FOX147	132	56° 18.1 ' N	156° 48.0'W	20BON
134			2259	G059A	FOX148	130	56° 21.7 ' N	156° 52.0'W	60BON
135			2259	G059A	FOX148	130	56° 21.7 ' N	156° 52.0'W	60BON
136			2259	G059A	FOX148	130	56° 21.7 ' N	156° 52.0'W	20BON
137			2335	G060A	FOX149	118	56° 24.1 ' N	156° 54.9'W	60BON
138			2335	G060A	FOX149	118	56° 24.1 ' N	156° 54.9'W	60BON
139			2335	G060A	FOX149	118	56° 24.1 ' N	156° 54.9'W	20BON
140			0016	G061A	FOX150	103	56° 26.6 ' N	156° 56.8'W	60BON
141			0016	G061A	FOX150	103	56° 26.6 ' N	156° 56.8'W	60BON
142			0016	G061A	FOX150	103	56° 26.6 ' N	156° 56.8'W	60BON
143	143	22-May	0136	G062A	FOX150	101	56° 26.5 ' N	156° 56.8'W	CTD#12 CTDB
144			0240	G063A	FOX149	118	56° 24.1 ' N	156° 54.8'W	CTD#13 CTDB
145			0324	G063B	FOX149	118	56° 24.0 ' N	156° 55.1'W	CTD#14 CTDB
146			0409	G064A	FOX148	130	56° 21.3 ' N	156° 52.2'W	CTD#15 CTDB
147			0515	G064B	FOX148	130	56° 21.4 ' N	156° 52.0'W	CTD#16 CTDB
148			0607	G065A	FOX147	105	56° 17.0 ' N	156° 48.6'W	CTD#17 CTDB
149			0751	G066A	F11	97	56° 08.9 ' N	157° 00.1'W	60BON
150			0751	G066A	F11	97	56° 08.9 ' N	157° 00.1'W	60BON
151			0843	G067A	G10	77	56° 01.6 ' N	157° 00.0'W	60BON
152			0843	G067A	G10	77	56° 01.6 ' N	157° 00.0'W	60BON
153			0937	G068A	H9	123	55° 53.6 ' N	156° 59.0'W	60BON
154			0937	G068A	H9	123	55° 53.6 ' N	156° 59.0'W	60BON
155			1051	G069A	F9	111	56° 01.3 ' N	157° 13.8'W	60BON
156			1051	G069A	F9	111	56° 01.3 ' N	157° 13.8'W	60BON
157			1154	G070A	E10	118	56° 09.4 ' N	157° 14.3'W	60BON
158			1154	G070A	E10	118	56° 09.4 ' N	157° 14.3'W	60BON
159			1252	G071A	D9	145	56° 07.8 ' N	157° 27.8'W	60BON
160			1252	G071A	D9	145	56° 07.8 ' N	157° 27.8'W	60BON
161			1400	G072A	C10	136	56° 16.0 ' N	157° 28.6'W	60BON
162			1400	G072A	C10	136	56° 16.0 ' N	157° 28.6'W	60BON
163			1454	G073A	B9	109	56° 15.4 ' N	157° 41.6'W	60BON
164			1454	G073A	B9	109	56° 15.4 ' N	157° 41.6'W	60BON
165			1606	G074A	B11	48	56° 23.5 ' N	157° 27.7'W	60BON
166			1606	G074A	B11	48	56° 23.5 ' N	157° 27.7'W	60BON
167			1623	G074B	B11	165	56° 24.0 ' N	157° 27.8'W	60BON
168			1623	G074B	B11	165	56° 24.0 ' N	157° 27.8'W	60BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
169			1710	G075A	B12	179	56° 29.6 ' N	157° 20.4'W	60BON
170			1710	G075A	B12	179	56° 29.6 ' N	157° 20.4'W	60BON
171			1746	G076A	C12	147	56° 23.9 ' N	157° 15.9'W	60BON
172			1746	G076A	C12	147	56° 23.9 ' N	157° 15.9'W	60BON
173			1840	G077A	D11	130	56° 16.8 ' N	157° 14.2'W	60BON
174			1840	G077A	D11	130	56° 16.8 ' N	157° 14.2'W	60BON
175			1936	G078A	E12	95	56° 16.2 ' N	157° 00.1'W	60BON
176			1936	G078A	E12	95	56° 16.2 ' N	157° 00.1'W	60BON
177			2033	G079A	D13	162	56° 23.9 ' N	157° 00.4'W	60BON
178			2033	G079A	D13	162	56° 23.9 ' N	157° 00.4'W	60BON
179			2113	G079B	D13	157	56° 24.0 ' N	157° 00.4'W	60BON
180			2113	G079B	D13	157	56° 24.0 ' N	157° 00.4'W	60BON
181			2132	G079C	D13	160	56° 23.8 ' N	157° 00.5'W	60BON
182			2132	G079C	D13	160	56° 23.8 ' N	157° 00.5'W	60BON
183			2150	G079D	D13	157	56° 24.0 ' N	157° 00.5'W	60BON
184			2150	G079D	D13	157	56° 24.0 ' N	157° 00.5'W	60BON
185			2229	G079E	D13	159	56° 23.9 ' N	157° 00.3'W	MARIN
186			2312	G079F	D13	157	56° 24.0 ' N	157° 00.4'W	TUCK1
187			2334	G079G	D13	154	56° 24.0 ' N	157° 00.3'W	60BON
188	144	23-May	0013	G079H	D13	160	56° 23.8 ' N	157° 00.0'W	METH
189			0130	G079I	D13	151	56° 24.2 ' N	157° 00.2'W	CTDB
190			0316	G080A	B15	137	56° 38.6 ' N	157° 01.6'W	60BON
191			0316	G080A	B15	137	56° 38.6 ' N	157° 01.6'W	60BON
192			0432	G081A	D15	117	56° 31.6 ' N	156° 46.7'W	60BON
193			0432	G081A	D15	117	56° 31.6 ' N	156° 46.7'W	60BON
194			0525	G082A		118	56° 23.7 ' N	156° 44.5'W	60BON
195			0525	G082A		118	56° 23.7 ' N	156° 44.5'W	60BON
196			0617	G082B		117	56° 23.6 ' N	156° 44.8'W	CTDB
197			0812	G083A	D13	158	56° 23.6 ' N	156° 59.3'W	METH
198			0956	G083B	D13	162	56° 23.6 ' N	156° 59.7'W	METH
199			1052	G083C	D13	161	56° 24.0 ' N	157° 00.1'W	MARIN
200	145	24-May	0345	G084A		178	56° 13.2 ' N	155° 56.4'W	EDDY#1 60BON
201			0345	G084A		178	56° 13.2 ' N	155° 56.4'W	EDDY#1 60BON
202			0428	G085A		217	56° 14.6 ' N	155° 59.0'W	EDDY#2 60BON
203			0428	G085A		217	56° 14.6 ' N	155° 59.0'W	EDDY#2 60BON
204			0511	G086A		223	56° 15.9 ' N	156° 01.8'W	EDDY#3 60BON
205			0511	G086A		223	56° 15.9 ' N	156° 01.8'W	EDDY#3 60BON
206			0551	G087A		238	56° 17.4 ' N	156° 04.7'W	EDDY#4 60BON
207			0551	G087A		238	56° 17.4 ' N	156° 04.7'W	EDDY#4 60BON
208			0633	G088A		247	56° 18.7 ' N	156° 07.0'W	EDDY#5 60BON
209			0633	G088A		247	56° 18.7 ' N	156° 07.0'W	EDDY#5 60BON
210			0744	G089A		220	56° 15.9 ' N	156° 01.6'W	EDDY#3 TUCK1

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
211			0744	G089A		220	56° 15.9 ' N	156° 01.6'W	EDDY#3 TUCK1
212			0909	G090A		243	56° 18.4 ' N	156° 06.3'W	CTD#20 CTDB
213			1001	G091A		234	56° 17.0 ' N	156° 04.5'W	CTD#21 CTDB
214			1053	G092A		222	56° 16.1 ' N	156° 02.1'W	CTD#22 CTDB
215			1235	G093A		220	56° 14.4 ' N	155° 59.6'W	CTD#23 CTDB
216			1325	G094A		185	56° 13.3 ' N	155° 56.6'W	CTD#24 CTDB
217			1448	G095A	L15	67	56° 03.2 ' N	155° 49.2'W	60BON
218			1501	G095B	L15	67	56° 03.2 ' N	155° 49.2'W	60BON
219			1501	G095B	L15	67	56° 03.2 ' N	155° 49.2'W	60BON
220			1609	G096A	J15	237	56° 10.2 ' N	156° 04.4'W	60BON
221			1609	G096A	J15	237	56° 10.2 ' N	156° 04.4'W	60BON
222			1718	G097A	H15	238	56° 17.9 ' N	156° 18.4'W	60BON
223			1718	G097A	H15	238	56° 17.9 ' N	156° 18.4'W	60BON
224			1811	G098A	G16	225	56° 24.4 ' N	156° 20.2'W	60BON
225			1811	G098A	G16	225	56° 24.4 ' N	156° 20.2'W	60BON
226			1903	G099A	F15	205	56° 24.7 ' N	156° 32.4'W	60BON
227			1903	G099A	F15	205	56° 24.7 ' N	156° 32.4'W	60BON
228			2003	G100A	E16	194	56° 31.8 ' N	156° 32.9'W	60BON
229			2003	G100A	E16	194	56° 31.8 ' N	156° 32.9'W	60BON
230			2025	G100B	E16	192	56° 32.1 ' N	156° 32.8'W	NISKIN
231			2136	G101A	C16	137	56° 38.9 ' N	156° 47.0'W	60BON
232			2136	G101A	C16	137	56° 38.9 ' N	156° 47.0'W	60BON
233			2230	G102A	B17	170	56° 44.6 ' N	156° 40.5'W	60BON
234			2230	G102A	B17	170	56° 44.6 ' N	156° 40.5'W	60BON
235	146	25-May	0002	G103A	C18	114	56° 46.7 ' N	156° 33.5'W	60BON
236			0002	G103A	C18	114	56° 46.7 ' N	156° 33.5'W	60BON
237			0105	G104A	D17	156	56° 39.4 ' N	156° 34.0'W	60BON
238			0105	G104A	D17	156	56° 39.4 ' N	156° 34.0'W	60BON
239			0211	G105A	E18	186	56° 39.9 ' N	156° 20.1'W	60BON
240			0211	G105A	E18	186	56° 39.9 ' N	156° 20.1'W	60BON
241			0311	G106A	F17	190	56° 38.4 ' N	156° 19.5'W	60BON
242			0311	G106A	F17	190	56° 38.4 ' N	156° 19.5'W	60BON
243			0409	G107A	G18	284	56° 32.3 ' N	156° 05.4'W	60BON
244			0409	G107A	G18	284	56° 32.3 ' N	156° 05.4'W	60BON
245			0504	G108A	H17	254	56° 24.6 ' N	156° 04.8'W	60BON
246			0504	G108A	H17	254	56° 24.6 ' N	156° 04.8'W	60BON
247			0613	G109A	J17	99	56° 17.9 ' N	155° 50.1'W	60BON
248			0613	G109A	J17	99	56° 17.9 ' N	155° 50.1'W	60BON
249			0721	G110A	J19	73	56° 25.8 ' N	155° 36.8'W	60BON
250			0721	G110A	J19	73	56° 25.8 ' N	155° 36.8'W	60BON
251			0846	G111A	H19	239	56° 32.9 ' N	155° 51.1'W	60BON
252			0846	G111A	H19	239	56° 32.9 ' N	155° 51.1'W	60BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
253			0944	G112A	G20	277	56° 40.1 ' N	155° 52.1'W	60BON
254			0944	G112A	G20	277	56° 40.1 ' N	155° 52.1'W	60BON
255			1046	G113A	F19	266	56° 40.1 ' N	156° 06.7'W	60BON
256			1046	G113A	F19	266	56° 40.1 ' N	156° 06.7'W	60BON
257			1145	G114A	E20	222	56° 47.4 ' N	156° 06.2'W	60BON
258			1145	G114A	E20	222	56° 47.4 ' N	156° 06.2'W	60BON
259			1247	G115A	D19	184	56° 47.3 ' N	156° 20.2'W	60BON
260			1247	G115A	D19	184	56° 47.3 ' N	156° 20.2'W	60BON
261			1338	G116A	C20	181	56° 54.2 ' N	156° 20.3'W	60BON
262			1338	G116A	C20	181	56° 54.2 ' N	156° 20.3'W	60BON
263			1431	G117A	B19	135	56° 54.4 ' N	156° 29.4'W	60BON
264			1431	G117A	B19	135	56° 54.4 ' N	156° 29.4'W	60BON
265			1557	G118A	B21	131	56° 59.5 ' N	156° 20.0'W	60BON
266			1557	G118A	B21	131	56° 59.5 ' N	156° 20.0'W	60BON
267			1812	G119A	C22	95	57° 02.1 ' N	156° 08.3'W	60BON
268			1812	G119A	C22	95	57° 02.1 ' N	156° 08.3'W	60BON
269			1906	G120A	D21	210	56° 55.0 ' N	156° 06.9'W	60BON
270			1906	G120A	D21	210	56° 55.0 ' N	156° 06.9'W	60BON
271			2002	G121A	E22	295	56° 54.7 ' N	156° 53.0'W	60BON
272			2002	G121A	E22	295	56° 54.7 ' N	156° 53.0'W	60BON
273			2052	G122A	F21	300	56° 47.8 ' N	156° 51.7'W	60BON
274			2052	G122A	F21	300	56° 47.8 ' N	156° 51.7'W	60BON
275			2117	G122B	F21	295	56° 47.9 ' N	156° 50.1'W	NISKIN
276			2201	G123A	G22	273	56° 47.9 ' N	156° 39.0'W	60BON
277			2201	G123A	G22	273	56° 47.9 ' N	156° 39.0'W	60BON
278			2255	G124A	H21	241	56° 40.8 ' N	155° 38.3'W	60BON
279			2255	G124A	H21	241	56° 40.8 ' N	155° 38.3'W	60BON
280	147	26-May	0007	G125A	J21	67	56° 33.5 ' N	155° 23.0'W	60BON
281			0007	G125A	J21	67	56° 33.5 ' N	155° 23.0'W	60BON
282			0111	G126A	J23	69	56° 40.6 ' N	155° 10.4'W	60BON
283			0111	G126A	J23	69	56° 40.6 ' N	155° 10.4'W	60BON
284			0233	G127A	H23	240	56° 48.1 ' N	155° 25.1'W	60BON
285			0233	G127A	H23	240	56° 48.1 ' N	155° 25.1'W	60BON
286			0326	G128A	G24	263	56° 55.3 ' N	155° 25.2'W	60BON
287			0326	G128A	G24	263	56° 55.3 ' N	155° 25.2'W	60BON
288			0425	G129A	F23	286	56° 55.1 ' N	155° 40.0'W	60BON
289			0425	G129A	F23	286	56° 55.1 ' N	155° 40.0'W	60BON
290			0530	G130A	E24	282	57° 02.9 ' N	155° 40.0'W	60BON
291			0530	G130A	E24	282	57° 02.9 ' N	155° 40.0'W	60BON
292			0630	G131A	D23	246	57° 01.9 ' N	155° 55.7'W	60BON
293			0630	G131A	D23	246	57° 01.9 ' N	155° 55.7'W	60BON
294			0732	G132A	C24	286	57° 09.6 ' N	155° 53.8'W	60BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
295			0732	G132A	C24	286	57° 09.6 ' N	155° 53.8'W	60BON
296			0836	G133A	B23	79	57° 09.1 ' N	156° 09.3'W	60BON
297			0836	G133A	B23	79	57° 09.1 ' N	156° 09.3'W	60BON
298			0949	G134A	B25	240	57° 16.6 ' N	155° 54.9'W	60BON
299			0949	G134A	B25	240	57° 16.6 ' N	155° 54.9'W	60BON
300			1056	G135A	D25	277	57° 09.9 ' N	155° 41.5'W	60BON
301			1056	G135A	D25	277	57° 09.9 ' N	155° 41.5'W	60BON
302			1214	G136A	F25	265	57° 02.9 ' N	155° 26.2'W	60BON
303			1214	G136A	F25	265	57° 02.9 ' N	155° 26.2'W	60BON
304			1235	G136B	F25	265	57° 02.9 ' N	155° 26.2'W	60BON
305			1235	G136B	F25	265	57° 02.9 ' N	155° 26.2'W	60BON
306			1342	G137B	H25	222	56° 56.3 ' N	155° 11.6'W	60BON
307			1342	G137B	H25	222	56° 56.3 ' N	155° 11.6'W	60BON
308			1516	G138A	F27	236	57° 10.5 ' N	155° 12.7'W	60BON
309			1516	G138A	F27	236	57° 10.5 ' N	155° 12.7'W	60BON
310			1628	G139A	D27	265	57° 17.8 ' N	155° 27.4'W	60BON
311			1628	G139A	D27	265	57° 17.8 ' N	155° 27.4'W	60BON
312			1741	G140A	B27	280	57° 24.6 ' N	155° 41.8'W	60BON
313			1741	G140A	B27	280	57° 24.6 ' N	155° 41.8'W	60BON
314			2027	G141A	FOX 61 C	294	57° 42.7 ' N	155° 15.8'W	TDB#25 CTDB
315			2027	G141B	FOX 61 C	294	57° 42.7 ' N	155° 15.8'W	TDB#26 CTDB
316			2203	G142A	FOX 60 C	289	57° 41.0 ' N	155° 09.8'W	TDB#27 CTDB
317			2203	G142B	FOX 60 C	289	57° 41.0 ' N	155° 09.8'W	TDB#28 CTDB
318			2357	G143A	FOX 58 C	233	57° 35.7 ' N	155° 00.4'W	TDB#29 CTDB
319			2357	G143B	FOX 58 C	233	57° 35.7 ' N	155° 00.4'W	TDB#30 CTDB
320	148	27-May	0218	G144A	FOX 56 C	211	57° 30.9 ' N	154° 47.2'W	TDB#31 CTDB
321			0218	G144B	FOX 56 C	211	57° 30.9 ' N	154° 47.2'W	TDB#32 CTDB
322			0345	G145A	FOX 56	201	57° 30.6 ' N	154° 46.6'W	60BON
323			0345	G145A	FOX 56	201	57° 30.6 ' N	154° 46.6'W	60BON
324			0345	G145A	FOX 56	201	57° 30.6 ' N	154° 46.6'W	20BON
325			0504	G146A	FOX 58	235	57° 36.1 ' N	155° 00.0'W	60BON
326			0504	G146A	FOX 58	235	57° 36.1 ' N	155° 00.0'W	60BON
327			0504	G146A	FOX 58	235	57° 36.1 ' N	155° 00.0'W	20BON
328			0617	G147A	FOX 60	288	57° 41.0 ' N	155° 09.4'W	60BON
329			0617	G147A	FOX 60	288	57° 41.0 ' N	155° 09.4'W	60BON
330			0617	G147A	FOX 60	288	57° 41.0 ' N	155° 09.4'W	20BON
331			0730	G148A	FOX 61	261	57° 42.6 ' N	155° 13.3'W	60BON
332			0730	G148A	FOX 61	261	57° 42.6 ' N	155° 13.3'W	60BON
333			0730	G148A	FOX 61	261	57° 42.6 ' N	155° 13.3'W	20BON
334			0812	G148B	FOX 61	295	57° 42.5 ' N	155° 14.1'W	60BON
335			0812	G148B	FOX 61	295	57° 42.5 ' N	155° 14.1'W	60BON
336			0812	G148B	FOX 61	295	57° 42.5 ' N	155° 14.1'W	20BON

Table 6. MF92-06 CRUISE SUMMARY

Shelikof Strait Larval Survey 17-29 May 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
337			1130	G149A	B27	274	57° 24.5 ' N	155° 43.7'W	MARIN
338			1240	G150A	B27	280	57° 23.7 ' N	155° 40.6'W	METH
339			1427	G151A	D25	241	57° 09.8 ' N	155° 40.5'W	60BON
340			1427	G151A	B23	241	57° 09.8 ' N	155° 40.5'W	60BON
341			1606	G152A	B23	100	57° 08.8 ' N	156° 09.1'W	60BON
342			1606	G152A	B23	100	57° 08.8 ' N	156° 09.1'W	60BON
343			1646	G152B	B23	108	57° 08.6 ' N	156° 09.9'W	TUCK1
344			1719	G152C	B23	104	57° 08.6 ' N	156° 08.7'W	METH
345			1837	G152D	B23	92	57° 08.1 ' N	156° 05.1'W	MARIN
346			1930	G152E	B23	109	57° 08.7 ' N	156° 09.0'W	TUCK1
347			1930	G152E	B23	109	57° 08.7 ' N	156° 09.0'W	TUCK1
348			1955	G152F	B23	100	57° 08.5 ' N	156° 09.0'W	60BON
349			1955	G152F	B23	100	57° 08.5 ' N	156° 09.0'W	60BON
350			2037	G152G	B23	95	57° 08.6 ' N	156° 09.2'W	CTDB
351			2326	G153A	F19	267	56° 39.8 ' N	156° 06.7'W	HYDRO
352	149	28-May	0015	G153B	F19	270	56° 39.9 ' N	156° 06.3'W	60BON
353			0015	G153B	F19	270	56° 39.9 ' N	156° 06.3'W	60BON
354			0115	G153C	F19	270	56° 39.9 ' N	156° 06.3'W	60BON
355			0115	G153C	F19	270	56° 39.9 ' N	156° 06.3'W	60BON
356			0150	G153D	F19	270	56° 40.1 ' N	156° 06.1'W	60BON
357			0150	G153D	F19	270	56° 40.1 ' N	156° 06.1'W	60BON
358			0811	G154A	E	246	57° 02.6 ' N	155° 58.2'W	EDDY2#1 60BON
359			0811	G154A	E	246	57° 02.6 ' N	155° 58.2'W	EDDY2#1 60BON
360			0856	G155A	E	237	57° 06.5 ' N	155° 53.5'W	EDDY2#2 60BON
361			0856	G155A	E	237	57° 06.5 ' N	155° 53.5'W	EDDY2#2 60BON
362			0940	G156A	E	268	57° 10.5 ' N	155° 49.4'W	EDDY2#3 60BON
363			0940	G156A	E	268	57° 10.5 ' N	155° 49.4'W	EDDY2#3 60BON
364			1649	G157A	M	205	55° 59.3 ' N	156° 14.6'W	EDDY#1 60BON
365			1649	G157A	M	205	55° 59.3 ' N	156° 14.6'W	EDDY#1 60BON
366			1923	G158A	M	245	56° 13.2 ' N	156° 07.8'W	EDDY#2 60BON
367			1923	G158A	M	245	56° 13.2 ' N	156° 07.8'W	EDDY#2 60BON
368			2014	G159A	M	225	56° 06.1 ' N	156° 12.0'W	EDDY#3 60BON
369			2014	G159A	M	225	56° 06.1 ' N	156° 12.0'W	EDDY#3 60BON
370			2144	G160A	M	257	56° 06.6 ' N	156° 03.1'W	EDDY#4 TUCK1
371			2144	G160A	M	257	56° 06.6 ' N	156° 03.1'W	EDDY#4 TUCK1
372			2234	G161A	M	169	56° 06.5 ' N	155° 59.1'W	EDDY#5 TUCK1
373			2234	G161A	M	169	56° 06.5 ' N	155° 59.1'W	EDDY#5 TUCK1
374			2326	G162A	M	213	56° 06.3 ' N	156° 00.6'W	EDDY#6 60BON

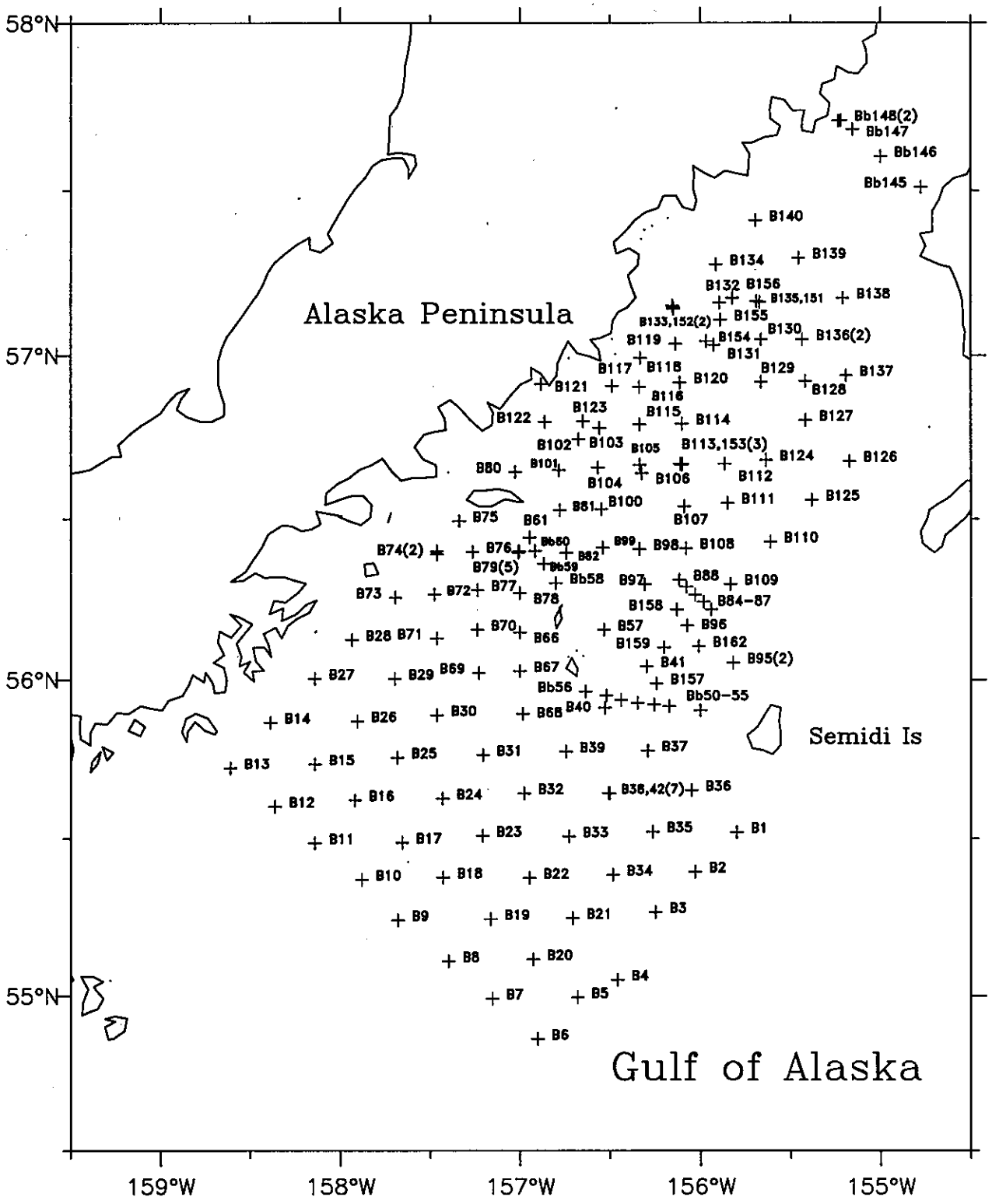


Fig. 4.1. MF92-06 Bongo Stations.

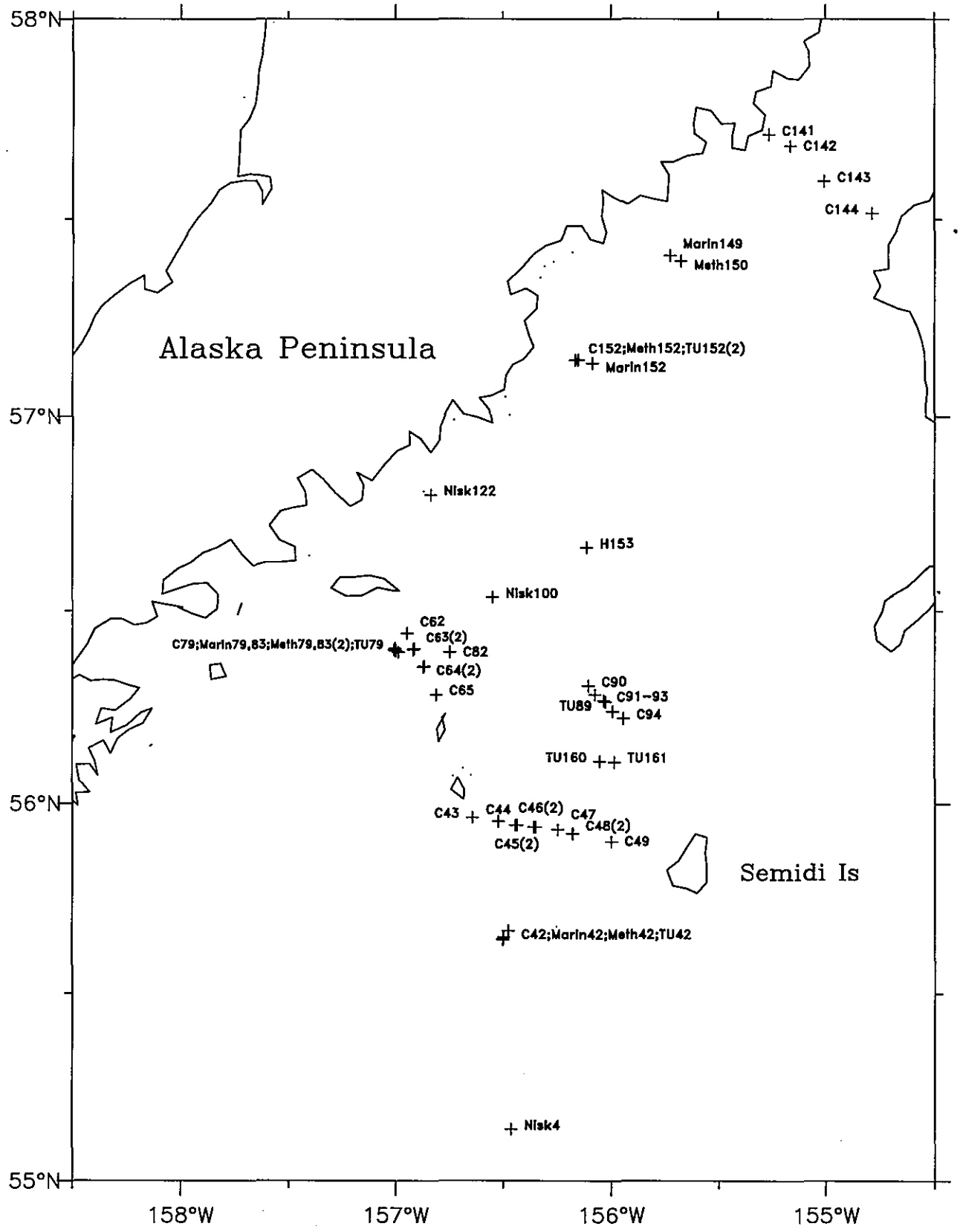


Fig. 4.2. MF92-06 CTD (C), Hydro (H), Marinovich (Marin), Methot (Meth), Niskin™ Bottle Sample (Nisk), and Tucker (TU) Stations.

MF92-09 (5MF92): 9 September–27 September, 1992

SCIENTIFIC PERSONNEL

Name	Title	Organization
Ron Reed	Chief Scientist	NOAA/PMEL
Carol DeWitt		NOAA/PMEL
Leslie Lawrence		NOAA/PMEL
Rick Miller		NOAA/PMEL
David Kachel		NOAA/PMEL
Rick Brodeur		NOAA/AFSC

SUMMARY OF OPERATIONS SCHEDULE

Depart Dutch Harbor	9 Sept.
Start operations	10 Sept.
Stop operations	26 Sept.
Arrive Dutch Harbor	27 Sept.

CRUISE STATISTICS

ADCP backtrack L	2
ADCP transects	2
CTD	56
Current mooring recovery	5 *
Marinovich trawls	5
Neuston tows	3
PROTEUS mooring recovery	1
Satellite tracked drifter buoys	10
Tucker trawls	4

* one current mooring lost (see cruise report)

OBJECTIVES

The goal of this project was to gain understanding of circulation along the Aleutian Islands, through the island passes, and in the central Bering Sea. This work was a part of Bering Sea-FOCI (Fisheries Oceanography Coordinated Investigations). Specific objectives included:

- recover Peggy Bering Sea
- recover additional moorings
- conduct CTD studies
- deploy satellite-tracked drifters
- transect the Alaska Stream making current measurements with the vessel-mounted ADCP
- conduct trawl and plankton sampling

CRUISE REPORT

The PROTEUS mooring, deployed in the eastern Bering Sea in April 1992, was recovered. Three of four subsurface moorings in the Aleutian passes and one on the northern slope, deployed in August 1991, were recovered. A total of 56 CTD casts were taken. Ten satellite-tracked drifting buoys were released in the Alaskan Stream and in the island passes. Currents were measured continuously along the ship's track with an acoustic Doppler current profiler (ADCP). Limited trawling and plankton sampling were done for personnel at AFSC.

We attempted to recover five subsurface (Aanderaa) current moorings. Four of them (three in Near Strait and one on the northern slope) were successfully recovered. Recoveries were sometimes hampered by difficulty in securing the upper float with a lasso or grappling hook. The addition of a tag line (with a small float), secured to the upper float during deployment, would be a major help in recovery operations. We attempted to recover mooring CM-A in Amchitka Pass on 15 September. The mooring was released at a range of 300 m (0.16 nm) during fairly good visibility. The floats were never seen, however even though we searched for ~8 hours, until darkness. At this point, the release was out of range, and we left the area. In retrospect, it seems likely that the upper float might have been damaged and failed to surface, or was torn away, which would have made the array quite hard to see.

A total of 56 CTD casts were taken to a maximum depth of 1500 m. A salinity sample was obtained for calibration on each cast, at various depths, and reversing thermometers were used on every third cast. The CTD performed well, and the data processing programs allowed us to examine water properties and geostrophic flow in a timely manner. This was extremely helpful on a cruise such as this one. Some problems were encountered with the depth sounders, and the CTD was inadvertently placed on bottom during one cast. The UGR's, especially, are archaic instruments and

make pinger location complicated. A system with a digital readout to locate the pinger would be very helpful.

Ten satellite-tracked drifters were deployed during the cruise, mainly south of the Aleutians and in Near Strait. The upper shackle on each unit had not been safety wired, and this was done before launching them. A system of launching them over the rail with lines was devised by CBM. R. Petrusiak and the deck force; this proved very helpful.

The ADCP was operated continuously at sea using GPS navigation. Two ADCP transects at constant speed were made across the Alaskan Stream immediately after occupying CTD sections. Two backtrack calibrations were also done. The system appeared to work quite well.

A multiple plankton sampler and new mid-water trawl were used during the early part of the cruise under the direction of R. Brodeur of AFSC. The new mid-water trawl did not work well; more coordination with shipboard personnel prior to using it would have been helpful. The new plankton sampler showed promise, and two successful tows were made before damaging the wiring for the tripping system. Five Marinovich trawls and three Neuston tows were made between Unmak and Adak Islands. On 23 September near mooring CM-E, four Tucker tows were made, under the supervision of W. Floering, for J. Napp of AFSC.

Table 7. MF92-09 CRUISE SUMMARY

Bering Sea Circulation 9-27 September 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
	253	9-Sep	1800						Depart Dutch Harbor
	254	10-Sep	0209			2210	54° 47.7' N	168° 33.0' W	Lowered Centerboard
1			0209	1	PEGGY	2210	54° 47.7' N	168° 33.0' W	CTDB
2			0754		PEGGY	754	54° 47.4' N	168° 31.0' W	Moor
			2200			607	53° 13.3' N	169° 39.0' W	Commenced fish ops
3			2227	M01		876	53° 13.6' N	169° 37.0' W	Midwater trawl
4	255	11-Sep	0110	P01		366	53° 11.1' N	169° 51.0' W	Mult. Plankton
			0230			708	53° 11.4' N	169° 54.0' W	Repair stbd winch
5			0249			614	53° 11.8' N	169° 54.0' W	Seacat Test
6			0706	P02		395	52° 58.3' N	171° 07.5' W	Plankton Trawl
7			0955	M02		530	52° 55.1' N	171° 05.2' W	Marin
8			1100	T01		500	52° 55.0' N	171° 03.9' W	1Tuck
9			1224	M03		743	52° 55.9' N	171° 02.6' W	Marin
10			2203	M04		672	52° 37.5' N	173° 19.0' W	Marin
11	256	12-Sep	0624	M05		1604	52° 12.8' N	175° 50.0' W	Marin
12			0705	M06		1604	52° 12.8' N	175° 48.0' W	Marin
13			0751	T02		1582	52° 13.1' N	175° 46.0' W	1Tuck
14			0944	T03		1500	52° 08.9' N	176° 12.0' W	1Tuck
			1600			105	52° 00.3' N	176° 17.0' W	Raised Centerboard
			1730				51° 51.5' N	176° 38.0' W	At Adak
			2027			118	51° 53.4' N	176° 31.0' W	Lowered Centerboard
15	257	13-Sep	0105	2	I,2	1625	51° 59.4' N	177° 25.0' W	CTDB
16			0430	3	I,3	3600	52° 21.7' N	177° 24.0' W	CTDB
17			0715	4	I,4	3681	52° 38.2' N	177° 25.0' W	CTDB
18			1019	5	I,5	3733	52° 57.9' N	177° 25.0' W	CTDB
19			1254	6	I,6	3729	52° 58.0' N	177° 50.0' W	CTDB
20			1619	7	I,7	3724	52° 57.8' N	178° 30.0' W	CTDB
21			1915	8	I,8	3349	52° 57.9' N	179° 02.2' W	CTDB
22			2205	9	I,9	602	52° 58.0' N	179° 39.0' W	CTDB
23	258	14-Sep	0604	11	II,11	990	51° 31.7' N	179° 09.6' W	CTDB
24			0659			1400	51° 30.3' N	179° 17.0' W	Drifter 7162
25			0809	12	II,12	1105	51° 29.6' N	179° 23.0' W	CTDB
26			1001	13	II,13	995	51° 30.1' N	179° 36.0' W	CTDB
27			1129	14	II,14	499	51° 30.0' N	179° 49.0' W	CTDB
28			1415	15	II,15	1274	51° 29.1' N	179° 58.1' E	CTDB
29			1617	17	II,17	1177	51° 28.1' N	179° 39.8' E	CTDB

Table 7. MF92-09 CRUISE SUMMARY

Bering Sea Circulation 9-27 September 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
30			1708			1190	51° 28.1' N	179° 32.4' E	Drifter 7233
31			1803	18	II,18	1353	51° 28.2' N	179° 24.8' E	CTDB
32	259	15-Sep	0004	19	III,19	1053	51° 10.7' N	179° 10.9' E	CTDB
33			0040			1234	51° 09.3' N	179° 10.6' E	Drifter 7165
34			0133	20	III,20	1525	51° 06.7' N	179° 11.0' E	CTDB
35			0213			1634	51° 05.8' N	179° 11.0' E	Drifter 7227
36			0256	21	III,21	1834	51° 05.3' N	179° 11.0' E	CTDB
37			0443	22	III,22	3284	50° 59.9' N	179° 10.8' E	CTDB
38			0544			3906	50° 54.9' N	179° 11.0' E	Drifter 7235
39			0651	23	III,23	4378	50° 49.8' N	179° 11.7' E	CTDB
40			0934	24	III,24	6123	50° 31.2' N	179° 10.5' E	CTDB
41			1238	25	III,25	5900	50° 09.3' N	179° 12.0' E	CTDB
42			1325			5800	50° 09.3' N	179° 12.0' E	Begin ADCP transect
43			1827			1034	51° 10.7' N	179° 10.9' E	End ADCP transect
44			2200		CM-A	1153	51° 29.8' N	179° 58.0' E	Moor
45	260	16-Sep	2348	26	IV,26	1755	52° 27.3' N	176° 14.7' E	CTDB
46	261	17-Sep	0535	27	IV,27	3940	52° 57.9' N	176° 18.2' E	CTDB
47			1034	28	IV,28	3943	53° 31.2' N	176° 18.3' E	CTDB
48			1610	29	IV,29	3936	54° 01.1' N	176° 17.1' E	CTDB
49			2118	30	IV,30	3312	54° 27.4' N	176° 16.1' E	CTDB
50	262	18-Sep	1259	31	V,31	1540	52° 20.6' N	172° 49.9' E	CTDB
51			1350			1750	52° 19.6' N	172° 46.6' E	Drifter 7236
52			1447	32	V,32	2300	52° 18.1' N	172° 45.2' E	CTDB
53			1700	33	V,33	3756	52° 10.0' N	172° 34.4' E	CTDB
54			1809			4780	52° 05.4' N	172° 27.7' E	Drifter 7211
55			1926	34	V,34	5530	52° 01.2' N	172° 12.1' E	CTDB
56			2203	35	V,35	6000	51° 52.8' N	172° 08.6' E	CTDB
57	263	19-Sep	0154	36	V,36	4700	51° 28.1' N	171° 42.7' E	CTDB
58			0245			4700	51° 28.2' N	171° 42.7' E	Begin ADCP transect
59			0941			1493	52° 22.1' N	172° 50.0' E	End ADCP transect
60			1355	37	VI,37	496	53° 00.0' N	172° 06.8' E	CTDB
61			1519	38	VI,38	523	53° 00.9' N	171° 52.0' E	CTDB
62			1600			556	53° 01.3' N	171° 44.3' E	Drifter 7174
63			1644	39	VI,39	663	53° 01.6' N	171° 37.4' E	CTDB
64			1901		CM-B	720	53° 01.8' N	171° 36.6' E	Moor
65			2304		CM-C	1491	53° 03.8' N	171° 15.2' E	Moor
66	264	20-Sep	0339		CM-D	1056	53° 19.8' N	170° 30.0' E	Moor
67			0850	40	VI,40	575	53° 02.9' N	171° 23.9' E	CTDB

Table 7. MF92-09 CRUISE SUMMARY

Bering Sea Circulation 9-27 September 1992

Plot No.	Date (JD)	Date (GMT)	Time (GMT)	Station No.	FOCI Grid No.	Depth (m)	Latitude	Longitude	Gear Code
68			1021	41	VI,41	1468	53° 03.5' N	171° 16.4' E	CTDB
69			1407	42	VI,42	1054	53° 19.3' N	170° 30.2' E	CTDB
70			1453			1750	53° 21.0' N	170° 23.0' E	Drifter 7229
71			1601	43	VI,43	1696	53° 23.0' N	170° 14.8' E	CTDB
72			1700			1970	53° 25.3' N	170° 09.2' E	Drifter 7170
73			1759	44	VI,44	1829	53° 27.2' N	170° 03.9' E	CTDB
74	265	21-Sep	0756	45	VII,45	3785	55° 25.8' N	172° 55.0' E	CTDB
75			1044	46	VII,46	3789	55° 15.9' N	173° 29.2' E	CTDB
76			1352	47	VII,47	3784	55° 05.3' N	174° 05.4' E	CTDB
77			1713	48	VII,48	3781	54° 55.0' N	174° 40.1' E	CTDB
78			2014	49	VII,49	3763	54° 40.0' N	175° 14.8' E	CTDB
79	267	23-Sep	0450	50		949	59° 14.7' N	178° 36.0' W	CTDB
80			0752	51		166	59° 37.1' N	178° 10.0' W	CTDB
81			0815	T01		162	59° 37.4' N	178° 10.0' W	1Tuck
82			1003	T02		393	59° 26.7' N	178° 23.0' W	1Tuck
83			1241	T03		1300	59° 15.2' N	178° 38.0' W	1Tuck
84			1352			1040	59° 14.8' N	178° 36.0' W	Begin ADCP Backtrack-L
85			1538			1350	59° 14.9' N	178° 39.0' W	End ADCP Backtrack-L
86			1615	T04		1350	59° 15.7' N	178° 38.0' W	1Tuck
87			1739		CM-E	1066	59° 15.0' N	178° 36.0' W	Moor
88	268	24-Sep	2300	52	VIII,52	2210	53° 34.5' N	179° 40.0' E	CTDB
89	269	25-Sep	0211	53	VIII,53	2450	53° 14.5' N	179° 46.0' E	CTDB
90			0436	54	VIII,54	629	53° 18.3' N	179° 50.0' W	CTDB
			0628				53° 23.0' N	179° 26.0' W	Wx Suspended Ops
91			1505	55	VIII,55	1160	53° 23.0' N	179° 26.0' W	CTDB
92			1708	56	VIII,56	3330	53° 24.0' N	179° 12.0' W	CTDB
93			1909	57	VIII,57	3420	53° 13.4' N	179° 08.7' W	CTDB
94			2253	58	VIII,58	3130	52° 45.4' N	179° 06.8' W	CTDB
95	270	26-Sep	1746			3166	53° 23.5' N	172° 57.0' W	Begin ADCP Backtrack-L
96			1924			3444	53° 23.0' N	172° 57.0' W	End ADCP Backtrack-L

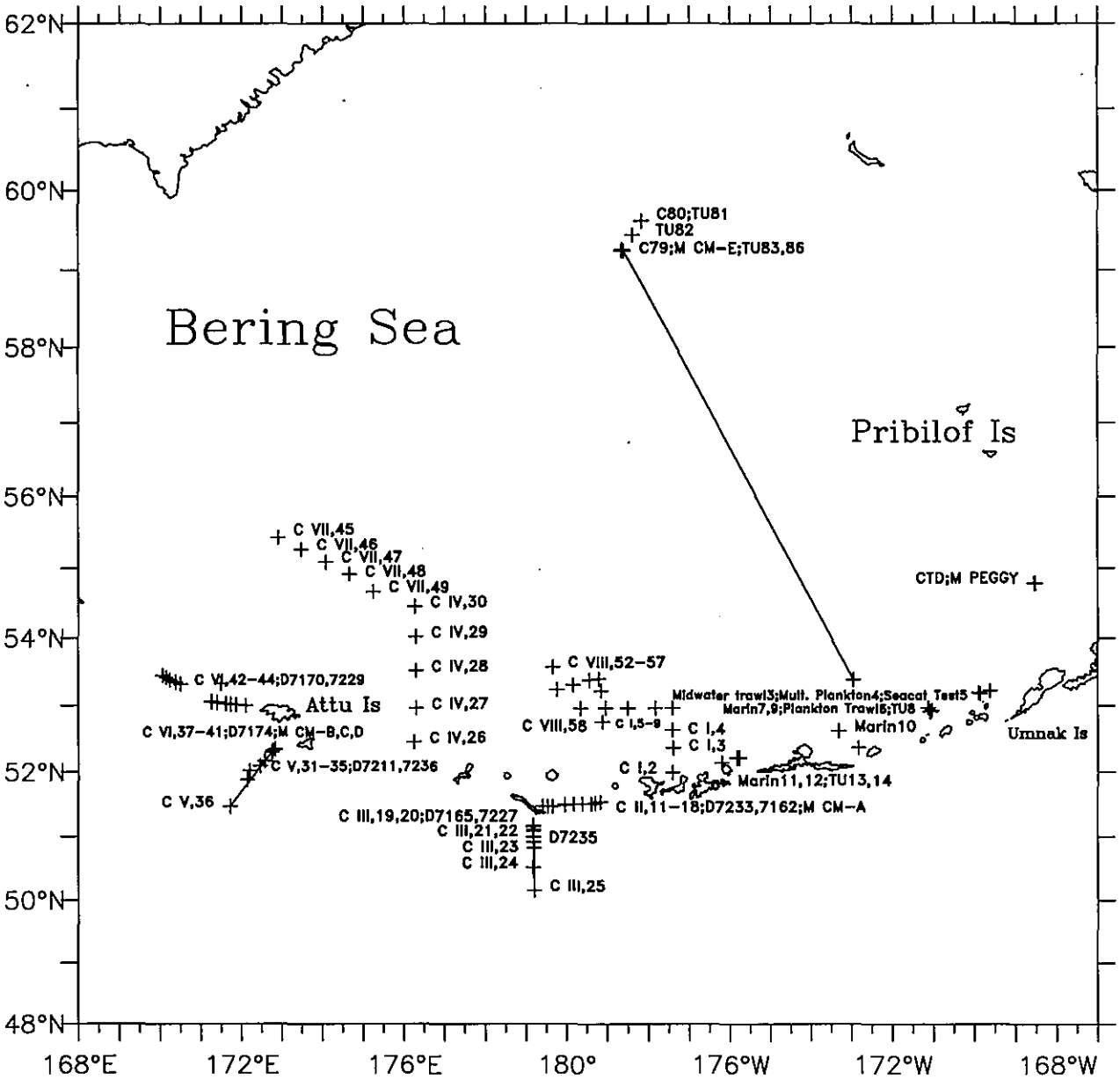


Fig. 5.1. MF92-09 CTD (C), Drifter (D), Marinovich (Marin), Mooring (M), Midwater Trawl Plankton Trawl, and Tucker (TU) Stations.

MOORING INFORMATION

During 1992 FOCI recovered two Gulf of Alaska moorings that had been deployed the previous year. These moorings measured currents at two levels near Sutwik and Mitrofania Islands and bottom pressure near Mitrofania.

In the Bering Sea, current meter moorings CM-B through E, deployed in August 1991, were recovered during September 1992; CM-A was not recovered. Also recovered at the end of the field season during MF92-09 was the PROTEUS mooring "Peggy" deployed during MF92-04.

Details of these recoveries and deployments are shown in Tables 8 and 9, while Figs. 6.1 and 6.2 show the sites. The mooring configurations are given in Figs. 6.3 through 6.10.

Table 8. Summary of FOCI's 1992 Mooring Recoveries

Summary of equipment recovered

No. of RCM-4s:	25
No. of ACMs:	5
No. of Seacats:	10
No. of RDI ADCPs:	1
No. of MTRs:	6
No. of WLR-5s:	1
No. of releases:	9

Mooring I.D.	9105	9140	PROTEUS PEGGY	PROTEUS PEGGY (CONTINUED)	PROTEUS PEGGY (CONTINUED)
Location	Sutwik	Mitrofania			
	56° 21.78' N	55° 45.03' N	54° 47.66' N		
	156° 54.59' W	158° 32.90' W	168° 33.89' W		
Duration	4/22/91-4/13/92	4/23/91-4/13/92	4/17/92-9/10/92		
Depth	126	141	2219		
Instruments	Aanderaa 31 m	Aanderaa 32.5 m	ADCP-150 surface	Seacat 39 m	ACM-2 150 m
	Aanderaa 111 m	Aanderaa 72.5 m	Seacat surface	MTR 50 m	Seacat 150.5 m
			MTR 10 m	Seacat 62 m	Seacat 197.5 m
			ACM-2 14 m	MTR 70 m	MTR 253.5 m
			Seacat 15 m	ACM-2 78 m	ACM-2 301.5 m
			MTR 22 m	Seacat 79 m	Seacat 397.5 m
			Seacat 30 m	Seacat 102 m	
			ACM-2 38 m	MTR 125 m	
Release	8242	191			8242/8242
Press Gage	none	Aanderaa WLR-5			none

Table 8. Summary of FOCI's 1992 Mooring Recoveries

Mooring I.D.	CM-A	CM-B	CM-C	CM-D	CM-E
Location	Amchitka Pass 57° 30.00' N 179° 58.30' E	Near Strait 53° 01.91' N 171° 36.59' E	Near Strait 53° 03.81' N 171° 15.23' E	Near Strait 53° 19.83' N 170° 30.34' E	St. Matthew 59° 14.97' N 178° 35.92' W
Duration	RECOVERY FAILURE	8/10/91-9/19/92	8/11/91-9/19/92	8/11/91-9/20/92	8/25/91- //92
Depth	1145	708	1494	1040	1001
Instruments	Aanderaa 140 m Aanderaa 290 m Aanderaa 440 m Aanderaa 590 m	Aanderaa 125 m Aanderaa 250 m Aanderaa 400 m Aanderaa 550 m	Aanderaa 131 m Aanderaa 281 m Aanderaa 481 m Aanderaa 731 m Aanderaa 981 m	Aanderaa 125 m Aanderaa 275 m Aanderaa 500 m Aanderaa 750 m	Aanderaa 150 m Aanderaa 300 m Aanderaa 500 m Aanderaa 750 m
Release	8242	8242	8242	8242	8242
Press Gage	none	none	none	none	none

Table 9. Summary of FOCI's 1992 Mooring Deployments

Summary of equipment deployed

No. of ACMs:	5
No. of Seacats:	10
No. of RDI ADCPs:	1
No. of MTRs:	6
No. of releases:	2

Mooring I.D.	PROTEUS PEGGY		PROTEUS PEGGY (CONTINUED)		PROTEUS PEGGY (CONTINUED)	
Location	54° 47.66' N 168° 33.89' W					
Duration	4/17/92-9/10/92					
Depth	2219					
Instruments	ADCP-150	surface	Seacat	39 m	ACM-2	150 m
	Seacat	surface	MTR	50 m	Seacat	150.5 m
	MTR	10 m	Seacat	62 m	Seacat	197.5 m
	ACM-2	14 m	MTR	70 m	MTR	253.5 m
	Seacat	15 m	ACM-2	78 m	ACM-2	301.5 m
	MTR	22 m	Seacat	79 m	Seacat	397.5 m
	Seacat	30 m	Seacat	102 m		
	ACM-2	38 m	MTR	125 m		
Release					8242/8242	
Press Gage					none	

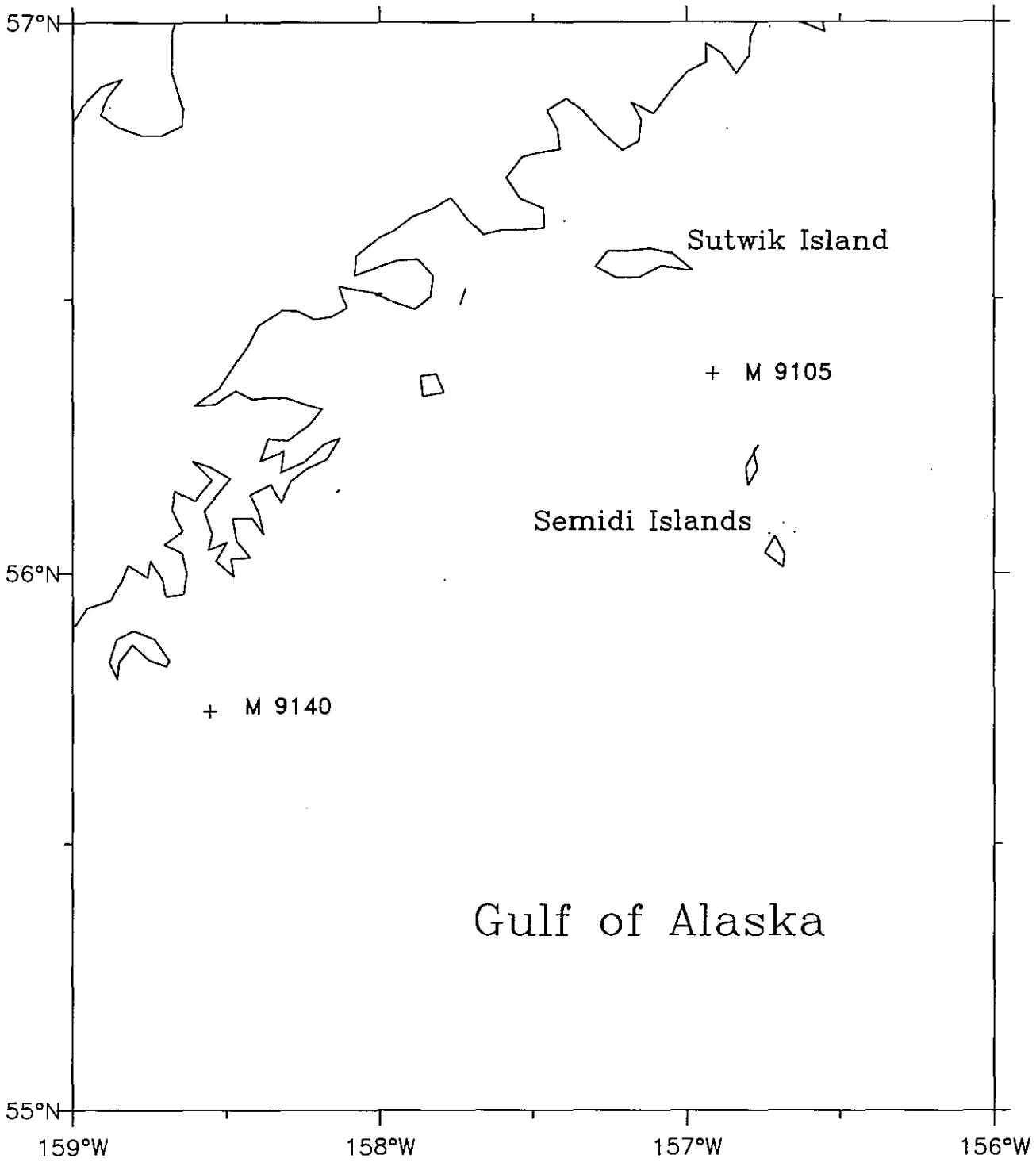


Fig. 6.1. 1992 Gulf of Alaska Deployment/Recovery Sites.

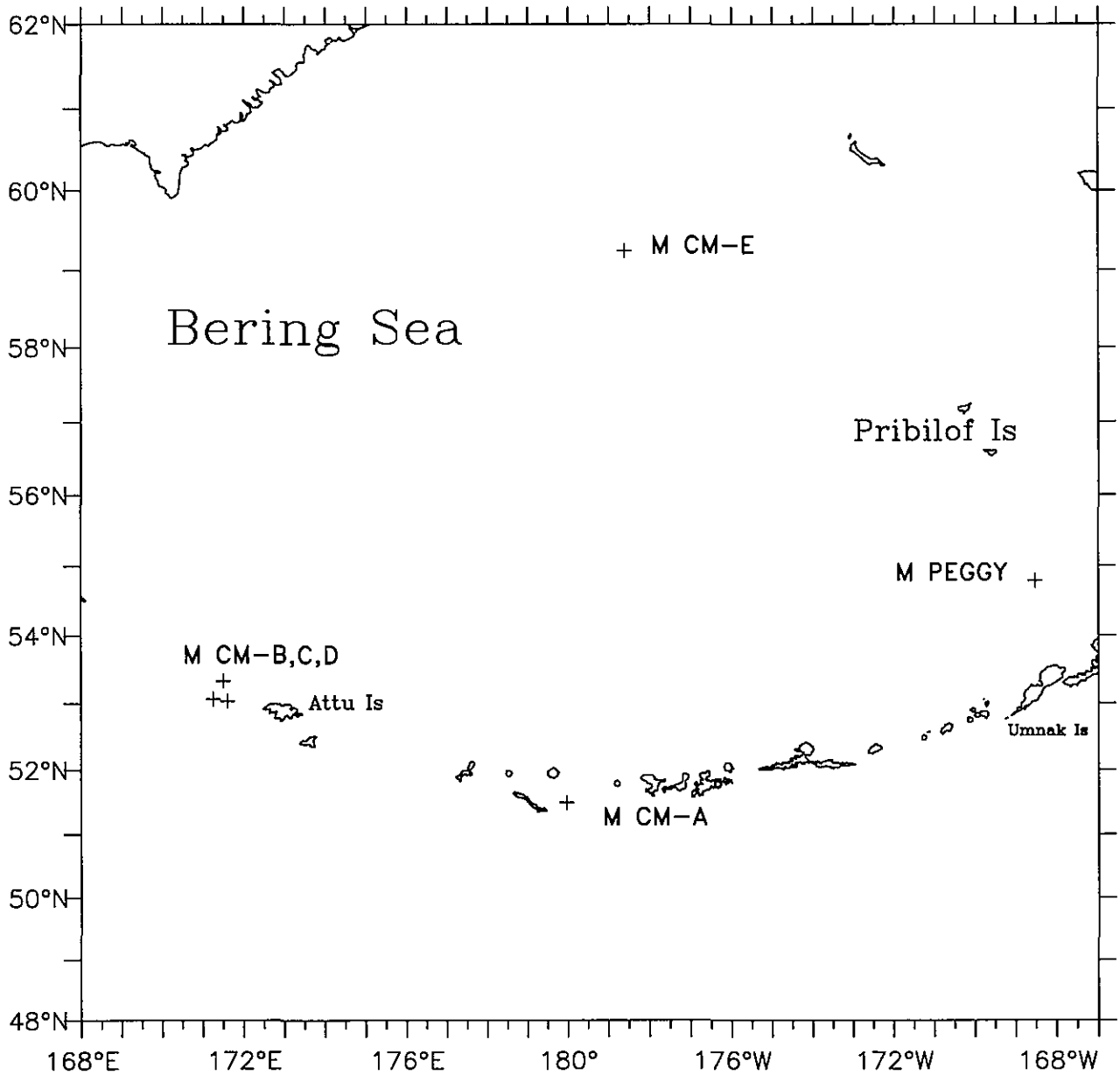
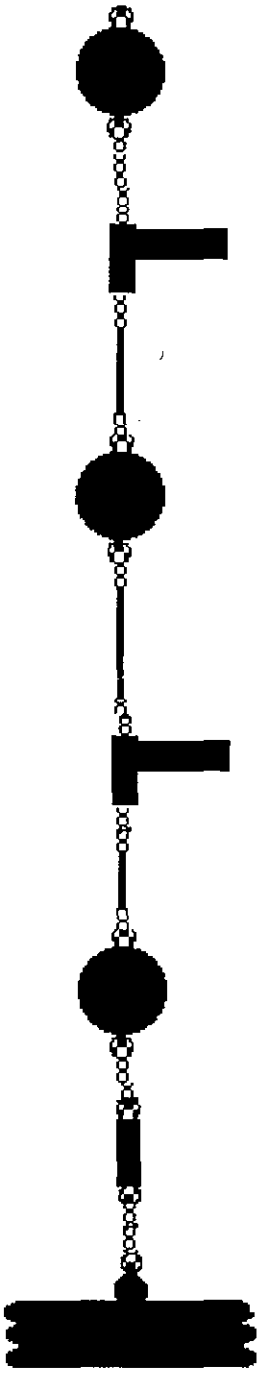


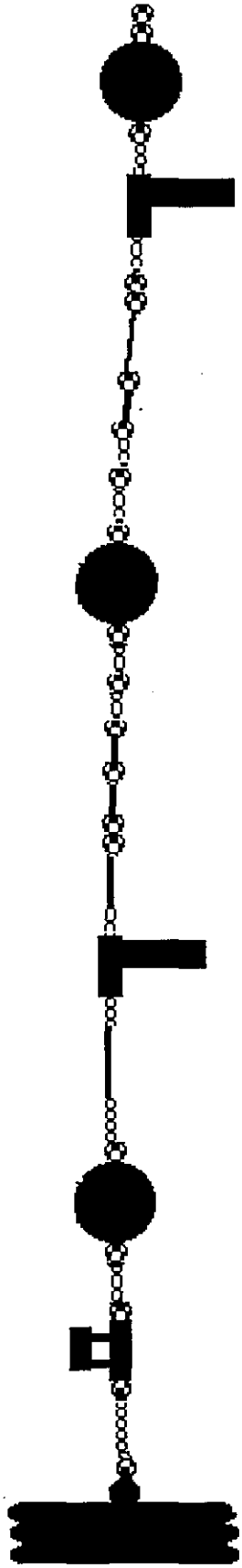
Fig. 6.2. 1992 Bering Sea Deployment/Recovery Sites.

MOORING	9105 (Sutwik)
POSITION	56° 21.78' N
	156° 54.59' W
LORAN	18724.9
	33095.2
	44862.1
DEPTH	126 m



CURRENT METER DEPTHS AND SERIAL NUMBERS
RCM S/N 5257 31 m
RCM S/N 1960 111 m
AR 191 RELEASE S/N 78 U

Fig. 6.3. Mooring 9105.



MOORING	9140 (Mitrofania)
POSITION	55° 45.03' N
	158° 32.90' W
LORAN	18674.2
	33451.1
	45543.7
DEPTH	88.5 m

CURRENT METER DEPTHS AND SERIAL NUMBERS

RCM S/N 3710
32.5 m

RCM S/N 1807
72.5 m

ART 191 RELEASE
S/N 93U
WLR-5 PRESS GAGE
S/N 209

Fig. 6.4. Mooring 9140.

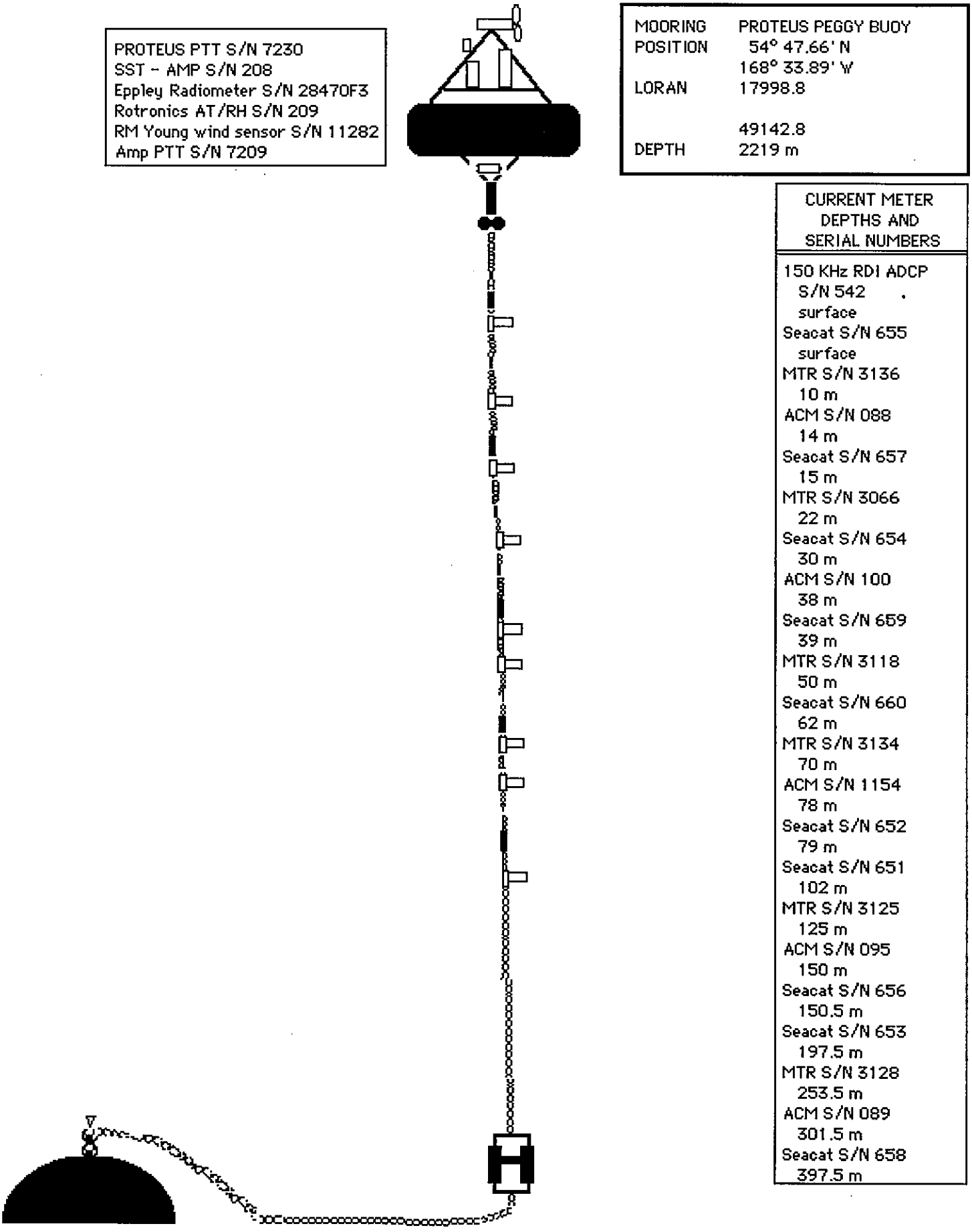


Fig. 6.5. Mooring PROTEUS Peggy.

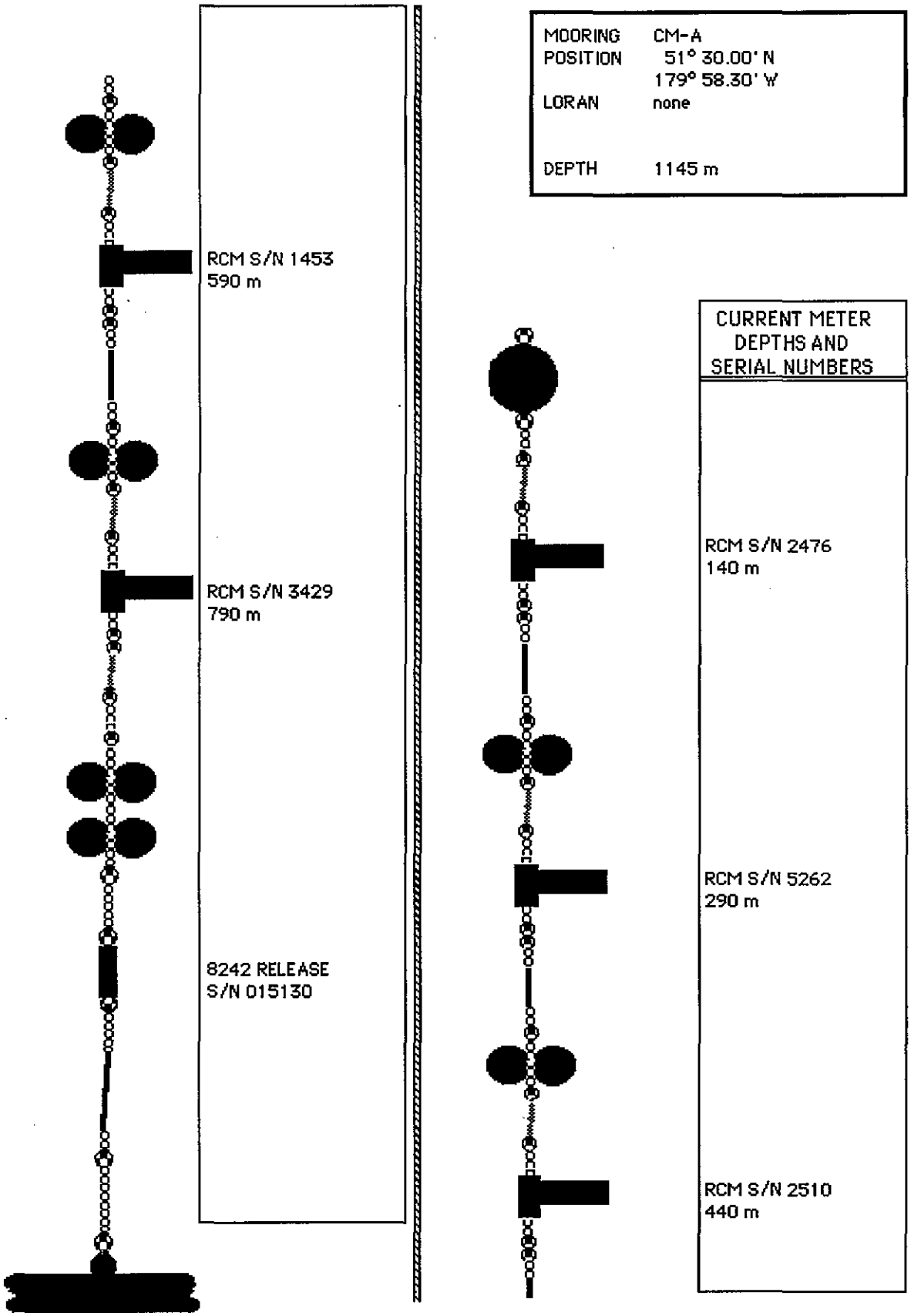


Fig. 6.6. Mooring CM-A.

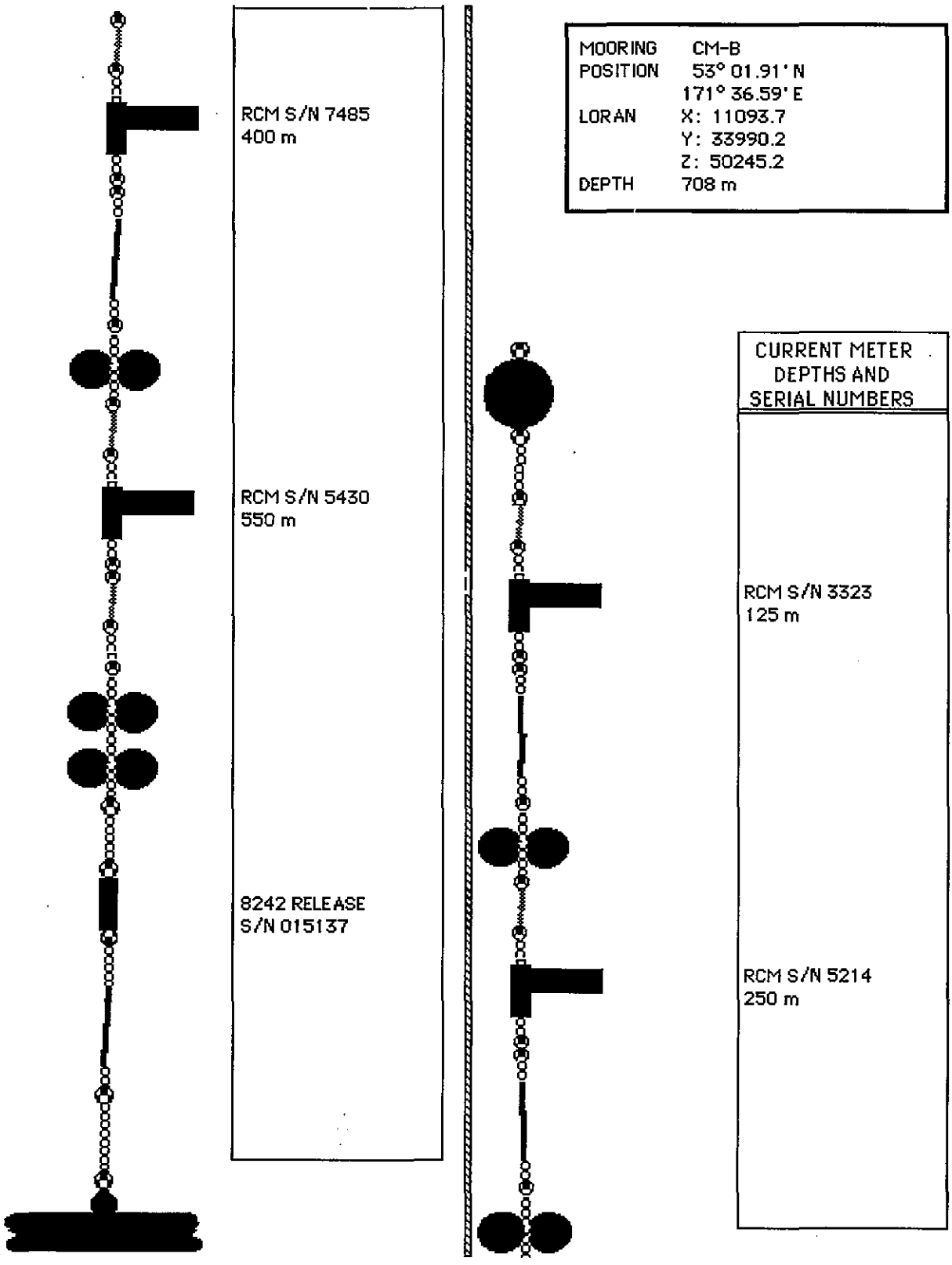


Fig. 6.7. Mooring CM-B.

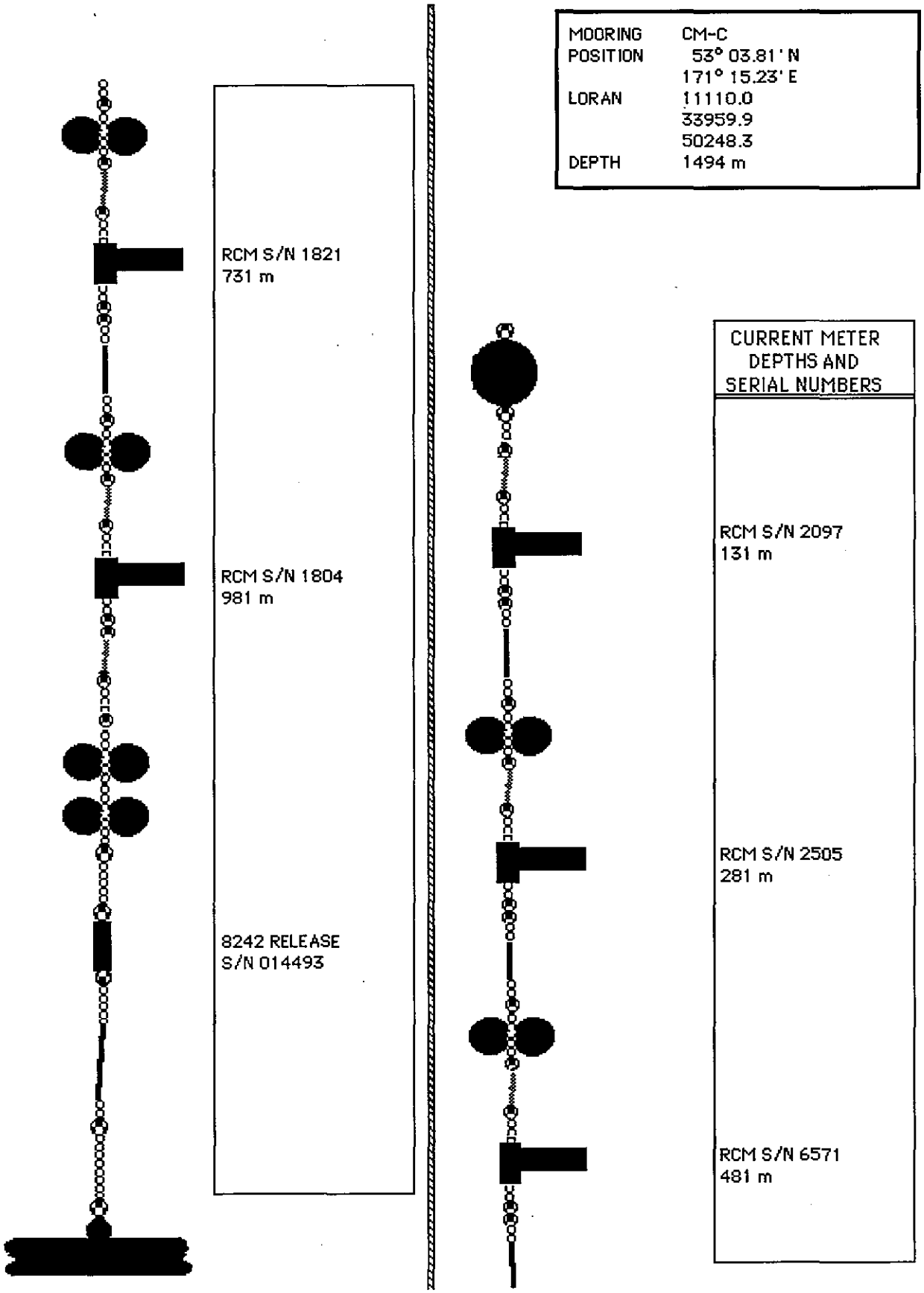


Fig. 6.8. Mooring CM-C.

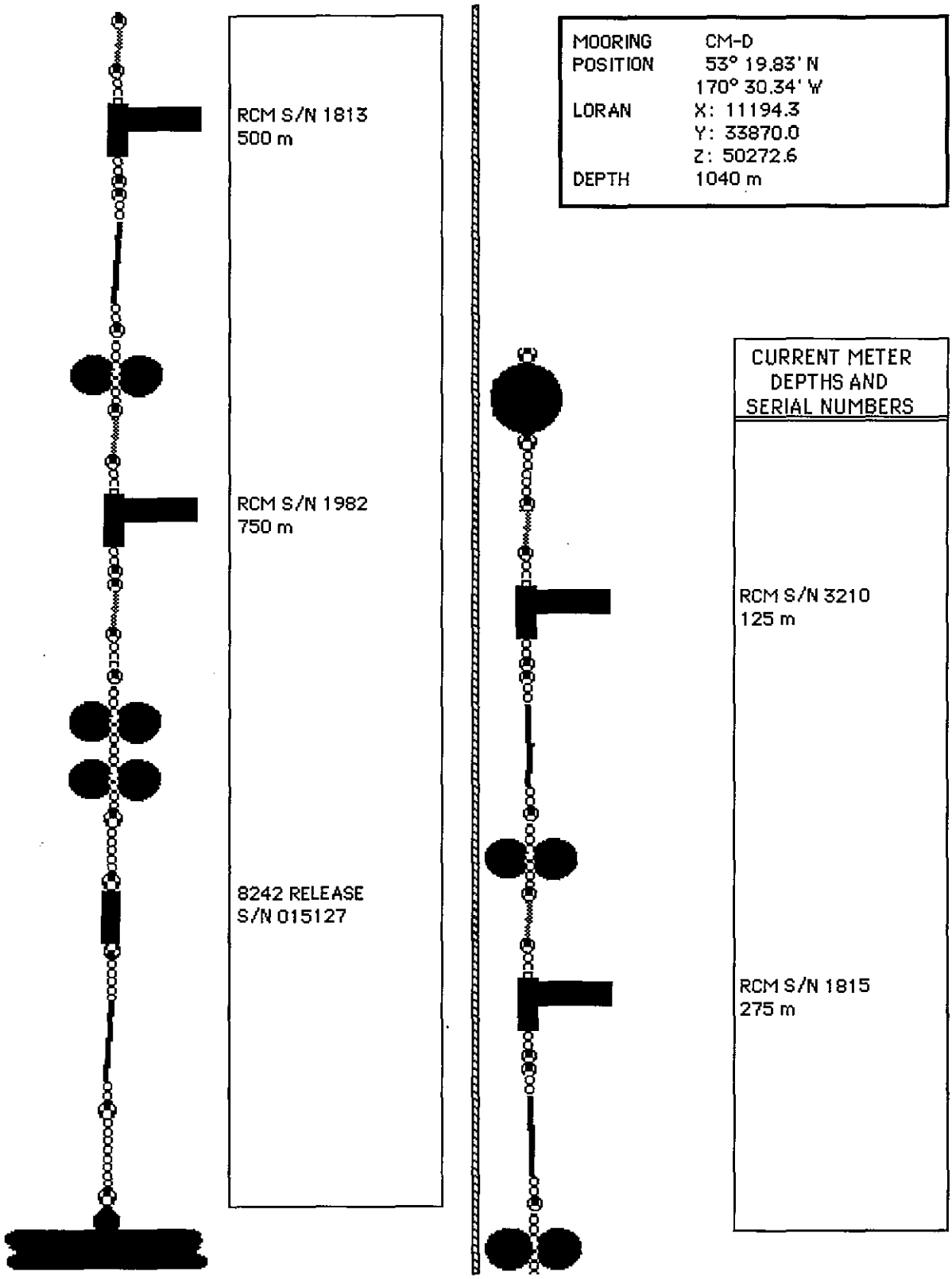


Fig. 6.9. Mooring CM-D.

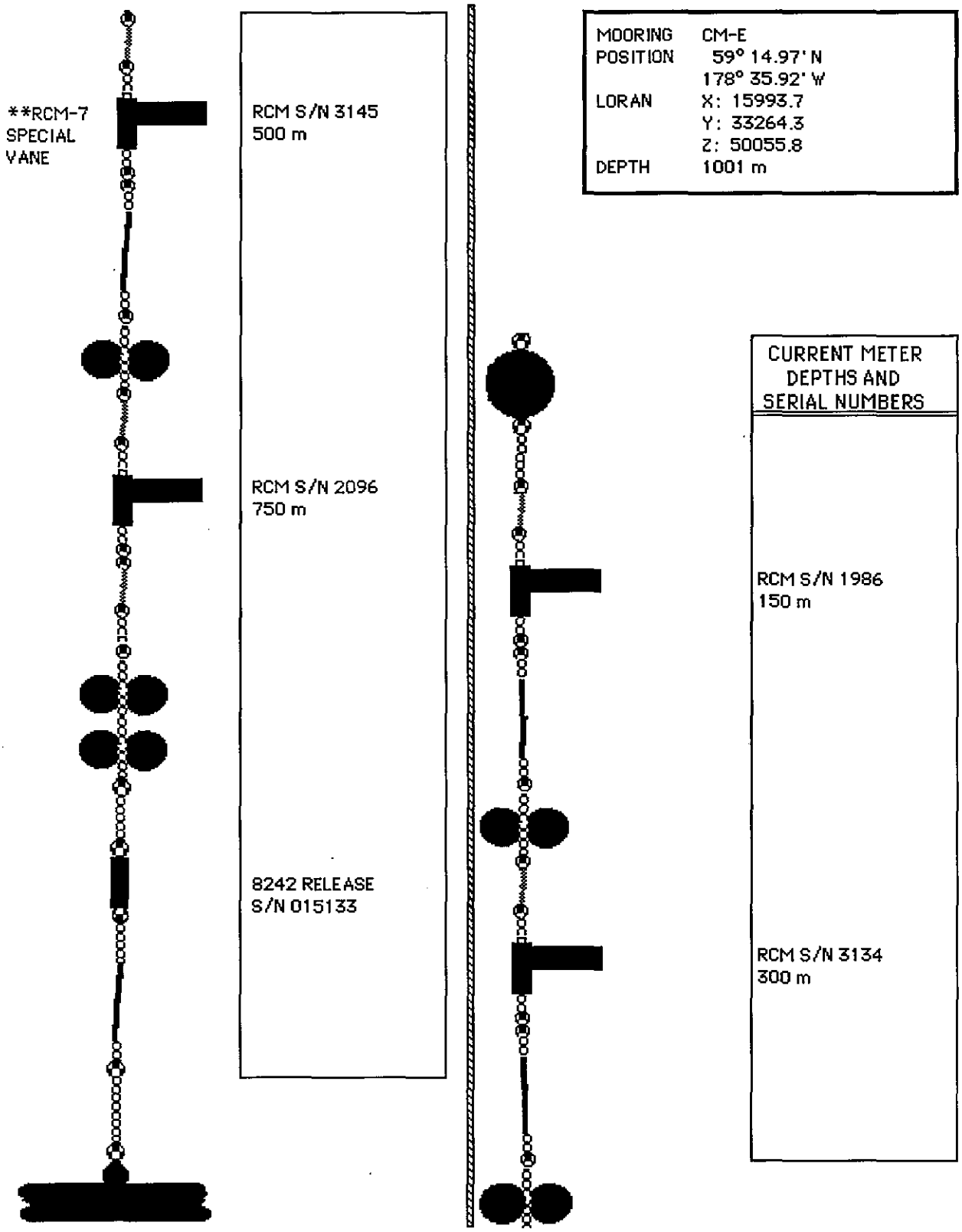


Fig. 6.10. Mooring CM-E.

RADIATION NETWORK (RadNet)

To support investigations of spatial and temporal variability in the spring bloom of phytoplankton in the Shelikof Strait region, FOCI deployed three radiation-measuring weather stations. Stations were erected on Sutwik Island [56° 32.08'N, 157° 02.9'W], south of Karluk [57° 32'N, 154° 31'W], and at Kodiak [57° 4'N, 152° 20'W]. Besides solar radiation, the Sutwik and Karluk stations made hourly measurements of wind speed and direction, air temperature, and barometric pressure (sensors are listed in Table 10). Observations were telemetered every three hours via GOES satellite to the data downlink in Wallops, VA. Data were retrieved from Wallops by phone link once a day.

Table 10. RadNet sensors.

Sensor	Model
Data Collection Platform	Handar 540S
Wind speed and direction	Handar 430A, 431A
Air temperature	Handar 435A
Barometric pressure	Setra 270
Solar radiation	LICOR

The Sutwik station was erected on March 31 and recorded its first data on April 1 (JD092) at 00300 UTC. This station was destroyed by bears by April 27. The remains were recovered on May 2 during MF92-05.

The Karluk station was erected on April 1. First data are from JD092 at 2330 UTC. This station continued to operate for the rest of the fiscal year.

The Kodiak station (radiation only) was erected at the airport of April 2. It recorded data first on JD093 at 2300 UTC. This station also operated throughout the rest of the fiscal year.

*U.S. GOVERNMENT PRINTING OFFICE:1995-673-018/00108