

*C. P. Cohet*

NOAA Data Report ERL PMEL-54



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**FISHERIES-OCEANOGRAPHY COORDINATED INVESTIGATIONS:  
1992 FIELD OPERATIONS REPORT**

D.R. Schleiger  
C. DeWitt  
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**UNITED STATES  
DEPARTMENT OF COMMERCE**

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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 yolk sac 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 Mitrofanova 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<br><del>SS</del> | MF92-04<br><del>SS</del> | MF92-05<br><del>SS</del> | MF92-06<br><del>SS</del> | MF92-09<br><del>SS</del> |
|----------------------------------|--------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 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      | <del>6</del>             | <del>6</del>             |                          |                          |                          |
| Mooring deployment               | 1      |                          | 1                        |                          |                          |                          |
| Mooring recovery                 | 8      |                          | 2                        |                          |                          |                          |
| Neuston tow                      | 3      |                          |                          |                          |                          | 6                        |
| Nutrient sample                  | 32     | 32                       |                          |                          |                          | 3                        |
| Pollock egg sample               | 45,000 | 45,000                   |                          |                          |                          |                          |
| Predator sample                  | 350    | 350                      |                          |                          |                          |                          |
| Stomach sample                   | 40     | 40                       |                          |                          |                          |                          |
| Tucker trawl                     | 23     | 11                       |                          | 1                        | 7                        | 4                        |

SCIENTIFIC PERSONNEL

| <u>Name</u>     | <u>Title</u>    | <u>Organization</u> |
|-----------------|-----------------|---------------------|
| 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 yolk sac 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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI Grid<br>No. | Depth<br>(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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI Grid<br>No. | Depth<br>(m) | Latitude |         | Longitude |         | Gear Code |
|--------------|---------------|---------------|----------------|------------------|--------------|----------|---------|-----------|---------|-----------|
| 98           | 7-Apr         | 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     |
|              |               | 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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI Grid<br>No. | Depth<br>(m) | Latitude |         | Longitude |         | Gear Code |
|--------------|---------------|---------------|----------------|------------------|--------------|----------|---------|-----------|---------|-----------|
| 99           | 8-Apr         | 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      |
|              |               | 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 | Ig-CB     |
|              |               | 0001          | G059A          |                  | 295          | 57°      | 43.4' N | 155°      | 08.2' W | Ig-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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI Grid<br>No. | Depth<br>(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     |



SCIENTIFIC PERSONNEL

| <u>Name</u>       | <u>Title</u>           | <u>Organization</u>         |
|-------------------|------------------------|-----------------------------|
| 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- $\mu$ m 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- $\mu$ m mesh on net 1 whose sample was discarded. 153- $\mu$ m 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- $\mu$ m sample was discarded. Five MOCNESS's were W-tows (M2, M3, M7–M9) in which 505- $\mu$ m mesh net 1 was sent down open to the designated depth, usually 450 m, and its sample later discarded. 153- $\mu$ m 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- $\mu$ m 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- $\mu$ m 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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI<br>Grid No. | Depth<br>(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<br>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<br>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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI<br>Grid No. | Depth<br>(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<br>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<br>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<br>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<br>MOC1     |
|              |               | 2256          | G040A          |                  | 1900         | 55°      | 01.1' N | 168°      | 20.3' W | Horizontal<br>MOC1     |
| 111          | 21-Apr        | 0058          | G040A          |                  | 1938         | 55°      | 01.1' N | 168°      | 20.0' W | Horizontal<br>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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI<br>Grid No. | Depth<br>(m) | Latitude |         | Longitude |         | Gear Code             |
|--------------|---------------|---------------|----------------|------------------|--------------|----------|---------|-----------|---------|-----------------------|
|              |               | 0650          |                |                  | 2000         | 54°      | 58.7' N | 168°      | 28.4' W | Raised<br>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<br>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<br>(JD) | Date<br>(GMT) | Time<br>(GMT) | Station<br>No. | FOCI<br>Grid No. | Depth<br>(m) | Latitude |         | Longitude |         | Gear Code             |
|--------------|---------------|---------------|----------------|------------------|--------------|----------|---------|-----------|---------|-----------------------|
|              |               | 2351          | G053A          |                  | 2035         | 54°      | 46.3' N | 168°      | 57.1' W | Horizontal<br>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<br>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<br>centerboard |

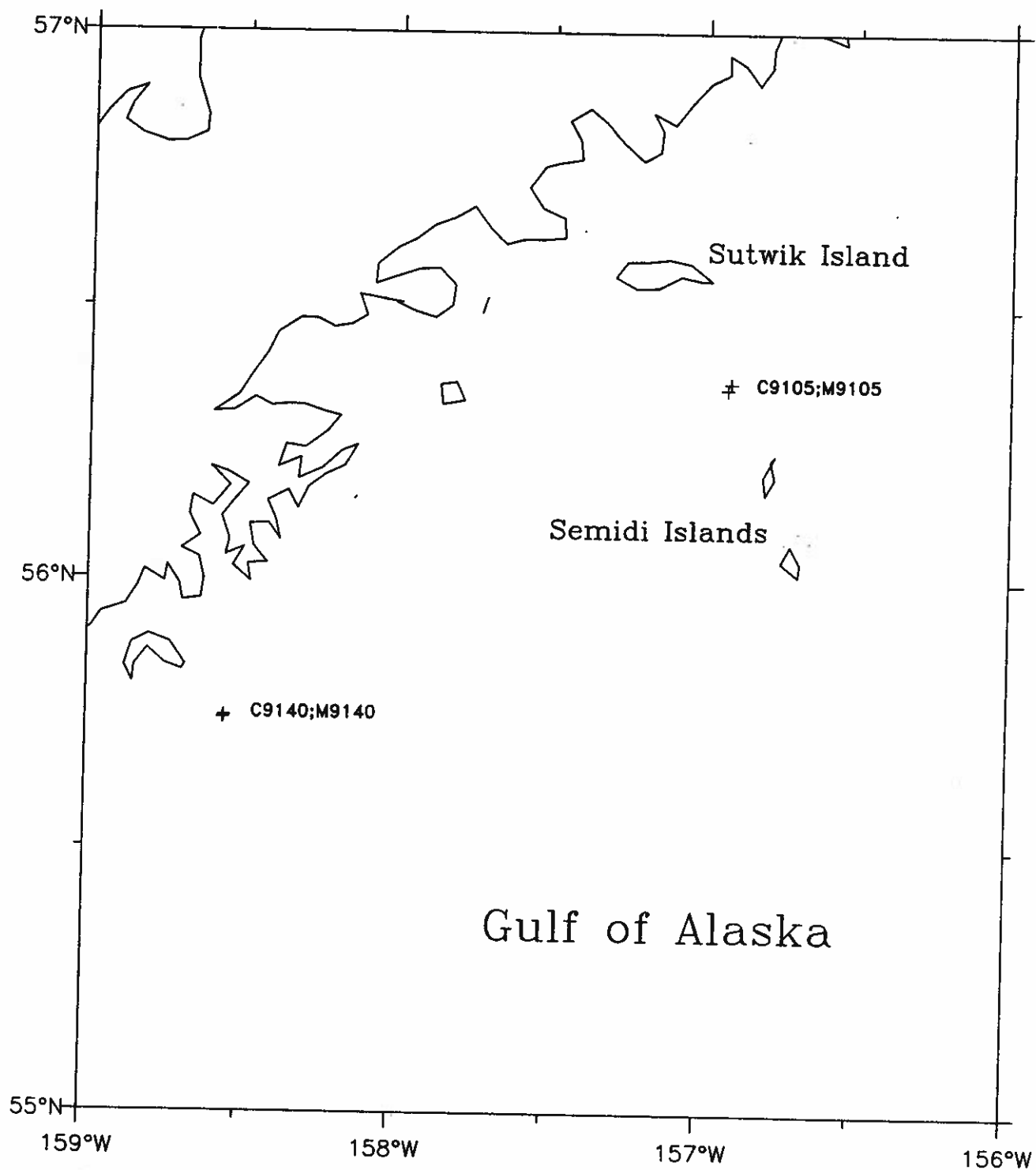


Fig. 2.1. MF92-04 Gulf of Alaska CTD (C) and Mooring (M) Stations.

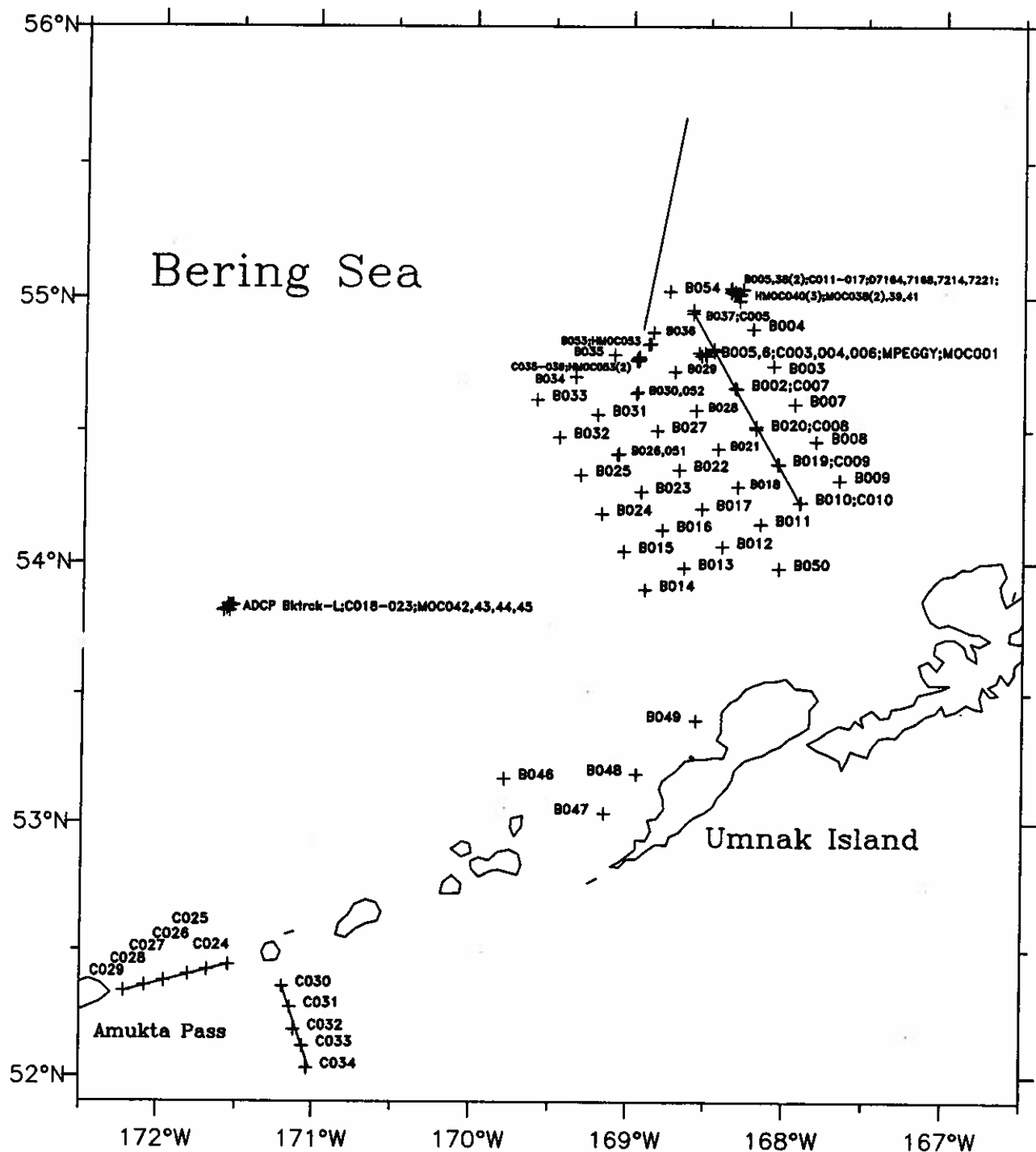


Fig. 2.2. MF92-04 Bering Sea ADCP lines (solid line) and Calibration (ADCP Bctrck-L), Bongo (B), CTD (C), Drifter (D), Horizontal MOCNESS (HMOC), MOCNESS (MOC), and Mooring (M) Stations.

SCIENTIFIC PERSONNEL

| <u>Name</u>             | <u>Title</u>    | <u>Organization</u> |
|-------------------------|-----------------|---------------------|
| 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 Mitrofanina 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       | G007A       | FOX061        | 269       | 57°      | 42.6' N | 155°      | 15.4' W | CTDB      |
| 10       |           |            | 2240       | G007B       | 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       | G008A       | FOX56         | 208       | 57°      | 30.5' N | 154°      | 47.3' W | 20Bon     |
| 13       |           |            | 0248       | G008A       | 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       | G009A       | 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       | G012A       | 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       | G015A       | 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

## Shellkof 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       | G053B       | FOX148        | 129       | 56°      | 21.3' N | 156°      | 52.1' W | CTDB      |
| 76       |           |            | 1453       | G054A       | FOX149        | 123       | 56°      | 24.0' N | 156°      | 55.1' W | CTDB      |
| 77       |           |            | 1517       | G054B       | FOX149        | 124       | 56°      | 24.0' N | 156°      | 55.4' W | CTDB      |
| 78       |           |            | 1601       | G055A       | FOX150        | 97        | 56°      | 26.6' N | 156°      | 57.4' W | CTDB      |
| 79       |           |            | 1726       | G056A       | FOX150        | 102       | 56°      | 26.6' N | 156°      | 57.2' W | 20BON     |
| 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 | 20BON     |
| 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 | 20BON     |

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       | G085C       | D19           | 182       | 56°      | 47.4' N | 156°      | 20.2' W | CALVET    |
| 135      |           |            | 1152       | G086A       | F19           | 270       | 56°      | 40.0' N | 156°      | 06.6' W | 60BON     |
| 136      |           |            | 1322       | G087A       | 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       | G092C       | 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 #<br>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 #<br>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       |               |           |             |              |                 |
| 272      |           |            | 0454       | G177C       |               | 150       | 56° 51.1' N | 156° 26.0' W | omitted         |
| 273      |           |            | 0552       | G177D       |               | 143       | 56° 51.8' N | 156° 26.4' W | CDTB/<br>CALVET |
| 274      |           |            | 0652       | G177E       |               | 153       | 56° 51.1' N | 156° 25.4' W | CDTB/<br>CALVET |
| 275      |           |            | 0740       | G177F       |               | 154       | 56° 51.5' N | 156° 25.1' W | CDTB/<br>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     |

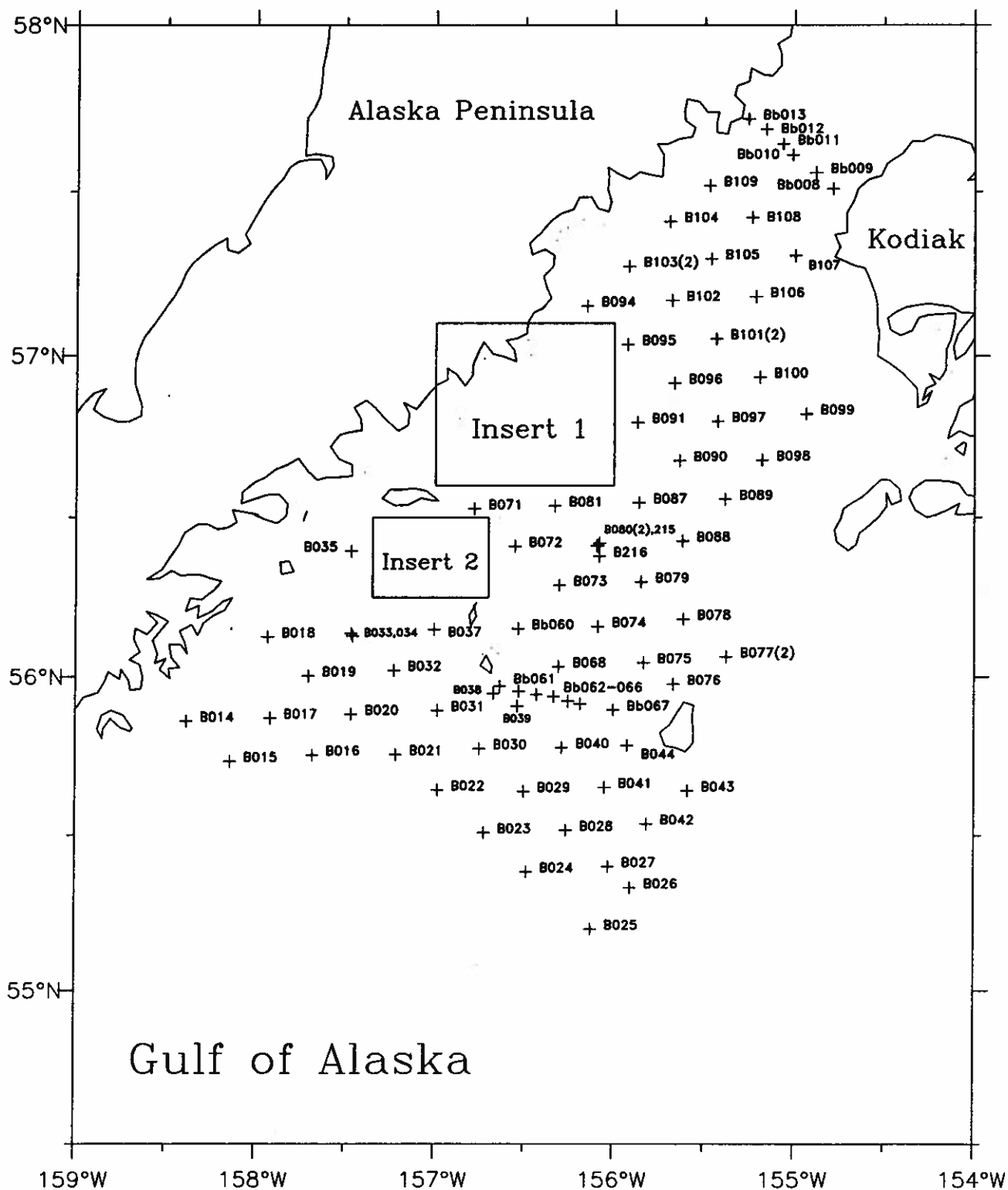


Fig. 3.1. MF92-05 Bongo Stations.



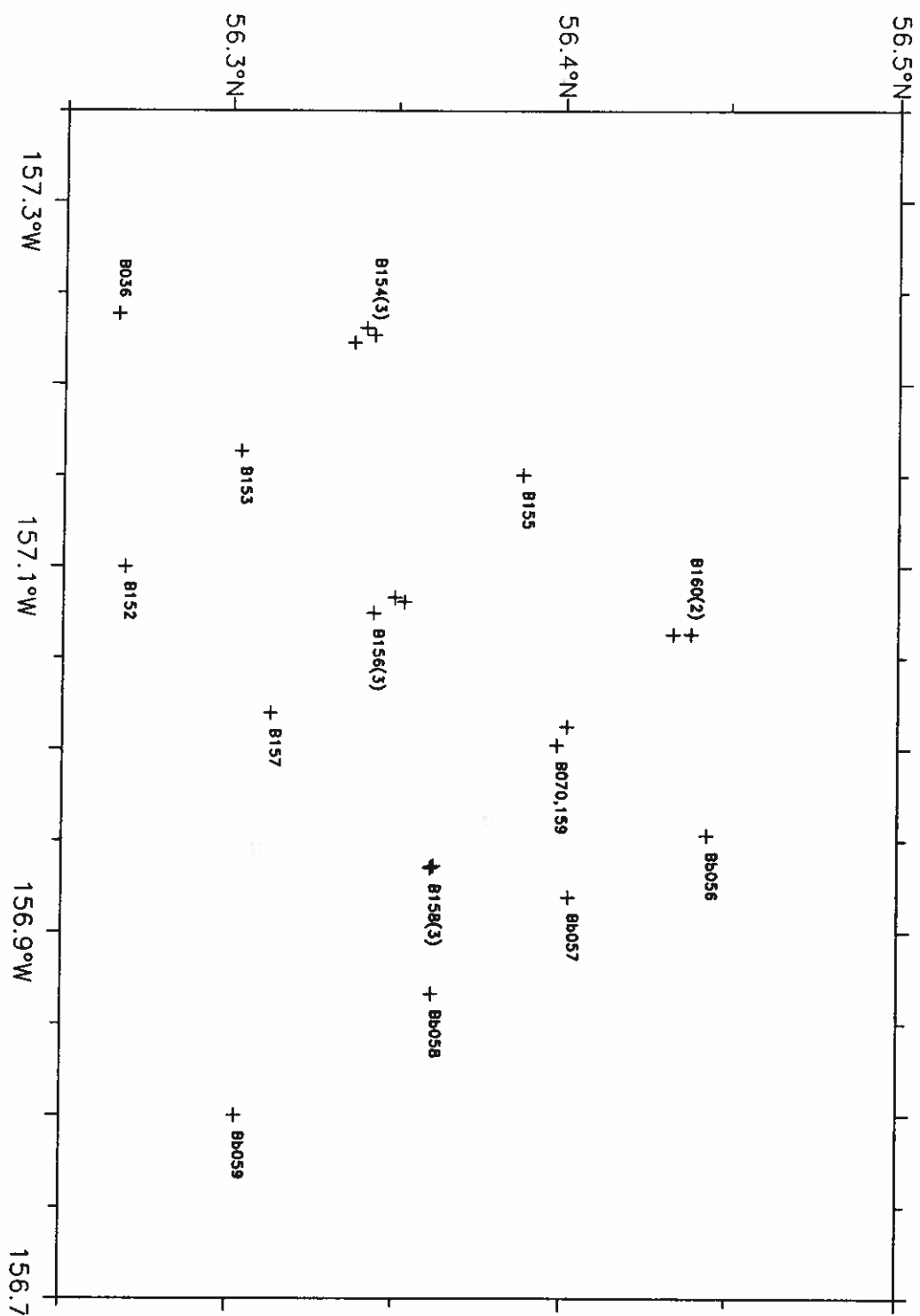


Fig. 3.3. MF92-05 Bongo Insert 2.

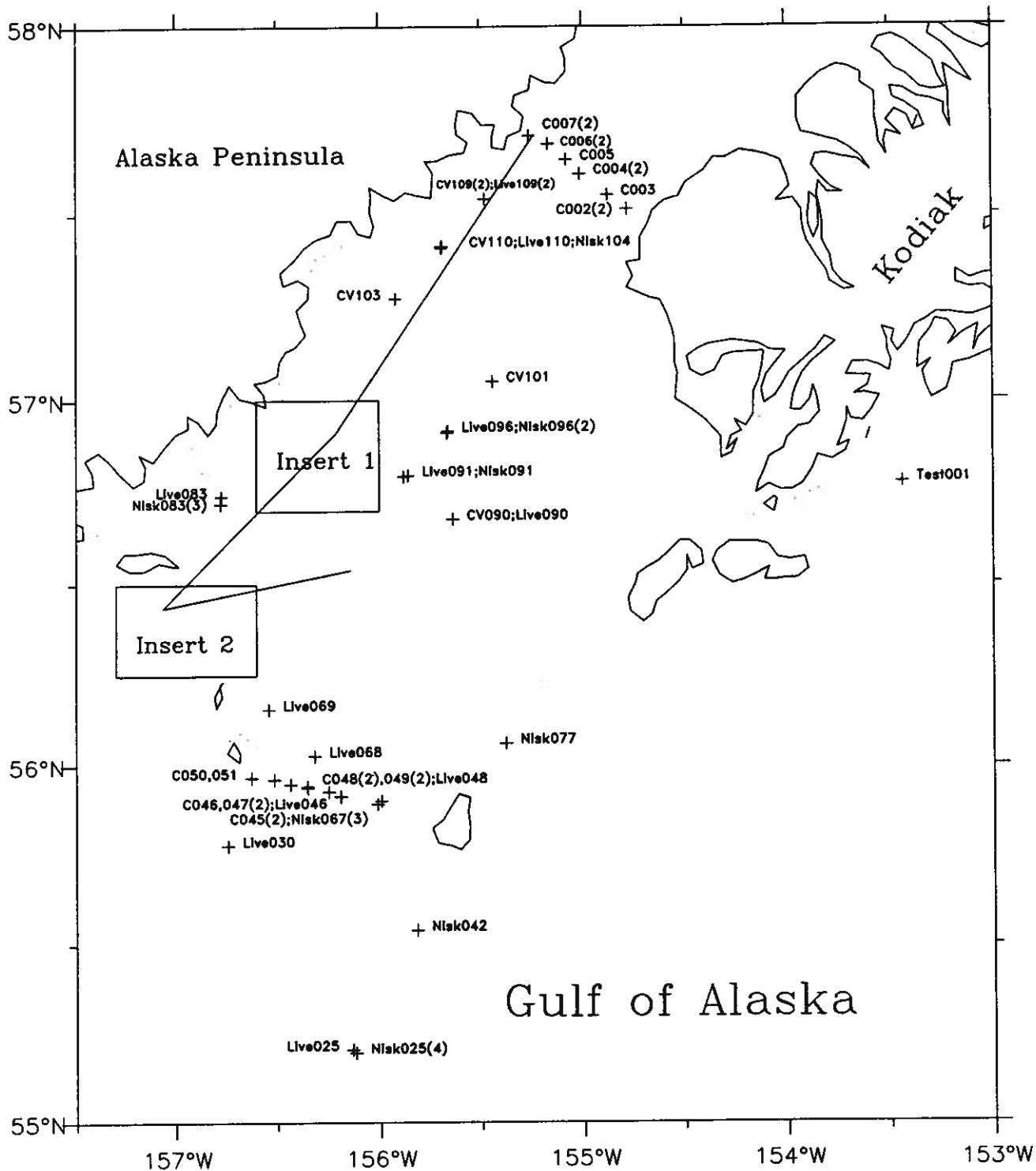


Fig. 3.4. MF92-05 CalVET (CV), CTD (C), Drifter (D), Live Tow (Live), MOCNESS (MOC), Tucker (TU), Radar (Radar), and Niskin™ Bottle Sample (Nisk) Stations.

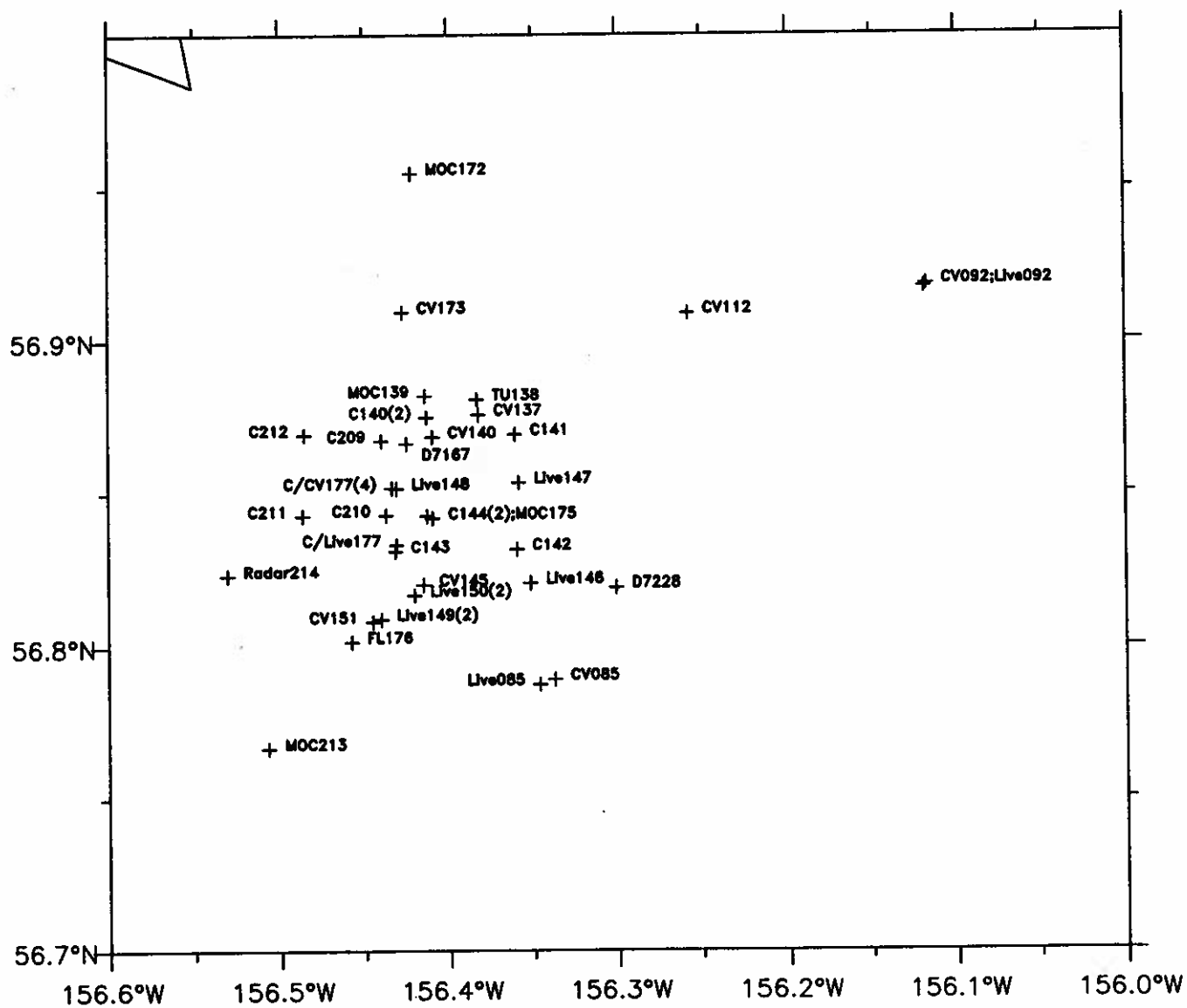


Fig. 3.5. MF92-05 Station Insert 1.

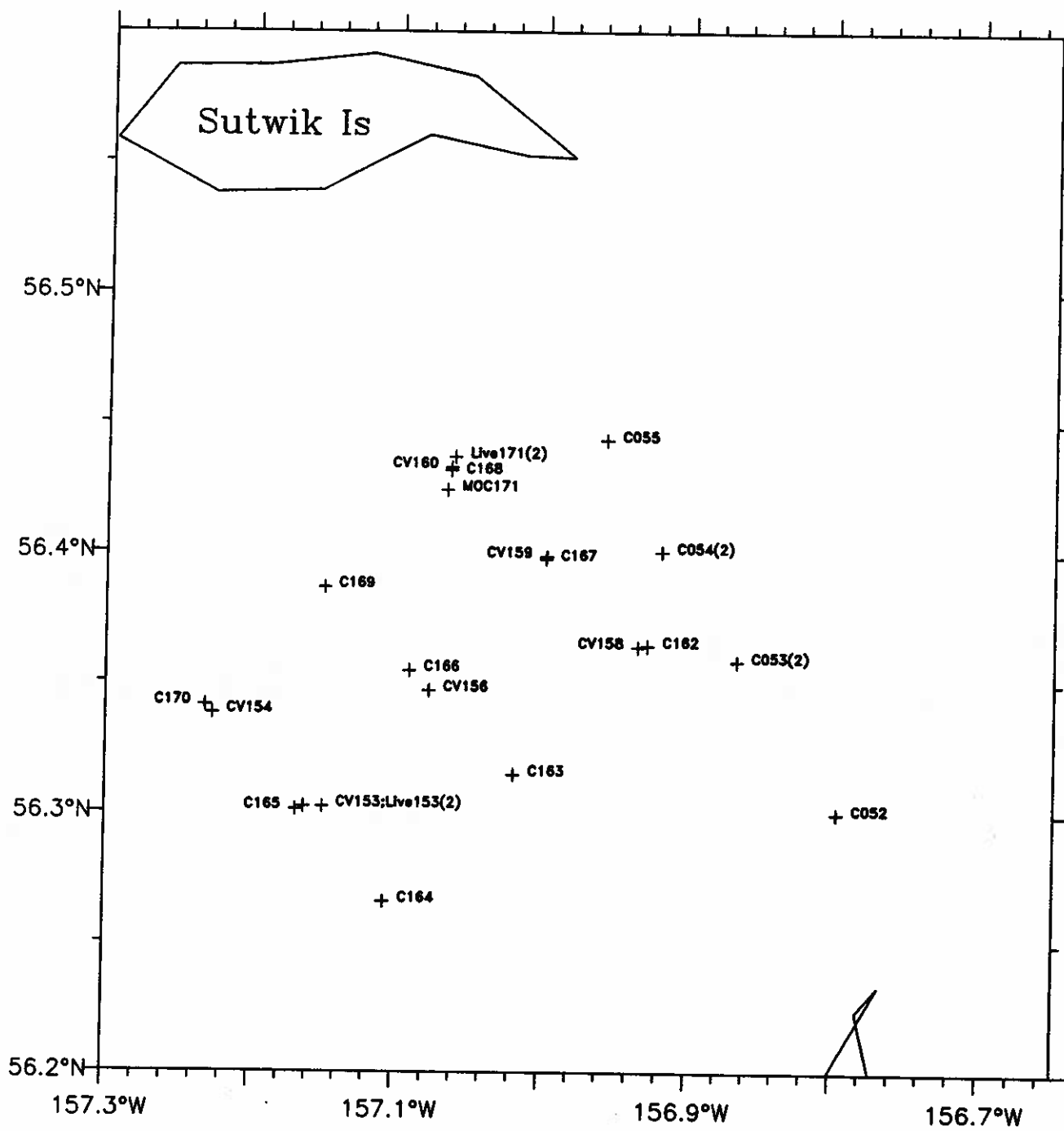


Fig. 3.6. MF92-05 Station Insert 2.

SCIENTIFIC PERSONNEL

| <u>Name</u>    | <u>Title</u>    | <u>Organization</u> |
|----------------|-----------------|---------------------|
| 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  $56^{\circ} 20.73'N$ ,  $156^{\circ} 00.00'W$ , 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       | G022A       | L5            | 88        | 55°      | 22.5' N | 156°      | 56.8'W | 60BON     |
| 45       |           |            | 1856       | G022A       | 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     |      |

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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

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| 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  
Shellkof 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  |

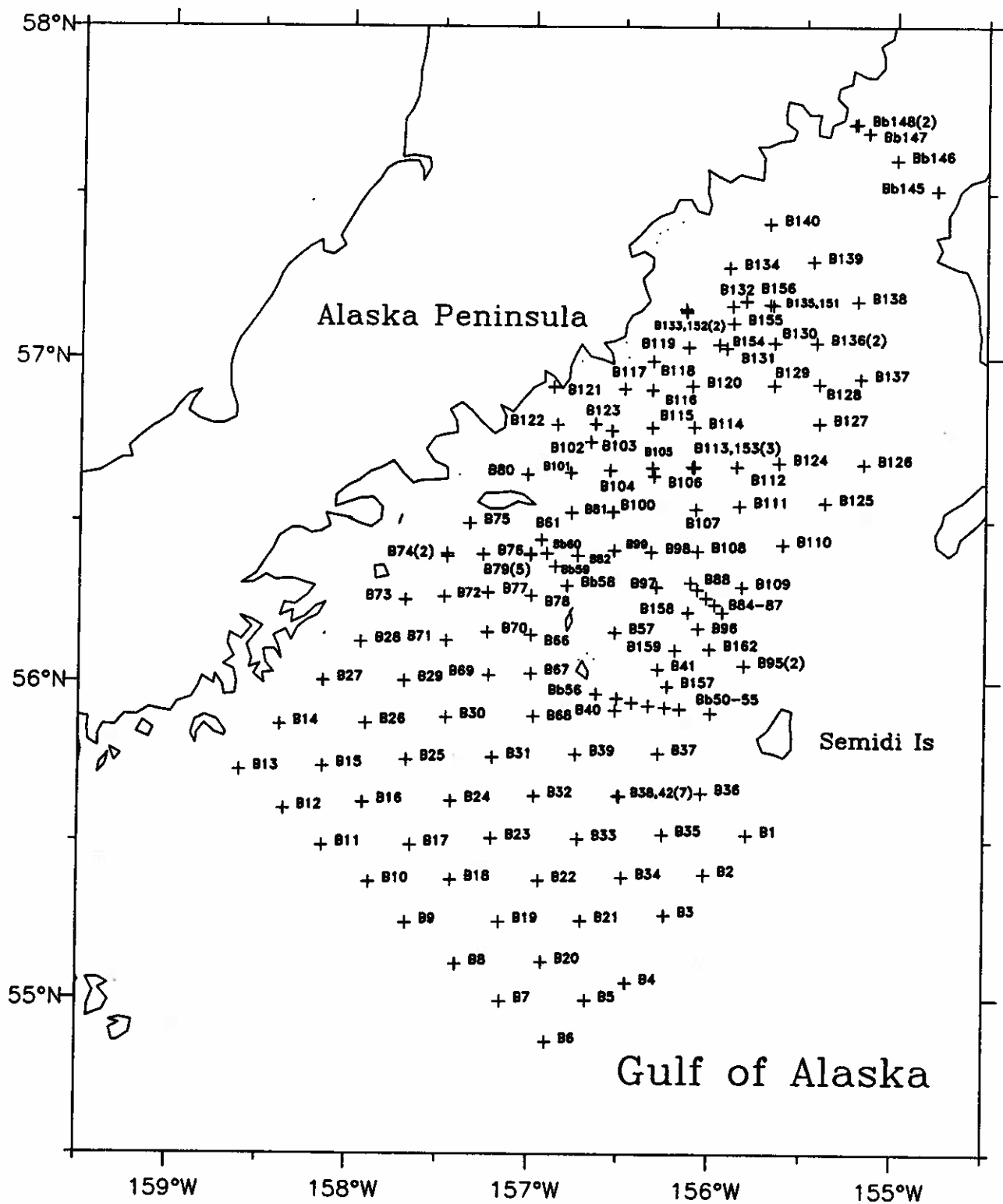


Fig. 4.1. MF92-06 Bongo Stations.

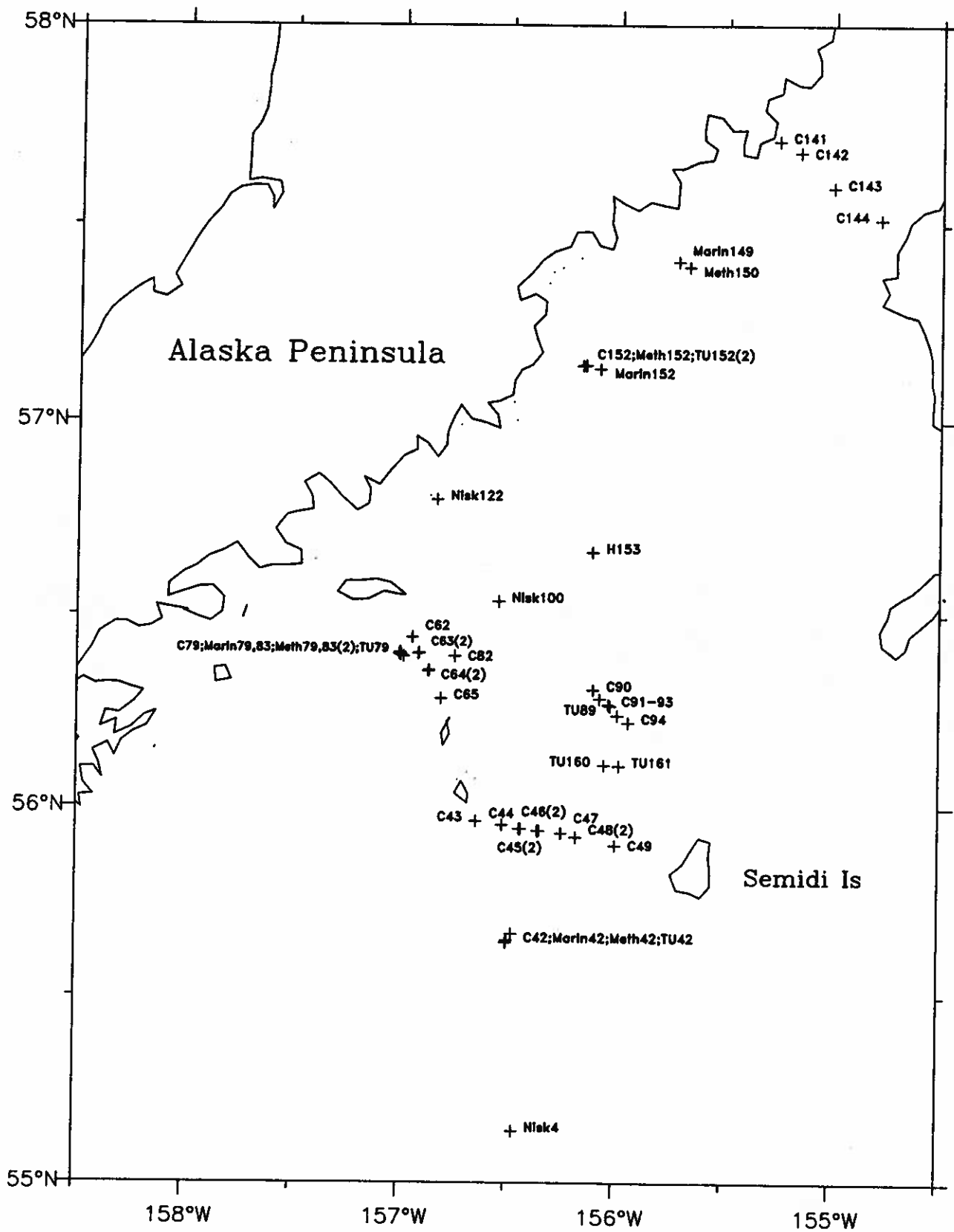


Fig. 4.2. MF92-06 CTD (C), Hydro (H), Marinovich (Marin), Methot (Meth), Niskin™ Bottle Sample (Nisk), and Tucker (TU) Stations.

MF92-09 (SMF92): 9 September–27 September, 1992

SCIENTIFIC PERSONNEL

| <u>Name</u>     | <u>Title</u>    | <u>Organization</u> |
|-----------------|-----------------|---------------------|
| 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<br>Backtrack-L |
| 85       |           |            | 1538       |             |               | 1350      | 59°      | 14.9' N | 178°      | 39.0' W | End ADCP<br>Backtrack-L   |
| 86       |           |            | 1615       | T04         |               | 1350      | 59°      | 15.7' N | 178°      | 38.0' W | 1Tuck                     |
| 87       |           |            | 1739       |             | CME           | 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<br>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<br>Backtrack-L |
| 96       |           |            | 1924       |             |               | 3444      | 53°      | 23.0' N | 172°      | 57.0' W | End ADCP<br>Backtrack-L   |

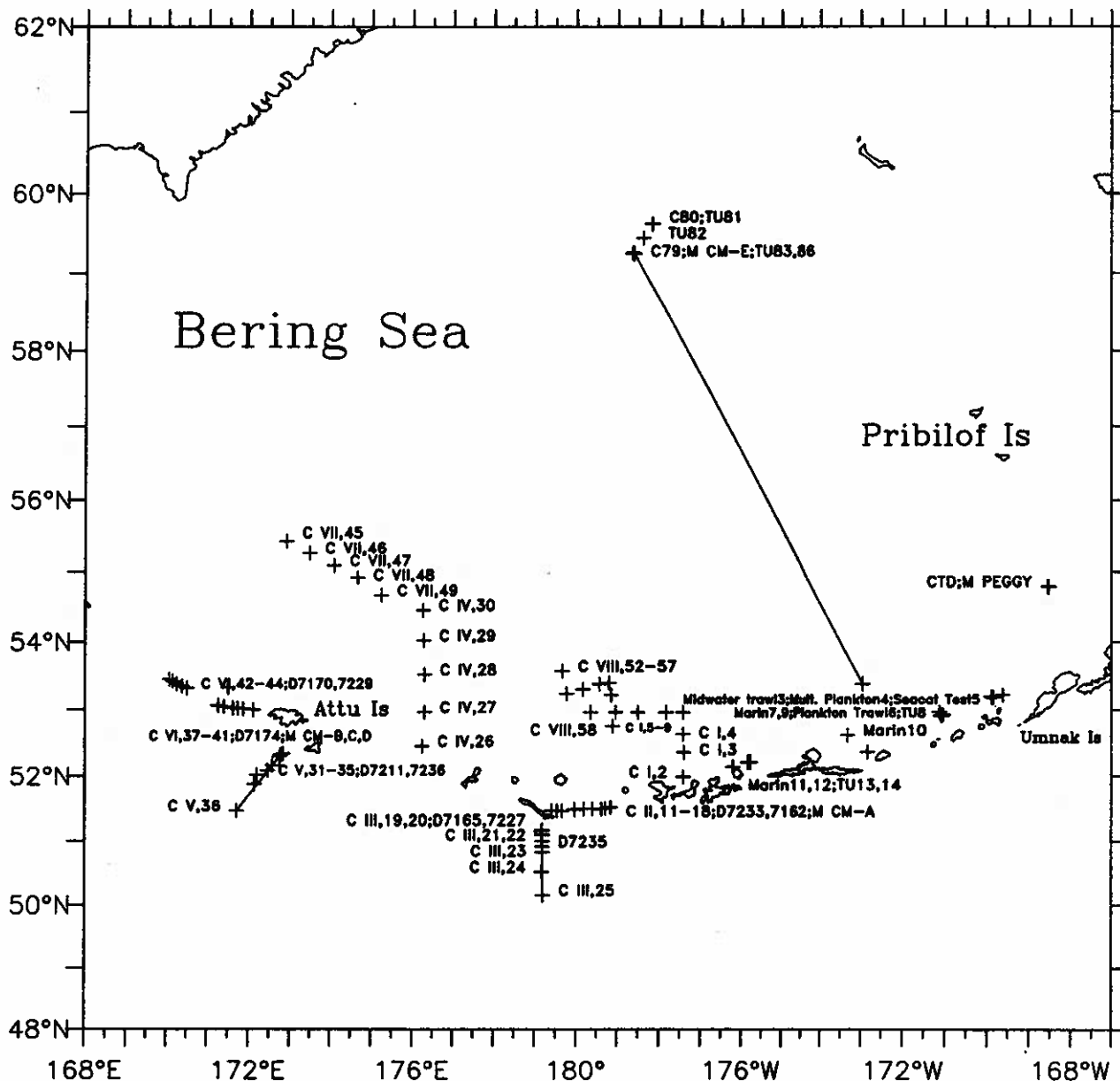


Fig. 5.1. MF92-09 CTD (C), Drifter (D), Marinovich (Marin), Mooring (M), Midwater Trawl Plankton Trawl, and Tucker (TU) Stations.

## **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 Mitrofanina Islands and bottom pressure near Mitrofanina.

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<br>(CONTINUED)                                                                        | PROTEUS PEGGY<br>(CONTINUED)                                 |
|--------------------|-----------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Location           | Sutwik<br>56° 21.78' N<br>156° 54.59' W | Mitrofanía<br>55° 45.03' N<br>158° 32.90' W | 54° 47.66' N<br>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<br>Aanderaa 111 m         | Aanderaa 32.5 m<br>Aanderaa 72.5 m          | ADCP-150 surface Seacat<br>Seacat surface MTR<br>MTR 10 m Seacat<br>ACM-2 14 m MTR<br>Seacat 15 m ACM-2<br>MTR 22 m Seacat<br>Seacat 30 m Seacat<br>ACM-2 38 m MTR | 39 m ACM-2<br>50 m Seacat<br>62 m Seacat<br>70 m MTR<br>78 m ACM-2<br>79 m Seacat<br>102 m<br>125 m | 150 m<br>150.5 m<br>197.5 m<br>253.5 m<br>301.5 m<br>397.5 m |
| Release Press Gage | 8242<br>none                            | 191<br>Aanderaa WLR-5                       |                                                                                                                                                                    |                                                                                                     | 8242/8242<br>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<br>57° 30.00' N<br>179° 58.30' E                       | Near Strait<br>53° 01.91' N<br>171° 36.59' E                         | Near Strait<br>53° 03.81' N<br>171° 15.23' E                                           | Near Strait<br>53° 19.83' N<br>170° 30.34' E                         | St. Matthew<br>59° 14.97' N<br>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<br>Aanderaa 290 m<br>Aanderaa 440 m<br>Aanderaa 590 m | Aanderaa 125 m<br>Aanderaa 250 m<br>Aanderaa 400 m<br>Aanderaa 550 m | Aanderaa 131 m<br>Aanderaa 281 m<br>Aanderaa 481 m<br>Aanderaa 731 m<br>Aanderaa 981 m | Aanderaa 125 m<br>Aanderaa 275 m<br>Aanderaa 500 m<br>Aanderaa 750 m | Aanderaa 150 m<br>Aanderaa 300 m<br>Aanderaa 500 m<br>Aanderaa 750 m |
| Release Press Gage | 8242<br>none                                                         | 8242<br>none                                                         | 8242<br>none                                                                           | 8242<br>none                                                         | 8242<br>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 |       | PROTEUS PEGGY |         |
|--------------|-----------------|---------|---------------|-------|---------------|---------|
| Location     |                 |         | (CONTINUED)   |       | (CONTINUED)   |         |
|              | 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            |         |               |       |               |         |

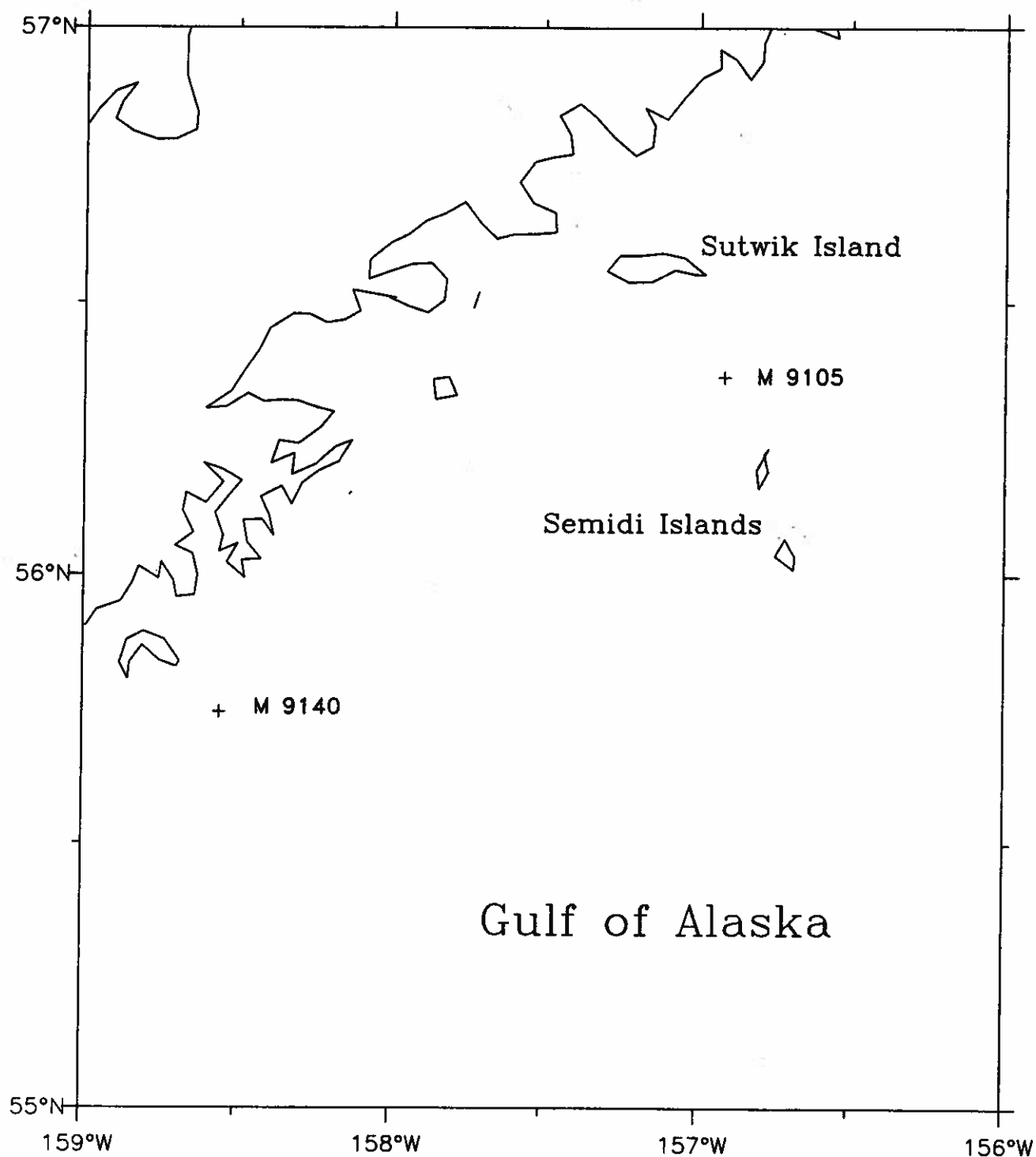


Fig. 6.1. 1992 Gulf of Alaska Deployment/Recovery Sites.

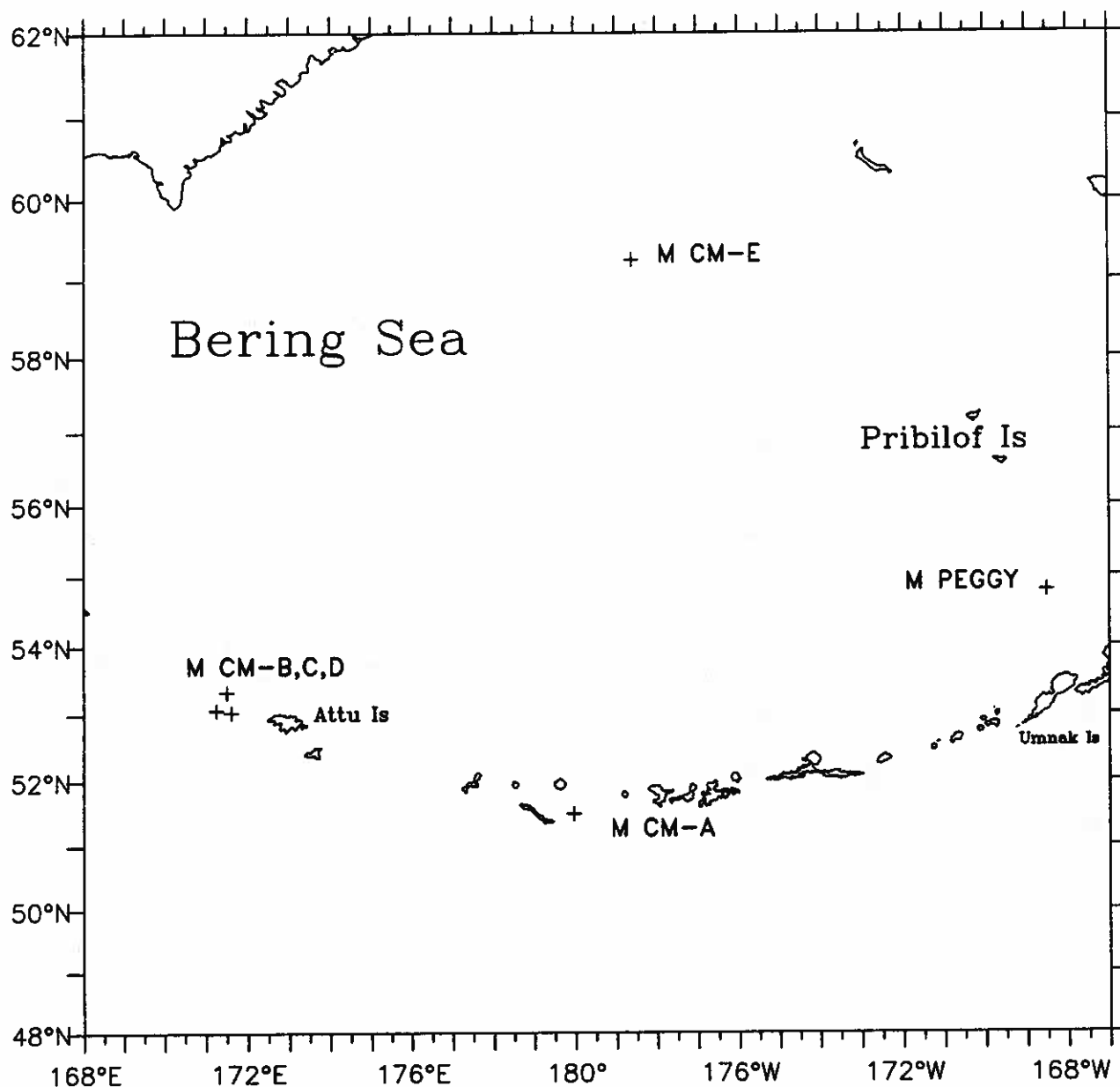
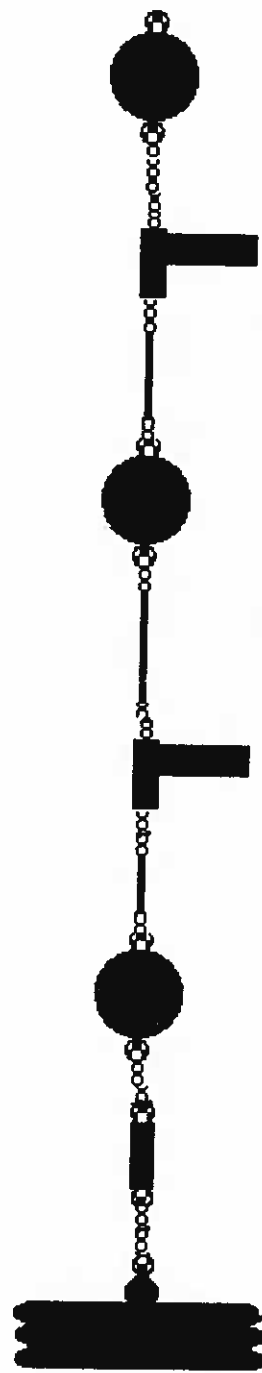


Fig. 6.2. 1992 Bering Sea Deployment/Recovery Sites.

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



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

Fig. 6.3. Mooring 9105.



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

| CURRENT METER<br>DEPTHS AND<br>SERIAL NUMBERS |
|-----------------------------------------------|
|-----------------------------------------------|

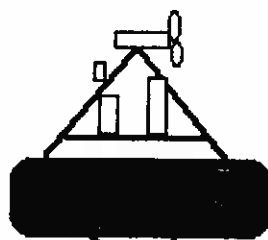
|                        |
|------------------------|
| RCM S/N 3710<br>32.5 m |
|------------------------|

|                        |
|------------------------|
| RCM S/N 1807<br>72.5 m |
|------------------------|

|                                                           |
|-----------------------------------------------------------|
| ART 191 RELEASE<br>S/N 93U<br>WLR-5 PRESS GAGE<br>S/N 209 |
|-----------------------------------------------------------|

Fig. 6.4. Mooring 9140.

PROTEUS PTT S/N 7230  
 SST - AMP S/N 208  
 Eppley Radiometer S/N 28470F3  
 Rotronics AT/RH S/N 209  
 RM Young wind sensor S/N 11282  
 Amp PTT S/N 7209



MOORING POSITION PROTEUS PEGGY BUOY  
 54° 47.66' N  
 168° 33.89' W  
 LORAN 17998.8  
 DEPTH 49142.8  
 2219 m

CURRENT METER  
 DEPTHS AND  
 SERIAL NUMBERS

150 KHz RDI ADCP  
 S/N 542  
 surface  
 Seacat S/N 655  
 surface  
 MTR S/N 3136  
 10 m  
 ACM S/N 088  
 14 m  
 Seacat S/N 657  
 15 m  
 MTR S/N 3066  
 22 m  
 Seacat S/N 654  
 30 m  
 ACM S/N 100  
 38 m  
 Seacat S/N 659  
 39 m  
 MTR S/N 3118  
 50 m  
 Seacat S/N 660  
 62 m  
 MTR S/N 3134  
 70 m  
 ACM S/N 1154  
 78 m  
 Seacat S/N 652  
 79 m  
 Seacat S/N 651  
 102 m  
 MTR S/N 3125  
 125 m  
 ACM S/N 095  
 150 m  
 Seacat S/N 656  
 150.5 m  
 Seacat S/N 653  
 197.5 m  
 MTR S/N 3128  
 253.5 m  
 ACM S/N 089  
 301.5 m  
 Seacat S/N 658  
 397.5 m



Fig. 6.5. Mooring PROTEUS Peggy.

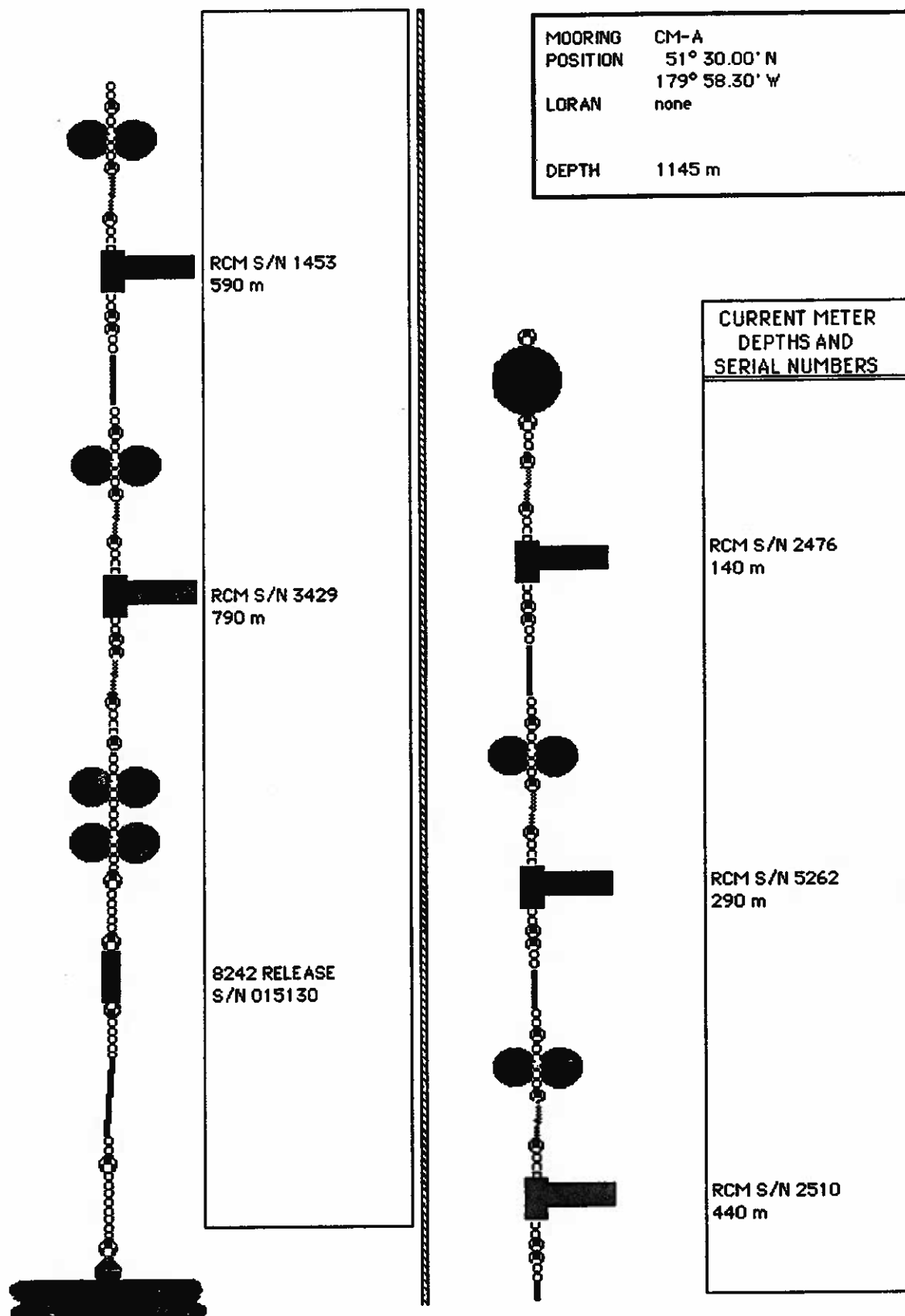


Fig. 6.6. Mooring CM-A.

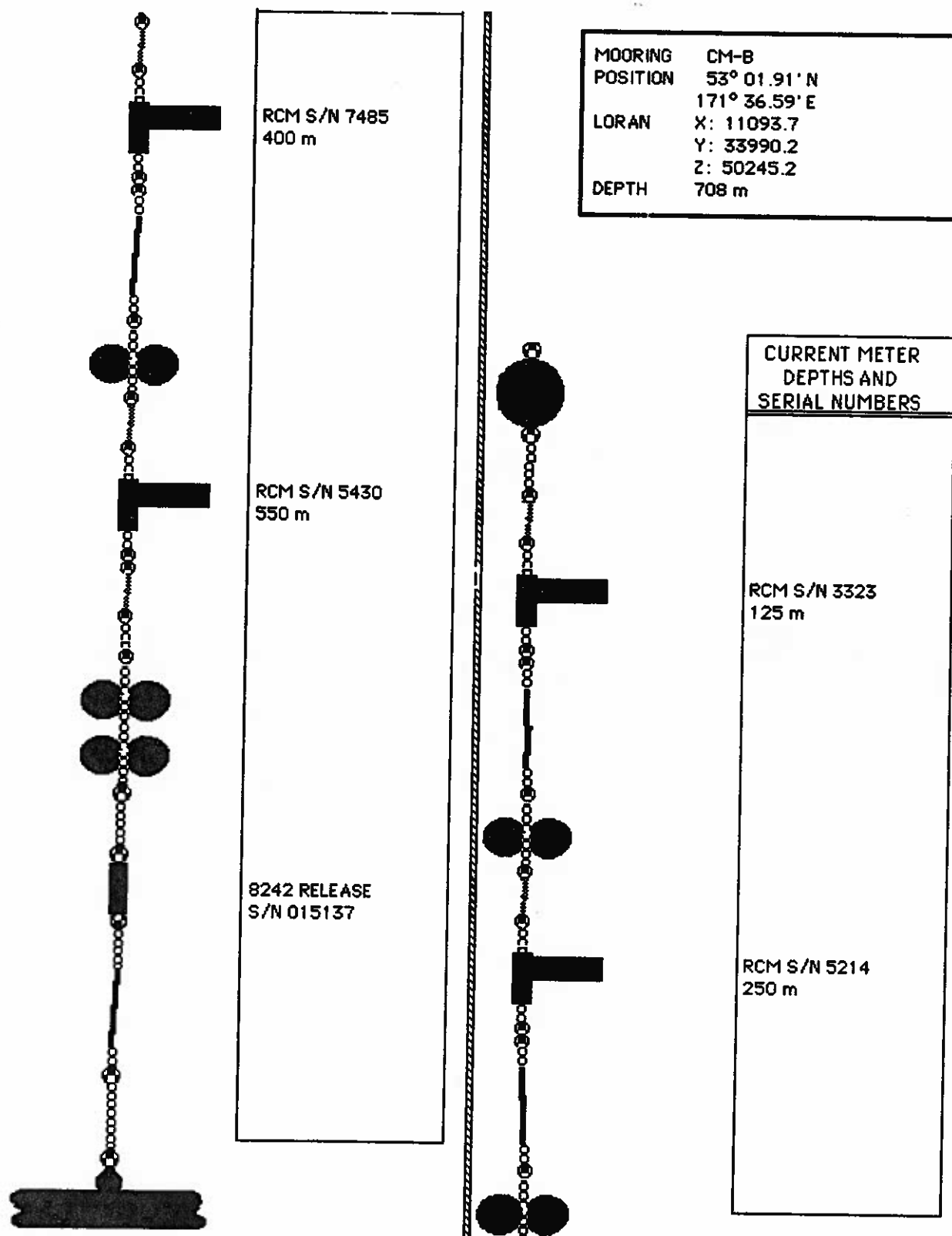


Fig. 6.7. Mooring CM-B.

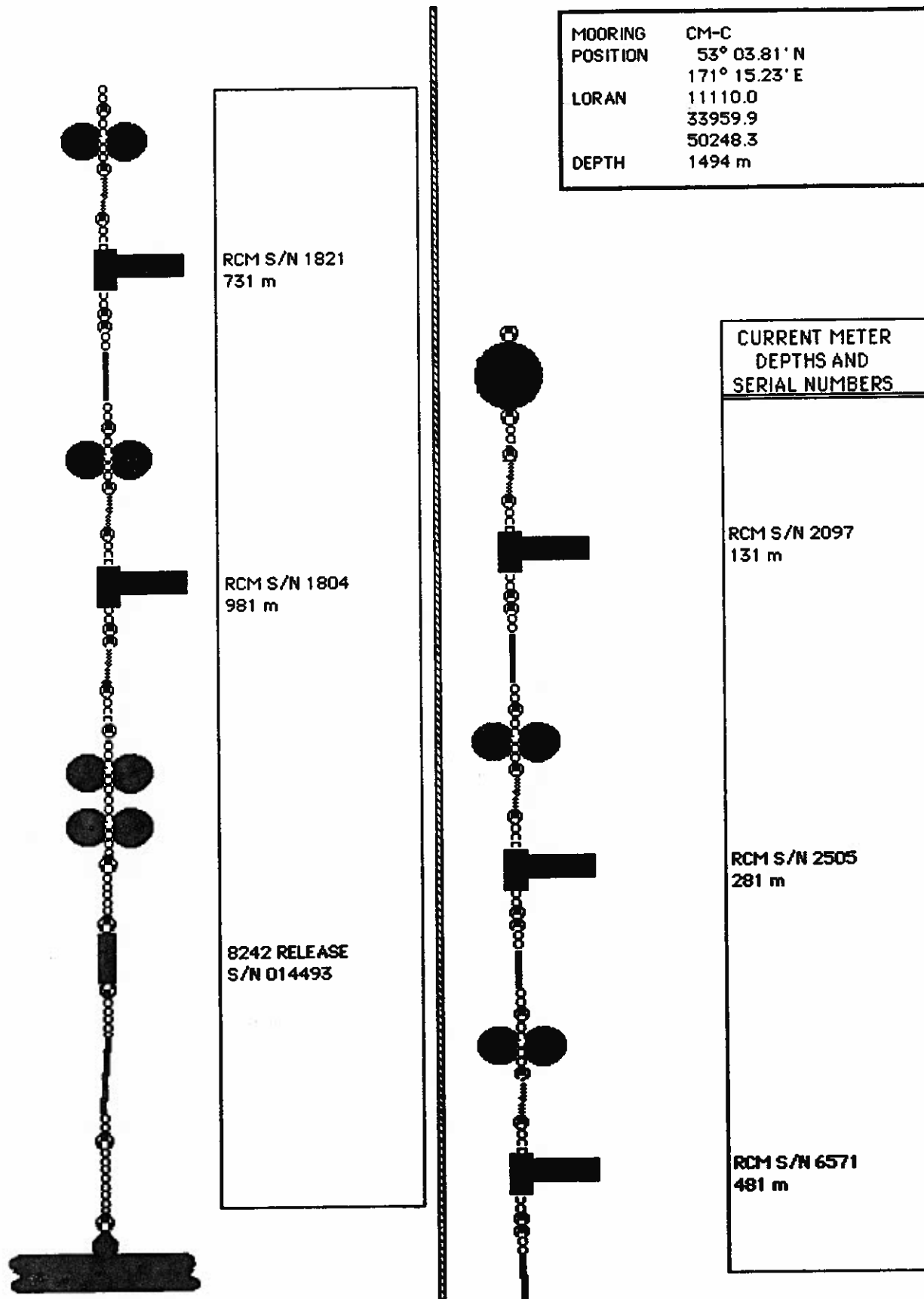


Fig. 6.8. Mooring CM-C.

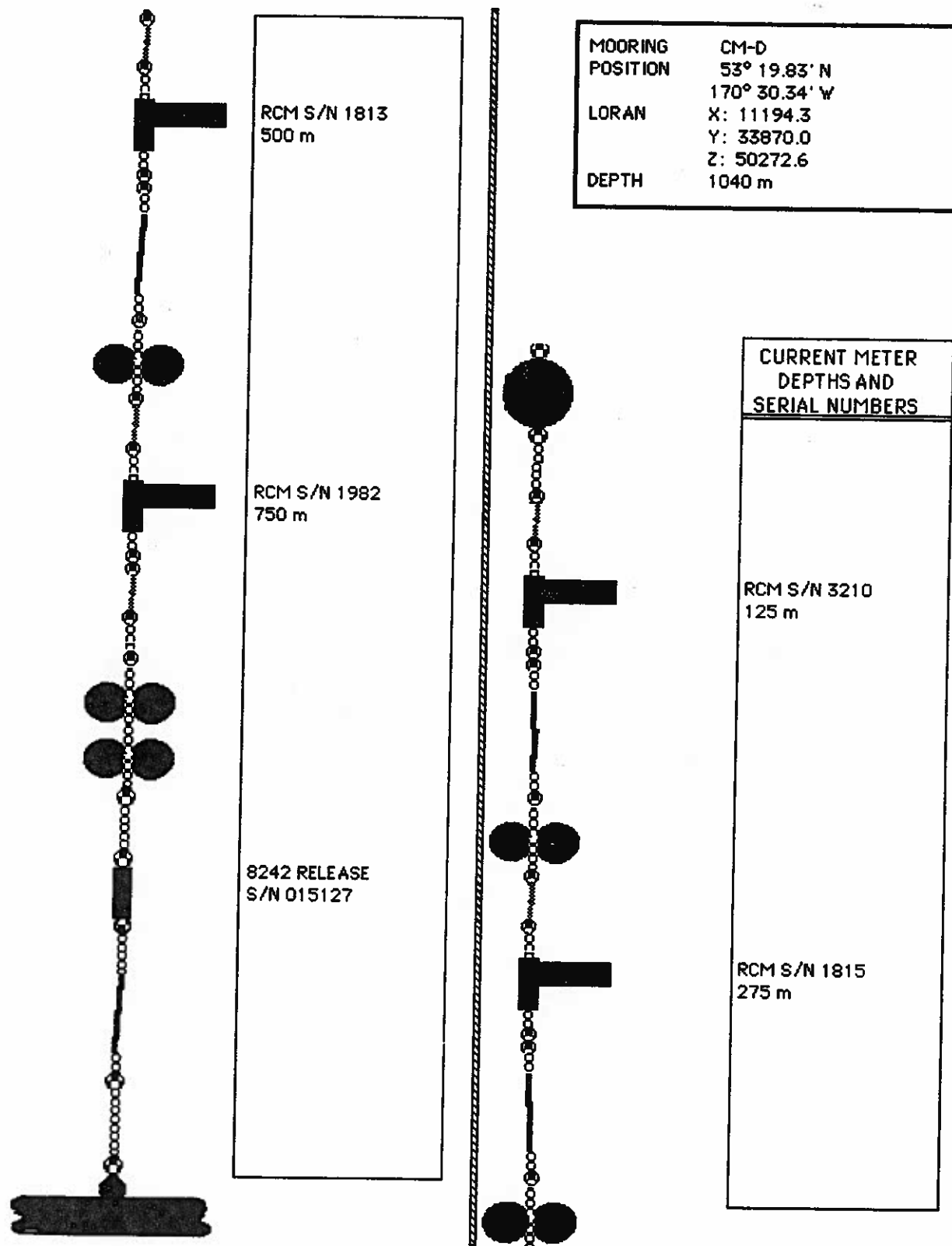


Fig. 6.9. Mooring CM-D.

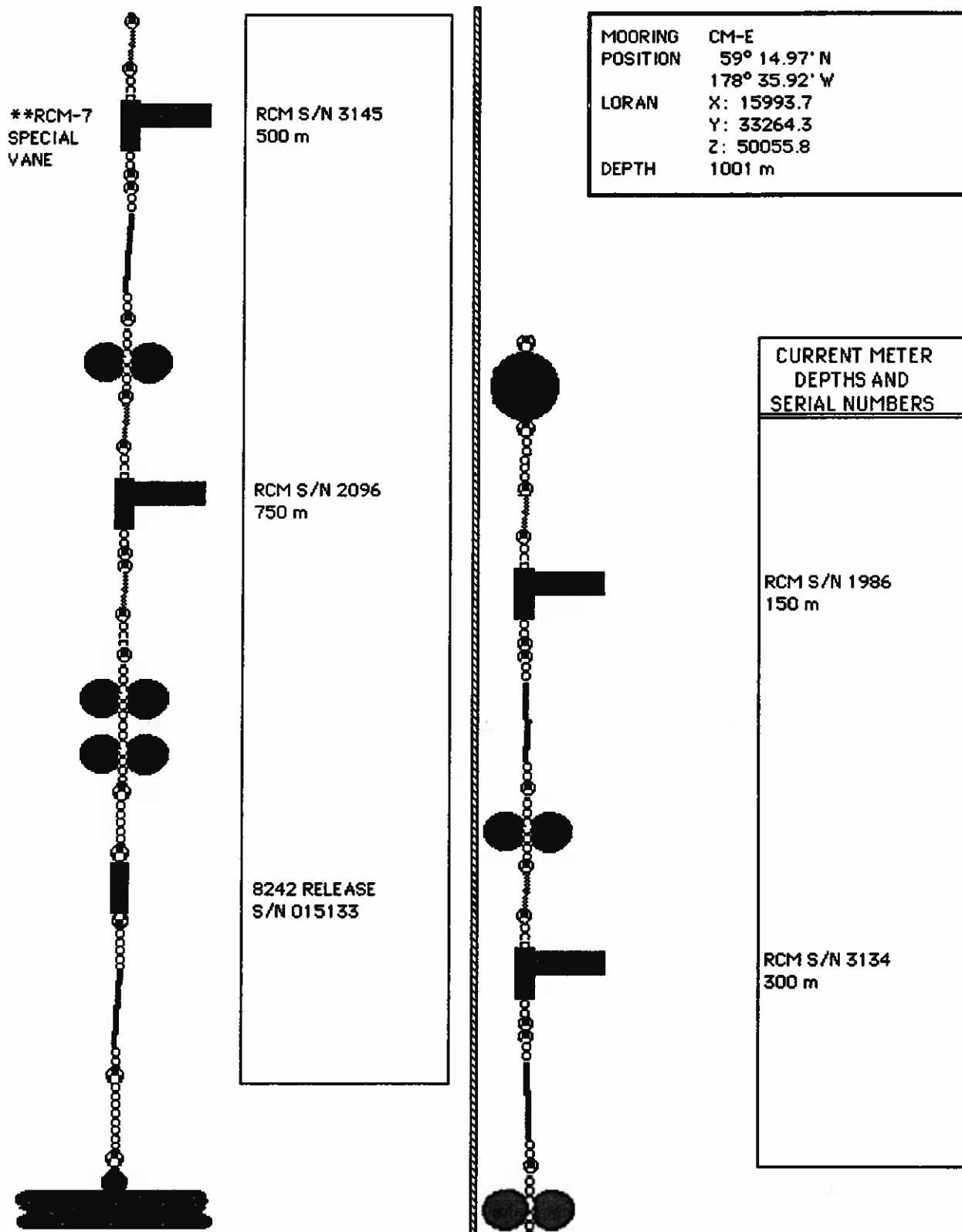


Fig. 6.10. Mooring CM-E.

## **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.