

CRUISE REPORT
MF93-04 (FOCI 93-02)
1-11 April, 1993

NOAA Ship MILLER FREEMAN
NOAA Alaska Fisheries Science Center (AFSC)
NOAA Pacific Marine Environmental Lab. (PMEL)

1.0 Introduction

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

The objectives of this cruise were:

- (1) to continue acquisition of long-term biological and physical time series;
- (2) to 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;
- (3) to collect adult pollock to obtain eggs for rearing on board and in Seattle/Newport;
- (4) to investigate vertebrate and invertebrate predation on pollock eggs;
- (5) to examine vertical distribution of pollock eggs in the water column;
- (6) to investigate the settling of unfertilized pollock eggs using moored sediment traps and shipboard settling columns.

2.0 Chronology

Depart Dutch Harbor, AK	1 April
Start Field Operations	3 April
Complete Field Operations	10 April
Arrive Kodiak, AK	11 April

3.0 Participating Scientists

Richard Brodeur (Chief Scientist)	M/USA	NOAA/AFSC
Carol Dewitt (Watch Chief)	F/USA	NOAA/PMEL
Bill Rugen (Watch Chief)	M/USA	NOAA/AFSC
Nazila Merati	F/USA	NOAA/AFSC
Debbie Blood	F/USA	NOAA/AFSC
Dave Tennant	M/USA	NOAA/PMEL
Leslie Lawrence	F/USA	NOAA/PMEL
Steve Porter	M/USA	NOAA/PMEL

4.0 Operations

Proceeded to Line 8 transect to deploy sediment trap moorings to investigate the settling of unfertilized pollock eggs. Three sediment trap moorings, each containing two traps, current meters and CTD's were successfully deployed at sites situated 0.5 km apart in the deepest part of the trough off Cape Kekurnoi. Tucker trawls and epibenthic sled tows were made to examine the vertical distribution of eggs and incidence of predation by zooplankton upon eggs. A CTD cast was done at each of the three mooring sites to calibrate the mooring CTD probes.

We next did five acoustic transects with the EK-500 in the northern part of Shelikof Strait off Cape Kuliak looking for spawning concentrations of pollock. Additional collections of zooplankton predators on pollock eggs using a 1 meter Tucker trawl were obtained on April 4 in areas of high and low egg abundance. Samples were taken from between 250-150 m and 150 m and surface during both daylight and nighttime hours. A small plankton net was suspended within the Tucker trawl to verify the presence or absence of eggs. Three Methot Trawl collections (for larger predators) and two small-mesh Tucker Trawls (for zooplankton) were also made in this area. A backtrack-L calibration of the ADCP was also conducted.

Line 8 time series stations (FOX 55-61) were occupied on April 4-5. Tucker trawls were used for collecting predators and zooplankton biomass on the first pass, CTD's, chlorophylls microzooplankton, nutrients and 20 and 60 cm bongos containing 0.153 and 0.333 mm mesh, respectively, were used to collect samples on the second pass. We were unable to trawl for spawning adult pollock during the Line 8 sampling because of generator problems. We dropped off Dave Tennant at Larsen Bay on the morning of 5 April between the two passes.

The egg survey in Shelikof Strait using 60 cm (0.333 mm mesh) bongo nets started on April 6, and was completed on April 10. A Seacat CTD was incorporated into the bongo array to provide physical data during the tow. We broke off operations for about six hours on April 7 to pick up generator parts in Larsen Bay.

On April 8 the Nor'eastern bottom 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 and length at hatch. Unfertilized eggs were also collected to study sinking rates. Stomach samples of 50 adult pollock and other fish predators were collected, and a CTD was taken. Length and maturity data were taken on a subsample of adult pollock. 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. Length and maturity data were taken from walleye pollock during both hauls.

5.0 Summary

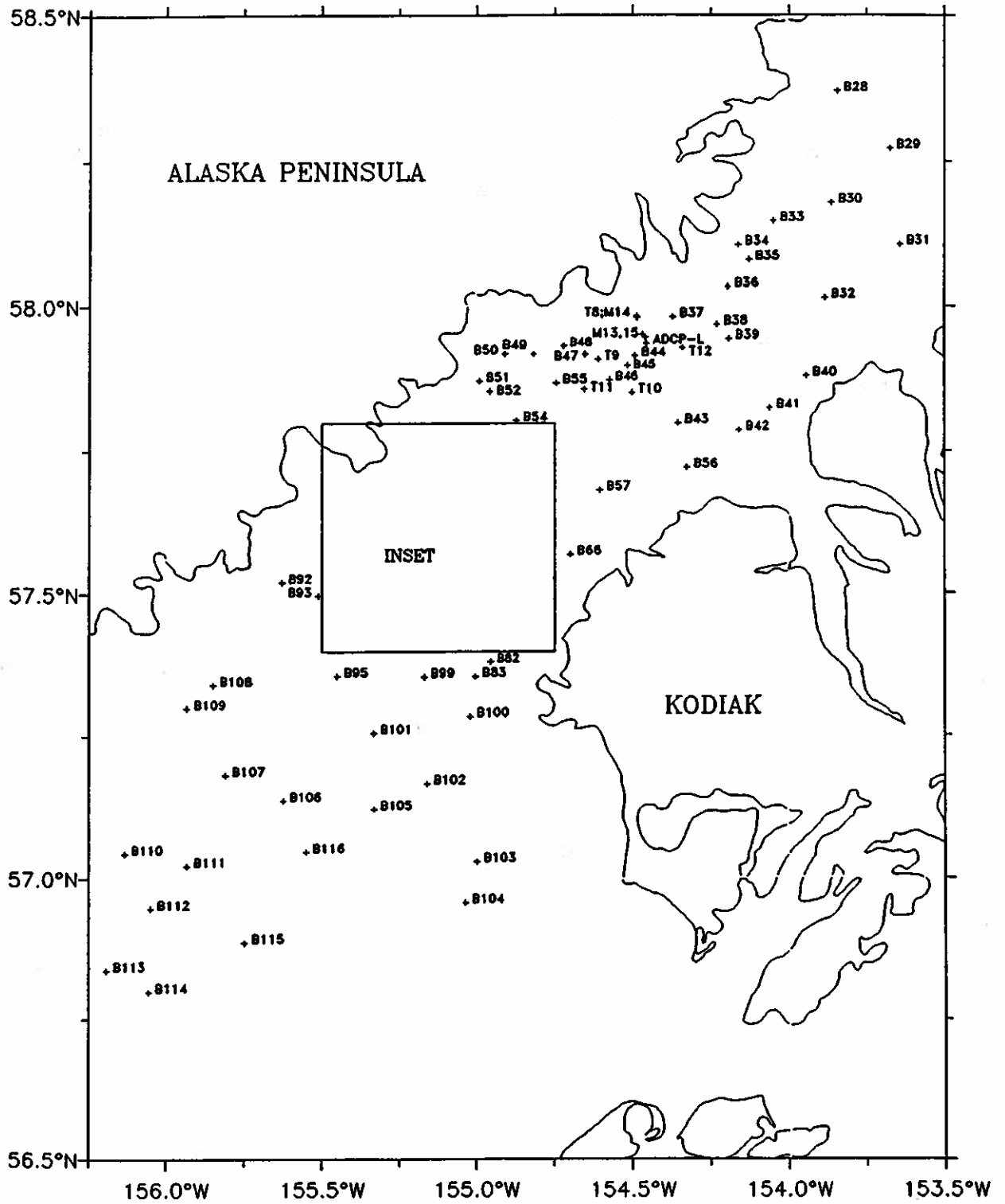
Spawning aggregations of adult pollock were found in the deep trough along the Alaska Peninsula side of Shelikof Strait from Cape Kuliak to Cape Kekurnoi. The egg distribution data suggest that spawning may have occurred further up Shelikof Strait than usual. Analysis of the bongo samples will be necessary before further results are available. Spawning of adult pollock was still in progress at the end of the cruise as evidenced by a large number of mature and spawning individuals collected the last trawl taken. The various studies of pollock eggs were ongoing aboard the ship and in Seattle after the conclusion of the cruise, with no definitive results.

6.0 Cruise Statistics

Moorings Deployed-----	3
60 cm Bongo-----	96
20 cm Bongo-----	6
CTD-----	10
Chlorophyll-----	30
Microzooplankton-----	36
Nutrients-----	20
Epibenthic Sled-----	6
Methot Trawls-----	3
Neuston Trawls-----	2
Tucker Trawls-----	14
Predators Collected-----	787
Stomach Samples-----	68
Fishing Trawls-----	2
Acoustic Transects-----	31
Pollock Eggs Collected----	36,000

7.0 Acknowledgements:

I would like to thank the C.O. Robert Pawlowski and the officers and crew of the MILLER FREEMAN for their cooperation and assistance in meeting all the cruise objectives and much more. Special thanks to Larry Greene, the Field Operations Officer, Scott Hill, the Executive Officer, Chief Survey Tech Bill Floering and Assistant Survey Tech Monica Cisternelli for the long hours and extra effort they gave us, the engineers for their tireless persistence in fixing the generator, and to Jim Lynn the Electronics Tech for his efforts and assistance.



MF-93-04: Bongo (B), Methot (M), Tucker (T)

