

August 23, 2004

WINTER 2005 ECHO INTEGRATION-TRAWL SURVEY OF WALLEYE POLLOCK IN THE ALEUTIAN BASIN NEAR BOGOSLOF ISLAND

1.0 SCHEDULE - AREA OF OPERATIONS

Scientists from the Midwater Assessment Program (MACE) at the Alaska Fisheries Science Center (AFSC) will conduct an echo integration-trawl (EIT) survey of walleye pollock (*Theragra chalcogramma*) aboard the NOAA ship *Miller Freeman* from 5-10 March 2005. The cruise will begin and end in Dutch Harbor, Alaska. The area of operations is the Aleutian Basin near Bogoslof Island (Figure 1).

2.0 VESSEL ITINERARY

Mar 5 Embark scientists in Dutch Harbor.

Mar 5-10 Depart Dutch Harbor; calibration of acoustic systems in Captains Bay, followed by an EIT survey of the Bogoslof Island region. Return to Dutch Harbor; end of cruise.

3.0 SCIENTIFIC OBJECTIVES

The primary objectives of the cruise are to:

- 3.1 collect echo integration data and trawl data necessary to determine the distribution, biomass, and biological composition of walleye pollock in the southeastern Aleutian Basin near Bogoslof Island.
- 3.2 collect pollock target strength data for use in scaling echo integration data to estimates of absolute abundance.
- 3.3 calibrate the 18-kHz, 38-kHz, 120-kHz, 200-kHz scientific acoustic systems using standard sphere techniques;
- 3.4 collect physical oceanographic data (temperature and salinity profiles) at selected sites, and continuously collect sea surface temperature, salinity, and water current profiles.
- 3.5 conduct field tests of an acoustically controlled opening and closing device installed on a frame fixed in the mouth of a trawl codend;
- 3.6 Echo integration data comparison and intership calibration of the *Miller Freeman* with the *Oscar Dyson*, NOAA-AFSC's new fisheries research vessel.

Secondary objectives of the cruise include scientific research requested by AFSC and other investigators.

4.0 OPERATIONAL PLANS

4.1 Survey operations will be conducted 24 hours per day. Acoustic data will be collected continuously along a series of parallel transects (Table 1) with Simrad EK500 and ER60 echo integration systems incorporating four centerboard-mounted transducers (18 kHz, 38 kHz, 120 kHz, and 200 kHz). Parallel transect spacing will be 5 nmi (Fig.1).

EIT survey operations require that an Aleutian wing trawl (AWT) and poly Nor'eastern bottom trawl with roller gear be loaded onto the net reels. Codend liners with mesh sizes of either 1.25 in. or 0.5 in. will be used with the AWT. A Marinovich trawl may be deployed. Fishbuster doors will be used with AWT, and Marinovich trawls; a restrictor line will be used with the Marinovich trawl.

Trawl hauls will be made at any time based on pollock echo sign to identify echo sign and provide pollock samples and other biological data. An average of 2-3 trawl hauls per 24 hours is anticipated. Haul duration will be kept to the minimum necessary to ensure an adequate sample. Biological data collected from each haul

will include species composition, sex composition, length frequencies, whole fish and ovary weights, maturities, and otoliths. Pollock tissue samples will be taken from selected hauls for fecundity studies.

4.2 Pollock target strength data collection will occur on an opportunistic basis. These data are used to validate the relationship between pollock length and target strength.

4.3 Conductivity-temperature-depth (CTD) data may be collected with a Seabird SeaCat system at trawl locations and at other selected locations. Temperature and depth data will be collected by attaching a Seabird SBE39 micro-bathythermograph to the headrope of selected trawls. Vertical temperature profiles may be collected at selected locations along transects by using expendable bathythermographs (XBTs).

4.4 A standard sphere calibration of the centerboard-mounted scientific acoustic systems (18 kHz, 38 kHz, 120 kHz and 200 kHz) will be conducted at the beginning of the cruise. This requires anchoring the vessel at bow and stern and suspending a calibration sphere assembly directly beneath the vessel's centerboard. A CTD cast will be conducted.

4.5 Field tests of an opening and closing device installed on a frame fixed in the mouth of the AWT codend will be conducted. This device is controlled by a fully integrated acoustic communication system comprised of software, a computer-controlled acoustic transmitter/receiver unit, transducers, acoustic releases, and associated cables, switches, and batteries. If testing is successful, the opening-closing net will be used in difficult sampling situations, such as where discrete upper and lower layers of pollock echosign are observed in the water column and it is impossible to sample the lower layer without contamination from the upper. With an opening and closing codend, these layers can be sampled separately, with catches from each layer retained in different codends.

4.6 An intership calibration with the *Oscar Dyson* will be conducted during the cruise, most likely in the Islands of Four Mountains area. In addition, the *Oscar Dyson* will follow the *Miller Freeman* along tracklines to provide data for echo integration comparison.

5.0 SCIENTIFIC PERSONNEL

5.1 Principal investigators are Taina Honkalehto phone (206) 526-4237, FAX: 206-526-6723, AFSC, Seattle, WA., email Taina.Honkalehto@noaa.gov, and Neal Williamson, email Neal.Williamson@noaa.gov. Staffing is yet to be determined.

6.0 COMMUNICATIONS

6.1 The INMARSAT telephone numbers for contacting the vessel at sea are as follows:

IRIDIUM voice 011-881-676-315-684
 INMARSAT B voice 011-872-330-394-120
 INMARSAT B fax 011-872-330-394-121

While the ship is at sea, email (text only) to scientific personnel should be addressed to mace.miller.freeman@mfneems.noaa.gov

For further vessel specifications, please visit the *Miller Freeman* website <http://www.pmc.noaa.gov/mf>

Table 1. Proposed waypoints for the winter 2005 echo integration-trawl survey of the Aleutian Basin near Bogoslof Island, MF2005-XX.

Latitude (Deg. N)		Longitude (Deg. W)		Waypoint
54	5.000	167	1.150	1
53	58.389	167	1.344	1.1
53	52.500	167	10.000	2
54	5.000	167	9.700	2.1
54	5.000	167	18.240	3
53	41.860	167	18.750	3.1
53	36.840	167	27.110	4
54	5.000	167	26.740	4.1
54	5.000	167	35.310	5
53	31.870	167	35.500	5.1
53	31.870	167	43.910	6
54	5.000	167	43.740	6.1
54	5.000	167	52.258	7
53	32.980	167	52.213	7.1
53	35.000	168	0.660	8
54	5.000	168	0.660	8.1
54	5.000	168	9.150	9
53	34.745	168	9.139	9.1
53	31.300	168	17.548	10
53	57.000	168	17.548	10.1
53	57.000	168	26.037	11
53	28.000	168	26.037	11.1
53	23.400	168	34.530	12
53	46.000	168	34.530	12.1
53	46.000	168	43.015	13
53	16.500	168	43.015	13.1
53	9.800	168	51.433	14
53	35.000	168	51.433	14.1
53	34.984	168	59.886	15
53	5.042	168	59.886	15.1
53	0.606	169	8.310	16
53	29.000	169	8.310	16.1
53	29.000	169	16.700	17
52	55.200	169	16.700	17.1
52	52.000	169	25.108	18
53	29.000	169	25.108	18.1
53	29.000	169	33.509	19
53	4.000	169	33.509	19.1
53	4.000	169	41.946	20
53	29.000	169	41.946	20.1
53	29.000	169	50.262	21
53	9.644	169	50.262	21.1
53	5.500	169	58.713	22
53	29.000	169	58.713	22.1

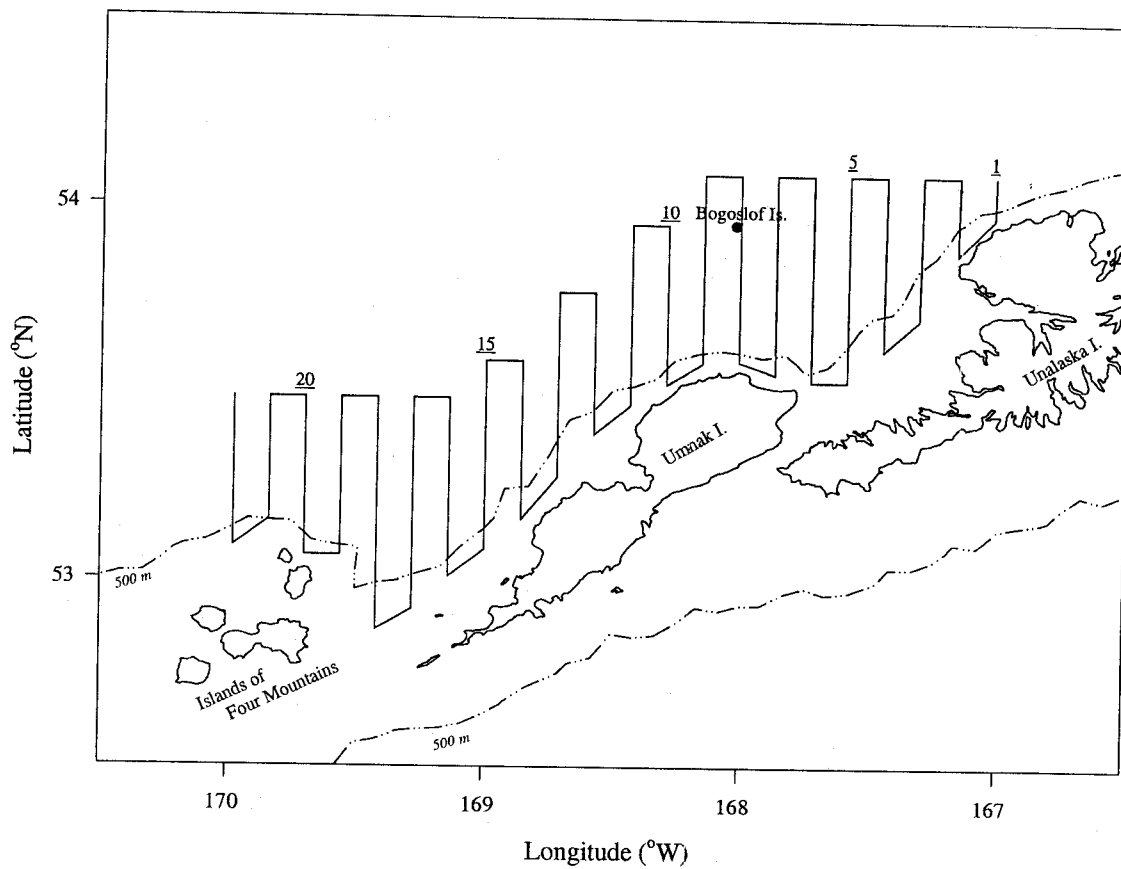


Figure 1. Transects proposed for the winter 2005 echo integration-trawl survey of the Aleutian Basin near Bogoslof Island (5-nmi spacing), MF2005-XX. Transect numbers are underlined.