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**United States Pelagic Trawl Survey Plan for the Northern Bering Sea shelf, August –
September 2011**

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CRUISE PLAN/INSTRUCTIONS: 2011 Northern Bering Sea pelagic trawl survey

1.0 SCHEDULE - AREA OF OPERATIONS

The survey will collect information on pelagic fish and oceanographic conditions in the coastal region of the northern Bering Sea shelf aboard the *F/V Bristol Explorer*, a chartered fishing vessel. The survey will begin 28 August in Nome, Alaska and end 22 September 2011 in Dutch Harbor, Alaska, for a total of 25 charter days.

2.0 VESSEL ITINERARY

Aug 27	Scientists and vessel arrive in Nome, Alaska.
Aug 28	Scientists embark vessel; depart Nome, Alaska.
Aug 29	Transit south to 60.5N.
Aug 30-Sep 18	Sample stations.
Sep 19-20	Transit south to Dutch Harbor, Alaska.
Sep 21	Inport Dutch Harbor, Alaska; unload vessel; scientists disembark.
Sep 22	Scientists Depart Dutch Harbor, Alaska.

3.0 SCIENTIFIC OBJECTIVES

The principal objectives of the survey will be to assess pelagic nekton and oceanographic conditions in the coastal region of the Northern Bering Sea. The survey has been designed to support scientific objectives in the Yukon River juvenile Chinook salmon project with primary funding provided by the Arctic Yukon Kuskokwim Sustainable Salmon Initiative and the Alaska Sustainable Salmon Fund. The survey has also been designed to support broader scientific objectives on species distribution and ecosystem structure identified in the Alaska Fisheries Science Center's Loss of Sea Ice (LOSI) research plan.

- 3.1 Estimate biomass (or relative abundance) distribution, and age structure of pelagic fish in the coastal domain of the northern Bering Sea shelf.
- 3.2 Estimate stock composition of juvenile Chinook salmon.

- 3.3 Collect oceanographic data at each station and while underway.
- 3.4 Collect ichthyoplankton and zooplankton data using bongo and Pairavet nets.

4.0 OPERATIONAL PLANS

- 4.1 Vessel operations will be conducted between 7:00am to 11:00pm unless otherwise agreed upon by the ship's captain and chief scientist. Stations will be sampled using a systematic grid design with stations spaced approximately 30 nautical miles apart. The survey will cover the area from 60.5N to 65N and east of 172N. Standard station activities will include:
- CTD cast with Niskin water sample collection.
 - Bongo, and Pairavet net tows (zooplankton).
 - Pelagic trawl (surface) sampling.
- 4.2 Adaptive pelagic trawl sampling (mid-water or surface) will be conducted to validate species composition of acoustic targets.
- 4.3 A Cantrawl 400/601 rope trawl will be used as the primary net for trawl operations and a smaller Cantrawl 300/580 will be loaded onboard the vessel for shallow water trawl stations, if required. A pair of NETS five-meter alloy doors and spectra bridals will be used with each trawl type. Each day will consist of a maximum of 4 standard stations and one adaptive pelagic trawl station to validate acoustic targets. Surface trawl haul duration will be set at 30 minutes and the ship's net sounder will be used as the primary tool for monitoring the trawl performance and making adjustments to the vessel during trawling. Electronic records of the net sonar will be saved and used as a record of trawl performance at each station. Duration of adaptive trawl hauls will depend on acoustic signal strength.
- 4.4 Biological data collected from trawl operations will include species catch composition by weight and number. Catches will be subsampled for length frequency distributions, food habits, and fish condition. Genetic tissues will be collected from all Chinook salmon and a subsample of chum salmon to enable genetic stock identification analysis. Scales and otoliths will be collected from salmon and other species as requested to provide information on age and growth.
- 4.5 Acoustic data will be collected continuously during the survey with a Simrad ES60 echo integration system and a 38 kHz

transducer.

- 4.6 Ichthyoplankton and zooplankton will be sampled using fine-mesh nets: 65 cm bongo nets with 505 and 335 micron mesh size, a 25 cm pairavet net with 150 micron mesh (both in an oblique tow configuration). Additional samples may be collected from vertical Juday net tows (150 micron mesh). All samples will be preserved in 5% buffered formalin.
- 4.7 Instruments and 5 L Niskin bottles added to the CTD carousel include: a PAR spherical sensor (Biospherical Instruments QSP 2300), chl-a fluorometer with turbidity sensor (Wet Labs ECO FL-NTU), beam transmissometer (Wet Labs C-star), dissolved oxygen sensor (SBE 43), and a pH meter.
- 4.8 Along-track surface measurements of temperature, salinity, and chla fluorescence will be collected with a thermosalinograph (TSG) system (SBE-45, Wet Labs WetStar fluorometer).
- 4.9 Water samples collected with Niskin bottles attached to the CTD will be sampled for chlorophyll a, nutrients, salinity, and oxygen-18.

5.0 SCIENTIFIC PERSONNEL

5.1 Scientific Staff:

<u>Name</u>	<u>Gender/ Nationality</u>	<u>Position</u>	<u>Organization</u>
Jim Murphy	M/USA	Chief Scientist	AFSC
Alex Andrews	M/USA	Fish Biologist	AFSC
Jeanette Gann	F/USA	Oceanographer	AFSC
Tina Honkalehto	F/USA	Acoustician	AFSC
Mary Auburn-Cook	F/USA	Food Habits	Invert
Keith Cox	M/USA	Fish Biologist	AFSC

AFSC - Alaska Fisheries Science Center, Juneau AK,

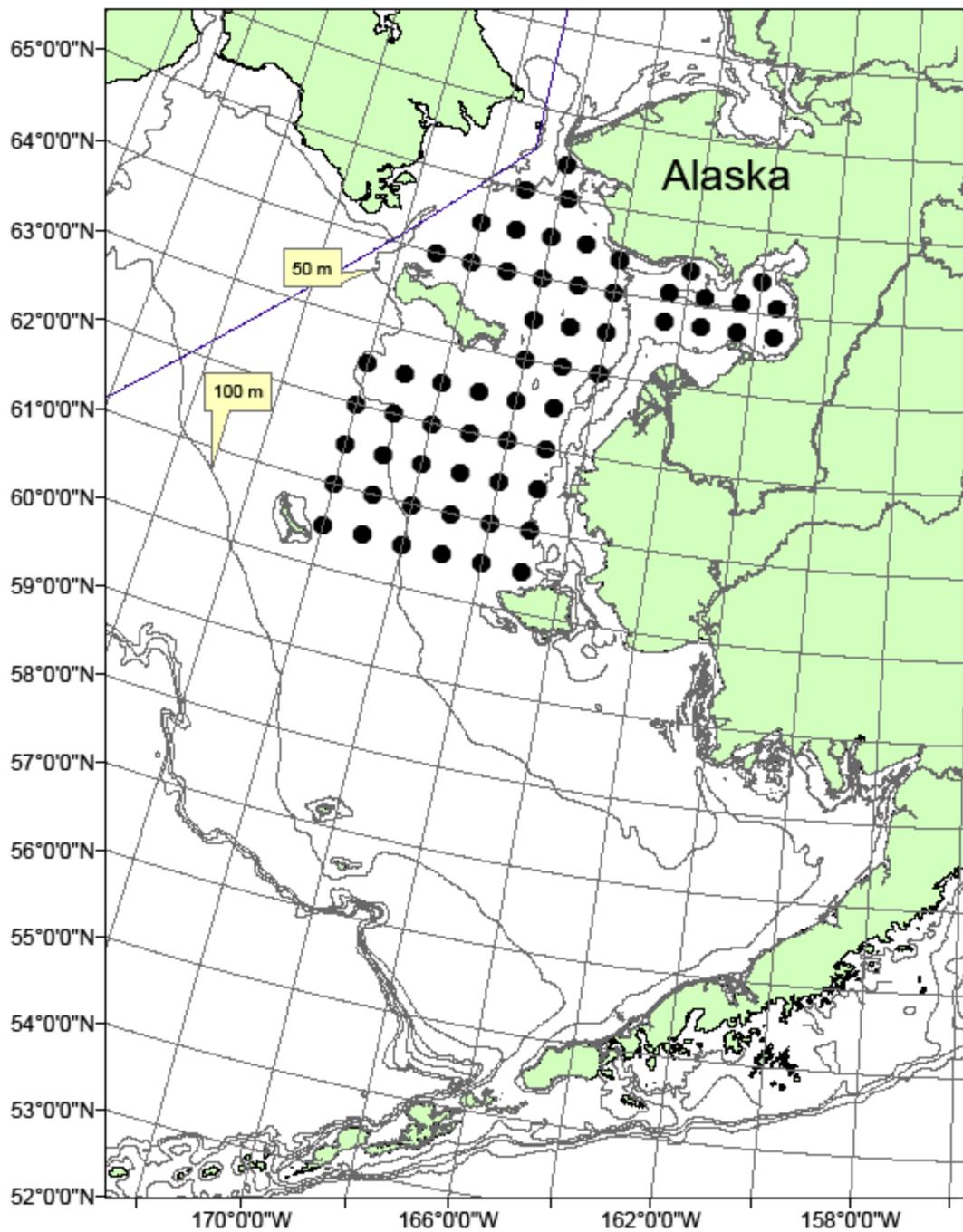


Figure 1. Proposed station coordinates for the *F/V Bristol Explorer* survey of the northern Bering Sea shelf, 28 August - 22 September, 2011.