

Northern Bering Sea Surface Trawl and Oceanographic Survey Plan, 2017

by

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Abstract

The 2017 northern Bering Sea surface trawl and oceanographic survey will be conducted aboard a chartered fishing vessel (TBD). The survey is scheduled to begin and end in Dutch Harbor, AK from August 25 and September 13, 2017. The 2017 surface trawl and oceanographic survey will be conducted in support of the Alaska Sustainable Salmon Fund (AKSSF) funded project entitled the 'Northern Bering Sea Juvenile Chinook Salmon Survey' and the Alaska Fisheries Science Center's Loss of Sea Ice program. The survey will also provide support for other research objectives by AFSC, the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, University of Alaska, and the Alaska Pacific University.

Overview

The 2017 northern Bering Sea surface trawl and oceanographic survey will start and end in Dutch Harbor, AK on Aug. 25 and Sep. 13, respectively. The survey will support research objectives on Chinook salmon, to maintain surface trawl time series for other pelagic nekton species, and to collect oceanographic data in the northern Bering Sea. The survey will support the Alaska Sustainable Salmon Fund (AKSSF) funded research project entitled Northern Bering Sea Juvenile Chinook Salmon Survey, and the Alaska Fisheries Science Center's, Loss of Sea Ice Program, and other research objectives by AFSC, the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, University of Alaska, and the Alaska Pacific University.

Survey objectives include: 1) Estimate abundance, distribution, size, and stock-structure of juvenile Chinook salmon in the coastal Northeast Bering Sea shelf, 2) Collect information on the pelagic fish ecosystem in the coastal Northeast Bering Sea shelf, 3) Collect electronic oceanographic data and water samples for temperature, salinity, chlorophyll a, nutrients, and particulate organic carbon with a SBE9-11 CTD and Niskin bottles, and 4) Collect zooplankton and ichthyoplankton samples with a 20 cm (150 µm mesh) and 60 cm (505 µm mesh) cm bongo array.

Personnel/Science Party: name, title, gender, and affiliation

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation
Murphy, Jim	Chief Scientist	8/24	9/13	M	AFSC
Garcia, Sabrina	Fish Bio	8/24	9/13	F	ADFG
Sewall, Fletcher	Res Fish Bio	8/24	9/13	M	AFSC
Weems, Jared	Student	8/24	9/13	M	UAF
TBD	Seabird Observer	8/24	9/13	TBD	USFWS
Stone, Jared	Student	8/24	9/13	M	APU

AFSC - Alaska Fisheries Science Center, Auke Bay Laboratories, Juneau, AK;

ADFG – Alaska Department of Fish and Game, Commercial Fisheries Division, Anchorage, AK

USFWS – US Fish and Wildlife Service, Office of Migratory Bird Management, Anchorage, AK

UAF – University of Alaska, Fairbanks, AK

APU – Alaska Pacific University, Anchorage, AK

Operations

Survey operations will be conducted during hours of 07:30 to 21:00. Stations will be sampled using a systematic grid design with a station grid of approximately 30 nm with stations spaced every 0.5 degree of Latitude and 1.0 degree of Longitude. The survey will cover the area from 60°N to 65.5°N (Fig. 1).

Surface sampling will be completed with a Cantrawl rope trawl with ¾” synthetic TS2 bridals to be loaded onto the net reel. All surface trawls will be deployed for a duration of 30 minutes. A net sonar will be used during each surface trawl deployment to monitor and record net dimensions. Temperature and depth sensors (SBE39) will be secured to the headrope and footrope of the trawl to record vertical dimensions of the trawl. Polyform buoys will be added to each headrope wingtip and to the centre of the headrope to help maintain the trawl at the surface.

An electronic catch logging system developed by AFSC (CLAMS) will be used to record station and biological data collected from each trawl haul. Biological data will include species catch composition by weight and number. All other biological data will be defined by sample protocols defined for 1) juvenile salmon, 2) immature/mature salmon, and 3) all other fish species. All specimen collections will be tracked with barcoded specimen tags in CLAMS. Diets of Chinook salmon will be examined on-board the vessel.

Zooplankton and ichthyoplankton data will be collected at each station with a 60 cm diameter bongo frame with 505 micron nets, a 20 cm diameter bongo frame with 150 micron nets and a Seabird SBE-49. This bongo array will be deployed obliquely through the water column from the surface to near-bottom (5m from bottom). One net from each bongo frame will be preserved in 5% buffered formalin, the second 60cm bongo net will be sorted on-board for crab larvae (UAF student project).

CTD casts will be conducted at station. Sensors that will be added to the SBE 911+ CTD include dual TC sensors, a PAR spherical sensor (Biospherical Instruments QSP 2300), chl-a fluorometer, beam transmissometer (Wet Labs C-star), and dissolved oxygen sensors (SBE 43). CTD casts will be to near-bottom (5 m from bottom). Water samples collected with Niskin bottles attached to the CTD will be sampled for chlorophyll a, nutrients, salinity, and particulate organic carbon.

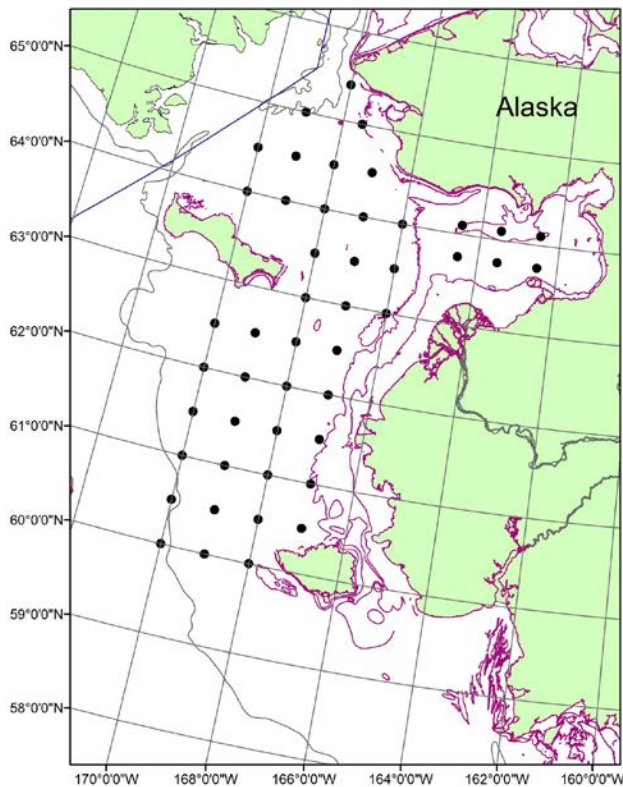


Figure 1. Proposed survey stations for the Northern Bering Sea pelagic trawl survey, August 25 to September 13, 2017 aboard a chartered fishing vessel (TBD).

Table 1 Planned station coordinates in decimal degrees, for the Northern Bering Sea surface trawl survey. Regions are defined as: NBS= northern Bering Sea, NS = Norton Sound, and BS = Bering Strait.

Station	Region	Latitude	Longitude	Station	Region	Latitude	Longitude
1	NBS	60.00	-168.00	37	BS	64.00	-166.00
2	NBS	60.00	-169.00	38	BS	64.00	-167.00
3	NBS	60.00	-170.00	39	BS	64.00	-168.00
4	NBS	60.50	-167.00	40	BS	64.50	-167.00
5	NBS	60.50	-168.00	41	BS	64.50	-168.00
6	NBS	60.50	-169.00	42	BS	65.00	-167.50
7	NBS	60.50	-170.00	43	BS	65.40	-168.00
8	NBS	61.00	-167.00				
9	NBS	61.00	-168.00				
10	NBS	61.00	-169.00				
11	NBS	61.00	-170.00				
12	NBS	61.50	-167.00				
13	NBS	61.50	-168.00				
14	NBS	61.50	-169.00				
15	NBS	61.50	-170.00				
16	NBS	62.00	-167.00				
17	NBS	62.00	-168.00				
18	NBS	62.00	-169.00				
19	NBS	62.00	-170.00				
20	NBS	62.50	-167.00				
21	NBS	62.50	-168.00				
22	NBS	62.50	-169.00				
23	NBS	62.50	-170.00				
24	NBS	63.00	-166.00				
25	NBS	63.00	-167.00				
26	NBS	63.00	-168.00				
27	NBS	63.50	-166.00				
28	NBS	63.50	-167.00				
29	NBS	63.50	-168.00				
30	NS	63.75	-164.50				
31	NS	63.75	-163.50				
32	NS	63.75	-162.50				
33	NS	64.10	-164.50				
34	NS	64.10	-163.50				
35	NS	64.10	-162.50				
36	BS	64.40	-166.00				

Supplementary Projects

Distribution and abundance of seabirds: A trained US Fish and Wildlife observer will be onboard the vessel to assess the distribution and abundance of seabirds and marine mammals. With limited vessel coverage of this area, a seabird observer will provide valuable information on the distribution of the upper trophic level species present in the coastal Northeast Bering Sea. Visual surveys for marine birds and mammals will be conducted while the vessel is in transit.

Distributed Biological Observatory (DBO): DBO sites are regional hotspot transect lines and stations located along a latitudinal gradient and are considered to exhibit high productivity, biodiversity, and overall rates of change in the Arctic marine ecosystem by NOAA Fisheries.

DBO Stn. Name	Historic/SWL Station Name	Type sampling	Decimal Lat.	Decimal Lon.	Comments
DBO2.1	UTBS-5	ADCP/ROS/NET/MUD*5	64.670	-169.920	DBO2
DBO2.2	UTBS-2	ADCP/ROS/NET/MUD*5	64.680	-169.100	
DBO2.3	UTBS-2a	CTD	64.670	-168.235	
DBO2.4	UTBS-4	ADCP/ROS/NET/MUD*5	64.960	-169.890	
DBO2.5	UTBS-1	ADCP/ROS/NET/MUD*5	64.990	-169.140	

Type sampling

CTD only

ROS=CTD/Rosette

NET=Phytoplankton and zooplankton nets

MUD=5 mud grabs (e.g.0.1 m² van Veen); 2=2 grabs (1 for sed/sieve for isotopes; 1 for identification)