

Zooplankton catch data from Tucker trawls from CGOA LTOP cruises from the Coastal Gulf of Alaska, Northeast Pacific, 2001-2003 (NEP project)

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Project

» [U.S. GLOBEC Northeast Pacific](#) (NEP)

Program

» [U.S. GLOBal ocean ECosystems dynamics](#) (U.S. GLOBEC)

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Abstract

Zooplankton catch data from Tucker trawls from CGOA LTOP cruises from the Coastal Gulf of Alaska, Northeast Pacific, 2001-2003.

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Coverage

Spatial Extent: N:60.0407 E:-137.1962 S:55.6635 W:-155.2792

Temporal Extent: 2001-07-17 - 2003-08-07

Dataset Description

Zooplankton counts for tucker trawls in the Gulf of Alaska during 2001 - 2003

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 updated July 2008

[Marine Ecosystem Monitoring in the Northern Gulf of Alaska](#) web site

[GAK1 Time Series](#) web site

[cruise reports](#) web site

GLOBEC 2000: Gulf of Alaska Long-Term Observation Program

T. Weingartner, L. Haldorson, R. Hopcroft, K. Coyle, T. E. Whitedge (all at University of Alaska, Fairbanks), T. Royer (Old Dominion University)

This project is to conduct the Gulf of Alaska Long-Term Observation Program (GOA-LTOP) as part of Phase II of the Northeast Pacific (NEP) GLOBEC program. The GOA shelf supports a rich ecosystem that includes many commercially important fisheries. The basis for this productivity is enigmatic for the GOA shelf is deep, forced by downwelling-favorable winds, and fed by a massive nutrient-poor coastal freshwater discharge. Both the winds and the freshwater discharge are intimately linked to the strength and position of the Aleutian Low. The GOA ecosystem experiences substantial physical and biological changes on decadal and interannual time scales. Although some of these changes are correlated with various climatic indices a mechanistic understanding of climate change and ecosystem response is unavailable. The generic goal of this LTOP is to understand and quantify temporal (seasonal and interannual) and spatial (cross- and along-shelf) variations in the thermohaline, chemical, and biological properties and relationships of this shelf. Our proposal supports GLOBEC goals that will help: 1) retrospective studies interpret historical data, 2) design a cost-effective long-term monitoring program, 3) provide the seasonal and interannual context for concurrent mesoscale and process studies, and 4) provide boundary conditions and data sets for model evaluation. This 5-year project entails 4 field years and a fifth year for data analyses and synthesis. The field effort involves seven, 9-day interdisciplinary cruises/year in the northern GOA. The study area encompasses the 220-km long, Seward Line (sampled in the 1970s) that extends across the shelf and slope and high resolution sampling of the Alaska Coastal Current (ACC), upstream, downstream, and within Prince William Sound. The ACC is an important shelf habitat for yoy salmon migrating from nursery areas in the sound and into the GOA. The sampling effort (Table A) is year-round and motivated by seasonally significant physical and biological events affecting yoy pink salmon.

Table A. Sampling schedule and rationale for GOA-LTOP. (Key for Winds, Discharge and Stratification: S=strong; M=moderate; W=weak; D=downwelling winds; U=upwelling winds; V=variable; L=low; H=high) Deep water moves onshore during the July-August upwelling period.

Month	Sampling				Physical Rationale			Biological Rationale
	CTD	Nutrients	Zoo	Fish	Winds	Disch	Strat	
March	X	X	X		D S	L	W	Zooplankton migrate from depth (at shelfbreak); transported inshore.
April	X	X	X		D M	L-M	W V	Phytoplankton bloom
May	X	X	X		D M- W	M	M V	Maximum oceanic copepod biomass.
July	X	X	X	X	D/U W	M-H	S	Maximum zooplankton abundance; YOY salmon enter shelf.
August	X	X	X	X	D/U W	M-H	S	Maximum YOY salmon abundance on shelf.
October	X	X	X	X	D S	H	H	YOY salmon on shelf.
December	X	X	X		D S	M	M	Fall-winter pre-conditioning for spring nutrients, small zooplankton.

The sampling protocol follows GLOBEC guidelines and uses gear types and techniques similar to those in the Oregon LTOP that is also a part of the NEP-GLOBEC program. Most of the research will be conducted from the R/V *Alpha Helix*. Fish sampling will be done from a chartered trawler in July, August, and October. Both vessels will work together during these cruises so that the fishing charter can verify fish targets detected on the

acoustics array towed from the *Alpha Helix*.

This page was last updated on September 22, 2000.

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Methods & Sampling

The OCC/GLOBEC survey occurred along the coastal waters of the Gulf of Alaska and in Shelikof Strait, AK during 2001-2004. Transects sampled during the survey were perpendicular to shore and extended from nearshore across the continental shelf to oceanic waters beyond the 200-m shelf break. The survey was conducted aboard the contract fishing vessel *F/V Great Pacific* during 2001-2002 and 2004, and aboard NOAA Ship *Miller Freeman* during 2003.

Fish samples were collected in a 198-m long mid-water rope trawl with hexagonal mesh wings and body, and a 1.2-cm mesh liner in the codend. The rope trawl was towed at 6.5 to 9.3 km • hour⁻¹, at or near surface, and had a typical spread of 40-m horizontally and 15-m vertically. All tows lasted 30 minutes and covered 2.8 to 4.6 km, and sampling was done during daylight hours; however, tows occurred during night as part of a 24-hour repeat sampling of a single station for one day during 2001 and 2003.

Once the net was hauled aboard, salmon and other fishes were sorted by species and counted. Standard biological measurements including fork length, body weight, and sex were taken from sub-samples of all salmon species. Sub-samples of juvenile pink (*Oncorhynchus gorbuscha*), chum (*O. keta*), and sockeye (*O. nerka*) salmon were frozen whole for laboratory analyses of food habits, otolith hatchery thermal marks (pink and chum salmon), and genetic analysis (chum salmon).

Plankton samples were collected using a 1-m² Tucker trawl fitted with a 505-um mesh net that was towed near surface (approximately 1 knot) for 5 minutes (2001-2003 surveys). During 2004, plankton samples were collected using a WP-2 net fitted with a 253-um mesh net that was deployed vertically to a depth of 100-m depth. The volume of water filtered by the net was estimated using flow meters. Plankton samples were transferred into vials, preserved in 5% formalin onboard the ship, and stored until a laboratory analysis was completed.

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Data Files

File
tucker_catch.csv (Comma Separated Values (.csv), 743.95 KB) MD5:4c466f6f64ce5f1310adfa7f0b054468
Primary data file for dataset ID 3010

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Parameters

Parameter	Description	Units
year	year, e.g. 2004 in the format YYYY	unitless
haul_id	Tow identification. First 4 numbers represent year, second 4 numbers represent haul number during year specified. in the format YYYYxxx	unitless
yrday_local	Local day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon).	dimensionless
month_local	Numerical month of year, local time. in the format mm	unitless
day_local	Numerical day of the month, local time. in the format dd	unitless
time_local_start	Starting time of observation, local time , 24 hour clock. in the format HHMM	unitless
lat_start	latitude at starting time of measurement (west is negative)	decimal degrees
lon_start	longitude at starting time of measurement (west is negative)	decimal degrees
lat_end	latitude at end time of measurement (south in negative), in decimal degress	decimal degrees
lon_end	longitude at end time of measurement (west is negative)	decimal degrees
station	CSE = Cape St. Elias CC = Cape Cleare GAK = Gulf of Alaska, Seward Line CCH = Cape Chiniak GP = Gore Point CK = Cape Kekurnoi IB = CKA = Cape Kaguyak IP = Icy Point CN = Cape Nukshak OC = Ocean Cape	text
depth	depth of tow	meters
duration	duration of tow	seconds
habitat	Habitat: Continental Shelf Continental Slope Nearshore Offshore of Continental Shelf	text
vol_settled	volume of settled plankton sample	milliliters
disp_vol	displacement volume (biovolume) of plankton net samples	milliliters
taxon	Taxonomic group or entity. This may be a family, class, genus, species, etc.; usually this parameter will contain a mixture of taxonomic entities.	text
sex	Classification by sex (male/female).	text
count_aliq	Number of individuals found in fraction of sample examined.	dimensionless
aliquot	Denominator of fraction of sample examined, e.g. 4 is one quarter (1/4).	dimensionless
count_total	Total number of individuals counted in the sample, calculated as the aliquot times the count in that aliquot.	dimensionless
comments_catch	Comments pertaining to the organisms in the sample.	text
comments_tow	Comments pertaining to the sampling, not the animals in the tow.	text
cruiseid	Cruise identifier	unitless

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Instruments

Dataset-specific Instrument Name	Tucker Trawl
Generic Instrument Name	Tucker Trawl
Dataset-specific Description	Plankton samples were collected using a 1-m ² Tucker trawl fitted with a 505-micron mesh net that was towed near the surface (for approximately 1 knot) for 5 minutes. Volume of water filtered by each net was estimated by flow meters and the plankton samples were preserved in 5% formalin.
Generic Instrument Description	The original Tucker Trawl, a net with a rectangular mouth opening first built in 1951 by G.H. Tucker, was not an opening/closing system, but shortly thereafter it was modified so that it could be opened and closed. The original had a 183 cm by 183 cm flexible rectangular mouth opening 914 cm long net with 1.8 cm stretched mesh for the first 457 cm and 1.3 cm mesh for last 457 cm. 152 cm of coarse plankton or muslin netting lined the end of the net. Tucker designed the net to collect animals associated with the deep scattering layers, principally euphausiids, siphonophores, and midwater fish. (from Wiebe and Benfield, 2003). Currently used Tucker Trawls usually have 1-m ² openings and can have a single net or multiple nets on the frame.

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Deployments

GP0108

Website	https://www.bco-dmo.org/deployment/57499
Platform	F/V Great Pacific
Report	http://globec.whoi.edu/nep/reports/cgoa_cruises/gp0108cr.pdf
Start Date	2001-07-17
End Date	2001-08-06
Description	The July - August 2001 OCC/GLOBEC cruise focused on salmon (<i>Oncorhynchus</i> spp.), and zooplankton distribution, and physical properties (current, temperature, and salinity) along 11 transects beginning at Icy Point near northern Southeast Alaska and ending at Cape Kaguyak at the western end of Kodiak Island. Sampling along each transect occurred over the continental shelf of the Gulf of Alaska and beyond the 200-m slope and into oceanic depths. The purpose was to investigate the relationships between biological and physical oceanographic processes that affect the distribution of juvenile salmon in the coastal Gulf of Alaska. This deployment was also known as GP0101.

GP0207-01

Website	https://www.bco-dmo.org/deployment/57500
Platform	F/V Great Pacific
Report	http://globec.whoi.edu/nep/reports/cgoa_cruises/gp0207cr.pdf
Start Date	2002-07-11
End Date	2002-07-27
Description	NEP GLOBEC gave this cruise the designation GP0207 and NOAA gave this cruise the designation GP0201. The data say 0201. The cruise report, inventory and eventlog say GP0207. 18 May 2011, dld - This cruise consisted of Leg 1 and Leg 2. Metadata is edited to reflect this information gleaned from the event log and the cruise report. The cruise report starts with a transit, not the science. Leg 1 includes the 11-16 July 2002 transit from Dutch Harbor to Yakutat where science personnel and gear were picked up. The Leg ends on 27 July in Seward. Chief Scientist was Edward D. Cokelet. Leg 2 departed Seward on 28 July and arrived in Dutch Harbor on 8 August with Christine Kondzela as Chief Scientist.

MF0310

Website	https://www.bco-dmo.org/deployment/57556
Platform	R/V Miller Freeman
Report	http://globec.whoi.edu/nep/reports/cgoa_cruises/mf0310cr.pdf
Start Date	2003-07-18
End Date	2003-08-09

GP0207-02

Website	https://www.bco-dmo.org/deployment/58669
Platform	F/V Great Pacific
Report	http://globec.whoi.edu/nep/reports/cgoa_cruises/gp0207cr.pdf
Start Date	2002-07-28
End Date	2002-08-08
Description	NEP GLOBEC gave this cruise the designation GP0207 and NOAA gave this cruise the designation GP0201. The data say 0201. The cruise report, inventory and eventlog say GP0207. 18 May 2011, dld - This cruise consisted of Leg 1 and Leg 2. Metadata is edited to reflect this information gleaned from the event log and the cruise report. The cruise report starts with a transit, not the science. Leg 1 includes the 11-16 July 2002 transit from Dutch Harbor to Yakutat where science personnel and gear were picked up. The Leg ends on 27 July in Seward. Chief Scientist was Edward D. Cokelet. Leg 2 departed Seward on 28 July and arrived in Dutch Harbor on 8 August with Christine Kondzela as Chief Scientist.

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Project Information

U.S. GLOBEC Northeast Pacific (NEP)

Website: <http://nepglobec.bco-dmo.org>

Coverage: Northeast Pacific Ocean, Gulf of Alaska

Program in a Nutshell

Program in a Nutshell

Goal: To understand the effects of climate variability and climate change on the distribution, abundance and production of marine animals (including commercially important living marine resources) in the eastern North Pacific. To embody this understanding in diagnostic and prognostic ecosystem models, capable of capturing the ecosystem response to major climatic fluctuations.

Approach: To study the effects of past and present climate variability on the population ecology and population dynamics of marine biota and living marine resources, and to use this information as a proxy for how the ecosystems of the eastern North Pacific may respond to future global climate change. The strong temporal variability in the physical and biological signals of the NEP will be used to examine the biophysical mechanisms through which zooplankton and salmon populations respond to physical forcing and biological interactions in the coastal regions of the two gyres. Annual and interannual variability will be studied directly through **long-term observations** and detailed **process studies**; variability at longer time scales will be examined through **retrospective analysis** of directly measured and proxy data. Coupled **biophysical models** of the ecosystems of these regions will be developed and tested using the process studies and data collected from the long-term observation programs, then further tested and improved by hindcasting selected retrospective data series.

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Program Information

U.S. GLOBAL ocean ECosystems dynamics (U.S. GLOBEC)

Website: <http://www.usglobec.org/>

Coverage: Global

U.S. GLOBEC (GLOBAL ocean ECosystems dynamics) is a research program organized by oceanographers and fisheries scientists to address the question of how global climate change may affect the abundance and production of animals in the sea.

The U.S. GLOBEC Program currently had major research efforts underway in the Georges Bank / Northwest Atlantic Region, and the Northeast Pacific (with components in the California Current and in the Coastal Gulf of Alaska). U.S. GLOBEC was a major contributor to International GLOBEC efforts in the Southern Ocean and Western Antarctic Peninsula (WAP).

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0109078
National Oceanic and Atmospheric Administration (NOAA)	unknown NEP NOAA

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