

Juvenile pink salmon energy density, wet, dry, frozen weights from F/V Great Pacific, R/V Miller Freeman cruises in the Coastal Gulf of Alaska, NE Pacific, 2001-2003 (NEP project)

Website: <https://www.bco-dmo.org/dataset/3108>

Data Type: Cruise Results

Version: 1

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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

Juvenile pink salmon energy density, wet, dry, frozen weights from F/V Great Pacific, R/V Miller Freeman cruises in the Coastal Gulf of Alaska, NE Pacific, 2001-2003.

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Coverage

Spatial Extent: N:60.04 E:-137.2 S:54.29 W:-157.43

Temporal Extent: 2001-07-17 - 2004-11-08

Dataset Description

GLOBEC 2000: Feeding, growth, condition and energetics of juvenile pink salmon

L. Haldorson [University of Alaska], D. Beauchamp [University of Washington], K. Myers [University of Washington]

The goal of this project is to determine how pink salmon in the northern Gulf of Alaska are affected by variation in the plankton production system during their first months at sea. This will be accomplished through an integrated project that includes field sampling, laboratory analyses and modeling. Pink salmon occupy surface waters of the continental shelf in the summer and fall after entering marine waters in the spring. In that period they grow rapidly and their feeding changes from small zooplankton in the summer to large zooplankton in the fall. This project will document temporal and spatial variation in prey use and availability, it will assess the effects of the shelf environment by measuring growth and condition of pink salmon, and it will use spatially-explicit foraging/bioenergetic modeling to understand observed patterns in feeding, growth and condition. Fish of hatchery origin, identified by thermal otolith marks, will be of particular interest, as the marine survival of each hatchery cohort will be available a year after those fish enter the marine environment.

Spatial and temporal variation in pink salmon diets and surface zooplankton will be described through laboratory analyses of field samples, and the basis for diet shifts to larger prey will be determined by calculations of prey selectivity. Standard length/weight condition measures will be calculated, and the energy content of salmon will be measured by calorimetry. Growth will be measured by size at age for hatchery fish and by scale analyses for all fish. The relationship between condition, growth and the environment will be examined. Habitat quality over the continental shelf will be assessed with spatially-explicit models with foraging and bioenergetic components that produce weight-specific estimates of growth potential. Bioenergetic modeling will also be used to estimate daily ration and seasonal consumption by pink salmon. The relationship between diets of pink salmon and other planktivorous fishes will be assessed.

This research will contribute directly to accomplishment of the GLOBEC program goal of understanding how production of upper trophic level species is linked to variation in oceanographic conditions. It is widely accepted that production of salmon in the GOA is determined by planktonic production. Detailed descriptions of spatial and temporal variation in diet, prey availability, temperature, growth and fish condition will substantially enhance our understanding of the connections between the marine environment and salmon production.
(*project abstract*)

Acquisition Description

Sampling Activities

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, 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-micron 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-micron 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.

Parameters

Parameter	Description	Units
control_id	identification number for individual sample: first four numbers are year; following six numbers are individual fish identification numbers.	dimensionless
year	year, reported as YYYY, e.g. 1995	dimensionless
weight_froz	weight of frozen fish	grams?
weight_wet	wet weight of fish	grams
weight_dry	dry weight of fish	grams
energy_dens	energy density as calculated: wet weight = $4.186 \cdot (\text{dry/wet})^*$ (cal/g)	Joules/gram wet weight

Instruments

Dataset-specific Instrument Name	Midwater Trawl
Generic Instrument Name	Midwater Trawl
Dataset-specific Description	Fish samples were collected with 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 3.5 to 5 kt, at or near surface, and had a typical spread of 40-m horizontally and 14-m vertically.
Generic Instrument Description	A mid-water or pelagic trawl is a net towed at a chosen depth in the water column to catch schooling fish such as herring and mackerel. Midwater trawl nets have very large front openings to herd schooling fish toward the back end where they become trapped in the narrow "broiler". The sides of the deployed net are spread horizontally with two large metal foils, called "doors," positioned in front of the net. As the trawler moves forward, the doors, and therefore the net, are forced outward, keeping the net open. This instrument designation is used when specific make and model are not known.

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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	<p>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.</p>

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	<p>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.</p>

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	<p>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. Coker. Leg 2 departed Seward on 28 July and arrived in Dutch Harbor on 8 August with Christine Kondzela as Chief Scientist.</p>

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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 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-0104622
National Oceanic and Atmospheric Administration (NOAA)	unknown NEP NOAA

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