CTD data from California Current System (CCS) Process/Mesoscale Cruises on the R/Vs New Horizon, Revelle, Thompson, and Wecoma in the Northeast Pacific from 2000-2002 as part of the U.S. GLOBEC program (NEP project)

Website: https://www.bco-dmo.org/dataset/2462
Data Type: Cruise Results
Version: 1
Version Date: 2007-04-10

Project
» U.S. GLOBEC Northeast Pacific (NEP)

Program
» U.S. GLOBal ocean ECosystems dynamics (U.S. GLOBEC)

Contributors	Affiliation	Role
Batchelder, Hal	Oregon State University (OSU-CEOAS)	Principal Investigator
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Abstract
CTD data from California Current System (CCS) Process/Mesoscale Cruises on the R/Vs New Horizon, Revelle, Thompson, and Wecoma in the Northeast Pacific from 2000-2002 as part of the U.S. GLOBEC program.

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Coverage

Spatial Extent: **N**:44.675 **E**:-123.692 **S**:38.7977 **W**:-126.1972
Temporal Extent: 2000-05-30 - 2002-08-19

Dataset Description

California Current System Process Cruises - CTD data

Methods & Sampling

Physical Influences on Populations in the California Current (Botsford, L. [Univ. Calif. Davis (UCD)], Hastings, A. M. [UCD], Largier, J. [Scripps Institute of Oceanography]) We propose to formulate models spanning the individual level to the metapopulation level for two genera of interest to GLOBEC in the CCS: (1) the two CCS salmon species identified by GLOBEC, coho salmon (Oncorhynchus kisutch) and chinook salmon (O. tshawytscha) and (2) Dungeness crab (Cancer magister), a species which covaries with salmon, is a significant

prey of both species, and is subject to similar mesoscale circulation patterns. The ultimate purpose of these models will be to link the different scales of variability and levels of ecological organization in the various retrospective, monitoring and process studies so that the effects of changes in the physical environment on populations can be projected. Also, we will answer a number of questions through modeling and analysis of existing data, that will allow better focus of field studies on critical issues.

While upwelling and the regime shift in the mid-1970s are believed to have affected survival through this period, results of field studies of the cause are equivocal. We will develop a model to evaluate the interaction of time of ocean entry, size at entry, varying growth rate, and size dependent mortality rate on the fraction surviving this phase, and use it to compare the various field results in a common context. The results will help to focus field studies, and the model will provide a framework for evaluation of those studies. Even though Core Hypothesis III focuses on the juvenile stage, ENSO events are known to have a dramatic effect on survival of pre-spawning adults. Because the behavior of random populations of semelparous, anadromous species is poorly understood, the relative effects of environmental variability on their persistence and productivity is unknown. We will formulate a population model to determine which variable life history stage has the greater effect so that the GLOBEC process studies can focus on the appropriate one. We will formulate a metapopulation model to evaluate whether covariability between the environmental influences on different subpopulations affect persistence, and if it does, whether more productive populations can "rescue" extinct less productive populations?

We will also model and analyze the Dungeness crab population because the dramatic fluctuations in their abundance along the coast may be caused by the same environmental factor(s) that cause the salmon populations to vary, and may also be a cause of that variability through predation. We will apply a new approach to population analysis that answers the question: which environmental forcing function can combine with known density-dependent recruitment mechanisms to produce the observed variability in crab catch? *(abstract)*

This page was last updated on March 15, 2007.

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Data Processing Description

Salinity was computed using standard algorithms from Fofonoff and Millard, 1983 (Algorithms for computation of fundamental properties of sea water. UNESCO Technical Papers in Marine Science, 44, 53 pp.)

Progress Report: April 1999: http://nepglobec.bco-dmo.org/projs/99.botsford.html

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Data Files

File	
ccs_proc_ctd.csv	(Comma Separated Values (.csv), 11.47 MB) MD5:5f1c5e1558c8e6d2dcf71e0214ea7598
Primary data file for dataset ID 2462	

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Parameters

Parameter	Description	Units
cruiseid	Cruise identifier, e.g. W0005 R/V Wecoma cruise 0005.	unitless
year	Year, e.g. 2002.	unitless
station	Consecutive station number.	unitless
station_name	Station code.	unitless
day	Day of month (local time).	unitless
month	Month of measurement (0 to 12); local time.	unitless
time	Time of day, local time, using 2400 clock format.	unitless
depth_w	Water depth, in meters.	meters
lat	Latitude; north is positive.	decimal degrees
lon	Longitude, in decimal degrees, east is positive.	decimal degrees
press	Pressure.	decibars
temp	Water temperature.	degrees Celsius
sal	salinity, calculated from the CTD 'primary sensors' of conductivity and temperature. See 'Processing Description'.	Practical Salinity Scale, dimensionless
potemp	Potential temperature.	International Practical Temperature Scale - 68 ,or 90
sigma_0	Sigma-theta density.	not supplied
sp_vol_an	Specific volume anomaly.	CL/T
DYN_HT	Dynamic height.	J/KG
flvolt	Fluoresence	volts
trans	light transmission, as percent	%
trans_v	light transmission, as volts	volts
O2_v	Oxygen current	volts
O2S	O2 saturation (guessing from O2S and units)	ml per liter
O2	dissolved oxygen	milliliter/liter
PAR	downwell Photosynthetically Available Radiation	uE/cm2/sec
O2_temp	oxygen temperature	degrees C

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Instruments

Dataset-specific Instrument Name	Conductivity, Temperature, Depth
Generic Instrument Name	CTD - profiler
Dataset-specific Description	CTD measurements taken, CTD unit unidentified.
Generic Instrument Description	The Conductivity, Temperature, Depth (CTD) unit is an integrated instrument package designed to measure the conductivity, temperature, and pressure (depth) of the water column. The instrument is lowered via cable through the water column. It permits scientists to observe the physical properties in real-time via a conducting cable, which is typically connected to a CTD to a deck unit and computer on a ship. The CTD is often configured with additional optional sensors including fluorometers, transmissometers and/or radiometers. It is often combined with a Rosette of water sampling bottles (e.g. Niskin, GO-FLO) for collecting discrete water samples during the cast. This term applies to profiling CTDs. For fixed CTDs, see https://www.bco-dmo.org/instrument/869934.

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Deployments

NH0005

Website	https://www.bco-dmo.org/deployment/57557
Platform	R/V New Horizon
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/nh0005/nh0005cr.pdf
Start Date	2000-05-28
End Date	2000-06-13

NH0007

Website	https://www.bco-dmo.org/deployment/57558
Platform	R/V New Horizon
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/nh0007/nh0007cr.pdf
Start Date	2000-07-27
End Date	2000-08-12

NH0207

Website	https://www.bco-dmo.org/deployment/57559
Platform	R/V New Horizon
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/nh0207acr.pdf
Start Date	2002-07-31
End Date	2002-08-19

R0208

Website	https://www.bco-dmo.org/deployment/57574
Platform	R/V Roger Revelle
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/r0208cr.pdf
Start Date	2002-07-31
End Date	2002-08-19

T0205

Website	https://www.bco-dmo.org/deployment/57595
Platform	R/V Thomas G. Thompson
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/t0205cr.pdf
Start Date	2002-06-01
End Date	2002-06-17

W0005A

Website	https://www.bco-dmo.org/deployment/57598
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/w0005a/w0005acr.pdf
Start Date	2000-05-29
End Date	2000-06-17

W0008

Website	https://www.bco-dmo.org/deployment/57600
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/w0008acr.pdf
Start Date	2000-07-29
End Date	2000-08-17

W0205A

Website	https://www.bco-dmo.org/deployment/57609
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/w0205acr.pdf
Start Date	2002-05-29
End Date	2002-06-18

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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-0003273
National Oceanic and Atmospheric Administration (NOAA)	unknown NEP NOAA

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