

CTD data from multiple R/V Clifford A. Barnes cruises in the Hood Canal, WA from 2012-2013 (Pelagic Hypoxia project)

Website: <https://www.bco-dmo.org/dataset/648914>

Data Type: Cruise Results

Version: working on final

Version Date: 2016-06-14

Project

» [Consequences of hypoxia on food web linkages in a pelagic marine ecosystem](#) (PelagicHypoxia)

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Coverage

Temporal Extent: 2012-06-12 - 2013-10-04

Dataset Description

CTD profiles of temperature, oxygen, salinity, density, fluorescence, PAR, and transmission.

Methods & Sampling

CTD (Sea Bird SBE 911) casts with WETLabs ECO-AFL fluorometer and SBE 43 oxygen sensor calibrated in the field using modified Winkler titrations.

Data Processing Description

Data started at 1m depth from surface were processed using Sea-Bird software to create 1-m data bins. Oxygen data were aligned. Dates and times are in local time, PDT.

The O2_mg_L data are aligned (standard procedure for CTD processing is to advance the oxygen 3-7 seconds relative to the pressure).

The oxygen saturation values were the same aligned and unaligned.

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Data Files

File
hypoxia.csv (Comma Separated Values (.csv), 2.11 MB) MD5:c14e115a03e26fde4376ebff48bc0dbe Primary data file for dataset ID 648914

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Parameters

Parameter	Description	Units
cruise_id	cruise identifier	unitless
station	station identifier	unitless
depth_w	water depth	meters
latitude	latitude of station	decimal degrees
longitude	longitude of station	decimal degrees
time_local	hours minutes and seconds in format HH:MM:SS ; time is in PDT	unitless
date_local	day month and year in format D-MMM-YYYY	unitless
ISO_DateTime_Local	Date/Time (local) in ISO format YYYY-MM-DDTHH:MM:SS[.xx] Time Zone is PDT	unitless
press	water pressure at measurement; depth reported as pressure; positive number increasing with water depth	pounds per square inch
depth	sample depth as measured by the CTD	meters
density	quantity of mass per unit volume	kilograms per cubic meter
fluor	fluorescence	milligrams per cubic meter
lat	latitude of sample as measured by the CTD	decimal degrees
lon	longitude of sample as measured by the CTD	decimal degrees
O2sat_GG	oxygen saturation as calculated by Garcia and Gordon (1992)	milligrams per liter
O2sat_Weiss	oxygen saturation as calculated by Weiss (1970)	milligrams per liter
PAR	photosynthetically available (active) radiation	unknown
pH	measure of the acidity or basicity of an aqueous solution	pH scale
sal	salinity	practical salinity unit (PSU)
sv_Delgross	sound velocity calculated using Del Grosso (1972)	meters per second
temp	temperature; ITS 90	degrees Celsius
potemp	potential temperature; ITS 90	degrees Celsius
press_psi	pressure	pounds per square inch
sv_chen	sound velocity calculated using Millero and Chen (1977)	meters per second
sv_wilson	sound velocity calculated using Wilson (1959)	meters per second
O2_mg_L	dissolved oxygen	milligrams per liter
flag	data flag from SeaBird sata processing software (0 = good)	unitless
year	year of sample in format YYYY	unitless

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Instruments

Dataset-specific Instrument Name	Sea-Bird SBE 911 CTD
Generic Instrument Name	CTD Sea-Bird 911
Generic Instrument Description	The Sea-Bird SBE 911 is a type of CTD instrument package. The SBE 911 includes the SBE 9 Underwater Unit and the SBE 11 Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). More information from Sea-Bird Electronics.

Dataset-specific Instrument Name	PAR/ Irradiance, Biospherical/Licor
Generic Instrument Name	LI-COR Biospherical PAR Sensor
Generic Instrument Description	The LI-COR Biospherical PAR Sensor is used to measure Photosynthetically Available Radiation (PAR) in the water column. This instrument designation is used when specific make and model are not known.

Dataset-specific Instrument Name	SBE 43
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	WETLabs ECO-AFL fluorometer
Generic Instrument Name	Wet Labs ECO-AFL/FL Fluorometer
Generic Instrument Description	The Environmental Characterization Optics (ECO) series of single channel fluorometers delivers both high resolution and wide ranges across the entire line of parameters using 14 bit digital processing. The ECO series excels in biological monitoring and dye trace studies. The potted optics block results in long term stability of the instrument and the optional anti-biofouling technology delivers truly long term field measurements. more information from Wet Labs

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Deployments

CB975

Website	https://www.bco-dmo.org/deployment/648944
Platform	R/V Clifford A. Barnes
Start Date	2012-06-10
End Date	2012-06-15

CB979

Website	https://www.bco-dmo.org/deployment/648969
Platform	R/V Clifford A. Barnes
Start Date	2012-07-08
End Date	2012-07-13

CB982

Website	https://www.bco-dmo.org/deployment/648970
Platform	R/V Clifford A. Barnes
Start Date	2012-08-05
End Date	2012-08-10

CB986

Website	https://www.bco-dmo.org/deployment/648971
Platform	R/V Clifford A. Barnes
Start Date	2012-09-01
End Date	2012-09-06

CB988

Website	https://www.bco-dmo.org/deployment/648972
Platform	R/V Clifford A. Barnes
Start Date	2012-09-30
End Date	2012-10-05

CB1002

Website	https://www.bco-dmo.org/deployment/648973
Platform	R/V Clifford A. Barnes
Start Date	2013-06-09
End Date	2013-06-14
Description	Start and end date, and Chief Scientist information from NSF R2R data catalog. (Cruise DOI: 10.7284/902746)

CB1003

Website	https://www.bco-dmo.org/deployment/648974
Platform	R/V Clifford A. Barnes
Start Date	2013-07-07
End Date	2013-07-12

CB1007

Website	https://www.bco-dmo.org/deployment/648976
Platform	R/V Clifford A. Barnes
Start Date	2013-08-30
End Date	2013-09-07

CB1009

Website	https://www.bco-dmo.org/deployment/648986
Platform	R/V Clifford A. Barnes
Start Date	2013-09-29
End Date	2013-10-04

CB1005

Website	https://www.bco-dmo.org/deployment/648975
Platform	R/V Clifford A. Barnes
Start Date	2013-08-04
End Date	2013-08-09

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Project Information

Consequences of hypoxia on food web linkages in a pelagic marine ecosystem (PelagicHypoxia)

Coverage: Puget Sound, WA (47 N, 123 W)

Description from NSF award abstract:

Low dissolved oxygen (hypoxia) is one of the most pronounced, pervasive, and significant disturbances in marine ecosystems. Yet, our understanding of the ecological impacts of hypoxia on pelagic food webs is incomplete because of our limited knowledge of how organism responses to hypoxia affect critical ecosystem processes. In pelagic food webs, distribution shifts of mesozooplankton and their predators may affect predator-prey overlap and dictate energy flow up food webs. Similarly, hypoxia may induce shifts in zooplankton community composition towards species that impede energy flow to planktivorous fish. However, compensatory responses by species and communities might negate these effects, maintaining trophic coupling and sustaining productivity of upper trophic level species. The PIs propose to answer the question "Does hypoxia affect energy flow from mesozooplankton to pelagic fish?" They approach this question with a nested framework of hypotheses that considers two sets of processes alternatively responsible for either changes or maintenance of pelagic ecosystem energy flows. They will conduct their study in the Hood Canal, WA. Unlike most hypoxia-impacted estuaries, hypoxic regions of Hood Canal are in close proximity to sites that are not affected. This makes it logistically easier to conduct a comparative study and reduces the number of potential confounding factors when comparing areas that are far apart.

Improved understanding of how hypoxia impacts marine ecosystems will benefit the practical application of ecosystem-based management (EBM) in coastal and estuarine ecosystems. Effective application of EBM requires that the impacts of human activities are well understood and that ecological effects can be tracked using indicators. This project will contribute to both of these needs. The PIs will share their findings on local and national levels with Federal, State, Tribal, and County biologists. To increase exposure of science to underrepresented groups, the PIs also will provide Native American youth with opportunities to participate in field collections and laboratory processing through summer internships. The PIs will collaborate with the NSF-funded Pacific Northwest Louis Stokes Alliance for Minority Participation and tribes from the Hood Canal region to recruit and mentor students for potential careers in marine science. This project will support several undergraduate researchers, two Ph.D. students, a post-doc, and two early-career scientists.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1154648

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