CTD profiles acquired in Puget Sound, WA aboard R/V Clifford A. Barnes during cruises CB1073 and CB1078 in 2017.

Website: https://www.bco-dmo.org/dataset/842972
Data Type: Cruise Results
Version: 1
Version Date: 2021-03-02

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

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Abstract
CTD profiles acquired in Puget Sound, WA aboard R/V Clifford A. Barnes during cruises CB1073 and CB1078 in 2017.

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Coverage

Spatial Extent: **N**:47.8972 **E**:-122.477 **S**:47.2748 **W**:-123.134
Temporal Extent: 2017-06-24 - 2017-09-02

Methods & Sampling

CTD (Sea Bird SBE 911) casts with WETLabs ECO-AFL fluorometer, SBE 43 oxygen sensor, and SBE 18 pH sensor.

Data starting at 1m depth from the surface were processed using Sea-Bird software to create 1-m data bins. Oxygen data were aligned. The pH data from CTD casts for each cruise were corrected using an average offset to pH calculated from the discrete total alkalinity and dissolved inorganic samples from that cast (see Bottle Data). Both raw and corrected pH are given.

Data Processing Description

BCO-DMO processing notes:

- Concatenated all CTD cast files
- Added station ID to dataset

- Adjusted parameter names to comply with database requirements

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Data Files

File
concat_all.csv (Comma Separated Values (.csv), 170.45 KB) MD5:b799fb9f0c3fc9b1aa15e1bee89a427d Primary data file for dataset ID 842972

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Parameters

Parameter	Description	Units
Station	Station ID	unitless
Latitude	Latitude of CTD cast	decimal degrees
Longitutde	Longitude of CTD cast	decimal degrees
ISO_DateTime_UTC	Date and time of CTD cast in ISO format (yyyy-mm-ddThh:mm:ss), UTC time zone	unitless
Depth	Water depth	meters (m)
pH	Raw pH from sensor	unitless
Temperature	Water temperature	degrees Celsius (°C)
Salinity	Seawater salinity	PSU
Fluorescence	Fluorescence	milligrams per cubic meter (mg/m3)
Oxygen_mg_L	Dissolved oxygen	milligrams per liter (mg/L)
Oxygen_mM_L	Dissolved oxygen	micromoles per liter (umol/L)
pH_corrected	pH adjusted with an average offset calculated from bottle samples	unitless
Pressure	Water pressure	decibels (db)

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Instruments

Dataset-specific Instrument Name	Sea-Bird SBE9 CTD profiler
Generic Instrument Name	CTD Sea-Bird 9
Dataset-specific Description	Sea-Bird SBE9 CTD profiler equipped with a pH sensor (SBE 18), oxygen sensor (SBE 43), fluorometer (WETLabs ECO-AFL), and Niskin bottles.
Generic Instrument Description	The Sea-Bird SBE 9 is a type of CTD instrument package. The SBE 9 is the Underwater Unit and is most often combined with the SBE 11 Deck Unit (for real-time readout using conductive wire) when deployed from a research 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, fluorometer, altimeter, etc.). Note that in most cases, it is more accurate to specify SBE 911 than SBE 9 since it is likely a SBE 11 deck unit was used. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Niskin bottles
Generic Instrument Name	Niskin bottle
Dataset-specific Description	Sea-Bird SBE9 CTD profiler equipped with a pH sensor (SBE 18), oxygen sensor (SBE 43), fluorometer (WETLabs ECO-AFL), and Niskin bottles.
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

Dataset-specific Instrument Name	SBE18
Generic Instrument Name	pH Sensor
Dataset-specific Description	Sea-Bird SBE9 CTD profiler equipped with a pH sensor (SBE 18), oxygen sensor (SBE 43), fluorometer (WETLabs ECO-AFL), and Niskin bottles.
Generic Instrument Description	An instrument that measures the hydrogen ion activity in solutions. The overall concentration of hydrogen ions is inversely related to its pH. The pH scale ranges from 0 to 14 and indicates whether acidic (more H+) or basic (less H+).

Dataset-specific Instrument Name	oxygen sensor (SBE 43)
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Dataset-specific Description	Sea-Bird SBE9 CTD profiler equipped with a pH sensor (SBE 18), oxygen sensor (SBE 43), fluorometer (WETLabs ECO-AFL), and Niskin bottles.
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	fluorometer (WETLabs ECO-AFL)
Generic Instrument Name	Wet Labs ECO-AFL/FL Fluorometer
Dataset-specific Description	Sea-Bird SBE9 CTD profiler equipped with a pH sensor (SBE 18), oxygen sensor (SBE 43), fluorometer (WETLabs ECO-AFL), and Niskin bottles
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

CB1073

Website	https://www.bco-dmo.org/deployment/841303
Platform	R/V Clifford A. Barnes
Start Date	2017-06-23
End Date	2017-07-01

CB1078

Website	https://www.bco-dmo.org/deployment/841305
Platform	R/V Clifford A. Barnes
Start Date	2017-08-25
End Date	2017-09-02

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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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