Depth-stratified krill net samples taken in Puget Sound, WA aboard R/V Clifford A. Barnes during cruises CB1073 and CB1078 in 2017.

Website: https://www.bco-dmo.org/dataset/842831
Data Type: Cruise Results
Version: 1
Version Date: 2021-03-01

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

Contributors	Affiliation	Role
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Abstract
Depth-stratified krill net samples taken 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**:47.426 **E**:-122.702 **S**:47.277 **W**:-123.1079
Temporal Extent: 2017-06-24 - 2017-09-01

Methods & Sampling

We sampled the density of all euphausiid life stages during dusk (within 1 hour of sunset) with a 60-cm diameter, 200-µm mesh ring net lifted vertically from 10 m off the bottom to the surface. We also characterized the nighttime density and vertical distribution of adult *Euphausia pacifica* using a 0.25 m2 Hydrobios MultiNet (five-net capacity) towed obliquely to collect depth-stratified samples. Flowmeters were used to monitor the volume of water filtered for all collections and samples were preserved in a 5% buffered formalin and seawater solution.

Data Processing Description

In the laboratory, samples from the vertical tows were quantitatively diluted to 4–10 times their settled volume and 2–3 subsamples were taken with a 1-mL Stempel pipette to quantify early life stages. In addition, one 10 mL Stempel pipette subsample was evaluated for any stages not found in the smaller subsamples. Euphausiid life stages were identified and classified as nauplius, calyptopis, furcilia, or juvenile/adult. All euphausiids from

vertical tows were classified regardless of species, and a small portion may have been the sub-dominant species *Thysannoessa raschii*. Euphausiids from the oblique tows that were larger than 10 mm total length were identified as *E. pacifica*, sexed, and measured. Samples that contained > 30 large euphausiids were split prior to analysis.

Densities (#/m3) were calculated by life stage from each net.

BCO-DMO processing notes:

- Adjusted parameter names to comply with database requirements.
- Converted date to ISO format.

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Data Files

File
densities.csv (Comma Separated Values (.csv), 4.87 KB) MD5:ed1372314db09decdbec2a4615e5e254 Primary data file for dataset ID 842831

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Parameters

Parameter	Description	Units
Date	Date sample was collected in ISO format (yyy-mm-dd)	unitless
Station	Station code where sampling occurred	unitless
Latitude	Latitude of station	decimal degrees
Longitude	Longitude of station	decimal degrees
Net_Type	Gear type used for sampling	unitless
Mesh_Size	Size of mesh used in sampling (microns)	microns
Depth_Max	Maximum depth sampled (meters)	meters (m)
Depth_Min	Minimum depth sampled (meters)	meters (m)
Species	Species sampled	unitless
Life_History_stage	Description of life history stage of sample	unitless
Density	density of species sampled	count per cubic meter
Start_time_tow	Start Time of the tow in ISO format (hh:mm)	unitless

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Instruments

Dataset-specific Instrument Name	TSK flow meter
Generic Instrument Name	Flow Meter
Dataset-specific Description	60-cm diameter, 200-µm mesh ring net with TSK flow meter
Generic Instrument Description	General term for a sensor that quantifies the rate at which fluids (e.g. water or air) pass through sensor packages, instruments, or sampling devices. A flow meter may be mechanical, optical, electromagnetic, etc.

Dataset-specific Instrument Name	Hydrobios MultiNet
Generic Instrument Name	MultiNet
Dataset-specific Description	0.25 m2 Hydrobios MultiNet (five-net capacity)
Generic Instrument Description	The MultiNet© Multiple Plankton Sampler is designed as a sampling system for horizontal and vertical collections in successive water layers. Equipped with 5 or 9 net bags, the MultiNet© can be delivered in 3 sizes (apertures) : Mini (0.125 m2), Midi (0.25 m2) and Maxi (0.5 m2). The system consists of a shipboard Deck Command Unit and a stainless steel frame to which 5 (or 9) net bags are attached by means of zippers to canvas. The net bags are opened and closed by means of an arrangement of levers that are triggered by a battery powered Motor Unit. The commands for actuation of the net bags are given via single or multi-conductor cable between the Underwater Unit and the Deck Command Unit. Although horizontal collections typically use a mesh size of 300 microns, mesh sizes from 100 to 500 may also be used. Vertical collections are also common. The shipboard Deck Command Unit displays all relevant system data, including the actual operating depth of the net system.

Dataset-specific Instrument Name	Ring net
Generic Instrument Name	Ring Net
Dataset-specific Description	60-cm diameter, 200-µm mesh ring net with TSK flow meter
Generic Instrument Description	A Ring Net is a generic plankton net, made by attaching a net of any mesh size to a metal ring of any diameter. There are 1 meter, .75 meter, .25 meter and .5 meter nets that are used regularly. The most common zooplankton ring net is 1 meter in diameter and of mesh size .333mm, also known as a 'meter net' (see Meter Net).

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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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