# Epifauna counts from BOWLS moorings deployed and recovered from R/V Oceanus cruises OC1304A and OC1406B off the Coast of Oregon from 2013-2014 (BOWLS project)

**Website**: https://www.bco-dmo.org/dataset/676064
**Data Type**: Cruise Results
**Version**: 1
**Version Date**: 2017-01-24

**Project**
» Biodiversity, connectivity and ecosystem function in organic-rich whale-bone and wood-fall habitats in the deep sea (BOWLS)

| Contributors | Affiliation | Role |
|---|---|---|
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**Abstract**
This dataset contains counts of epifaunal organism Phyla from BOWLS moorings deployed in April of 2013 and recovered in June of 2014. Phyla sampled: Annelida, Arthropoda, Chaetognatha, Chordata, Cnidaria, Echinodermata, Kinorhynca, Mollusca, Nematoda, Nemertea, and Platyhelminthes. Also included are the mooring identifiers, substrate type (control, wood, whale-bone), latitude, longitude, depth, and deployment and recovery dates.

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## Coverage

**Spatial Extent**: **N**:47.9577 **E**:-125.1706 **S**:43.8784 **W**:-127.5929
**Temporal Extent**: 2013-04-05 - 2014-06-27

### Methods & Sampling

Immediately upon recovery of the benthic landers (moorings), experimental substrates and associated mesh bags were transferred to buckets containing chilled, filtered seawater. Following the collection of ecosystem function measurements, epifaunal individuals were:

1) washed from the mesh bag over a 500 µm sieve, split and fixed in each 95% ethanol and 4% formaldehyde
2) picked from the surface of each substrate using forceps and fixed in each 95% ethanol and 4% formaldehyde

3) washed from the bucket over a 500 um sieve, split and fixed in each 95% ethanol and 4% formaldehyde following removal of the substrate.

Epifaunal samples, preserved in both 95% ethanol and 4% formaldehyde were quantitatively sorted in the lab using a stereomicroscope. The “substrate” is the experimental treatment type; Control, Whale-bone or Wood. Phylum counts are the number of individuals (or heads for incomplete specimens) per three replicate substrates at each mooring.

PDF image of the mooring deployment sites.

**Data Processing Description**

No further processing.

**BCO-DMO Data Manager Processing notes:**
* Added conventional header with dataset name, PI name, version date
* Column names reformatted to comply with BCO-DMO standards
* Combined individual files for cruise epifauna into one dataset
* Added mooring deployment location, dates and depths from BOWLS Moorings dataset (https://www.bco-dmo.org/dataset/568713)

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## Data Files

| File |
|---|
| **BOWLS_epifauna.csv** (Comma Separated Values (.csv), 1.47 KB) MD5:1629d18e1ef95fc87a3fb866a90d25fc<br>Primary data file for dataset ID 676064 |

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## Supplemental Files

| File |
|---|
| **BOWL mooring deployment locations map**<br>filename: NE_Pacific_Bone-wood_lander_deployment_sites.pdf (Portable Document Format (.pdf), 175.16 KB) MD5:31fb978903448e951f6fb88c3d3eebd4<br>Location of BOWL mooring deployments, recovered after ~15 month during cruise OC1406B |

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## Parameters

| Parameter | Description | Units |
|---|---|---|
| mooring | Mooring ID number. | dimensionless |
| date_deployed | Date of mooring deployment. | mm/dd/yyyy |
| date_recovered | Date mooring was recovered. | mm/dd/yyyy |

| | | |
|---|---|---|
| lat | Latitude of mooring. | decimal degrees |
| lon | Longitude of mooring. | decimal degrees |
| depth | Depth of water at mooring location. | meters |
| cruise_deploy | ID of cruise during which moorings were deployed. | dimensionless |
| cruise_recover | ID of cruise during which moorings were recovered. | dimensionless |
| Annelida | Annelida Phylum organism counts | untiless |
| Arthropoda | Arthropoda Phylum organism counts | unitless |
| Chaetognatha | Chaetognatha Phylum organism counts | unitless |
| Chordata | Chordata Phylum organism counts | unitless |
| Cnidaria | Cnidaria Phylum organism counts | unitless |
| Echinodermata | Echinodermata Phylum organism counts | unitless |
| Kinorhynca | Kinorhynca Phylum organism counts | unitless |
| Mollusca | Mollusca Phylum organism counts | unitless |
| Nematoda | Nematoda Phylum organism counts | unitless |
| Nemertea | Nemertea Phylum organism counts | unitless |
| Platyhelminthes | Platyhelminthes Phylum organism counts | unitless |
| substrate_type | Experimental substrate (control/whale-bone/wood) | unitless |

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## Instruments

| | |
|---|---|
| **Dataset-specific Instrument Name** | stereo microscope |
| **Generic Instrument Name** | Microscope - Optical |
| **Generic Instrument Description** | Instruments that generate enlarged images of samples using the phenomena of reflection and absorption of visible light. Includes conventional and inverted instruments. Also called a "light microscope". |

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## Deployments

**OC1304A**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/568472 |
| **Platform** | R/V Oceanus |
| **Start Date** | 2013-04-03 |
| **End Date** | 2013-04-15 |

**OC1406B**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/568626 |
| **Platform** | R/V Oceanus |
| **Start Date** | 2014-06-22 |
| **End Date** | 2014-07-05 |

**CRS-1464**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/568709 |
| **Platform** | CRS-1464 |
| **Start Date** | 2013-04-05 |
| **End Date** | 2014-06-27 |
| **Description** | The investigators deployed four free-vehicle Bone-Wood Landers (BOWLs) as moorings that (1) sink autonomously to the deep-sea floor, (2) expose 9 controlled experimental substrates of whale bone, wood, or inert materials at the seafloor for months to years, and (3) upon acoustic command, enclose each experimental substrate in a sealed 500-micrometer mesh bag and returns to the ocean surface. This new BOWL technology allows controlled quantitative study of biotic colonization, biodiversity, ecosystem function and connectivity for bone, wood and other experimental substrates in the deep sea at relatively low fabrication and ship-time costs. See a PDF image of the mooring deployment sites. |

**CRS-1467**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/568710 |
| **Platform** | CRS-1467 |
| **Start Date** | 2013-04-06 |
| **End Date** | 2014-06-26 |
| **Description** | The investigators deployed four free-vehicle Bone-Wood Landers (BOWLs) as moorings that (1) sink autonomously to the deep-sea floor, (2) expose 9 controlled experimental substrates of whale bone, wood, or inert materials at the seafloor for months to years, and (3) upon acoustic command, enclose each experimental substrate in a sealed 500-micrometer mesh bag and returns to the ocean surface. This new BOWL technology allows controlled quantitative study of biotic colonization, biodiversity, ecosystem function and connectivity for bone, wood and other experimental substrates in the deep sea at relatively low fabrication and ship-time costs. See a PDF image of the mooring deployment sites. |

**CRS-1471**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/568711 |
| **Platform** | CRS-1471 |
| **Start Date** | 2013-04-08 |
| **End Date** | 2014-06-23 |
| **Description** | The investigators deployed four free-vehicle Bone-Wood Landers (BOWLs) as moorings that (1) sink autonomously to the deep-sea floor, (2) expose 9 controlled experimental substrates of whale bone, wood, or inert materials at the seafloor for months to years, and (3) upon acoustic command, enclose each experimental substrate in a sealed 500-micrometer mesh bag and returns to the ocean surface. This new BOWL technology allows controlled quantitative study of biotic colonization, biodiversity, ecosystem function and connectivity for bone, wood and other experimental substrates in the deep sea at relatively low fabrication and ship-time costs. See a PDF image of the mooring deployment sites. |

**CRS-1472**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/568712 |
| **Platform** | CRS-1472 |
| **Start Date** | 2013-04-09 |
| **End Date** | 2014-06-22 |
| **Description** | The investigators deployed four free-vehicle Bone-Wood Landers (BOWLs) as moorings that (1) sink autonomously to the deep-sea floor, (2) expose 9 controlled experimental substrates of whale bone, wood, or inert materials at the seafloor for months to years, and (3) upon acoustic command, enclose each experimental substrate in a sealed 500-micrometer mesh bag and returns to the ocean surface. This new BOWL technology allows controlled quantitative study of biotic colonization, biodiversity, ecosystem function and connectivity for bone, wood and other experimental substrates in the deep sea at relatively low fabrication and ship-time costs. See a PDF image of the mooring deployment sites. |

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## Project Information

**Biodiversity, connectivity and ecosystem function in organic-rich whale-bone and wood-fall habitats in the deep sea (BOWLS)**

**Website**: http://craigrsmithlab.com/bowls-project/

**Coverage**: Off the Oregon and Washington State coast; roughly 43.833N, 127.5W to 47.3N, 127.4W

*Description from NSF award abstract:*
Organic-rich habitat islands support specialized communities throughout natural ecosystems and often play fundamental roles in maintaining alpha and beta diversity, thus facilitating adaptive radiation and evolutionary novelty. Whale-bone and wood falls occur widely in the deep-sea and contribute fundamentally to biodiversity and evolutionary novelty; nonetheless, large-scale patterns of biodiversity, connectivity, and ecosystem function in these organic-rich metacommunity systems remain essentially unexplored.

The PIs propose a novel comparative experimental approach to evaluate bathymetric, regional, and inter-basin variations in biodiversity and connectivity, as well as interactions between biodiversity and ecosystem function, in whale-bone and wood-fall habitats at the deep-sea floor. Their experiments will use bottom landers to carry and hold samples of bone and wood and a control substrate (basalt) at two depths (1500 and 3000 m), 250-500 km apart, in the NE Pacific and SW Atlantic basins, with quantitative recovery of the colonizing assemblages 15 month later. Each depth will have three replicates. Their experiments will test fundamental hypotheses concerning biodiversity (genetic and taxonomic) and biogeography of macrofaunal and microbial organisms exploiting these resource-rich habitats in energy limited deep-sea environments, and will explore the utility of whale-bone and wood falls as model experimental systems to address patterns of connectivity and decomposer function in the deep sea.

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## Funding


| Funding Source | Award |
|---|---|
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1155188 |
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1155703 |


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