

# Presence/absence of taxa detected with the Phylochip in a sediment core collected in the Ulleng Basin in 2011

**Website:** <https://www.bco-dmo.org/dataset/746718>

**Data Type:** Other Field Results

**Version:** 1

**Version Date:** 2018-06-14

## Project

» [The Effect of Methane on Microbial Community Distributions in the Ulleung Basin](#) (Methane\_Microbes)

## Program

» [Center for Dark Energy Biosphere Investigations](#) (C-DEBI)

Contributors	Affiliation	Role
<a href="#">Briggs, Brandon</a>	Oregon State University (OSU)	Principal Investigator
<a href="#">Colwell, Frederick</a>	Oregon State University (OSU)	Co-Principal Investigator
<a href="#">Biddle, Mathew</a>	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

## Abstract

Presence/absence of taxa detected with the Phylochip in a sediment core collected in the Ulleng Basin in 2011.

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## Coverage

**Spatial Extent:** Lat:37 Lon:131

**Temporal Extent:** 2011 - 2011

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## Dataset Description

Presence/ absence of taxa detected with the Phylochip.

## Acquisition Description

In summary, sediment cores were collected using a Furor Hydraulic Piston Corer following the Integrated Ocean Drilling Program (IODP) guidelines for obtaining high quality microbiology cores. Aboard ship, whole

round cores were subcored by paring the outer two cm of sediment with an alcohol and flame sterilized chisel. The sub-cores were placed into sterile Whirl Pak Bags and stored at -80C. DNA was extracted from 10g of sediment using a PowerMax Soil DNA extraction kit. DNA was amplified using 27F and 1492R (bacterial) or 4F and 1492R (archaeal) universal primers. 150ng of bacterial and 50ng of archaeal amplicons were hybridized to the PhyloChip array.

## Processing Description

Data processing can be found in Briggs et al. (2013).

### BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- adjusted the duplicate column header HY03682 to HY03682\_A
- appended latitude and longitude fields for mapping.

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## Related Publications

Briggs, B. R., Graw, M., Brodie, E. L., Bahk, J.-J., Kim, S.-H., Hyun, J.-H., ... Colwell, F. S. (2013). Microbial distributions detected by an oligonucleotide microarray across geochemical zones associated with methane in marine sediments from the Ulleung Basin. *Marine and Petroleum Geology*, 47, 147–154.

doi:[10.1016/j.marpetgeo.2013.02.015](https://doi.org/10.1016/j.marpetgeo.2013.02.015)

*Methods*

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## Parameters

Parameter	Description	Units
Domain	Domain level phylogenetic classification	unitless
Phylum	Phylum level phylogenetic classification	unitless
Subphylum	Subphylum level phylogenetic classification	unitless
Class	Class level phylogenetic classification	unitless
Order	Order level phylogenetic classification	unitless
Family	Family level phylogenetic classification	unitless
BSR03691	Presence (1) Absence (0) in sample BSR03691	unitless
BSR03692	Presence (1) Absence (0) in sample BSR03692	unitless
BSR36165_A	Presence (1) Absence (0) in sample BSR36165_A	unitless
HY03682	Presence (1) Absence (0) in sample HY03682	unitless
HY03684	Presence (1) Absence (0) in sample HY03684	unitless
HY03685	Presence (1) Absence (0) in sample HY03685	unitless
HY03687	Presence (1) Absence (0) in sample HY03687	unitless
HY03689	Presence (1) Absence (0) in sample HY03689	unitless

HY03690	Presence (1) Absence (0) in sample HY03690	unitless
HY03672	Presence (1) Absence (0) in sample HY03672	unitless
HY03673	Presence (1) Absence (0) in sample HY03673	unitless
HY03675	Presence (1) Absence (0) in sample HY03675	unitless
HY03676	Presence (1) Absence (0) in sample HY03676	unitless
HY03682_A	Presence (1) Absence (0) in sample HY03682_A	unitless
HY36145_A	Presence (1) Absence (0) in sample HY36145_A	unitless
HY36146_A	Presence (1) Absence (0) in sample HY36146_A	unitless
HY36147_A	Presence (1) Absence (0) in sample HY36147_A	unitless
HY36148_A	Presence (1) Absence (0) in sample HY36148_A	unitless
HY36149	Presence (1) Absence (0) in sample HY36149	unitless
HY36150_A	Presence (1) Absence (0) in sample HY36150_A	unitless
HY36153_A	Presence (1) Absence (0) in sample HY36153_A	unitless
HY36154_A	Presence (1) Absence (0) in sample HY36154_A	unitless
HY36151_A	Presence (1) Absence (0) in sample HY36151_A	unitless
HY36152_A	Presence (1) Absence (0) in sample HY36152_A	unitless
SMI03648	Presence (1) Absence (0) in sample SMI03648	unitless
SMI36123_A	Presence (1) Absence (0) in sample SMI36123_A	unitless
SMI36124_A	Presence (1) Absence (0) in sample SMI36124_A	unitless
SMI03647	Presence (1) Absence (0) in sample SMI03647	unitless
SMI36126_A	Presence (1) Absence (0) in sample SMI36126_A	unitless
SMI36127_A	Presence (1) Absence (0) in sample SMI36127_A	unitless
SMI36128_A	Presence (1) Absence (0) in sample SMI36128_A	unitless
SMI03649	Presence (1) Absence (0) in sample SMI03649	unitless
SMI03650	Presence (1) Absence (0) in sample SMI03650	unitless
lon	Longitude in decimal degrees east.	decimal degrees
lat	Latitude in decimal degrees north.	decimal degrees

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## Instruments

<b>Dataset-specific Instrument Name</b>	Furor Hydraulic Piston Corer
<b>Generic Instrument Name</b>	Piston Corer
<b>Dataset-specific Description</b>	Sediment cores were collected using a Furor Hydraulic Piston Corer following the Integrated Ocean Drilling Program (IODP) guidelines for obtaining high quality microbiology cores.
<b>Generic Instrument Description</b>	The piston corer is a type of bottom sediment sampling device. A long, heavy tube is plunged into the seafloor to extract samples of mud sediment. A piston corer uses a "free fall" of the coring rig to achieve a greater initial force on impact than gravity coring. A sliding piston inside the core barrel reduces inside wall friction with the sediment and helps to evacuate displaced water from the top of the corer. A piston corer is capable of extracting core samples up to 90 feet in length.

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## Deployments

### Ulleung\_Basin\_Core

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/746765">https://www.bco-dmo.org/deployment/746765</a>
<b>Platform</b>	Unknown Platform
<b>Start Date</b>	2011-01-01
<b>End Date</b>	2011-12-31

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## Project Information

### The Effect of Methane on Microbial Community Distributions in the Ulleung Basin (Methane\_Microbes)

**Website:** <https://www.darkenergybiosphere.org/award/the-effect-of-methane-on-microbial-community-distributions-in-the-ulleung-basin/>

**Coverage:** Ulleung Basin 37 N 131 E

The DEBI/C-DEBI research exchange gave me the opportunity to travel to Lawrence Berkeley National Laboratory (LBNL) to work with Dr. Eoin Brodie. While at LBNL, I was able to learn and adopt a new microarray technology for subseafloor microbial ecology investigations. The PhyloChip is a microarray that contains probes for Bacterial and Archaeal 16s rRNA genes and uses parallel hybridization to minimize the influence of dominant organisms; therefore, it is highly sensitive to rare microbes. In addition, to this data the research exchange provided necessary funding for me to finish my dissertation. The research exchange funds allowed two sites in the Ulleung Basin to be fully analyzed and incorporated into my dissertation "Geomicrobiology of sediment containing methane". This collaboration also introduced me to how research is conducted at a national laboratory. This information is valuable in deciding my future

career path. Whatever that path may be the collaboration and techniques that I learned will continue beyond graduate school, as we are planning future studies using the PhyloChip. For more on this method, see Briggs, Pohlman, Torres, Reidel, Brodie and Colwell's 2011 AEM paper Macroscopic biofilms in fracture-dominated sediment that anaerobically oxidize methane.

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## Program Information

### Center for Dark Energy Biosphere Investigations (C-DEBI)

**Website:** <http://www.darkenergybiosphere.org>

**Coverage:** Global

The mission of the Center for Dark Energy Biosphere Investigations (C-DEBI) is to explore life beneath the seafloor and make transformative discoveries that advance science, benefit society, and inspire people of all ages and origins.

C-DEBI provides a framework for a large, multi-disciplinary group of scientists to pursue fundamental questions about life deep in the sub-surface environment of Earth. The fundamental science questions of C-DEBI involve exploration and discovery, uncovering the processes that constrain the sub-surface biosphere below the oceans, and implications to the Earth system. What type of life exists in this deep biosphere, how much, and how is it distributed and dispersed? What are the physical-chemical conditions that promote or limit life? What are the important oxidation-reduction processes and are they unique or important to humankind? How does this biosphere influence global energy and material cycles, particularly the carbon cycle? Finally, can we discern how such life evolved in geological settings beneath the ocean floor, and how this might relate to ideas about the origin of life on our planet?

C-DEBI's scientific goals are pursued with a combination of approaches:

- (1) coordinate, integrate, support, and extend the research associated with four major programs—Juan de Fuca Ridge flank (JdF), South Pacific Gyre (SPG), North Pond (NP), and Dorado Outcrop (DO)—and other field sites;
- (2) make substantial investments of resources to support field, laboratory, analytical, and modeling studies of the deep subseafloor ecosystems;
- (3) facilitate and encourage synthesis and thematic understanding of submarine microbiological processes, through funding of scientific and technical activities, coordination and hosting of meetings and workshops, and support of (mostly junior) researchers and graduate students; and
- (4) entrain, educate, inspire, and mentor an interdisciplinary community of researchers and educators, with an emphasis on undergraduate and graduate students and early-career scientists.

Note: Katrina Edwards was a former PI of C-DEBI; James Cowen is a former co-PI.

### Data Management:

C-DEBI is committed to ensuring all the data generated are publically available and deposited in a data repository for long-term storage as stated in their [Data Management Plan \(PDF\)](#) and in compliance with the [NSF Ocean Sciences Sample and Data Policy](#). The data types and products resulting from C-DEBI-supported research include a wide variety of geophysical, geological, geochemical, and biological information, in addition to education and outreach materials, technical documents, and samples. All data and information generated by C-DEBI-supported research projects are required to be made publically available either following publication of research results or within two (2) years of data generation.

To ensure preservation and dissemination of the diverse data-types generated, C-DEBI researchers are working with BCO-DMO Data Managers make data publicly available online. The partnership with BCO-

DMO helps ensure that the C-DEBI data are discoverable and available for reuse. Some C-DEBI data is better served by specialized repositories (NCBI's GenBank for sequence data, for example) and, in those cases, BCO-DMO provides dataset documentation (metadata) that includes links to those external repositories.

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## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-0939564</a>

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