

Environmental data from CTD during the Fall 2016 ESP deployment in Monterey Bay, CA

Website: <https://www.bco-dmo.org/dataset/756376>

Data Type: Other Field Results

Version: 1

Version Date: 2019-02-20

Project

» [Bacterial Taxa that Control Sulfur Flux from the Ocean to the Atmosphere](#) (OceanSulfurFluxBact)

Program

» [Dimensions of Biodiversity](#) (Dimensions of Biodiversity)

Contributors	Affiliation	Role
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Abstract

Environmental data from CTD during the Fall 2016 ESP deployment in Monterey Bay, CA. The CTD was moored next to the Environmental Sample Processor (ESP) and sampled seawater ~ every 2.5 minutes while the ESP was filtering seawater. The ESP was located near Station M0 (36.835 N, 121.901W).

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Coverage

Spatial Extent: Lat:36.835 Lon:-121.901

Temporal Extent: 2016-09-26 - 2016-11-16

Methods & Sampling

The CTD was moored next to the Environmental Sample Processor (ESP) and sampled seawater ~ every 2.5 minutes while the ESP was filtering seawater. The ESP was located near Station M0 (36.835 N, 121.901W).

Data Processing Description

BCO-DMO Processing:

- modified parameter names (removed units; replaced spaces with underscores; rearranged names that started with numbers);
- replaced "#N/A" with "nd" (no data);
- created ISO_DateTime field.

Data Files

File
2016_CTD.csv (Comma Separated Values (.csv), 59.35 KB) MD5:aa0bc30c9709da84c8579e2d6c24ff2d
Primary data file for dataset ID 756376

Parameters

Parameter	Description	Units
Datetime	Date, time, and time zone	unitless
ISO_DateTime_Local	Date and time (local) formatted to ISO8601 standard	unitless
Temperature	Water temperature	degrees Celsius
Salinity	Water salinity	psu
Depth	Sampling depth	meters (m)
Dissolved_Oxygen	Dissolved oxygen concentration	milliliters per liter (m/L)
Chlorophyll	Chlorophyll a	micrograms per liter (ug/L)
Light_Transmission	Percent light transmission	unitless (percent)
Metagenome_Sample_Name	Metagenome Sample Name	unitless
Metatranscriptome_Sample_Name	Metatranscriptome Sample Name	unitless
Ribosomal_16S_iTag_Sample_Name	16S Ribosomal iTag Sample Name	unitless
Ribosomal_18S_iTag_Sample_Name	18S Ribosomal iTag Sample Name	unitless

Instruments

Dataset-specific Instrument Name	SBE 16plus CTD
Generic Instrument Name	CTD Sea-Bird SEACAT
Generic Instrument Description	The CTD SEACAT recorder is an instrument package manufactured by Sea-Bird Electronics. The first Sea-Bird SEACAT Recorder was the original SBE 16 SEACAT developed in 1987. There are several model numbers including the SBE 16plus (SEACAT C-T Recorder (P optional)) and the SBE 19 (SBE 19plus SEACAT Profiler measures conductivity, temperature, and pressure (depth)). More information from Sea-Bird Electronics.

Dataset-specific Instrument Name	Turner Cyclops 7 fluorometer
Generic Instrument Name	Fluorometer
Generic Instrument Description	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

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Deployments

Moran_Monterey_2016

Website	https://www.bco-dmo.org/deployment/755677
Platform	Environmental Sample Processor
Start Date	2016-09-23
End Date	2016-11-16

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Project Information

Bacterial Taxa that Control Sulfur Flux from the Ocean to the Atmosphere (OceanSulfurFluxBact)

Surface ocean bacterioplankton preside over a divergence point in the marine sulfur cycle where the fate of dimethylsulfoniopropionate (DMSP) is determined. While it is well recognized that this juncture influences the fate of sulfur in the ocean and atmosphere, its regulation by bacterioplankton is not yet understood. Based on recent findings in biogeochemistry, bacterial physiology, bacterial genetics, and ocean instrumentation, the microbial oceanography community is poised to make major advances in knowledge of this control point. This research project is ascertaining how the major taxa of bacterial DMSP degraders in seawater regulate DMSP transformations, and addresses the implications of bacterial functional, genetic, and taxonomic diversity for global sulfur cycling.

The project is founded on the globally important function of bacterial transformation of the ubiquitous organic sulfur compound DMSP in ocean surface waters. Recent genetic discoveries have identified key genes in the two major DMSP degradation pathways, and the stage is now set to identify the factors that regulate gene expression to favor one or the other pathway during DMSP processing. The taxonomy of the bacteria mediating DMSP cycling has been deduced from genomic and metagenomic sequencing surveys to include four major groups of surface ocean bacterioplankton. How regulation of DMSP degradation differs among these groups and maps to phylogeny in co-occurring members is key information for understanding the marine sulfur cycle and predicting its function in a changing ocean. Using model organism studies, microcosm experiments (at Dauphin Island Sea Lab, AL), and time-series field studies with an autonomous sample collection instrument (at Monterey Bay, CA), this project is taking a taxon-specific approach to decipher the regulation of bacterial DMSP degradation.

This research addresses fundamental questions of how the diversity of microbial life influences the geochemical environment of the oceans and atmosphere, linking the genetic basis of metabolic potential to taxonomic diversity. The project is training graduate students and post-doctoral scholars in microbial biodiversity and providing research opportunities and mentoring for undergraduate students. An outreach program is enhance understanding of the role and diversity of marine microorganisms in global elemental cycles among high school students. Advanced Placement Biology students are participating in marine microbial research that covers key learning goals in the AP Biology curriculum. Two high school students are selected each year for summer research internships in PI laboratories.

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Program Information

Dimensions of Biodiversity (Dimensions of Biodiversity)

Website: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503446

Coverage: global

(adapted from the NSF Synopsis of Program)

Dimensions of Biodiversity is a program solicitation from the NSF Directorate for Biological Sciences. FY 2010 was year one of the program. [\[MORE from NSF\]](#)

The NSF Dimensions of Biodiversity program seeks to characterize biodiversity on Earth by using integrative, innovative approaches to fill rapidly the most substantial gaps in our understanding. The program will take a broad view of biodiversity, and in its initial phase will focus on the integration of genetic, taxonomic, and functional dimensions of biodiversity. Project investigators are encouraged to integrate these three dimensions to understand the interactions and feedbacks among them. While this focus complements several core NSF programs, it differs by requiring that multiple dimensions of biodiversity be addressed simultaneously, to understand the roles of biodiversity in critical ecological and evolutionary processes.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1342694

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