Diazotroph abundances (nifH gene) from multiple HOE-DYLAN cruises from July to September 2012 (C-MORE project)

Website: https://www.bco-dmo.org/dataset/553241
Data Type: Cruise Results
Version: 1
Version Date: 2023-08-15

Project
» Center for Microbial Oceanography: Research and Education (C-MORE)

Contributors	Affiliation	Role
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Abstract
This dataset contains diazotroph abundances determined using quantitative PCR (qPCR) targeting the nifH gene, from a long-term occupation of Station ALOHA in the North Pacific Subtropical Gyre (July to September 2012). The goal of this extended field sampling was to characterize temporal (diel to seasonal) variability in microbial processes, and link these changes to the biogeochemistry of the region. Part of this entailed characterizing the temporal and spatial dynamics of the diazotroph (N2-fixing) community.

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Coverage

Spatial Extent: **Lat**:22.75 **Lon**:-158
Temporal Extent: 2012-07-09 - 2012-09-03

Dataset Description

Diazotroph abundances (nifH gene).

Oligotrophic waters 100 miles north of Oahu, Hawaii, near Station ALOHA (22.75 N, 158.00 W).

Hawaii Ocean Experiment - Dynamics of Light and Nutrients (HOE-DYLAN)

BCO-DMO Processing Description

The date column in the submitted file was converted to a format YYYY-MM-DD

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Data Files

File
HOE_DYLAN diazotroph observations filename: 553241_v1_hoe_dylan_cruises_diazotrophs.csv (Comma Separated Values (.csv), 4.40 KB) MD5:d9254f474f94eff67e89502dcb76f832 Primary data table for dataset #553241 V1

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Parameters

Parameter	Description	Units
cruise_id	cruise name	unitless
sta	station number	unitless
date	sampling date (UTC)	unitless
lat	latitude	decimal degrees (South is negative)
lon	longitude	decimal degrees (West is negative)
depth	depth	meters
UCYN_A	cyanobacterium UCYN-A (average total)	copies/liter
UCYN_A_log_xplus1_DNA	cyanobacterium UCYN-A log(x+1) DNA	copies/liter
UCYN_A2	cyanobacterium UCYN-A2 (average total)	copies/liter
UCYN_A2_log_xplus1_DNA	cyanobacterium UCYN-A2 log(x+1) DNA	copies/liter
UCYN_B	cyanobacterium UCYN-B (average total)	copies/liter
UCYN_B_log_xplus1_DNA	cyanobacterium UCYN-B log(x+1) DNA	copies/liter
g_Pia	gammaproteobacterium Gamma Pia (average total)	copies/liter
g_Pia_log_xplus1_DNA	gammaproteobacterium Gamma Pia log(x+1) DNA	copies/liter
Het_1	heterotrophic strain Het 1 (average total)	copies/liter
Het_1_log_xplus1_DNA	heterotrophic strain Het 1 log(x+1) DNA	copies/liter
Het_2	heterotrophic strain Het 2 (average total)	copies/liter
Het_2_log_xplus1_DNA	heterotrophic strain Het 2 log(x+1) DNA	copies/liter
tricho	Trichodesmium (average total)	copies/liter
tricho_log_xplus1_DNA	Trichodesmium log(x+1) DNA	copies/liter

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Instruments

Dataset-specific Instrument Name	CTD Sea-Bird SBE 911plus
Generic Instrument Name	CTD Sea-Bird SBE 911plus
Generic Instrument Description	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Niskin bottle
Generic Instrument Name	Niskin bottle
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.

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Deployments

KM1215

Website	https://www.bco-dmo.org/deployment/59101
Platform	R/V Kilo Moana
Start Date	2012-07-08
End Date	2012-07-28
Description	In the summer of 2012, C-MORE conducted a "continuous" long-term field experiment at Station ALOHA to observe and interpret temporal variability in microbial processes, and the consequences for ecological dynamics and biogeochemical cycling. Special focus was given to time-space coupling because proper scale sampling of the marine environment is an imperative, but generally neglected aspect of marine microbiology. Hawaii Ocean Experiment - Dynamics of Light and Nutrients (HOE-DYLAN)

KM1217

Website	https://www.bco-dmo.org/deployment/59103
Platform	R/V Kilo Moana
Start Date	2012-08-05
End Date	2012-08-14
Description	In the summer of 2012, C-MORE conducted a "continuous" long-term field experiment at Station ALOHA to observe and interpret temporal variability in microbial processes, and the consequences for ecological dynamics and biogeochemical cycling. Special focus was given to time-space coupling because proper scale sampling of the marine environment is an imperative, but generally neglected aspect of marine microbiology. Hawaii Ocean Experiment - Dynamics of Light and Nutrients (HOE-DYLAN)

KM1219

Website	https://www.bco-dmo.org/deployment/59105
Platform	R/V Kilo Moana
Start Date	2012-08-22
End Date	2012-09-11
Description	In the summer of 2012, C-MORE conducted a "continuous" long-term field experiment at Station ALOHA to observe and interpret temporal variability in microbial processes, and the consequences for ecological dynamics and biogeochemical cycling. Special focus was given to time-space coupling because proper scale sampling of the marine environment is an imperative, but generally neglected aspect of marine microbiology. Hawaii Ocean Experiment - Dynamics of Light and Nutrients (HOE-DYLAN)

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Project Information

Center for Microbial Oceanography: Research and Education (C-MORE)

Website: http://cmore.soest.hawaii.edu/

Coverage: North Pacific Subtropical Gyre (large region around 22 45 N, 158 W)

Project summary

The **Center for Microbial Oceanography: Research and Education** (C-MORE) is a recently established (August 2006; NSF award: EF-0424599) NSF-sponsored Science and Technology Center designed to facilitate a more comprehensive understanding of the diverse assemblages of microorganisms in the sea, ranging from the genetic basis of marine microbial biogeochemistry including the metabolic regulation and environmental controls of gene expression, to the processes that underpin the fluxes of carbon, related bioelements and energy in the marine environment. Stated holistically, C-MORE's primary mission is: *Linking Genomes to Biomes*.

We believe that the time is right to address several major, long-standing questions in microbial oceanography. Recent advances in the application of molecular techniques have provided an unprecedented view of the structure, diversity and possible function of sea microbes. By combining these and other novel approaches with more well-established techniques in microbiology, oceanography and ecology, it may be possible to develop a meaningful predictive understanding of the ocean with respect to energy transduction, carbon sequestration, bioelement cycling and the probable response of marine ecosystems to global environmental variability and climate change. The strength of C-MORE resides in the synergy created by bringing together experts who traditionally have not worked together and this, in turn, will facilitate the creation and dissemination of new knowledge on the role of marine microbes in global habitability.

The new Center will design and conduct novel research, broker partnerships, increase diversity of human resources, implement education and outreach programs, and utilize comprehensive information about microbial life in the sea. The Center will bring together teams of scientists, educators and community members who otherwise do not have an opportunity to communicate, collaborate or design creative solutions to long-term ecosystem scale problems. The Center's research will be organized around four interconnected themes:

- (Theme I) microbial biodiversity,
- (Theme II) metabolism and C-N-P-energy flow,
- (Theme III) remote and continuous sensing and links to climate variability, and
- (Theme IV) ecosystem modeling, simulation and prediction.

Each theme will have a leader to help coordinate the research programs and to facilitate interactions among the other related themes. The education programs will focus on pre-college curriculum enhancements, in service teacher training and formal undergraduate/graduate and post-doctoral programs to prepare the next generation of microbial oceanographers. The Center will establish and maintain creative outreach programs to help diffuse the new knowledge gained into society at large including policymakers. The Center's activities will be dispersed among five partner institutions:

- Massachusetts Institute of Technology,
- Woods Hole Oceanographic Institution,
- Monterey Bay Aquarium Research Institute,
- University of California at Santa Cruz and
- Oregon State University

and will be coordinated at the University of Hawaii at Manoa.

Related Files:

Strategic plan (PDF file)

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Funding

Funding Source	Award
NSF Division of Biological Infrastructure (NSF DBI)	DBI-0424599

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