Cruise track from R/V Atlantic Explorer AE0914 in the BATS site from June 2009 (Ocean Microbial Observatory project)

Website: https://www.bco-dmo.org/dataset/543610
Data Type: Cruise Results
Version: 1
Version Date: 2014-12-22

Project
» Transitions in the Surface Layer and the Role of Vertically Stratified Microbial Communities in the Carbon Cycle - An Oceanic Microbial Observatory (Ocean Microbial Observatory)

Contributors	Affiliation	Role
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Abstract
Cruise track from R/V Atlantic Explorer AE0914 in the BATS site from June 2009.

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Coverage

Spatial Extent: **N**:-64.491508 **E**:32.380002 **S**:-64.666257 **W**:32.125982
Temporal Extent: 2009-06-30 - 2009-07-01

Dataset Description

Cruise track from R/V Atlantic Explorer AE0914 in the BATS site from June 2009.

Methods & Sampling

Control point navigation was obtained from the R2R catalog: http://www.rvdata.us/catalog/AE0914

Data Processing Description

BCO-DMO Processing Notes
- Data obtained from R2R site
- Added parameter header

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Data Files

File
cruise_track_AE0914.csv (Comma Separated Values (.csv), 1009 bytes) MD5:1e46a8d8c74db0ea9136ce460f96eaaf Primary data file for dataset ID 543610

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Parameters

Parameter	Description	Units
lat	Latitude component of geographic position; north is positive.	Decimal degrees
lon	Longitude component of geographic position; east is positive.	Decimal degrees
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted. This standard is based on ISO 8601:2004(E) in YYYY-MM-DDTHH:MM:SS[.xx]Z format.	unitless

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Instruments

Dataset-specific Instrument Name	GPS
Generic Instrument Name	Global Positioning System Receiver
Generic Instrument Description	The Global Positioning System (GPS) is a U.S. space-based radionavigation system that provides reliable positioning, navigation, and timing services to civilian users on a continuous worldwide basis. The U.S. Air Force develops, maintains, and operates the space and control segments of the NAVSTAR GPS transmitter system. Ships use a variety of receivers (e.g. Trimble and Ashtech) to interpret the GPS signal and determine accurate latitude and longitude.

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Deployments

AE0914

Website	https://www.bco-dmo.org/deployment/543340
Platform	R/V Atlantic Explorer
Start Date	2009-06-30
End Date	2009-07-01
Description	Cruise for project "Microbial Observatory: Community Structure in the Carbon Cycle"

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Project Information

Transitions in the Surface Layer and the Role of Vertically Stratified Microbial Communities in the Carbon Cycle - An Oceanic Microbial Observatory (Ocean Microbial Observatory)

Website: http://www.bios.edu/research/projects/oceanic-microbial-observatory/

Coverage: Bermuda Atlantic Time-Series study site

(*Adapted from the NSF award abstract*)

The premise of this project is that stratified bacterioplankton clades engage in specialized biogeochemical activities that can be identified by integrated oceanographic and microbiological approaches. Specifically, the objective of this project is to assess if the mesopelagic microbial community rely on diagenetically altered organic matter and subcellular fragments that are produced by microbial processes in the euphotic zone and delivered into the upper mesopelagic by sinking or mixing. In past efforts this microbial observatory had greater success cultivating members of the euphotic zone microbial community, and revealed an unanticipated growth requirement for reduced sulfur compounds in alphaproteobacteria of the SAR11 clade. Genomic information showed that intense competition for substrates imposes trade-offs on bacterioplankton - there are regions of N dimensional nutrient space where specialists win. We postulate that specific growth requirements may explain some the regular spatial and temporal patterns that have been observed in upper mesopelagic bacterioplankton communities, and the difficulties of culturing some of these organisms.

The specific objectives of this project are: 1) to produce 13C and 15N labeled subcellular (e.g., soluble, cell wall, and membrane) and DOM fractions from photosynthetic plankton cultures and use stable isotope probing to identify specific clades in the surface and upper mesopelagic microbial community that assimilate fractions of varying composition and lability. 2) to use fluorescence in situ hybridization approaches to monitor temporal and spatial variability of specific microbial populations identified from the SIP and HTC experiments. To increase resolution we will use CARD-FISH protocols. 3) to measure the proteomes of bacterioplankton communities to identify highly translated genes in the surface layer and upper mesopelagic, and community responses to seasonal nutrient limitation. 4) and, to cultivate these organisms via high throughput culturing (HTC) by pursuing the hypothesis that they require specific nutrient factors and/or diagenetically altered organic substrates. Complete genome sequences from key organisms will be sought and used as queries to study patterns of natural variation in genes and populations that have been associated with biogeochemically important functions.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0802004

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