5m intervals of CTD profiles from R/V New Horizon cruise NH1315 in the Eastern Tropical North Pacific (ETNP) during June 2013

Website: https://www.bco-dmo.org/dataset/822818
Data Type: Cruise Results
Version: 1
Version Date: 2020-08-31

Project
» Ecology and biogeochemical impacts of viruses in marine oxygen minimum zones (OMZ Viruses)

Contributors	Affiliation	Role
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Abstract
5m intervals of CTD profiles from R/V New Horizon cruise NH1315 in the Eastern Tropical North Pacific (ETNP) during June 2013.

Table of Contents

Coverage

Spatial Extent: **N**:18.92 **E**:-104.89 **S**:18.92 **W**:-108.799
Temporal Extent: 2013-06-19 - 2013-06-22

Dataset Description

Processed CTD data from R/V New Horizon cruise NH1315, Eastern Tropical North Pacific, June 2013.

Data Processing Description

BCO-DMO Processing:
- added station number as a column;
- added station latitude and longitude;
- added date (from related dataset https://www.bco-dmo.org/dataset/629125).

[table of contents | back to top]

Data Files

File
ctd.csv(Comma Separated Values (.csv), 26.38 KB) MD5:4bff6f90fcef20527d3c00e2d945b5e8 Primary data file for dataset ID 822818

[table of contents | back to top]

Related Datasets

Different Version

Stewart, F. J. (2015) **Upcast CTD profiles from R/V Pelican cruise PE16-01 from the Louisiana Shelf (hypoxic zone) and Gulf of Mexico from 2013 to 2104 (OMZ_Sulfur_Cycling project).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 15 December 2015) Version Date 2015-12-15 http://lod.bco-dmo.org/id/dataset/629125 [view at BCO-DMO]
Relationship Description: The "CTD Profiles - Upcasts" data have been binned in dataset "ETNP CTD casts 5m intervals".

[table of contents | back to top]

Parameters

Parameter	Description	Units
Station	Station number	unitless
Latitude	Station latitude	degrees North
Longitude	Station longitude	degrees East
Date	Date; format: YYYY-MM-DD	unitless
Depth_db	Depth	decibars (db)
Depth	Depth	meters (m)
Fluorescence	Fluorescence	fsu
Oxygen	Oxygen	micromoles per kilogram (umol/kg)
Salinity	Salinity	psu
Temperature	Temperature	degrees Celsius

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	CTD unit, SBE 911 plus
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	Fluorometer, Seapoint
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.

Dataset-specific Instrument Name	Oxygen sensor, SBE 43
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

[table of contents | back to top]

Deployments

NH1315

Website	https://www.bco-dmo.org/deployment/628427
Platform	R/V New Horizon
Start Date	2013-06-13
End Date	2013-06-28
Description	Oxygen Minimum Zone Microbial Biogeochemistry Expedition (OMZoMBiE) Proposed Sampling Stations Cruise information and original data are available from the NSF R2R data catalog.

[table of contents | back to top]

Project Information

Ecology and biogeochemical impacts of viruses in marine oxygen minimum zones (OMZ Viruses)

NSF Award Abstract:
Marine oxygen minimum zones (OMZs) are regions of the world's oceans that have low or no oxygen. Often referred to as "dead zones" because of their lack of larger organisms, OMZs actually support specific microbial communities adapted to survive in these low-oxygen regions. These microbes perform metabolic processes that produce greenhouse gases such as methane, and significantly alter global nitrogen budgets. In turn, viruses can alter every aspect of microbial communities by causing mortality and altering microbial functions; yet we know little regarding how viruses affect OMZ ecosystems, which is limiting our ability to predict future changes to the Earth system as these OMZs expand over time. This proposed research seeks to fill this knowledge gap by examining the types of viruses that are present in OMZs, as well as how they alter microbial communities and their impact on global processes. In the broader perspective, this proposed work will provide extensive datasets for 7 marine OMZ regions that can be interrogated through publically-available analysis tools, thus enabling environmental science for both research and educational purposes including real-world research experience in undergraduate classes to strengthen scientific education. One postdoc, two graduate students, and undergraduate students will be trained and mentored during this project. Furthermore, the work will facilitate international collaboration with leading microbial oceanographers from across the world.

This project will use recent advances in quantitative environmental viral analysis to rapidly enhance our knowledge of OMZ viral communities through examination of 100s of samples from 7 globally-distributed marine OMZ regions with varying levels of oxygen depletion. The specific aims of the project are to (i) gain a basic understanding of viral abundances, viral-induced microbial mortality, and viral community structure, as well as the environmental conditions that drive differences in these parameters, and (ii) assess the effects of viruses on nutrient and gas cycling in OMZs. These aims will be accomplished through analyzing viral metagenomes to assess how viral communities differ among the 7 diverse OMZ regions, and how they diverge from communities in oxygenated waters. Further, the viral metagenomes will be coupled with microbial metagenomes to assess virus-host dynamics and the effects of viral-induced mortality on microorganisms performing key metabolic functions. Finally, the abundance and expression of viral-encoded metabolic genes will be used to perform gene-based biogeochemical modeling to determine the extent of viral influences in OMZ biogeochemical cycling.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1658040

[table of contents | back to top]