CTD profiles from R/V Point Sur cruise PS1312 off the Central California Coast from June to July of 2013 (Diatom Group Si Prod project)

Website: https://www.bco-dmo.org/dataset/701338
Data Type: Cruise Results
Version:
Version Date: 2017-08-30

Project
» Group-Specific Diatom Silica Production in a Coastal Upwelling System (Diatom Group Si Prod)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:38.26483 **E**:-121.969 **S**:36.448 **W**:-123.977
Temporal Extent: 2013-06-27 - 2013-07-05

Dataset Description

This dataset includes temperature, salinity, pressure, depth, sigma-theta density, PAR, fluorescence, and dissolved oxygen from CTD profiles collected during the R/V Point Sur cruise PS13-12 between 2013-06-27 2013-07-05.

The data are available by clicking the "Get Data" button on this page.

Original .asc files submitted to BCO-DMO are available for download as a zip file:
CTD profile .asc files (268 KB ZIP, 914 KB uncompressed)
* The "BCO-DMO Data Manager Processing Notes" in the Processing section of this page do not apply to these originally submitted .asc files

Methods & Sampling

Multiple hydrocasts were conducted at stations using a SeaBird CTD with redundant sensors for temperature and conductivity; the instrument package was owned and operated by the R/V Point Sur (Moss Landing Marine Laboratories, Moss Landing, California). Prior to the cruise, the transmissometer was not calibrated and many

data anomalies were observed; therefore, transmissometer data are suspect.

Data Processing Description

All hydrocast data was processed to1-m bins.

BCO-DMO Data Manager Processing Notes:
* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions
* blank values replaced with no data value 'nd'
* added ISO DateTime UTC which was generated from Date and Time values
* special characters in data parameter names replaced
* changed precision %.3 except Spar %.2f
* used date/time local and zulu, lat, lon, cast number from provided event log
* added comment "redo cast 3 as there were bad bottles" from bottle file comment
* changed column Cruise to Cruise_name
* added column Cruise with value PS13-12 to match other datasets

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Data Files

File
CTD.csv (Comma Separated Values (.csv), 868.99 KB) MD5:c125bcd8b783804901aeb24a42a8a2d0 Primary data file for dataset ID 701338

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Parameters

Parameter	Description	Units
Cast_NUM	CTD cast number	unitless
Cruise	Cruise identifier	unitless
Cruise_name	Cruise name	unitless
Latitude	Latitude in decimal degrees	unitless
Longitude	Longitude in decimal degrees	unitless
Date_Local	Date (local) in format mmm dd yyyy	unitless
Time_Local	Time (local) in format HH:MM:SS	unitless
Date_Zulu	Date (UTC) in format mmm dd yyyy	unitless
Time_Zulu	Time (UTC) in format HH:MM:SS	unitless
ISO_DateTime_UTC	ISO timestamp based on the ISO 8601:2004(E) standard in format YYYY-mm-ddTHH:MMZ (UTC)	unitless
Comment	Comment about cast	unitless
Depth	Depth from CTD (Seasave parameter DepSM)	meters (m)
Pressure	Pressure from CTD (Seasave parameter PrDM)	decibars (db)
Temperature0	Primary temperature from CTD (Seasave parameter T090C)	degrees Celsius
Temperature1	Secondary temperature from CTD (Seasave parameter T190C)	degrees Celsius
Conductivity0	Primary conductivity from CTD (Seasave parameter C0S/m)	Siemens per meter (S/m)
Conductivity1	Secondary conductivity from CTD (Seasave parameter C1S/m)	Siemens per meter (S/m)
Salinity0	Primary salinity from CTD (Seasave parameter Sal00)	Practical Salinity Units (PSU)
Salinity1	Secondary sailinity from CTD (Seasave parameter Sal11)	Practical Salinity Units (PSU)
Density0	Primary sigma-theta from CTD (Seasave parameter Sigma/e00)	kilograms per meter cubed (kg/m3)
Density1	Primary sigma-theta from CTD (Seasave parameter Sigma/e11)	kilograms per meter cubed (kg/m3)
Fluorescence	Fluorescence from Wet Labs ECO-AFL sensor on CTD (Seasave parameter FlECO/AFL)	milligrams per meter cubed (mg/m3)
Oxygen	Dissolved Oxygen from CTD (Seasave parameter Sbeox0Mm/Kg)	micromoles per kilogram (umol/kg)
PAR	Photosynthetically Active Radiation (PAR) from CTD (Seasave parameter Par)	microeinsteins per square meter per second (uE/m2/s)
Surface_PAR	Surface Photosynthetically Active Radiation (PAR) from CTD (Seasave parameter Spar)	microeinsteins per square meter per second (uE/m2/s)
Corrected_PAR	Corrected Irradiance from CTD (Seasave parameter Cpar)	percent (%)

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	CTD Sea-Bird 9
Dataset-specific Description	Sensor and calibration information for all casts can be found in the original .btl file zip file available on the dataset landing page: https://www.bco-dmo.org/dataset/701430
Generic Instrument Description	The Sea-Bird SBE 9 is a type of CTD instrument package. The SBE 9 is the Underwater Unit and is most often combined with the SBE 11 Deck Unit (for real-time readout using conductive wire) when deployed from a research vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorometer, altimeter, etc.). Note that in most cases, it is more accurate to specify SBE 911 than SBE 9 since it is likely a SBE 11 deck unit was used. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Fluorometer, WET Labs ECO-AFL/FL
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	PAR/Irradiance, Biospherical/Licor
Generic Instrument Name	LI-COR Biospherical PAR Sensor
Generic Instrument Description	The LI-COR Biospherical PAR Sensor is used to measure Photosynthetically Available Radiation (PAR) in the water column. This instrument designation is used when specific make and model are not known.

Dataset-specific Instrument Name	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

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Deployments

PS1312

Website	https://www.bco-dmo.org/deployment/701341
Platform	R/V Point Sur
Start Date	2013-06-27
End Date	2013-07-06
Description	Cruise DOI: 10.7284/903425

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Project Information

Group-Specific Diatom Silica Production in a Coastal Upwelling System (Diatom Group Si Prod)

Coverage: In-, and off-shore, between Monterey Bay and Bodega Bay, CA

This study will examine the distribution of silica production among diatom species, using a novel combination of existing approaches, to evaluate the contributions of specific species or genera to total diatom silica production. Specific hypotheses regarding the distribution of silica production among species of diatoms will be tested by exploiting the strong contrasts in diatom community structure and silica production between a coastal upwelling system and in an oligotrophic subtropical gyre. Several lines of evidence support the idea that the diatoms responsible for the majority of silica production shifts from the most numerically abundant species in coastal systems to relatively rare, but very large, cells in offshore oligotrophic environments. This shift alters the role of diatoms in regional food webs and because many processes determining the role of phytoplankton groups in biogeochemical cycles are a function of cell size, such a shift has strong implications for regional differences in the contribution of diatoms to upper-ocean carbon cycling and the biological pump.

This study also seeks to understand of the role of silicon limitation in regulating diatom silica production at the species level. Si limitation of silica production has been detected in every system examined to date, ranging from the high Si waters of the Antarctic, to coastal upwelling systems and the oligotrophic subtropical gyres. Field studies of Si limitation are rarely accompanied by examination of the species present. When studies do have taxonomic data the lack of information on the performance of individual species makes it impossible to allocate the measured rates among cells, potentially leading to erroneous conclusions about the contribution of specific diatom groups to community composite rates.

The project will test five hypotheses. Each is related to the general theme of using species-specific data to improve understanding of the factors regulating diatoms' role in marine food webs. By combining bulk measures of silica production using the radioisotope 32Si with quantitative measures of silicon deposition rates by individual cells using the fluorescent probe 2-(4-pyridyl)-5((4-(2-dimethylaminoethyl-aminocarbamoyl)-methoxy)phenyl)oxazole, or PDMPO, the following will be determined: species-specific diatom contributions to total community silica production, regional differences in the distribution of silica production among diatom species as a function of cell size, species-specific kinetic parameters governing the ability of species to compete for dissolved silicon, and whether dominance of a particular diatom group or species can be explained by knowledge of their capacity to utilize Si and their numerical abundance (as opposed to other factors such as grazing or limitation by other nutrients).

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1155663

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