Log of sampling events from R/V Point Sur cruises PS1009 and PS1103 in the Santa Barbara Channel from 2010-2011 (SBDOM project, SBC LTER project)

Website: https://www.bco-dmo.org/dataset/3693

Data Type: Cruise Results

Version: 2

Version Date: 2014-07-07

Project

» Mechanisms controlling the production and fate of DOM during diatom blooms (SBDOM)

» Santa Barbara Coastal Long Term Ecological Research site (SBC LTER)

Program

» Long Term Ecological Research network (LTER)

Contributors	Affiliation	Role
Carlson, Craig	University of California-Santa Barbara (UCSB-MSI)	Chief Scientist
Brzezinski, Mark	University of California-Santa Barbara (UCSB-MSI)	Co-Chief Scientist
Wear, Emma	University of California-Santa Barbara (UCSB)	Student
Windecker, Laura	University of California-Santa Barbara (UCSB)	Student
Halewood, Elisa	University of California-Santa Barbara (UCSB-MSI)	Data Manager
Rauch, Shannon	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

Log of events recorded during SBDOM deployments PS1009 (also known as SBDOM10) and PS1103 (SBDOM11).

Table of Contents

Coverage

Spatial Extent: **N**:34.43348 **E**:-119.41123 **S**:34.0984 **W**:-120.69275

Temporal Extent: 2010-04-09 - 2011-05-16

Dataset Description

Log of events recorded during SBDOM deployments PS1009 (also known as SBDOM10) and PS1103 (SBDOM11). See more information about cruises [PS1009](#) and [PS1103](#) in the R2R Cruise Catalog (http://www.rvdata.us/catalog/PS1009, http://www.rvdata.us/catalog/PS1103).

Acquisition Description

CTD, Triaxus, and experimental water sampling occurred from R/V Point Sur in April 2010 and May 2011.

Processing Description

Parameter names were modified to conform with BCO-DMO conventions; blanks were replaced with 'nd' to indicate no data.

Parameters

Parameter	Description	Units
cruise_name	Name of the cruise/deployment.	text
year	Four-digit year.	YYYY
event	Unique event number.	YYYYmmddHHMM
date_gmt	Date, GMT time.	mm/dd/yy
month_gmt	Two-digit month of year, GMT (01 to 12).	mm
day_gmt	Two-digit day of month, GMT (01 to 31).	dd
time_gmt	Time, GMT.	HHMM
date_local	Date, local time. Local time = GMT - 7hrs.	mm/dd/yy
time_local	Time, local. Local time = GMT - 7hrs.	HHMM
lat	Latitude in decimal degrees. North = positive.	decimal degrees
lon	Longitude in decimal degrees. East = positive.	decimal degrees
sta_id	Station identification.	text
depth_bottom	Bottom depth.	meters
activity	Type of sampling activity: BiB = mesocosm experiment BAG = DOM consumption bag test TRIX = Triaxus	text
sample	Consecutive sample number.	dimensionless
sample_type	Types of samples collected.	text
comment	Free-text comments about the sampling event.	text
ISO_DateTime_UTC	Date and time (UTC) formatted to ISO8601 standard. T indicates start of time string; Z indicates UTC.	YYYY-mm-ddTHH:MM:SS.ssZ
cruise_id	Official cruise identifier.	text

Deployments

PS1009

Website	https://www.bco-dmo.org/deployment/58833
Platform	R/V Point Sur
Report	http://dmoserv3.whoi.edu/data_docs/SBDOM/SBDOM10_cruise_plan.doc
Start Date	2010-04-09
End Date	2010-04-18
Description	Triaxus and CTD operations within the Santa Barbara Channel. Collected samples for particulates and dissolved constituents. Made determinations of primary production by 14C and 32Si incorporation using on-deck incubator. Measurements of microbial activity, biomass and DNA. 3H-Leucine used to assess bacterial production. Conducted deckboard incubation experiments. See information on PS1009 in the R2R Cruise Catalog.

PS1103

Website	https://www.bco-dmo.org/deployment/517703
Platform	R/V Point Sur
Report	http://dmoserv3.whoi.edu/data_docs/SBDOM/SBDOM11_cruise_plan.doc
Start Date	2011-05-07
End Date	2011-05-20
Description	Triaxus and CTD operations within the Santa Barbara Channel. Collected samples for particulates and dissolved constituents. Made determinations of phytoplankton productivity using 14C, 15NO3 and 32Si incorporation using on-deck incubator. Measurements of microbial activity, biomass and DNA. 3H-Leucine will be used to assess bacterial production. Â Â Conducted deck board incubation experiments. See information on PS1103 in the R2R Cruise Catalog.

Project Information

Mechanisms controlling the production and fate of DOM during diatom blooms (SBDOM)

Coverage: Pacific California, Santa Barbara Channel

This project is also affiliated with the Plumes and Blooms project. Data: The following data files have been submitted to BCO-DMO but are not yet available online. Data are restricted until June 2016. Please contact the PI for access prior to public availability: -- SBDOM10 and SBDOM11 CTD and Niskin bottle data. The following are available online (see 'Datasets' heading below): -- SBDOM10 and SBDOM11 cruise plans (available online on deployment pages: PS1009, PS1103) -- SBDOM10 and SBDOM11 event logs (available online; see 'Datasets' below) -- Laboratory-based Bloom in a Bottle (BIB) Experiment -- Laboratory-based Remineralization Experiments -- SBDOM10 and SBDOM11 data summaries (including CTD data, nutrients, and bacterial production) Project Description from NSF Award Proposal and Abstract: Diatom blooms are known to produce prodigious quantities of DOM upon entering nutrient stress with a chemical composition that varies with the type of nutrient limitation (Si or N). This variable composition likely influences the nutritional value of DOM to microbes driving species successions towards functional groups of heterotrophic prokaryotes that are best able to metabolize particular forms of DOM. To date each side of this coupled system of production/consumption has been examined independently. A few studies have examined how limitation by different limiting nutrients affects the chemical character of the DOM produced by phytoplankton, while others have focused on the fate of DOM without detailed understanding of the mechanisms influencing its initial chemical composition. We propose to investigate the mechanisms determining the character and fate of DOM produced during temperate diatom blooms. Specifically we will investigate how physiological stress on diatoms induced by different limiting nutrients influences the production, chemical composition of DOM and the microbial community structure that respond to it to better understand the mechanisms driving the accumulation and persistence of DOM in marine systems. The research will involve both laboratory and field experiments. The novel aspects of this work are: 1) We will investigate how limitation by either N or Si impacts the quantity and chemical composition of the DOM released by diatoms. 2) Assess how the differences in the chemical composition of the DOM produced under N or Si limitation affect its lability by examining the productivity, growth efficiency and community structure of heterotrophic bacterioplankton responding to the release of substrates. 3) Predicted DOM dynamics based on (1) and (2) will be tested in the field during diatom blooms in the Santa Barbara Channel, California. While experiments investigating aspects of either 1 or 2 have been conducted successfully in the past (Lancelot, 1983; Billen and Fontigny, 1987; Goldman et al., 1992; Carlson et al.,1999; Cherrier and Bauer, 2004; Conan et al., 2007) ours will be the first study to combine these approaches in an integrated assessment of the mechanisms governing both the production and fate of DOM produced by diatom blooms experiencing limitation by different nutrients.

References: Lancelot, C. (1983). Factors affecting phytoplankton extracellular release in the Southern Bight of the North Sea. Marine Ecology Progress Series 12: 115-121. Billen, G. and A. Fontigny (1987). Dynamics of a Phaeocystis -dominated spring bloom in Belgian coastal waters. II. Bacterioplankton dynamics. Mar. Ecol. Prog. Ser. 37: 249-257. Goldman, J.C., D.A. Hansell and M.R. Dennett (1992). Chemical characterization of three large oceanic diatoms: potential impact on water column chemistry. Marine Ecology Progress Series 88: 257-270. Carlson, C.A., N.R. Bates, H.W. Ducklow and D.A. Hansell (1999). Estimation of bacterial respiration and growth efficiency in the Ross Sea, Antarctica. Aquatic Microbial Ecology 19: 229-244. Cherrier, J. and J.E. Bauer (2004). Bacterial utilization of transient plankton-derived dissolved organic carbon and nitrogen inputs in surface ocean waters. Aquatic Microbial Ecology 35(3): 229-241. Conan, P., M. Sondegaard, T. Kragh, F. Thingstad, M. Pujo-Pay, P.J.l.B. Williams, S. Markager, G. Cauwet, N.H. Borch, D. Evans and B. Rieman (2007). Partitioning of organic production in marine plankton communities: The effects of inorganic nutrient ratios and community composition on new dissolved organic matter. Limnology and Oceanography 52(2): 753-765.

Santa Barbara Coastal Long Term Ecological Research site (SBC LTER)

Website: http://sbc.lternet.edu/

Coverage: Southern California Coastal Zone

From http://www.lternet.edu/sites/sbc The Santa Barbara Coastal LTER is located in the coastal zone of southern California near Santa Barbara. It is bounded by the steep east-west trending Santa Ynez Mountains and coastal plain to the north and the unique Northern Channel Islands archipelago to the south. Santa Barbara Coastal Long-Term Ecological Research (SBC) Project is headquartered at the University of California, Santa Barbara, and is part of the National Science Foundation's (NSF) Long-Term Ecological Research (LTER) Network. The research focus of SBC LTER is on ecological systems at the land-ocean margin. Although there is increasing concern about the impacts of human activities on coastal watersheds and nearshore marine environments, there have been few long-term studies of the linkages among oceanic, reef, sandy beaches, wetland, and upland habitats. SBC LTER is helping to fill this gap by studying the effects of oceanic and coastal watershed influences on kelp forests in the Santa Barbara Channel located off the coast of southern California. The primary research objective of SBC LTER is to investigate the relative importance of land vs. ocean processes in structuring giant kelp (Macrocystis pyrifera) forest ecosystems for different conditions of land use, climate and ocean influences. SBC LTER Data: The Santa Barbara Coastal (SBC) LTER data are managed by and available directly from the SBC project data site URL shown above. If there are any datasets listed below, they are data sets that were

collected at or near the SBC LTER sampling locations, and funded by NSF OCE as ancillary projects related to the SBC LTER core research themes. See the SBC LTER Data Overview page for access to data and information about data management policies.

Program Information

Long Term Ecological Research network (LTER)

Website: http://www.lternet.edu/

Coverage: United States

adapted from http://www.lternet.edu/ The National Science Foundation established the LTER program in 1980 to support research on long-term ecological phenomena in the United States. The Long Term Ecological Research (LTER) Network is a collaborative effort involving more than 1800 scientists and students investigating ecological processes over long temporal and broad spatial scales. The LTER Network promotes synthesis and comparative research across sites and ecosystems and among other related national and international research programs. The LTER research sites represent diverse ecosystems with emphasis on different research themes, and cross-site communication, network publications, and research-planning activities are coordinated through the LTER Network Office. 2017 LTER research site map obtained from https://lternet.edu/site/lter-network/

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0850857