

Scientific sampling event log from R/V Knorr cruise KN207-01 in the southern tip of Nova Scotia to Bermuda in 2012 (SargassoSeaLipids project)

Website: <https://www.bco-dmo.org/dataset/3661>

Version: 17 July 2012

Version Date: 2012-07-17

Project

» [Biogeochemical Impact and Fate of Non-phosphorus Membrane Lipids in the Sargasso Sea](#)
(SargassoSeaLipids)

Program

» [Ocean Carbon and Biogeochemistry](#) (OCB)

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Dataset Description

The science party maintained a digital event log, recording all instrument deployments and significant events during the KN207-01 cruise. Post-cruise time and position corrections have been made (refer to comments column).

Methods & Sampling

The event log was created using the Rolling Deck to Repository (R2R) event log application (ELOG). The log includes a record of all scientific sampling events from the cruise. In addition to event identification numbers unique for the cruise, the scientific sampling event log includes date and time (GMT), position (latitude and longitude), station and cast identifier as appropriate to the sampling event, sampling instrument name (e.g. CTD, Net_Trap, McLanePump), name of person responsible for the sampling event, and a comment field to record additional information. See more information about the [R2R event log](#).

Data Processing Description

BCO-DMO made the following modifications to the data display: Parameter names were converted to lowercase and/or to standard BCO-DMO naming conventions; values of 'NaN' and blanks were replaced with 'nd' to indicate 'no data'; the original 'dateTimeUTC' field was separated into two fields (date_utc and time_utc).

BCO-DMO made the following corrections to the data:

Removed several duplicate entries.

Corrected cast number of event 20120429.1002, from 50 to 51.

Corrected time, lat, lon, and depth for events with comments stating the event was recorded late (see comments column).

Events were added for the deployment of CTD casts 23, 56, and 57.

Corrected time, lat, lon, and depth of deployments of CTD casts 36, 40, 47, and 69 to match the CTD cast data.

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Data Files

File
KN207-01_event_log.csv (Comma Separated Values (.csv), 34.98 KB) MD5:5397371613189a4da48e94bc69ce432f
Primary data file for dataset ID 3661

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Parameters

Parameter	Description	Units
event	ID number for the event.	dimensionless
date_utc	Date (UTC), in YYYYmmdd format, that the event took place.	dimensionless
time_utc	Time (UTC), in HHMM format, that the event took place.	dimensionless
station	Alpha-numeric code representing the sampling station.	dimensionless
cast	Cast number.	dimensionless
lat	Latitude in decimal degrees.	decimal degrees
lon	Longitude, in decimal degrees.	decimal degrees
depth_w	Water depth (in meters). Name changed from 'Seafloor' during processing.	meters
instrument	Name of instrument. (CTD911 = SeaBird SBE 911plus CTD; Net_trap = free floating sediment trap; PIT_trap = particle interceptor trap; McLanePump = McLane Pump; planktonNetTow = Plankton Net Tow)	dimensionless
action	Activity performed with the instrument.	dimensionless
author	Name of person entering the event.	dimensionless
comment	Free-text comment entered about the sampling event and post-cruise corrections.	dimensionless
transect	Transect number.	dimensionless
ISO_DateTime_UTC	Date and time formatted to ISO8601 standard. T indicates start of time string; Z indicates UTC.	YYYY-mm-ddTHH:MM:SS.ss

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Deployments

KN207-01

Website	https://www.bco-dmo.org/deployment/58787
Platform	R/V Knorr
Start Date	2012-04-21
End Date	2012-05-04
Description	Projected Science Plan: The plan is to conduct two, 5-day quasi-lagrangian time-series stations at 65W, one north of the Gulf Stream and one south of the Gulf Stream. The daily cruise track will be centered around following free-floating sediment net traps arrays. The traps will be retrieved and re-deployed on 24 hour intervals (generally beginning at day break). CTD casts, primarily in the upper 250 meters, will be done in the afternoons, with McLane pumps deployed overnight. This cruise is funded by NSF OCE-1031143. More information about this cruise is available from the vessel operator (WHOI cruise synopsis). Cruise information and original data are available from the NSF R2R data catalog.

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Project Information

Biogeochemical Impact and Fate of Non-phosphorus Membrane Lipids in the Sargasso Sea (SargassoSeaLipids)

Coverage: Sargasso Sea

Intact polar diacylglycerols (IP-DAGs) are the fatty-acid bearing lipid molecules that compose bacterial and eukaryotic cell membranes. As such, they are one of the most abundant classes of lipid molecules in plankton, and play a major role in the marine carbon cycle. However, until very recently, the molecular diversity of IP-DAGs was poorly understood; the structural identity and characteristics of IP-DAGs were inferred almost exclusively from their constituent fatty acids. These non-phosphorus containing IP-DAGs were largely unknown to chemical oceanography. In contrast, phospholipids, which have been the focus of considerable research, compose a disproportionately small fraction of total IP-DAGs. But we still lack even a cursory understanding of biochemical functions and geochemical fates of non-phosphorus IP-DAGs. Given that these molecules are among the most abundant lipid molecules on the planet, this represents a profound and unexpected gap in our understanding the marine carbon and phosphorus cycles.

In this project, researchers at the Woods Hole Oceanographic Institution will launch a pioneering study of these poorly understood compounds. Their approach will be guided by four questions: (1) How do non-phosphorus lipids contribute to variations in the C:N:P of particulate organic matter in the Sargasso Sea? (2) What are the relative degradation rates of phospholipids and non-phosphorus lipids in surface waters? (3) Which groups of microbes utilize the carbon and phosphorus from different IP-DAGs? (4) What are the relative contributions of different IP-DAGs to particulate organic matter export to the deep-sea?

These questions will be answered by using sophisticated HPLC/MS analyses and novel isotope tracing approaches in conjunction with long-standing methods for measuring the C:N:P of plankton and determining the degradation rates of organic molecules. The research team will establish whether these newly-recognized sulfolipids and betaine lipids molecules are a quantitatively important biochemical option for phytoplankton to affect flexible C:N:P stoichiometry in the face of nutrient stress. They will also elucidate the degradation rate, microbial fate, and export potential of the carbon and phosphorus from IP-DAGs. This will shed new light on the broader roles of these molecules in the cycling of these elements by the planktonic community.

This project contains components that are specifically designed to meet the NSF criteria for "advancing discovery and understanding while promoting teaching, training and learning." The project will support the training of a graduate student and postdoctoral fellow. In addition, the research team will work with the non-profit Zephyr Foundation in Woods Hole to design educational 'units' based on the team's research that will be tailored to student in grades 6 - 12. The Foundation will present these units as part of their hands-on marine science field trip series that is delivered to over 200 students and their teachers per year.

Program Information

Ocean Carbon and Biogeochemistry (OCB)

Website: <http://us-ocb.org/>

Coverage: Global

The Ocean Carbon and Biogeochemistry (OCB) program focuses on the ocean's role as a component of the global Earth system, bringing together research in geochemistry, ocean physics, and ecology that inform on and advance our understanding of ocean biogeochemistry. The overall program goals are to promote, plan, and coordinate collaborative, multidisciplinary research opportunities within the U.S. research community and with international partners. Important OCB-related activities currently include: the Ocean Carbon and Climate Change (OCCC) and the North American Carbon Program (NACP); U.S. contributions to IMBER, SOLAS, CARBOOCEAN; and numerous U.S. single-investigator and medium-size research projects funded by U.S. federal agencies including NASA, NOAA, and NSF.

The scientific mission of OCB is to study the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change through studies of marine biogeochemical cycles and associated ecosystems.

The overarching OCB science themes include improved understanding and prediction of: 1) oceanic uptake and release of atmospheric CO₂ and other greenhouse gases and 2) environmental sensitivities of biogeochemical cycles, marine ecosystems, and interactions between the two.

The OCB Research Priorities (updated January 2012) include: ocean acidification; terrestrial/coastal carbon fluxes and exchanges; climate sensitivities of and change in ecosystem structure and associated impacts on biogeochemical cycles; mesopelagic ecological and biogeochemical interactions; benthic-pelagic feedbacks on biogeochemical cycles; ocean carbon uptake and storage; and expanding low-oxygen conditions in the coastal and open oceans.

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1031143