Scientific sampling event logs from R/V Endeavor and R/V Atlantic Explorer cruises EN501, EN502, AE1211, EN513, EN520 in the Bermuda Rise from 2011-2012 (BaRFlux project)

Website: https://www.bco-dmo.org/dataset/3567
Version: 18 May 2012
Version Date: 2013-04-02

Project
» Do interactions between vertically and horizontally transported particles measurably affect particle composition and flux to the sediments? A mechanistic approach. (BaRFlux)

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
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Table of Contents

Dataset Description

The science party maintained a digital event log, recording all instrument deployments and significant events during the BaRFlux cruises.

NOTE: These data are preliminary; position corrections have not been made when needed (refer to the 'comment' column).

Methods & Sampling

EN501: The science party used an Excel spreadsheet to record all instrument deployments during the BaRFlux 1 cruise. This version of the event log was posted following the initial post-cruise review by the science party.

EN502, AE1211, EN513, and EN520: For the BaRFlux 2, 3, 4, and 5 cruises, the scientific sampling event log was created using the Rolling Deck to Repository (R2R) event log application (ELOG with cruise-specific custom configuration files). 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, TM, MOC10), 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 modifcations:
- Comments have been added in the 'comment' column to draw attention to those events that need time/position correction.
- All original column names were converted to lowercase;
- 'NaN' and blanks were replaced with 'nd' to indicate no data;
- Events logged as part of testing the event logger application have been removed from the data display;
- lat and lon formatted to 5 decimal places for all cruises;
- The original 'dateTimeUTC' column was separated into two columns: date_utc and time_utc;
- 02 April 2013: The corrections below were made after correspondence with the project PI:
 (1) Removed event 20120819.2233.001 from EN513. This was a duplicate entry that should have been deleted.
 (2) Changed station of event 20120819.2210.001 (EN513) from M+2 to M+1.
 (3) Changed cast # of event 20120823.0319.001 (EN513) from 'nd' to 7.
 (4) Added events 20120507.1530 through 20120508.0842 from event log provided by Cyndy Lee to BCO-DMO on 18 Oct 2012.

[table of contents | back to top]

Data Files

File
event_log.csv (Comma Separated Values (.csv), 28.83 KB) MD5:3f5662793e87ec2d75bc65e74a5730b2 Primary data file for dataset ID 3567

[table of contents | back to top]

Parameters

Parameter	Description	Units
cruise_id	Name/ID number of the cruise.	dimensionless
year	Year, in YYYY format.	YYYY
start_date	Date the cruise started in YYYYmmdd format.	YYYYmmdd
end_date	Date the cruise ended in YYYYmmdd format.	YYYYmmdd
chief_scientist	Name of the chief scientist.	dimensionless
event	ID number for the event; YYYYmmdd.HHMM	YYYYmmdd.HHMM
date_utc	Date (UTC), in YYYYmmdd format, that the event took place.	YYYYmmdd
time_utc	Time (UTC), in HHMM format, that the event took place.	HHMM

day_utc	2-digit day of month, UTC.	dd
month_utc	2-digit month of year, UTC.	mm
station	Alpha-numeric code representing the sampling station.	dimensionless
cast	Cast number.	dimensionless
latitude	Latitude in decimal degrees.	decimal degrees
longitude	Longitude, in decimal degrees.	decimal degrees
depth_w	Name changed from 'Seafloor' during processing.	meters
instrument	Name of instrument.	dimensionless
action	Activity performed with the instrument.	dimensionless
author	Name of person entering the event.	dimensionless
comment	Comment entered about the sampling event; free-text.	dimensionless
cruise_description	Name of the cruise.	dimensionless

[table of contents | back to top]

Deployments

EN501

Website	https://www.bco-dmo.org/deployment/58731
Platform	R/V Endeavor
Start Date	2011-10-26
End Date	2011-11-07
Description	EN501 is the first of six cruises that span 18 months (one every three months) for the BaRFlux or BR Particles project funded by NSF OCE-1061128. Cruise information is available from UNOLS: http://strs.unols.org/Public/diu_cruise_view.aspx?cruise_id=125182 Planned field work for the first BaRFlux cruise includes: deployment and recovery operations of one sediment trap mooring (with multiple traps on the mooring), water pumping, and box/multi-coring at mooring site on the Bermuda Rise. The mooring will consist of 5 sediment trap clusters located at 300, 1000, 1500, 2000, and 4400 meters water depth. Pumping will occur at the trap depths and some closer to the surface, and coring will occur on-site as well. The plan is to do a total of six cruises over 18 months (one every three months). BaRFlux ship requests from UNOLS office (6 cruises total): http://strs.unols.org/public/diu_project_view.aspx?project_id=102618 Cruise information and original data are available from the NSF R2R data catalog. **Methods & Sampling** The science party used an Excel spreadsheet to record all instrument deployments during the BaRFlux 1 cruise. This version of the event log was posted following the initial post-cruise review by the science party.

EN502

Website	https://www.bco-dmo.org/deployment/58791
Platform	R/V Endeavor
Start Date	2012-02-08
End Date	2012-02-20
Description	EN502 is the second of six cruises that span 18 months (one every three months) for the BaRFlux or BR Particles project funded by NSF OCE-1061128. Cruise information is available from UNOLS: http://strs.unols.org/Public/diu_cruise_view.aspx?cruise_id=134848 Cruise information and original data are available from the NSF R2R data catalog. **Methods & Sampling** For the BaRFlux 2 cruise, the scientific sampling event log was created using the Rolling Deck to Repository (R2R) event log application (ELOG with cruise-specific custom configuration files). 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, TM, MOC10), name of person responsible for the sampling event, and a comment field to record additional information. See more information about the R2R event log.

AE1211

Website	https://www.bco-dmo.org/deployment/58825
Platform	R/V Atlantic Explorer
Start Date	2012-05-06
End Date	2012-05-15
Description	AE1211 is the third of six cruises that span 18 months (one every three months) for the BaRFlux or BR Particles project funded by NSF OCE-1061128. Cruise information is available from UNOLS: http://strs.unols.org/Public/diu_cruise_view.aspx?cruise_id=131972 Cruise track generated from control point navigation data from R2R (23 July 2013). Until 26 November 2012 this cruise was identified by BIOS as AE-X1211. On 26 November 2012, the cruise ID was corrected by BIOS o be the new cruise ID AE1211. This change was also made at BCO-DMO on 26 November 2012. Original cruise data are available from the R2R data catalog **Methods & Sampling** For the BaRFlux 3 cruise, the scientific sampling event log was created using the Rolling Deck to Repository (R2R) event log application. See more information about the R2R event log.

EN513

Website	https://www.bco-dmo.org/deployment/58853
Platform	R/V Endeavor
Start Date	2012-08-15
End Date	2012-08-27
Description	EN513 is the fourth of six cruises that span 18 months (one every three months) for the BaRFlux or BR Particles project funded by NSF OCE-1061128. Cruise information is available from UNOLS: http://strs.unols.org/Public/diu_cruise_view.aspx?cruise_id=134845. Cruise track generated from control point navigation data from R2R (23 July 2013). Cruise information and original data are available from the NSF R2R data catalog. **Methods & Sampling** On the 4th BaRFlux cruise, EN513, the scientific sampling event log was created using the Rolling Deck to Repository (R2R) event log application. See more information about the R2R event log.

EN520

Website	https://www.bco-dmo.org/deployment/58873
Platform	R/V Endeavor
Start Date	2012-11-09
End Date	2012-11-20
Description	EN520 is the fifth of six cruises that span 18 months (one every three months) for the BaRFlux or BR Particles project funded by NSF OCE-1061128. Cruise information is available from UNOLS: http://strs.unols.org/Public/diu_cruise_view.aspx?cruise_id=134850. The study area is the Bermuda Rise (33°41N, 57°36 W). The science party will conduct deployment and recovery operations of one sediment trap mooring (with multiple traps on the mooring), water pumping, and box/multi-coring at a mooring site on the Bermuda Rise. The mooring will consist of 5 sediment trap clusters located at 300, 1000, 1500, 2000, and 4400 m water depth. Pumping will occur at the trap depths and some closer to the surface, and coring will occur on-site as well. Cruise track generated from control point navigation data from R2R (23 July 2013). Cruise information and original data are available from the NSF R2R data catalog. **Methods & Sampling** On the 5th BaRFlux cruise, EN520, the scientific sampling event log was created using the Rolling Deck to Repository (R2R) event log application. See more information about the R2R event log.

[table of contents | back to top]

Project Information

Do interactions between vertically and horizontally transported particles measurably affect particle composition and flux to the sediments? A mechanistic approach. (BaRFlux)

Coverage: Bermuda Rise

from the NSF award abstract:

The export of many elements from the surface ocean to the deep sea is mediated by the flux of sinking particles; for example, sinking particles account for 50-80% of the vertical transport of organic carbon through the mesopelagic zone. Heterotrophic remineralization of particulate organic carbon (POC) in the open ocean is usually very efficient, as >90% of the POC produced in surface waters is returned to inorganic form in the euphotic zone or during transit through the upper water column. However, a small fraction of the organic matter produced in surface waters survives transit to the deep ocean or seafloor. Similarly, the flux and composition of inorganic material also vary during transport to the sea floor. Perhaps the most obvious example of such modification is the dissolution of carbonate and biogenic silica as they sink through the water column. However, the flux and composition of particulate organic and inorganic matter that reaches the deep sea and sediments depend not just on their source in the surface waters, but also on alteration, supplementation, and selective removal that occurs during vertical transit. In some regions, particularly near margins, lateral transport can also be extensive. Exchange between sinking material and suspended particles or dissolved organic matter via aggregation/disaggregation and solution/dissolution can also influence composition.

In this project, a research team at the State University of New York at Stony Brook is setting out to develop a better mechanistic understanding of the ocean's role in the global carbon cycle and the factors that influence the sedimentary record. Their work addresses five interrelated hypotheses revolving around the themes of remineralization and exchange as particles sink to the sea floor, potential horizontal influences on sinking particles, and how vertical and horizontal transport potentially influence the interpretation of the sediment record. They will apply some of the tools developed during the recent MedFlux program to produce better quantitative models of sinking fluxes by incorporating explicit consideration of ballast minerals (including celestite and barite) and to define better the interactions among particles as they sink. They will also compare results of inorganic, organic and radiochemical analyses of particles sampled by traps and pumps with those of bottom sediments at our proposed site on the Bermuda Rise.

While this is a modern process study, it is expected to have significant paleoceanographic implications. Quantifying the relative vertical and horizontal fluxes of key paleoceanographic proxies in combination with characterization of the seasonal fluxes will greatly enhance our understanding of the existing sediment record at the Bermuda Rise, and improve the quality of future reconstructions as well as lead to more robust interpretations from other sites with significant lateral input.

[table of contents | back to top]

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.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1061128

[table of contents | back to top]