Nutrients; silicate, nitrate plus nitrite, and phosphate from R/V Weatherbird II WB0409, WB0413, WB0506, WB0508 in the Sargasso Sea from 2004-2005 (EDDIES project)

Website: https://www.bco-dmo.org/dataset/3021
Data Type: Cruise Results
Version: 1
Version Date: 2007-10-08

Project
» Eddies Dynamics, Mixing, Export, and Species composition (EDDIES)

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
Bates, Nicholas	Bermuda Biological Station for Research (BBSR)	Principal Investigator
Kosnyrev, Olga	Woods Hole Oceanographic Institution (WHOI)	Data Manager
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Nutrients; silicate, nitrate plus nitrite, and phosphate from R/V Weatherbird II WB0409, WB0413, WB0506, WB0508 in the Sargasso Sea from 2004-2005.

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Coverage

Spatial Extent: **N**:32.2042 **E**:-64.063 **S**:29.723 **W**:-69.41

Temporal Extent: 2004-06-24 - 2005-08-26

Dataset Description

Nutrients; silicate, nitrate plus nitrite, phospate from Niskin bottle samples taken on all EDDIES WB cruises

dates: 2004 - 2005
location: Sargasso Sea
project/cruise: EDDIES/WB0409 2004 Transect 1 (EDT1)
EDDIES/WB0413 2004 Transect 2 (EDT2)
EDDIES/WB0506 2005 Transect 1 (EDT3)
EDDIES/WB0508 2005 Transect 2 (EDT4)
platform: R/V Weatherbird II

Methodology: analyses performed by Paul Henderson (phenderson@whoi.edu) at WHOI Nutrients Facility; for sampling methodology, please refer to U.S. JGOFS BATS Method Manual Version 4 (1997). Bermuda Atlantic Time-Series Study April 1997. Anthony H. Knap, Anthony F. Michaels et al., 136 pp. (link to BATS Method Manual version 4 local copy)

Change history: YYMMDD
061211: downloaded original data from EDDIES data web site; EddiesBBSR05 (client) 2006_final.xls;
070112: added to OCB database by Nancy Copley and Cyndy Chandler, OCB DMO
071004: downloaded CruiseID_nuts_final.txt files from EDDIES data Web site and prepared for OCB; ammonium data and EDT sample identification codes were not reported with this version of the data

OCB DMO note: match station number in cruise event log to determine sampling location, date and time; depth_n estimated from depth and added to enable merge with bottle data; these data are reported in umol/kg for which the conversion is roughly: N_umol/kg = N_umol/L / 1.025

Analysis Note: files listing those data that are from the sample rerun:
WB Silicate reruns

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Parameters

Parameter	Description	Units
Cruise_ID	cruise ID designation code	alphanumeric
sta	station number	dimensionless
Nis	Niskin bottle number	dimensionless
Nis_WB	unique WB sample identification (9&&&&$$@@ where &&&& is cruise number, $$=ctd station number, @@=niskin number	dimensionless
depth	depth	meters
depth_n	depth, nominal	meters
SiO4_umol_kg	Silicate	micromoles/kilogram
NO3_NO2_umol_kg	Nitrate plus Nitrite	micromoles/kilogram
PO4_umol_kg	Phosphate	micromoles/kilogram

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Instruments

Dataset-specific Instrument Name	Niskin bottle
Generic Instrument Name	Niskin bottle
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24 or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

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Deployments

WB0409

Website	https://www.bco-dmo.org/deployment/57955
Platform	R/V Weatherbird II
Start Date	2004-06-23
End Date	2004-07-02
Description	EDT1 2004 Transect 1 cruise Funded by: NSF OCE-0241310

WB0413

Website	https://www.bco-dmo.org/deployment/57960
Platform	R/V Weatherbird II
Start Date	2004-08-02
End Date	2004-08-11
Description	EDT2 2004 Transect 2 cruise Funded by: NSF OCE-0241310

WB0506

Website	https://www.bco-dmo.org/deployment/57963
Platform	R/V Weatherbird II
Start Date	2005-07-06
End Date	2005-07-15
Description	EDT3 2005 Transect 1 cruise Funded by: NSF OCE-0241310

WB0508

Website	https://www.bco-dmo.org/deployment/57966
Platform	R/V Weatherbird II
Start Date	2005-08-17
End Date	2005-08-26
Description	EDT4 2005 Transect 2 Funded by: NSF OCE-0241310

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Project Information

Eddies Dynamics, Mixing, Export, and Species composition (EDDIES)

Website: http://science.whoi.edu/users/olga/eddies/EDDIES_Project.html

Coverage: Sargasso Sea

The original title of this project from the NSF award is: Collaborative Research: Impacts of Eddies and Mixing on Plankton Community Structure and Biogeochemical Cycling in the Sargasso Sea". Prior results have documented eddy-driven transport of nutrients into the euphotic zone and the associated accumulation of chlorophyll. However, several key aspects of mesoscale upwelling events remain unresolved by the extant database, including: (1) phytoplankton physiological response, (2) changes in community structure, (3) impact on export out of the euphotic zone, (4) rates of mixing between the surface mixed layer and the base of the euphotic zone, and (5) implications for biogeochemistry and differential cycling of carbon and associated bioactive elements. This leads to the following hypotheses concerning the complex, non-linear biological regulation of elemental cycling in the ocean: H1: Eddy-induced upwelling, in combination with diapycnal mixing in the upper ocean, introduces new nutrients into the euphotic zone. H2: The increase in inorganic nutrients stimulates a physiological response within the phytoplankton community. H3: Differing physiological responses of the various species bring about a shift in community structure. H4: Changes in community structure lead to increases in export from, and changes in biogeochemical cycling within, the upper ocean. Publications Andrews, J.E., Hartin, C., and Buesseler, K.O.. "7Be Analyses in Seawater by Low Background Gamma-Spectroscopy.," Journal of Radioanalytical and Nuclear Chemistry, v.277, 2008, p. 253. Andrews, J.E., Hartin, C., Buesseler, K.O.. "7Be Analyses in Seawater by Low Background Gamma-Spectroscopy," Journal of Radioanalytical and Nuclear Chemistry, v.277, 2008, p. 253. Benitez-Nelson, C.R. and McGillicuddy, D.J..

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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.

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