Sediment trap flux data from R/V Weatherbird II WB0409, WB0413, WB0506, WB0508 cruises in the Sargasso Sea, 2004-2005 (EDDIES project)

Website: https://www.bco-dmo.org/dataset/3056
Version: 07 March 2006
Version Date: 2006-03-07

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
Chandler, Cynthia L.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Table of Contents

- Dataset Description
- Data Files
- Parameters
- Instruments
- Deployments
- Project Information
- Program Information

Dataset Description

Sediment trap flux data are reported by PI Nicholas "Nick" Bates of the Bermuda Biological Station for Research (BBSR).

Methodology: see Chapter 20: Sediment Traps in 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)

[table of contents | back to top]

Data Files

File
trap_flux_WB0409.csv (Comma Separated Values (.csv), 284 bytes) MD5:d43ba9b23ba8114bd10cf3b212d34d66 version 07 March 2006 PI: Nick Bates (BBSR) EDDIES 2004 cruise WB0409 (EDT1) sediment trap flux data
trap_flux_WB0413.csv (Comma Separated Values (.csv), 327 bytes) MD5:2f71521517b22df5e59514ecf0a96259 version 07 March 2006 PI: Nick Bates (BBSR) EDDIES 2004 cruise WB0413 (EDT2) sediment trap flux data
trap_flux_WB0506.csv (Comma Separated Values (.csv), 305 bytes) MD5:057bba0c74101769080e64826f11f829 version 09 October 2007 PI: Nick Bates (BBSR) EDDIES 2005 cruise WB0506 (EDT3) sediment trap flux data
trap_flux_WB0508.csv (Comma Separated Values (.csv), 304 bytes) MD5:f3ea1bcc0761c6fdacc8c2c6d78181bd version 09 October 2007 PI: Nick Bates (BBSR) EDDIES 2005 cruise WB0508 (EDT4) sediment trap flux data

[table of contents | back to top]

Parameters

Parameter	Description	Units
array_name	sediment trap array name	alphanumeric
location	EDDY center or control	dimensionless
filter_ID	Filter ID	dimensionless
depth_n	sample collection depth	meters
flux_mass	Mass Flux	mg/m^2/day
flux_Corg	Organic C-flux	mg/m^2/day
flux_N	Nitrogen flux	mg/m^2/day

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	Sediment Trap
Generic Instrument Name	Sediment Trap
Generic Instrument Description	Sediment traps are specially designed containers deployed in the water column for periods of time to collect particles from the water column falling toward the sea floor. In general a sediment trap has a jar at the bottom to collect the sample and a broad funnel-shaped opening at the top with baffles to keep out very large objects and help prevent the funnel from clogging. This designation is used when the specific type of sediment trap was not specified by the contributing investigator.

[table of contents | back to top]

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 **Methods & Sampling** PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Sediment trap flux data dates: 24 June 2004 to 28 June 2004 (20040624-20040628) location: N: 31.474 S: 30.458 W: -64.964 E: -64.095 project/cruise: EDDIES/WB0409 2004 Transect 1 (EDT1) platform: R/V Weatherbird II Methodology: see Chapter 20: Sediment Traps in 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 060307: downloaded original data from EDDIES data web site; added to OCB database by Cyndy Chandler, OCB DMO; PI notes: Mass flux for EDT1 arrays A&B have been estimated from the weight of the bolus since these samples were compromised following a drying oven problem. Estimate was calculated by assuming 89% of total mass transfer to bolus. Sediment trap position data is available separately.

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 **Methods & Sampling** PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Sediment trap flux data dates: 14 July 2004 to 09 August 2004 (20040714-20040809) location: N: 31.670 S: 30.665 W: -66.405 E: -64.112 project/cruise: EDDIES/WB0413 2004 Transect 2 (EDT2) platform: R/V Weatherbird II Methodology: see Chapter 20: Sediment Traps in 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 060307: downloaded original data from EDDIES data web site; added to OCB database by Cyndy Chandler, OCB DMO; DMO note: note that the dates for the BATS190 array are in July and this cruise began on 02 August 2004. PI notes: Mass flux for BATS190 has been estimated from the weight of the bolus since these samples were compromised following a drying oven problem. Estimate was calculated by assuming 89% of total mass transfer to bolus. Mass flux for EDT2-Array A is the actual measured flux. Sediment trap position data is available separately.

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 **Methods & Sampling** PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Sediment trap flux data dates: 08 July 2005 to 15 July 2005 (20050708 - 20050715) location: N: 30.900 S: 30.446 W: -66.845 E: -66.272 project/cruise: EDDIES/WB0506 2005 Transect 1 (EDT3) platform: R/V Weatherbird II Methodology: see Chapter 20: Sediment Traps in 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 070601: original data downloaded from EDDIES data web site by Nancy Copley (WHOI); /eddies/data/2005_data/traps/ and /eddies/data/2005_data/wbII_x0508/sediment_trap/EDT3flux_info.txt 071010: added to OCB database by Cyndy Chandler, OCB DMO; PI notes: Sediment trap position data is available separately.

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 **Methods & Sampling** PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Sediment trap flux data dates: 19 August 2005 to 25 August 2005 (20050819-20050825) location: N: 30.233 S: 29.707 W: -69.119 E: -68.447 project/cruise: EDDIES/WB0508 2005 Transect 2 (EDT4) platform: R/V Weatherbird II Methodology: see Chapter 20: Sediment Traps in 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 070601: original data downloaded from EDDIES data web site by Nancy Copley (WHOI); /eddies/data/2005_data/traps/ and /eddies/data/2005_data/wbII_x0506/sediment_trap/EDT4flux_info.txt 071010: added to OCB database by Cyndy Chandler, OCB DMO; PI notes: Sediment trap position data is available separately.

[table of contents | back to top]

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.. "Mesoscale Physical-Biological-Biogeochemical Linkages in the Open Ocean: An Introduction to the Results of the E-Flux and EDDIES Programs.," Deep Sea Research II, v.55, 2008, p. 1133.

Benitez-Nelson, C.R. and McGillicuddy, D.J.. "Mesoscale Physical-Biological-Biogeochemical Linkages in the Open Ocean: An Introduction to the Results of the E-Flux and EDDIES Programs," Deep-Sea Research II, v.55, 2008, p. 1133.

Bibby, T.S., Gorbunov, M.Y., Wyman, K.W., Falkowski, P.G.. "Photosynthetic community responses to upwelling in mesoscale eddies in the subtropical North Atlantic and Pacific Oceans," Deep-Sea Research Part II: Topical Studies in Oceanography, v.55, 2008, p. 1310.

Buesseler, K.O., Lamborg, C., Cai, P., Escoube, R., Johnson, R., Pike, S., Masque, P., McGillicuddy, D.J., Verdeny, E.. "Particle Fluxes Associated with Mesoscale Eddies in the Sargasso Sea," Deep Sea Research II, v.55, 2008, p. 1426.

Carlson, C.A., del Giorgio, P., Herdl, G.. "Microbes and the dissipation of energy and respiration: From cells to ecosystems," Oceanography, v.20, 2007, p. 89.

Davis, C.S., and McGillicuddy, D.J.. "Transatlantic Abundance of the N2-Fixing Colonial Cyanobacterium Trichodesmium," Science, v.312, 2006, p. 1517.

Ewart, C.S., Meyers, M.K., Wallner, E., McGillicuddy, D.J., Carlson, C.A.. "Microbial Dynamics in Cyclonic and Anticyclonic Mode-Water Eddies in the Northwestern Sargasso Sea," Deep Sea Research II, v.55, 2008, p. 1334.

Ewart, C.S., Meyers, M.K., Wallner, E., McGillicuddy, D.J., Carlson, C.A.. "Microbial Dynamics in Cyclonic and Anticyclonic Mode-Water Eddies in the Northwestern Sargasso Sea," Deep-Sea Research II, v.55, 2008, p. 1334.

Goldthwait, S.A. and Steinberg, D.K.. "Elevated biomass of mesozooplankton and enhanced fecal pellet flux in cyclonic and mode-water eddies in the Sargasso Sea," Deep-Sea Research Part II: Topical Studies in Oceanography, v.55, 2008, p. 1360.

Greenan, B.J.W.. "Shear and Richardson number in a mode-water eddy," Deep-Sea Research Part II: Topical Studies in Oceanography, v.55, 2008, p. 1161.

Jenkins, W.J., McGillicuddy, D.J., and Lott III, D.E.. "The Distributions of, and Relationship Between 3 He and

Nitrate in Eddies," Deep Sea Research II, v.55, 2008, p. 1389.

Jenkins, W.J., McGillicuddy, D.J., Lott III, D.E.. "The Distributions of, and Relationship Between 3 He and Nitrate in Eddies," Deep-Sea Research II, v.55, 2008, p. 1389.

Ledwell, J.R., McGillicuddy, D.J., and Anderson, L.A.. "Nutrient Flux into an Intense Deep Chlorophyll Layer in a Mode-water Eddy.," Deep Sea Research II, v.55, 2008, p. 1139.

Ledwell, J.R., McGillicuddy, D.J., Anderson, L.A.. "Nutrient Flux into an Intense Deep Chlorophyll Layer in a Mode-water Eddy," Deep-Sea Research II, v.55, 2008, p. 1139.

Li, Q.P. and Hansell, D.A.. "Intercomparison and coupling of MAGIC and LWCC techniques for trace analysis of phosphate in seawater," Analytical Chemica Acta, v.611, 2008, p. 68.

Li, Q.P., Hansell, D.A., McGillicuddy, D.J., Bates, N.R., Johnson, R.J.. "Tracer-based assessment of the origin and biogeochemical transformation of a cyclonic eddy in the Sargasso Sea," Journal of Geophysical Research, v.113, 2008, p. 10006.

Li, Q.P., Hansell, D.A., Zhang, J.-Z.. "Underway monitoring of nanomolar nitrate plus nitrite and phosphate in oligotrophic seawater," Limnology and Oceanography: Methods, v.6, 2008, p. 319.

Li, Q.P., Zhang, J.-Z., Millero, F.J., Hansell, D.A.. "Continuous colorimetric determination of trace ammonium in seawater with a long-path liquid waveguide capillary cell," Marine Chemistry, v.96, 2005, p. 73.

McGillicuddy, D.J., et. al.. "Eddy/Wind Interactions Stimulate Extraordinary Mid-Ocean Plankton Blooms," Science, v.316, 2007, p. 1021.

McGillicuddy, D.J., Ledwell, J.R., and Anderson, L.A.. "Response to Comment on "Eddy/Wind Interactions Stimulate Extraordinary Mid-Ocean Plankton Bloom"." Science, v.320, 2008.

McGillicuddy, D.J., Ledwell, J.R., Anderson, L.A.. "Response to Comment on "Eddy/Wind Interactions Stimulate Extraordinary Mid-Ocean Plankton Bloom"," Science, v.320, 2008.

McGillicuddy, et. al.. "Eddy/Wind Interactions Stimulate Extraordinary Mid-Ocean Plankton Blooms.," Science, v.316, 2007, p. 1021.

Mourino B., and McGillicuddy, D.J.. "Mesoscale Variability in the Metabolic Balance of the Sargasso Sea," Limnology & Oceanography, v.51, 2006, p. 2675.

[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]