

# Primary Production 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/3053>

Version: 19 October 2007

Version Date: 2007-10-19

## Project

» [Eddies Dynamics, Mixing, Export, and Species composition](#) (EDDIES)

## Program

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

Contributors	Affiliation	Role
<a href="#">Bates, Nicholas</a>	Bermuda Biological Station for Research (BBSR)	Principal Investigator
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## Dataset Description

**PI:** Nick Bates  
**of:** Bermuda Biological Station for Research (BBSR)  
**dataset:** Primary Production data  
**platform:** R/V Weatherbird II

Methodology: see Chapter 18: Primary Production 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)

These data are considered final.

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## Parameters

Parameter	Description	Units
event	unique sampling event number	YYYYMMDDhhmm
date	date of water collection	YYYYMMDD
time	time of collection (GMT)	hhmm
lon	longitude of water collection; negative denotes West	decimal degrees
lat	latitude of water collection; negative denotes South	decimal degrees
deploy_ID	deployment identifier	alphanumeric
depth_n	depth; nominal	meters
light1	light bottle 1 sample	mg C/m <sup>3</sup> /day
light2	light bottle 2 sample	mg C/m <sup>3</sup> /day
light3	light bottle 3 sample	mg C/m <sup>3</sup> /day
dark	dark bottle sample	mg C/m <sup>3</sup> /day
t0	time zero bottle sample	mg C/m <sup>3</sup> /day

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## Instruments

<b>Dataset-specific Instrument Name</b>	Go-flo Bottle
<b>Generic Instrument Name</b>	GO-FLO Bottle
<b>Generic Instrument Description</b>	GO-FLO bottle cast used to collect water samples for pigment, nutrient, plankton, etc. The GO-FLO sampling bottle is specially designed to avoid sample contamination at the surface, internal spring contamination, loss of sample on deck (internal seals), and exchange of water from different depths.

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## Deployments

**WB0409**

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57955">https://www.bco-dmo.org/deployment/57955</a>
<b>Platform</b>	R/V Weatherbird II
<b>Start Date</b>	2004-06-23
<b>End Date</b>	2004-07-02
<b>Description</b>	<p>EDT1 2004 Transect 1 cruise Funded by: NSF OCE-0241310</p> <p><b>Methods &amp; Sampling</b>  PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Primary Production data dates: 24 June 2004 to 30 June 2004 (20040624-20040630) location: N: 30.501 S: 29.960 W: -65.547 E: -64.919 project/cruise: EDDIES/WB0409 2004 Transect 1 (EDT1) platform: R/V Weatherbird II Methodology: see Chapter 18: Primary Production 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 file from EDDIES data web site; added to OCB database by Cyndy Chandler, OCB DMO; Date and location data were not contributed; 071019: date and location taken from cast sheet and event log entries for the GoFlo cast done to collect water for the array. These data are considered final.</p>

### WB0413

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57960">https://www.bco-dmo.org/deployment/57960</a>
<b>Platform</b>	R/V Weatherbird II
<b>Start Date</b>	2004-08-02
<b>End Date</b>	2004-08-11
<b>Description</b>	<p>EDT2 2004 Transect 2 cruise Funded by: NSF OCE-0241310</p> <p><b>Methods &amp; Sampling</b>  PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Primary Production data dates: 03 August 2004 to 03 August 2004 (20040803-20040803) location: N: 30.6798 S: 30.6798 W: -65.5493 E: -65.5493 project/cruise: EDDIES/WB0413 2004 Transect 2 (EDT2) platform: R/V Weatherbird II Methodology: see Chapter 18: Primary Production 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 file from EDDIES data web site; added to OCB database by Cyndy Chandler, OCB DMO; Date and location data were not contributed; 071019: date and location taken from cast sheet and event log entries for the GoFlo cast done to collect water for the array. These data are considered final.</p>

### WB0506

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57963">https://www.bco-dmo.org/deployment/57963</a>
<b>Platform</b>	R/V Weatherbird II
<b>Start Date</b>	2005-07-06
<b>End Date</b>	2005-07-15
<b>Description</b>	<p>EDT3 2005 Transect 1 cruise Funded by: NSF OCE-0241310</p> <p><b>Methods &amp; Sampling</b>  PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Primary Production data dates: 08 July 2005 to 14 July 2005 (20050708 - 20050714) location: N: 30.8978 S: 30.7193 W: -66.7040 E: -66.2852 project/cruise: EDDIES/WB0506 2005 Transect 1 (EDT3) platform: R/V Weatherbird II Methodology: see Chapter 18: Primary Production 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 070604: downloaded original data file from EDDIES data web site; prepared for OCB database by Nancy Copley (OCB DMO) 071009: added to OCB database by Cyndy Chandler, OCB DMO; date and location are for the GoFlo cast done to collect water for the array. These data are considered final.</p>

### WB0508

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57966">https://www.bco-dmo.org/deployment/57966</a>
<b>Platform</b>	R/V Weatherbird II
<b>Start Date</b>	2005-08-17
<b>End Date</b>	2005-08-26
<b>Description</b>	<p>EDT4 2005 Transect 2 Funded by: NSF OCE-0241310</p> <p><b>Methods &amp; Sampling</b>  PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: Primary Production data dates: 19 August 2005 to 24 August 2005 (20050819-20050824) location: N: 30.1773 S: 29.8717 W: -69.1118 E: -68.5765 project/cruise: EDDIES/WB0508 2005 Transect 2 (EDT4) platform: R/V Weatherbird II Methodology: see Chapter 18: Primary Production 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 070604: downloaded original data file from EDDIES data web site; prepared for OCB database by Nancy Copley (OCB DMO) 071009: added to OCB database by Cyndy Chandler, OCB DMO; date and location are for the GoFlo cast done to collect water for the array. These data are considered final.</p>

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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](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**

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Buesseler, K.O., Lamborg, C., Cai, P., Escube, 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.

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Jenkins, W.J., McGillicuddy, D.J., and Lott III, D.E.. "The Distributions of, and Relationship Between <sup>3</sup>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  $^3\text{He}$  and Nitrate in Eddies," Deep-Sea Research II, v.55, 2008, p. 1389.

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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 CO<sub>2</sub> 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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