

# Pigments, chlorophyll-a and phaeophytin sampled from Niskin bottles from R/V Oceanus OC404-01, OC404-04 in the Sargasso Sea in 2004 (EDDIES project)

**Website:** <https://www.bco-dmo.org/dataset/3040>

**Version:** 20 June 2007

**Version Date:** 2007-06-20

## 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:** pigments chlorophyll-a and phaeophytin sampled from Niskin bottles  
**platform:** R/V Oceanus

Methodology: see Chapter 14: Determination of Chlorophyll & Phaeopigments 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)

Technician: Rod Johnson (rod@sargasso.bbsr.edu)

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## Parameters

Parameter	Description	Units
sta	station number	dimensionless
event	unique sampling event number composite of GMT date and time	YYYYMMDDhhmm
date	sampling date (GMT)	YYMMDD
time	sampling time (GMT)	HHMM
lon	longitude, negative denotes West	decimal degrees
lat	latitude, negative denotes South	decimal degrees
depth_n	sample depth, nominal	meters
SID_chla	sample ID, chlorophyll-a	dimensionless
chl_a_fluor_uL	chlorophyll-a	micrograms/liter
phaeo	phaeophytin	micrograms/liter
F0	initial fluorescence	relative
Fa	fluorescence after acidification	relative
Fo_blank	initial fluorescence minus fluorescence of a blank	relative
Fa_blank	fluorescence after acidification minus fluorescence of a blank	relative

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## Instruments

<b>Dataset-specific Instrument Name</b>	Niskin bottle
<b>Generic Instrument Name</b>	Niskin bottle
<b>Generic Instrument Description</b>	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

OC404-01

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57956">https://www.bco-dmo.org/deployment/57956</a>
<b>Platform</b>	R/V Oceanus
<b>Report</b>	<a href="http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-1_Draft_Cruise_Report.pdf">http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-1_Draft_Cruise_Report.pdf</a>
<b>Start Date</b>	2004-06-11
<b>End Date</b>	2004-07-03
<b>Description</b>	<p>EDDIES 2004 Survey 1 cruise Funded by: NSF OCE-0241310 Original cruise data are available from the NSF R2R data catalog (Cruise DOI: 10.7284/900337)</p> <p><b>Methods &amp; Sampling</b>  PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: pigments chlorophyll-a and phaeophytin sampled from Niskin bottles dates: 12 June 2004 to 02 July 2004 (20040612-20040702) location: N: 37.934 S: 29.777 W: -68.703 E: -58.754 project/cruise: EDDIES/OC404-1 2004 Survey 1 platform: R/V Oceanus Methodology: see Chapter 14: Determination of Chlorophyll &amp; Phaeopigments 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) Technician: Rod Johnson (<a href="mailto:rod@sargasso.bbsr.edu">rod@sargasso.bbsr.edu</a>) Change history: YYMMDD 050610: original data contributed by Rod Johnson (<a href="mailto:rod@sargasso.bbsr.edu">rod@sargasso.bbsr.edu</a>); added to OCB database by Cyndy Chandler, OCB DMO 070313: change parameter names to be consistent within EDDIES 070620: add event, date, time, lon and lat from cruise event log (Copley, OCB)</p>

#### OC404-04

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57961">https://www.bco-dmo.org/deployment/57961</a>
<b>Platform</b>	R/V Oceanus
<b>Report</b>	<a href="http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-4_Draft_Cruise_Report.pdf">http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-4_Draft_Cruise_Report.pdf</a>
<b>Start Date</b>	2004-07-25
<b>End Date</b>	2004-08-12
<b>Description</b>	<p>EDDIES project 2004 Survey 2 cruise Funded by: NSF OCE-0241310 Original cruise data are available from the NSF R2R data catalog</p> <p><b>Methods &amp; Sampling</b>  PI: Nick Bates of: Bermuda Biological Station for Research (BBSR) dataset: chlorophyll-a and phaeophytin pigments sampled from Niskin bottles dates: 26 July 2004 to 11 August 2004 (20040726-20040811) location: N: 31.942 S: 29.958 W: -66.603 E: -59.450 project/cruise: EDDIES/OC404-4 2004 survey 2 platform: R/V Oceanus Methodology: see Chapter 14: Determination of Chlorophyll &amp; Phaeopigments 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) Technician: Rod Johnson (<a href="mailto:rod@sargasso.bbsr.edu">rod@sargasso.bbsr.edu</a>) Change history: YYMMDD 061213: downloaded original data from EDDIES data web site; 070112: added to OCB database by Nancy Copley and Cyndy Chandler, OCB DMO 070313: change parameter names to be consistent within EDDIES 070524: added data for stations 49-68; event, date and position are from log DMO note: The local SID_chla data match data reported in the bottle_SID object</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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cyclonic and mode-water eddies in the Sargasso Sea," Deep-Sea Research Part II: Topical Studies in Oceanography, v.55, 2008, p. 1360.

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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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