

Multi-cruise sampling event log from R/V Oceanus OC404-01 and R/V Weatherbird II WB0409 cruises in the Sargasso Sea in 2004 (EDDIES project)

Website: <https://www.bco-dmo.org/dataset/3017>

Data Type: Cruise Results

Version: 1

Version Date: 2007-02-27

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)	Chief Scientist
McGillicuddy, Dennis J.	Woods Hole Oceanographic Institution (WHOI)	Principal Investigator
Ewart, Courtney	University of California-Santa Barbara (UCSB)	Co-Principal Investigator
Chandler, Cynthia L.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

Multi-cruise sampling event log from R/V Oceanus OC404-01 and R/V Weatherbird II WB0409 cruises in the Sargasso Sea in 2004.

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Coverage

Spatial Extent: N:37.934 E:-58.752 S:28.641 W:-68.703

Temporal Extent: 2004-06-12 - 2004-07-03

Dataset Description

PI: Dennis McGillicuddy and Nick Bates
of: WHOI and BBSR
dataset: multi-cruise sampling event log
dates: 12 June 2004 to 03 July 2004 (20040612-20040703)
location: N: 37.934 S: 28.641 W: -68.703 E: -58.754
project/cruise: EDDIES 2004 Survey 1 OC404-1 and Transect 1 WB0409
platform: R/V OCEANUS and R/V WEATHERBIRD II

Methodology: [processing notes](#) are available

Change history:

- 051213: create merged cruise log from OC404-1 and WB0409 CTD event logs
- 060313: add date and time fields (cchandler, OCB DMO)
- 070227: add all sampling events from complete event log created and contributed by Courtney Ewart (UCSB); (added by cchandler)

Related information:

- 070227: Courtney Ewart (UCSB) contributed a merged CTD map for OC404-1 and WB0409 that may help to determine relative CTD station locations ([PDF file of 3 maps](#))

DMO note: The WB0409 cruise is also called EDDIES Transect #1 or EDT1 (EDDIES Transects 1 and 2 were done in 2004, 3 and 4 in 2005)

The dist_EC (distance from eddy center, ADCP eddy center trajectories) was calculated by Valery Kosnyrev (WHOI).

Processing Description

EDDIES 2004 cruises: Survey 1 OCEANUS 404-1 and Transect 1 WB0409 event_log_E1 data processing notes

PI: Dennis McGillicuddy (WHOI) and Nick Bates (BBSR)

27 February 2007: Prepared for OCB data system by Cyndy Chandler, OCB DMO (MCG Dept, WHOI)

from a processing notes file contributed by Courtney Ewart (UCSB).

The merged cruise event log of all recorded sampling events aboard two coordinated EDDIES cruises in 2004 was created and contributed by Courtney Ewart (UCSB) in August 2006.

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The merged event log combines data from:

OC and WB CTD cast sheets
WHOI XBT logs and combined CTD station logs (OCB DMO, WHOI)
Thorium pump cast logs contributed by Steve Pike (WHOI)
Optics and BBOP Metadata from Dave Siegel (UCSB)
and ADCP eddy center trajectories calculated by Valery V. Kosnyrev (WHOI)
Information for the sediment traps could not be located.

Explanation of sampling_type descriptor codes

	Location of eddy center each day based on ADCP trajectory (V. Kosnyrev).
EC	Time was set to 0000 to generate a unique event #, and does not therefore represent GMT 0000.
BBOP	WB chl samples taken for BBOP (1, 20, 40, 60m)
CTD Profile	No bottles fired. CTD depth profile only.
Go-flo	Production array deployment
CTD	Niskin bottles fired and sampled
LP/Rad	Light probe/Radiometer
MOC	Mocness tow
ST	Surface tow
Wire	unknown sampling event type

NOTE: "Rad" and "LP" are same event type (radiometer) but "OC404-4 event log" info for LP does not match Siegel "Optics Metadata" xls file, so have included both an LP and Rad

category here. "LP" events can be eliminated if "Rad" events from optics meta data are correct since "Rad" metadata seems more complete than "LP" metadata.

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Parameters

Parameter	Description	Units
event	unique sampling event number composite of UTC date and time	YYYYMMDDhhmm
date	start date of event (UTC)	YYYYMMDD
time	start time of event (UTC)	hhmm
lon	longitude, negative denotes West	decimal degrees
lat	latitude, negative denotes South	decimal degrees
Cruise_ID	cruise identifier	dimensionless
sta	CTD station number	dimensionless
ev_type	event type descriptor	dimensionless
sampling_type	sampling device type	dimensionless
depth_max	maximum depth of sampling	meters
dist_EC	distance from eddy center	kilometers
radiometer_file	file associated with radiometer	dimensionless
activity_and_comments	concatenated string: cruise_ID, sampling method, and 2 digit station	dimensionless

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Deployments

OC404-01

Website	https://www.bco-dmo.org/deployment/57956
Platform	R/V Oceanus
Report	http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-1_Draft_Cruise_Report.pdf
Start Date	2004-06-11
End Date	2004-07-03
Description	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)

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

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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.. "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., 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. 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 ³He 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 ^3He 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.

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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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