S. Atlantic profiling radiometer system (SPMR/SMSR) 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/3028
Data Type: Cruise Results
Version: 1
Version Date: 2007-11-17

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

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
Siegel, David	University of California-Santa Barbara (UCSB-ICESS)	Principal Investigator
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
S. Atlantic profiling radiometer system (SPMR/SMSR) from R/V Weatherbird II WB0409, WB0413, WB0506, WB0508 in the Sargasso Sea from 2004-2005.

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Coverage

Spatial Extent: **N**:31.9319 **E**:-64.08 **S**:29.7775 **W**:-69.391
Temporal Extent: 2004-06-24 - 2005-08-23

Dataset Description

Please refer to the separate document for the Methodology and PI notes. DMO note: appropriate wavelengths are listed with each parameter; 9.9E+35, -999, NA, and blank cells replaced with 'nd'; time_begin and time_end reformated from hours and decimal minutes to hhmm.

Change history: YYMMDD
061212: original data downloaded from Eddies website
(WEATHERBIRD_SPMR_Profiles.xls)
071008: prepared for OCB database by N. Copley, OCB DMO
071117: added to OCB database by C.Chandler (BCO-DMO, WHOI)

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Data Files

File
lightProbe_WB.csv (Comma Separated Values (.csv), 4.36 MB) MD5:fe03df3668956017f596cb638c1b747a Primary data file for dataset ID 3028

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Parameters

Parameter	Description	Units
Cruise_ID	cruise ID designation code	dimensionless
date_begin	date sampling begins in the format YYYYMMDD	unitless
yrday	day of year sampling began (GMT)	dimensionless
time_begin	time at start of profile	hhmm
time_end	time at end of profile	hhmm
lon	longitude, negative denotes West	decimal degrees
lat	latitude, negative denotes South	decimal degrees
lon_eddy	longitude of eddy, negative denotes West	decimal degrees
lat_eddy	latitude of eddy, negative denotes South	decimal degrees
dist_EC	radial distance from eddy center	kilometers
comments	comments	dimensionless
depth	depth, sample, best estimate usually calculated from pressure	meters
temp_SPMR	in-situ temperature of sea water from SPMR	degrees Centigrade
fluor_chla_stim	stimulated fluorescence of chl-a	volts
lu324	upwelling radiance at wavelength 324	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu340	upwelling radiance at wavelength 340	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu380	upwelling radiance at wavelength 380	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu412	upwelling radiance at wavelength 412	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu443	upwelling radiance at wavelength 443	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu490	upwelling radiance at wavelength 490	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu510	upwelling radiance at wavelength 510	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu555	upwelling radiance at wavelength 555	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu565	upwelling radiance at wavelength 565	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu665	upwelling radiance at wavelength 665	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)
lu683	upwelling radiance at wavelength 683	microWatts/meter^2/nanometer/steradian (uW/cm^2/nm/sr)

ed324	downwelling irradiance at wavelength 324	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed340	downwelling irradiance at wavelength 340	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed380	downwelling irradiance at wavelength 380	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed412	downwelling irradiance at wavelength 412	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed443	downwelling irradiance at wavelength 443	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed490	downwelling irradiance at wavelength 490	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed510	downwelling irradiance at wavelength 510	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed555	downwelling irradiance at wavelength 555	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed565	downwelling irradiance at wavelength 565	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed665	downwelling irradiance at wavelength 665	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
ed683	downwelling irradiance at wavelength 683	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
rrs325	remote sensing reflectances (lw/ed) at wavelength 325	steradian^-1
rrs340	remote sensing reflectances (lw/ed) at wavelength 340	steradian^-1
rrs380	remote sensing reflectances (lw/ed) at wavelength 380	steradian^-1
rrs412	remote sensing reflectances (lw/ed) at wavelength 412	steradian^-1
rrs443	remote sensing reflectances (lw/ed) at wavelength 443	steradian^-1
rrs490	remote sensing reflectances (lw/ed) at wavelength 490	steradian^-1
rrs510	remote sensing reflectances (lw/ed) at wavelength 510	steradian^-1
rrs555	remote sensing reflectances (lw/ed) at wavelength 555	steradian^-1
rrs565	remote sensing reflectances (lw/ed) at wavelength 565	steradian^-1
rrs665	remote sensing reflectances (lw/ed) at wavelength 665	steradian^-1
rrs683	remote sensing reflectances (lw/ed) at wavelength 683	steradian^-1
kl324	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 324	meter^-1
kl340	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 340	meter^-1
kl380	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 380	meter^-1

kl412	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 412	meter^-1
kl443	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 443	meter^-1
kl490	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 490	meter^-1
kl510	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 510	meter^-1
kl555	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 555	meter^-1
kl565	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 565	meter^-1
kl665	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 665	meter^-1
kl683	up-welled (diffuse) attenuation coefficnent of lu at wavelenth 683	meter^-1
kd324	down-welled (diffuse) attenuation coefficient of ed at wavelength 324	meter^-1
kd340	down-welled (diffuse) attenuation coefficient of ed at wavelength 340	meter^-1
kd380	down-welled (diffuse) attenuation coefficient of ed at wavelength 380	meter^-1
kd412	down-welled (diffuse) attenuation coefficient of ed at wavelength 412	meter^-1
kd443	down-welled (diffuse) attenuation coefficient of ed at wavelength 443	meter^-1
kd490	down-welled (diffuse) attenuation coefficient of ed at wavelength 490	meter^-1
kd510	down-welled (diffuse) attenuation coefficient of ed at wavelength 510	meter^-1
kd555	down-welled (diffuse) attenuation coefficient of ed at wavelength 555	meter^-1
kd565	down-welled (diffuse) attenuation coefficient of ed at wavelength 565	meter^-1
kd665	down-welled (diffuse) attenuation coefficient of ed at wavelength 665	meter^-1
kd683	down-welled (diffuse) attenuation coefficient of ed at wavelength 683	meter^-1
es325	downwelling surface irradiance at wavelength 325	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
es340	downwelling surface irradiance at wavelength 340	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
es380	downwelling surface irradiance at wavelength 380	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
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es554	downwelling surface irradiance at wavelength 554	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
es565	downwelling surface irradiance at wavelength 565	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
es665	downwelling surface irradiance at wavelength 665	microWatts/centimeter^2/nanometer (uW/cm^2/nm)
es683	downwelling surface irradiance at wavelength 683	microWatts/centimeter^2/nanometer (uW/cm^2/nm)

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Instruments

Dataset-specific Instrument Name	Fluorometer
Generic Instrument Name	Fluorometer
Generic Instrument Description	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

Dataset-specific Instrument Name	SeaWiFS Profiling Multi-Channel Radiometer
Generic Instrument Name	SeaWiFS Profiling Multi-Channel Radiometer
Generic Instrument Description	The SeaWiFS Profiling Multi-Channel Radiometer (SPMR) is a free-falling instrument that is equipped with two sensors, collecting the upwelling irradiance (Ed) and downwelling (Lu) radiance at the following 11 wavelengths: 324, 340, 380, 412, 443, 490, 510, 555, 565, 665, and 683nm. The unit is protected in a long case that contains the majority of the system's electronics, while the optical sensors are located at either end of the case and face in opposite directions (i.e., up and down). These sensors measure the irradiance in units of uW/cm2/nm and the radiance in units of uW/cm2/nm/sr. Tilt and pressure are recorded at the same frequency as the irradiance measurements (6Hz). The SPMR is accompanied by a deck reference sensor, called the SeaWiFS Multichannel Surface Reference (SMSR). This sensor is equipped with the same 11 wavelengths as the SPMR, and is based on the same electronics. Data acquisition is synchronized between the SPMR and the SMSR and is performed at the same (6Hz) frequency.

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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.

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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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