Profile data products from R/V Atlantic Explorer and R/V Cape Hatteras multiple cruises in the Sargasso Sea, Bermuda Atlantic Time Series (BATS) area, and Hydrostation "S" from 2007 to 2008 (ON DEQUE project)

Website: https://www.bco-dmo.org/dataset/3527
Version: 22 August 2011
Version Date: 2011-07-22

Project
» Optical and Nutrient Dependence of Quantum Efficiency (ON DEQUE)

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
Vaillancourt, Robert D.	Millersville University	Principal Investigator, Contact
Marra, John F.	Brooklyn College (CUNY Brooklyn)	Co-Principal Investigator
Gegg, Stephen R.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Table of Contents

Dataset Description

Database Profile Data Products

Methods & Sampling

(tbd)

Data Processing Description

BCO-DMO Processing Notes
Generated from original .xlsx file "ONDEQUE Database_v1.0.xlsx", Sheet: "Profile Data Products" contributed by Robert Vallancourt

BCO-DMO Edits

- Column inserted for Date_UTC to go along with Time_UTC
- "nd" (no data) value inserted in blank cells

- Parameter names modified to conform to BCO-DMO convention

[table of contents | back to top]

Data Files

File
Database_ProfileProds.csv (Comma Separated Values (.csv), 265.54 KB) MD5:c620ea773b44a8fc766eccabd8a46fc7 Primary data file for dataset ID 3527

[table of contents | back to top]

Parameters

Parameter	Description	Units
ProjectId	ID Info; Project	text
CruiseId	ID Info; Cruise Name	text
StationId	ID Info; On Deque station ID	integer
CastId	ID Info; CAST ID	text
Location_Description	ID Info; Location Description	text
Year	ID Info; Year	YYYY
Month	ID Info; Gregorian Month	text
Day_of_Month	ID Info; Day of Gregorian Month	DD
Day_of_Year	ID Info; Sequential Day of Year (whole days 1 = 1 Jan)	DDD
Date_UTC	ID Info; UTC Date	YYYYMMDD
Time_UTC	ID Info; UTC Time	HHMM
Date_Local	ID Info; Local Date	YYYYMMDD
Time_Local	ID Info; Local Time	HHMM

Lon	ID Info; Longitude (deg E)	decimal degrees
Lat	ID Info; Latitude (deg N)	decimal degrees
Depth	ID Info; Depth (meters)	meters
Optical_Depth	Optical Depth [lnPAR0-/PARz)	[lnPAR0-/PARz)
Time_UTC_CTD	CTD Info; UTC Time	HHMMSS
Pressure	CTD Info; Pressure [db]	decibars
Depth_CTD_a	CTD Info; Depth [m]	meters
Potential_Temp	CTD Info; Potential Temperature (T090) [deg C]	degrees C
Temperature	CTD Info; Temperature (T090) [deg C]	degrees C
Conductivity	CTD Info; Conductivity [S m-1]	S m-1
Salinity	CTD Info; Salinity [psu]	psu
Density	CTD Info; Density [Kg m-3]	Kg m-3
Density_sigma_t	CTD Info; Density sigma t [Kg m-3]	Kg m-3
Beam_Attenuation	CTD Info; Beam Attenuation [m-1]	[m-1
Beam_Transmissivity	CTD Info; Beam Transmissivity [%]	percentage
Fluorescence_Chelsea	CTD Info; Fluorescence; Chelsea [mg m-3]	mg m-3
PAR_Irradiance	CTD Info; PAR/Irradiance;	mol quanta/m^2(??)
Fluorometric_Chl_extracted	Fl-Chl; Fluorometric Chl (extracted) (mg m-3)	mg m-3
Depth_Nominal	Nuts; Nominal Depth (m)	meters

Depth_CTD_b	CTD Info; Depth [m]	meters
PO4_minus_P	Nuts; PO4-P (ug at P L-1)	ug at P L-1
NO2_plus_NO3_minus_N	Nuts; NO2+NO3-N (ug at N L-1)	ug at N L-1
Silicate_minus_Si	Nuts; Silicate-Si (ug at Si L-1) ALL BELOW DETECTION LIMITS OF 2.86	ug at Si L-1
Depth_Nominal_PP	IS PP; Nominal PP Depth [m]	meters
PP_Sample_Number	IS PP; PP Sample #	integer
Primary_Productivity_12hour	IS PP; Primary PRoductivity by 12hour In-situ Incubation [mg C m-3 12h-1]	mg C m-3 12h-1
Primary_Productivity_24hour	IS PP; Primary PRoductivity by 24hour In-situ Incubation [mg C m-3 12h-1]	mg C m-3 12h-1
Daily_PAR_Irradiance_Surface	Daily Surface PAR Irradiance (Hargreave's LiCor) [mol quanta/m^2]	mol quanta/m^2
Daily_PAR_Irradiance_Depth_Z	Daily PAR Irradiance at depth z (Hargreave's LiCor) [mol quanta/m^2]	mol quanta/m^2
Ap_440	Ap; Ap-440 [m-1]	m-1
Ap_675	Ap; Ap-675 [m-1]	m-1
mean_Ap	Ap; mean Ap [m-1]	m-1
Ad_440	Ap; Ad-440 [m-1]	m-1
Ad_675	Ap; Ad-675 [m-1]	m-1
mean_Ad	Ap; mean Ad [m-1]	m-1
Aph_440	Ap; Aph-440 [m-1]	m-1

Aph_675	Ap; Aph-675 [m-1]	m-1
mean_Aph	Ap; mean Aph [m-1]	m-1
spec_wtd_aph_rt_tron	Ap; spec-wtd aph [1/m] (spec-wtd to spectrum of rp-tron bulb)	1/m
spec_wtd_aph_in_situ	Ap; spec-wtd aph [1/m] (spec-wtd to in-situ spectrum)	1/m
spec_wtd_appc	spec-wtd appc [1/m] (spec-wtd to in-situ spectrum)	1/m
appc_to_aph	appc/aph (%)	percentage
spec_wtd_apsp	spec-wtd apsp [1/m] (spec-wtd to in-situ spectrum)	1/m
Prochlorococcus	FCM; Prochlorococcus (cells ml-1 SW)	cells ml-1 SW
Synechococcus	FCM; Synechococcus (cells ml-1 SW)	cells ml-1 SW
Picoeukaryotes_total	FCM; Picoeukaryotes (total) (cells ml-1 SW)	cells ml-1 SW
Nanoeukaryotes	FCM; Nanoeukaryotes (cells ml-1 SW)	cells ml-1 SW
TChl_a	HPLC; [TChl a] (mg/m^3)	mg/m^3
Tchl_b	HPLC; [TChl b](mg/m^3)	mg/m^3
TChl_c	HPLC; [TChl c] (mg/m^3)	mg/m^3
Caro	HPLC; [Caro] (mg/m^3)	mg/m^3
But_fuco	HPLC; [But fuco] (mg/m^3)	mg/m^3
Hex_fuco	HPLC; [Hex fuco] (mg/m^3)	mg/m^3
Allo	HPLC; [Allo] (mg/m^3)	mg/m^3
Diad	HPLC; [Diad] (mg/m^3)	mg/m^3

Diato	HPLC; [Diato] (mg/m^3)	mg/m^3
Fuco	HPLC; [Fuco] (mg/m^3)	mg/m^3
Perid	HPLC; [Perid] (mg/m^3)	mg/m^3
Zea	HPLC; [Zea] (mg/m^3)	mg/m^3
Chl_a	HPLC; [Chl a] (mg/m^3)	mg/m^3
DVChl_a	HPLC; [DVChl a] (mg/m^3)	mg/m^3
Chlide_a	HPLC; [Chlide a] (mg/m^3)	mg/m^3
Chl_b	HPLC; [Chl b] (mg/m^3)	mg/m^3
DVChl_b	HPLC; [DVChl b] (mg/m^3)	mg/m^3
Chl_c1	HPLC; Chl c1 (mg/m^3)	mg/m^3
Chl_c2	HPLC; Chl c2 (mg/m^3)	mg/m^3
Chl_c12	HPLC; [Chl c12] (mg/m^3)	mg/m^3
Chl_c3	HPLC; [Chl c3] (mg/m^3)	mg/m^3
Lut	HPLC; [Lut] (mg/m^3)	mg/m^3
Neo	HPLC; [Neo] (mg/m^3)	mg/m^3
Viola	HPLC; [Viola] (mg/m^3)	mg/m^3
Phytin_a	HPLC; [Phytin a] (mg/m^3)	mg/m^3
Phide_a	HPLC; [Phide a] (mg/m^3)	mg/m^3
Pras	HPLC; [Pras] (mg/m^3)	mg/m^3

Gyr_diester	HPLC; [Gyr diester] (mg/m^3)	mg/m^3
TChl	HPLC; [TChl] (mg/m^3)	mg/m^3
PPC	HPLC; [PPC] (mg/m^3)	mg/m^3
PSC	HPLC; [PSC] (mg/m^3)	mg/m^3
PSP	HPLC; [PSP] (mg/m^3)	mg/m^3
TCaro	HPLC; [TCaro] (mg/m^3)	mg/m^3
TAcc	HPLC; [TAcc] (mg/m^3)	mg/m^3
TPig	HPLC; [TPig] (mg/m^3)	mg/m^3
DP	HPLC; [DP] (mg/m^3)	mg/m^3
Pmax	PvsE Exps; Pmax [mgC m^-3 h^-1]	mgC m^-3 h^-1
Pmax_ERROR	PvsE Exps; Pmax ERROR [mgC m^-3 h^-1]	mgC m^-3 h^-1
alpha	PvsE Exps; alpha [mgC m^-3 h^-1 (uE/m^2s)^-1]	mgC m^-3 h^-1 (uE/m^2s)^-1
alpha_ERROR	PvsE Exps; alpha ERROR [mgC m^-3 h^-1 (uE/m^2s)^-1]	mgC m^-3 h^-1 (uE/m^2s)^-1
Fo_particulate	FRRF; Fo (particulate)	(tbd)
Fo_standard_error	FRRF; fo_standard error	(tbd)
Fm_particulate	FRRF; Fm (particulate)	(tbd)
Fm_standard_error	FRRF; Fm_standard error	(tbd)
Fv_particulate	FRRF; Fv (particulate)	(tbd)
Fv_Standard_error	FRRF; Fv Standard error	(tbd)

Fv_to_Fm_particulate	FRRF; Fv/Fm (particulate)	(tbd)
Fv_to_Fm_sterr	FRRF; Fv/Fm_sterr	(tbd)
SigmaPSII_particulate	FRRF; SigmaPSII (particulate) [A^2/quanta]	A^2/quanta
SigmaPSII_Standard_error	FRRF; SigmaPSII Standard error [A^2/quanta]	A^2/quanta
p_value	FRRF; p-value	(tbd)
p_value_standard_error	FRRF; p-value standard error	(tbd)
tau_particulate	FRRF; tau (particulate)	(tbd)
tau_sterr	FRRF; tau_sterr	(tbd)

[table of contents | back to top]

Deployments

GF222_BATS

Website	https://www.bco-dmo.org/deployment/58135
Platform	R/V Atlantic Explorer
Start Date	2007-04-14
End Date	2007-04-20

GF226_BATS

Website	https://www.bco-dmo.org/deployment/58136
Platform	R/V Atlantic Explorer
Start Date	2007-08-11
End Date	2007-08-19

CH-05-08

Website	https://www.bco-dmo.org/deployment/58137
Platform	R/V Cape Hatteras
Start Date	2008-07-05
End Date	2008-07-22

[table of contents | back to top]

Project Information

Optical and Nutrient Dependence of Quantum Efficiency (ON DEQUE)

Coverage: Western North Atlantic Ocean. Sargasso Sea, Gulf stream, slope waters, shelfbreak front, continental shelf, mid-Atlantic bight

The control of photosynthetic quantum yield of phytoplankton by light intensity and diapycnal nutrient flux

Primary production in the ocean is probably the least known part of the ocean's carbon cycle. One reason that primary production is little known is the lack of understanding of the geographical and temporal variability in phytoplankton physiology. For example it is only recently that the importance has been revealed, of the so-called photoprotectant pigments, pigments that, in effect, shield the photosynthetic apparatus from too much sunlight. This project will investigate the geographic and temporal variability of a fundamental property of oceanic photosynthesis: the quantum yield, or the ratio of the available light to the amount of carbon fixed in photosynthesis. The PIs propose an hypothesis based on earlier measurements, that in the lower parts of the euphotic zone in the stratified ocean, the upward flux of nutrients regulates the value of the quantum yield, while in the upper parts, irradiance governs its value, through the pigment composition of the phytoplankton. This hypothesis will be tested by making estimates of the quantum yield's maximum value through very careful and comprehensive measurements of the bio-optical properties and species composition of the phytoplankton, as well as the submarine light environment, hydrography, and nutrients. These measurements will be along both temporal and spatial gradients in the ocean to create the basis for environmental regulation of quantum yield. These measurements will be used to establish precisely how the maximum value of the quantum yield is regulated by solar flux and plant nutrients. This research provides a mechanism to understand how the processes of nutrient supply and light affect the physiology of natural populations of phytoplankton, a long-standing problem in biological oceanography. It also provides a means for improving the modeling primary productivity, including estimating productivity in the global ocean from space.

[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]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0550725

[table of contents | back to top]