Macronutrients from R/V Atlantic Explorer and R/V Cape Hatteras cruises F222_BATS and CH0508 in the Sargasso Sea, south of Bermuda, BATS area, and Hydrostation "S" from 2007 to 2008 (ON DEQUE project)

Website: https://www.bco-dmo.org/dataset/3529
Version: 22 August 2011
Version Date: 2011-08-22

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

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
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Dataset Description

Macronutrients - Nitrogen, Phosphorus and Silicate concentrations
Note: The lab report for OnDeque2/BATS226 cannot be found.

Note: No date, time, lat, lon contributed for these data

Methods & Sampling

Samples for macronutrient analysis were collected directly from Niskin bottles using a acid-cleaned latex tubing into 60 ml plastic Nalgene bottles that were rinsed with several volumes of sample prior to capping. The Nalgene bottles had been cleaned by soaking for several days in dilute Micro detergent, rinsed with distilled water, then soaked for several days in HCl and then rinsed copiously with deionized water.

Data Processing Description

BCO-DMO Processing Notes

Generated from original .xlsx files "ON DEQUE BATS222 Nutrients.xlsx" "and ONDEQUE CH0508 Nutrients.xlsx" contributed by Robert Vallancourt

BCO-DMO Edits
- Column inserted for OnDeque Project Id
- Column inserted for OnDeque Cruise Id
- Parameter names modified to conform to BCO-DMO convention
- BATS222 QA/QC Report extracted and included in platform deployment processing description

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Data Files

File
Nutrients.csv (Comma Separated Values (.csv), 6.26 KB) MD5:04d28c5e5cf48f593cb3d1e5bcae4d45 Primary data file for dataset ID 3529

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Parameters

Parameter	Description	Units
ProjectId	ON DEQUE Project Id	text
CruiseId	ON DEQUE Cruise Id	text
SampleId	ON DEQUE Sample Id	integer
PO4	PO4-P	ug at P/l
NO23	NO2+NO3-N	ug at N/l
SI	Silicate	ug at Si/l

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Instruments

Dataset-specific Instrument Name	Niskin bottle
Generic Instrument Name	Niskin bottle
Generic Instrument Description	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

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
Description	**Processing Description** QA/QC Report NO2+NO3-N Sample Rep. 1 Rep.2 Sample Actual Expected Orig. 104 1.01 1.1 406 3.93 3.95 0.84 308 2.42 2.46 202 3.52 3.47 0.32 PO4-P 204 0.45 0.5 209 1.06 1.14 0.05 407 0.13 0.14 402 1.12 1.13 0.04 Si 106 0.36 0.71 204 29.3 34.3 0.36 308 0.71 0.71 408 29.6 34.3 0.36 603 0.36 0.36

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

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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.

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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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Funding

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

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