Chlorophyll a estimates from Niskin bottle casts from R/V Seward Johnson cruise SJ0516 in the North Atlantic, largely between Ireland and Iceland in 2005 (NASB 2005 project)

Website: https://www.bco-dmo.org/dataset/3105
Version: 13 April 2009
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Project
» North Atlantic Spring Bloom 2005 (NASB 2005)

Contributors	Affiliation	Role
Hutchins, David A.	University of Southern California (USC-HIMS)	Principal Investigator
DiTullio, Giacomo	College of Charleston - Hollings Marine Lab (CoC-HML)	Co-Principal Investigator
Wilhelm, Steven W.	University of Tennessee	Co-Principal Investigator
Chandler, Cynthia L.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

Fluorometric chlorophyll a estimates from Niskin bottle cast samples

Methods & Sampling

NOTE: station 1- or 2- refers to either cruise leg 1 (Florida to the Azores) or cruise leg 2 (Azores to Iceland)

Only 'surface' samples were taken while dead-heading on leg 1. The surface samples are recorded as being from nominal depth of 3 meters as that was the approximate depth of the ship's underway intake system.

Calibration notes

Instrument was calibrated prior to the cruise (~ May 1, 2005) using extracted chlorophyll a standards.

Extracted standards were checked with a spectrophotometer to determine chlorophyll a concentrations.

Extracted standards were used to calibrate the solid standard (Turner Designs).

Solid-standard normalizations were completed each day upon initiation of the fluorometer.

Size-fractionated chl a concentrations were determined on replicate samples collected on 0.22, 2.0, and 20.0 um nominal pore size, 47 mm diameter polycarbonate filters (Osmonics). Samples were extracted in 90% acetone for 24 h at 4°C and quantified using a solid-standard normalized 10-AU field fluorometer (Turner Designs) using the nonacidification protocol (Welschmeyer 1994).

Welschmeyer NA (1994) Fluorometric analysis of chlorophyll
a in the presence of chlorophyll b and phaeopigments.
Limnol Oceanogr 39:1985-1992

Data Processing Description

DMO processing notes:

1. reported longitudes corrected to negative (Western hemisphere)

2. depth_n of 'surface' replaced with a nominal depth of 3 meters (to enable plotting of data)

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Data Files

File
chlorophyll.csv (Comma Separated Values (.csv), 36.34 KB) MD5:e602b7fe7fda820d1fa65e950344736a Primary data file for dataset ID 3105

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Parameters

Parameter	Description	Units
station	station identifier (leg-station number optionally followed by a or b)	dimensionless
depth_n	nominal (target) depth of sample	meters
chl_a	mean chlorophyll a concentration from duplicate samples; fluorometric method with nonacidification protocol (Welschmeyer 1994)	micrograms/liter
size	polycarbonate filter pore size in microns; investigators looked at size-fractionated distribution of chlorophyll a	micrometers
range_n2	range of the duplicate samples	dimensionless
date	date (GMT) start of sampling (from event log)	dimensionless
time	time (GMT) at start of sampling (from event log)	dimensionless
lat	latitude, in decimal degrees, North is positive, negative denotes South (from event log)	decimal degrees
lon	longitude, in decimal degrees, East is positive, negative denotes West (from event log)	decimal degrees

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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.

Dataset-specific Instrument Name	Turner Designs Fluorometer -10-AU
Generic Instrument Name	Turner Designs Fluorometer 10-AU
Generic Instrument Description	The Turner Designs 10-AU Field Fluorometer is used to measure Chlorophyll fluorescence. The 10AU Fluorometer can be set up for continuous-flow monitoring or discrete sample analyses. A variety of compounds can be measured using application-specific optical filters available from the manufacturer. (read more from Turner Designs, turnerdesigns.com, Sunnyvale, CA, USA)

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Deployments

SJ0516

Website	https://www.bco-dmo.org/deployment/57981
Platform	R/V Seward Johnson
Start Date	2005-06-03
End Date	2005-07-06
Description	This R/V Seward Johnson cruise, funded by NSF OCE/BIO (OCE-0423418), was conducted as part of the NASB 2005 US/EC Collaboration on Potential Climate Change Impacts on Algal Community Structure and Biogeochemistry During the North Atlantic Spring Bloom. It is uncertain whether a cruise ID was ever assigned. The US State Department designator was SJ-2004-126, possibly reflecting request for approval that began in 2004. The Oceanic Research Ship Schedules database (from the Ocean Information Center maintained by the College of Marine & Earth Studies at the University of Delaware) assigned JOH/05/0063 to leg 2 of this cruise. The BCO-DMO assigned SJ0516 as the unique cruise ID since leg 2 was the sixteenth cruise for R/V Seward Johnson in 2005. Cruise Synopsis adapted from the original text written by NASB 2005 project investigator Matthew Cottrell The R/V Seward Johnson departed from Fort Pierce, FL in June, 2005. The vessel first transited to the Azores (cruise leg 1, Florida to the Azores) where it spent two days before heading north to Iceland (cruise leg 2, Azores to Iceland). The purpose of this cruise was to explore the ecology of heterotrophic and photoheterotrophic bacteria in the North Atlantic. Surface waters were sampled during the transit across the oligotrophic Atlantic, passing Bermuda on the way. Depth profiles were sampled on the leg from the Azores to Iceland. Water was collected for a number of analyses. One of the most important assessed the effect of light on the growth of heterotrophic bacteria using 3H-leucine incorporation and the uptake of other organic compounds. We were especially interested in cyanobacteria, including Prochlorococcus and Synechococcus. Flow cytometery and flow sorting of radiolabeled cells was key to this project. Other analyses included bacterial abundance, bacterial production, bacterial community structure (FISH), community activity (Micro-FISH), chlorophyll a, bacterial chlorophyll a, and the abundance of aerobic anoxigenic phototrophic (AAP) bacteria.

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Project Information

North Atlantic Spring Bloom 2005 (NASB 2005)

Coverage: North Atlantic

Climate-related shifts in phytoplankton assemblages may have profound implications for oceanic feedbacks on the atmosphere, and for human use of marine resources. Particular algal groups are largely responsible for crucial processes like vertical carbon export, biogenic calcification and silicification, production of climatically active gases like dimethylsulfide (DMS), and for sustaining food webs that lead to economically valuable higher trophic levels. The North Atlantic Spring Bloom 2005 (NASB 2005) research program was designed to investigate potential climate change impacts on algal community structure and biogeochemistry during the North Atlantic Spring Bloom, a regime that is ideal for determining how changing ocean conditions may affect both calcareous and siliceous algae.

The research was coordinated with CarboOcean, a major European Union funded activity led by investigators from the Alfred Wegener Institute.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0423418

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