

Pigment concentrations and water bottle cast data from R/V Endeavor, R/V Atlantis II cruises EN198, AII-119-4, AII-119-5 in the North Atlantic in 1989 (U.S. JGOFS NABE project)

Website: <https://www.bco-dmo.org/dataset/2575>

Version: January 14, 2003

Version Date: 2003-01-14

Project

» [U.S. JGOFS North Atlantic Bloom Experiment](#) (NABE)

Program

» [U.S. Joint Global Ocean Flux Study](#) (U.S. JGOFS)

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Dataset Description

Pigment concentrations, water bottle casts

Methods & Sampling

PI: Dan Repeta
of: Woods Hole Oceanographic Institution
dataset: Pigment concentrations, water bottle casts
project/cruise: North Atlantic Bloom Experiment cruises

Methodology:

CHLOROPHYLL-A (Repeta, WHOI)

For shipboard extraction of suspended particulate matter, 0.5-1 L of seawater is filtered through a 47 mm Gelman A/E or 47 mm Whatman GF/F glass fiber filter under low vacuum. The filter is immediately placed in a glass grinding tube at 0° Centigrade, 2 mL of acetone and 0.1 mL of the internal standard (8'-Ethyl-apocarotenoate or canthaxanthin in acetone) added, and the sample ground at high speed for 2 min. The sample is centrifuged for 2-4 min, and analyzed by high pressure liquid chromatography (HPLC). If the sample is to be stored for future analysis, the filter is folded, heat sealed in a plastic bag, and rapidly frozen to -20° Centigrade.

For shipboard analysis of suspended particulate matter samples, we use a 10 cm reverse-phase ODS column (adsorbosphere HS, 3µm) eluted

with a linear gradient of 0-100% B (A=20/80 0.5N NH₄Ac(aq)/MeOH; B=20/80 acetone/MeOH) over 10 min at 1.5 mL/min. For more detailed analysis, we use a 15 cm column and a 30 min gradient. All samples were analyzed by diode array spectroscopy (350-700nm) and fluorescence detection.

Individual components were quantified by normalizing the data to the internal standard to correct for evaporative losses, differences in water retention by filters, and nonquantitative transfers during handling, then correcting the data for individual compounds by using an appropriate detector calibration factor. We calibrate our system by isolating pure pigments, making quantitative standards, and carrying out a series of analyses over the calibration range of interest. Depending on the pigment's spectral properties, and the wavelength of detection, calibration factors for individual pigments may differ by up to a factor of 5. For calibration in the field, concentrated solutions of standards are prepared in benzene, and 1 mL aliquots dispensed to 10 mL volumetric flasks. The flasks are flushed with N₂, capped, frozen at -20° Centigrade. Randomly chosen standards are stored in the laboratory for spectroscopic analysis at a later date. The remaining flasks are stored on shipboard until use. For calibration, the standards are returned to room temperature and acetone or methanol added to 10 mL. Aliquots are then analyzed by HPLC. In the US JGOFs program, over 30 replicate standards were prepared and analyzed daily in triplicate showed a SD of were calibrated daily for the internal standard and twice weekly for chlorophyll-a. Calibration factors for major xanthophylls were determined at least one time per week.

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Parameters

Parameter	Description	Units
year	year as YYYY	YYYY
event	event number from event log	MMDDhhmm
sta	station number from event log	dimensionless
cast	cast number from event log	dimensionless
bot	bottle number	dimensionless
press	pressure	decibars
chl_a	chlorophyll-a	nanograms/liter
peridinin	peridinin	nanograms/liter
fucox_but	19-prime-butanoyloxyfucoxanthin	nanograms/liter
fucox	19-prime-fucoxanthin	nanograms/liter
fucox_hex	hexanoyloxyfucoxanthin	nanograms/liter
diadinox	diadinoxanthin	nanograms/liter
diatox	diatoxanthin	nanograms/liter
zeax	zeaxanthin	nanograms/liter
carotene	carotene	nanograms/liter
sta_name	station name as assigned by PI (this is not station number)	
depth_n	nominal depth of sample	meters

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Instruments

Dataset-specific Instrument Name	Go-flo Bottle
Generic Instrument Name	GO-FLO Bottle
Dataset-specific Description	Go-Flo Rosette bottles were used to collect the water samples.
Generic Instrument Description	GO-FLO bottle cast used to collect water samples for pigment, nutrient, plankton, etc. The GO-FLO sampling bottle is specially designed to avoid sample contamination at the surface, internal spring contamination, loss of sample on deck (internal seals), and exchange of water from different depths.

Dataset-specific Instrument Name	Niskin Bottle
Generic Instrument Name	Niskin bottle
Dataset-specific Description	Niskin Rosette bottles were used to collect the water samples.
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

EN198

Website	https://www.bco-dmo.org/deployment/57739
Platform	R/V Endeavor
Start Date	1989-06-28
End Date	1989-07-07
Description	<p>post bloom cruise; 7 locations; 63°N 25°W to 59°N 14°W</p> <p>Methods & Sampling PI: Dan Repeta of: Woods Hole Oceanographic Institution dataset: Pigment concentrations, water bottle casts dates: June 28, 1989 to July 7, 1989 location: N: 62.6 S: 59.5 W: -24.1 E: -20.9 project/cruise: North Atlantic Bloom Experiment/Endeavor 198 ship: R/V Endeavor DMO NOTE: This dataset was submitted without the supporting geographic and data/time parameters. The Endeavor 198 cruise focused on two NABE sites: 59.5N 20.9W and 62.6N 24.1W (see event log). The DMO is reluctant to assign positional information to this dataset. Therefore, these data are presented here for use by the science community, at their discretion, with the knowledge that this deficiency exists. It should also be understood that the sta_name parameter reported with this data is not the same as station number. The station numbers on this cruise ranged from 2 through 9 whereas the sta_name values range from 3 through 12.</p>

All-119-5

Website	https://www.bco-dmo.org/deployment/57738
Platform	R/V Atlantis II
Start Date	1989-05-15
End Date	1989-06-06
Description	<p>late bloom cruise; 31 locations; 61N 22W to 41N 17W</p> <p>Methods & Sampling PI: Dan Repeta of: Woods Hole Oceanographic Institution dataset: HPLC Pigment concentrations, water bottle casts dates: April 20, 1989 to June 06, 1989 location: N: 59.7418 S: 46.245 W: -20.81 E: -17.6433 project/cruise: North Atlantic Bloom Experiment/Atlantis II 119, leg 5 ship: R/V Atlantis II</p>

All-119-4

Website	https://www.bco-dmo.org/deployment/57737
Platform	R/V Atlantis II
Start Date	1989-04-17
End Date	1989-05-11
Description	<p>early bloom cruise; 17 locations; 60N 21W to 46N 18W</p> <p>Methods & Sampling PI: Dan Repeta of: Woods Hole Oceanographic Institution dataset: HPLC Pigment concentrations, water bottle casts dates: April 20, 1989 to June 06, 1989 location: N: 59.7418 S: 46.245 W: -20.81 E: -17.6433 project/cruise: North Atlantic Bloom Experiment/Atlantis II 119, leg 4 ship: R/V Atlantis II</p>

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Project Information

U.S. JGOFS North Atlantic Bloom Experiment (NABE)

Website: <http://usjgofs.whoi.edu/research/nabe.html>

Coverage: North Atlantic

One of the first major activities of JGOFS was a multinational pilot project, North Atlantic Bloom Experiment (NABE), carried out along longitude 20° West in 1989 through 1991. The United States participated in 1989 only, with the April deployment of two sediment trap arrays at 48° and 34° North. Three process-oriented cruises were conducted, April through July 1989, from R/V *Atlantis II* and R/V *Endeavor* focusing on sites at 46° and 59° North. Coordination of the NABE process-study cruises was supported by NSF-OCE award # 8814229. Ancillary sea surface mapping and AXBT profiling data were collected from NASA's P3 aircraft for a series of one day flights, April through June 1989.

A detailed description of NABE and the initial synthesis of the complete program data collection efforts appear in: Topical Studies in Oceanography, JGOFS: The North Atlantic Bloom Experiment (1993), Deep-Sea Research II, Volume 40 No. 1/2.

The U.S. JGOFS Data management office compiled a preliminary NABE data report of U.S. activities: Slagle, R. and G. Heimerdinger, 1991. U.S. Joint Global Ocean Flux Study, North Atlantic Bloom Experiment, Process Study Data Report P-1, April-July 1989. NODC/U.S. JGOFS Data Management Office, Woods Hole Oceanographic Institution, 315 pp. (out of print).

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Program Information

U.S. Joint Global Ocean Flux Study (U.S. JGOFS)

Website: <http://usjgofs.whoi.edu/>

Coverage: Global

The United States Joint Global Ocean Flux Study was a national component of international JGOFS and an integral part of global climate change research.

The U.S. launched the Joint Global Ocean Flux Study (JGOFS) in the late 1980s to study the ocean carbon cycle. An ambitious goal was set to understand the controls on the concentrations and fluxes of carbon and associated nutrients in the ocean. A new field of ocean biogeochemistry emerged with an emphasis on quality measurements of carbon system parameters and interdisciplinary field studies of the biological, chemical and physical process which control the ocean carbon cycle. As we studied ocean biogeochemistry, we learned that our simple views of carbon uptake and transport were severely limited, and a new "wave" of ocean science was born. U.S. JGOFS has been supported primarily by the U.S. National Science Foundation in collaboration with the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the Department of Energy and the Office of Naval Research. U.S. JGOFS, ended in 2005 with the conclusion of the Synthesis and Modeling Project (SMP).

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Funding

Funding Source	Award
National Science Foundation (NSF)	unknown NABE NSF

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