

Calibration reports for data from B4-2008, B9-2008, B10-2008, KN193-03, SG140, SG141, SG142, SG143, and Biofloat_48 in the subpolar North Atlantic and Iceland Basin in 2008 (NAB 2008 project)

Website: <https://www.bco-dmo.org/dataset/3451>

Data Type: Cruise Results

Version: 2 December 2011

Version Date: 2011-12-02

Project

» [North Atlantic Bloom Experiment 2008](#) (NAB 2008)

Program

» [Ocean Carbon and Biogeochemistry](#) (OCB)

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Dataset Description

Calibration reports for North Atlantic Bloom Experiment 2008 (NAB08) projects, which include cruises, SeaGlider and Float deployments:

- B4-2008
- KN193-03
- B9-2008
- B10-2008
- NAB08 SG140
- NAB08 SG141
- NAB08 SG142
- NAB08 SG143
- NAB08 Lagrangian Float 48 (Biofloat_48)

Contents include:

1. Ship_TS_despiking-NAB08.pdf: Temperature and salinity correction procedure for CTD sensors deployed on cruises KN 193-03, B4-2008, B9-2008 and B10-2008.
2. CTD_float_Calibration-NAB08.pdf: Temperature and salinity correction procedure for CTD sensors deployed aboard NAB08 Lagrangian Float 48 and intercalibration with CTD data from KN193-03 via series of calibration casts.
3. CTD_seaglider_calibration-NAB08.pdf: Temperature and salinity correction procedure for glider datasets NAB08 SG140, NAB08 SG141, NAB08 SG142 and NAB08 SG143 and intercalibration with CTD sensors deployed aboard KN 193-03, B4-2008, B9-2008, B10-2008 via series of calibration casts.
4. Oxygen_glider_float_Calibration-NAB08.pdf: Calibration procedure associated with dissolved oxygen measurements aboard NAB08 SG140, NAB08 SG141, NAB08 SG142 and NAB08 SG143 and further corrections via calibration casts with NAB08 Lagrangian Float 48.
5. Winkler_oxygen-NAB08.pdf: Winkler oxygen measurements of CTD rosette and underway samples during KN193-03.
6. Chlorophyll_Calibration-NAB08.pdf: algorithm development for chlorophyll concentration product using empirical relationship between extracted chlorophyll aboard KN193-03 and concurrent in-situ measurements of chlorophyll fluorescence, temperature, PAR, depth, and time.
7. ISUS_Nitrate_Sensor Float_Calibration-NAB08.pdf: Temperature and salinity depended calibration of the ISUS Nitrate Sensor on Float 48 and intercalibration (via calibration casts) with discrete measurements of nitrate obtained during KN 193-03.
8. Backscatter_Calibration-NAB08.pdf: Processing, correction and intercalibration procedure for backscattering sensors deployed aboard KN 193-03, B4-2008, B9-2008, B10-2008, NAB08 Lagrangian Float 48, NAB08 SG140, NAB08 SG141, NAB08 SG142 and NAB08 SG143.
9. Oxygen_Calibration-NAB08.pdf: Report explaining correction and intercalibration of NAB08 Lagrangian Float 48 and KN 193-03 dissolved oxygen sensors via series of calibration casts using discrete Winkler method measured dissolved oxygen. Addendum to this document describes calibration procedure and resulting correction for KN 193-03 dissolved oxygen sensor.
10. C-Star Calibration-NAB08.pdf: Processing, corrections and intercalibration of beam transmissometers deployed aboard KN 193-03, B4-2008, B9-2008, B10-2008 and NAB08 Lagrangian Float 48.
11. Radiometry_and_PAR_Calibration-NAB08.pdf: Calibrations, intercalibrations and corrections for radiometers deployed aboard NAB08 Lagrangian Float 48, B4-2008, B9-2008, B10-2008 and KN 193-03. [\[under review\]](#)
12. POC_cp_bbp_Calibration-NAB08.pdf: Development of particulate organic carbon (POC) proxy using relationship between POC measured aboard KN193-03 and backscattering (bbp) and attenuation (cp) coefficient measurements. [\[under review\]](#)
13. Seaglider_chl_Calibration.pdf: Correction and intercalibration of chlorophyll fluorometers deployed aboard NAB08 SG140, NAB08 SG141, NAB08 SG142 and NAB08 SG143 via calibration casts. [\[under review\]](#)
14. Laboratory_analysis_report-NAB08.pdf: Detailed procedure regarding the discrete measurements of nutrients, Winkler dissolved oxygen, absorption coefficients, particulate organic carbon, fluorometric and HPLC pigment analysis.
15. Phytoplankton_Carbon-NAB08.pdf: Materials and methodology used for phytoplankton cell number and biomass determination.

Data Files

File
NAB08_Calibration_Documents.csv (Comma Separated Values (.csv), 1.62 KB) MD5:6ed4f77b47d264766fe92e8999d0f371
Primary data file for dataset ID 3451

Parameters

Parameter	Description	Units
document_name	Name of document	
document_link	Hyperlink to document	

Instruments

Dataset-specific Instrument Name	Lagrangian Float
Generic Instrument Name	Lagrangian Float
Dataset-specific Description	The 2008 North Atlantic Bloom Experiment (NAB08) employed a "Lagrangian float", custom built at the University of Washington Applied Physics Laboratory. (D'Asaro, 2003, Performance of Lagrangian Floats, Journal of Atmospheric and Oceanic Technology, Vol. 20, 896-911).
Generic Instrument Description	Built at the University of Washington Applied Physics Laboratory, the Lagrangian Float is not an ARGO float. It is primarily designed to accurately follow the three-dimensional motion of water parcels within the mixed layer, through a combination of neutral buoyancy and high drag provided by a one meter diameter black drogue. Typical buoyancies of a few grams result in vertical velocities relative to the water of a few mm/s, small compared to the cm/s turbulent velocities in the mixed layer. The float's motion within the mixed layer thus closely imitates that of a planktonic organism. The float can also profile vertically. It sends data and receives commands using the Iridium satellite system. The float is designed to accommodate a wide variety of sensors.

Dataset-specific Instrument Name	Seaglider
Generic Instrument Name	Seaglider
Generic Instrument Description	The Seaglider is an autonomous underwater vehicle developed through a collaboration between The Applied Physics Laboratory -University of Washington and the University of Washington School of Oceanography. These small, free-swimming vehicles can gather conductivity-temperature-depth (CTD) data from the ocean for months at a time and transmit it to shore in near-real time via satellite data telemetry. Seagliders make oceanographic measurements traditionally collected by research vessels or moored instruments. They can survey along a transect, profile at a fixed location, and can be commanded to alter their sampling strategies throughout a mission.

Deployments

B4-2008

Website	https://www.bco-dmo.org/deployment/58145
Platform	R/V Bjarni Saemundsson
Start Date	2008-04-01
End Date	2008-04-06
Description	Deployment cruise: R/S Bjarni Saemundsson departed 1 April 2008 10:00 from Reykjavik to deploy 2 floats (Biofloat 47 and 48 and 4 Seagliders (SG 140, 141, 142, 143); these were all successfully deployed on 4 April 2008. Biofloat 47 failed within a few weeks of deployment; therefore its data are not reported. CTD profiles (n=9) and water samples were collected before and after the autonomous platform deployment. R/S Bjarni Saemundsson returned to Reykjavik on 6 April 2008.

B9-2008

Website	https://www.bco-dmo.org/deployment/58152
Platform	R/V Bjarni Saemundsson
Start Date	2008-06-02
End Date	2008-06-06
Description	Rescue cruise: R/S Bjarni Saemundsson departed 2 June 2008 2030 from Reykjavik to recover Float 48 and Seaglider 143. Ten CTD casts were made and bottles samples collected for calibration of remaining Seagliders before departing study area. R/S Bjarni Saemundsson returned to Reykjavik on 6 June 2008.

B10-2008

Website	https://www.bco-dmo.org/deployment/58146
Platform	R/V Bjarni Saemundsson
Start Date	2008-06-25
End Date	2008-07-01
Description	Recovery cruise: R/S Bjarni Saemundsson departed 25 June 2008 0930 from Reykjavik to recover Seagliders 140, 141, 142. Before the ship departed port, SG 142 stopped communicating; hence, a survey pattern was carried out to acoustically ping for the glider but was unsuccessful in locating it. CTD casts were made (n=12) and bottles samples collected for calibration of SG 140 and 141 before they were recovered. The ship steamed to near the original deployment site (59.02°, -20.49) on 29 June 2008 to deploy two bio-optical ARGO floats for Dr. H. Claustre, LOV, France. R/S Bjarni Saemundsson returned to Reykjavik on 1 July 2008.

KN193-03

Website	https://www.bco-dmo.org/deployment/58153
Platform	R/V Knorr
Start Date	2008-05-01
End Date	2008-05-22
Description	A three-week process cruise on the R/V Knorr operated in the vicinity of five autonomous platforms that had been deployed in early April by another vessel. A total of 10 simultaneous float and CTD calibration profiles were taken to calibrate sensors on the Lagrangian mixed layer float (Biofloat 48) and to validate proxy measurements (i.e., optical attenuation to particulate organic carbon, etc.). One simultaneous Seaglider and CTD calibration profile was collected for each of the four Seagliders. Knorr also carried out a number of bow-tie surveys around the Lagrangian mixed layer float. A second float, Biofloat 47, had ceased functioning shortly after deployment was rescued at the beginning of the cruise. Two SOLOPC floats were deployed but were damaged on deployment and sank. A number of successful short deployments of PELAGRA floating were made during the cruise. Core ship-board measurements supported by project funding were: 1) CTD profiles (temperature, conductivity, oxygen, chlorophyll fluorescence, optical backscatter, and beam transmission) on all four cruises; 133 CTD profiles were obtained on this cruise. 2) analysis of water samples collected with the CTD Rosette (chlorophyll, HPLC pigments, nutrients, particulate organic carbon, particulate absorption spectrum, phytoplankton, oxygen and other guest investigator measurements). Original cruise data are available from the NSF R2R data catalog Science personnel: Mary Jane Perry, University of Maine, Chief Scientist Witold Bagniewsk, University of Maine Nicole Bale, Plymouth Laboratory, UK Nathan Briggs, University of Maine David Checkley, Scripps Institution of Oceanography Giorgio Dall'Olmo, Oregon State University Andrea Drzewianowski, University of Maine Amanda Gray, University of Washington Jennifer Fortier, University of Maine Alba Gonzalez-Posada, University of East Anglia, UK Emily Kallin, University of Maine Kristinn Gudmundsson, Marine Research Institute, Reykjavik, Iceland Richard Lampitt, National Oceanography Centre, South Hampton, UK Patrick Martin, National Oceanography Centre, South Hampton, UK Maren Moltke Lyngsgaard, University of Copenhagen, Denmark Nicole Poulton, Bigelow Laboratory Eric Rehm, University of Washington Katherine Richardson, University of Copenhagen, Denmark Ryan Rykaczewski, Scripps Institution of Oceanography Michael Sauer, University of Maine Richard Sawyer, National Oceanography Centre, South Hampton, UK Michael Sieracki, Bigelow Laboratory Tatiana Rynearson, University of Rhode Island Toby Westberry, Oregon State University Dane Wojcicki, University of Maine Lin Zhang, University of Rhode Island

SG140

Website	https://www.bco-dmo.org/deployment/58148
Platform	Seaglider 140
Start Date	2008-04-04
End Date	2008-06-28
Description	Starting position: 58.999, -20.507 (according to Seaglider Tracks dataset)

SG141

Website	https://www.bco-dmo.org/deployment/58149
Platform	Seaglider 141
Start Date	2008-04-04
End Date	2008-06-27
Description	Starting position: 59.010, -20.501 (according to Seaglider Tracks dataset)

SG142

Website	https://www.bco-dmo.org/deployment/58150
Platform	Seaglider 142
Start Date	2008-04-04
End Date	2008-06-24
Description	Starting position: 58.994, -20.484 (according to Seaglider Tracks dataset)

SG143

Website	https://www.bco-dmo.org/deployment/58151
Platform	Seaglider 143
Start Date	2008-04-04
End Date	2008-06-03
Description	Starting position: 59.005, -20.511 (according to Seaglider Tracks dataset)

Biofloat 48

Website	https://www.bco-dmo.org/deployment/58147
Platform	Biofloat 48
Start Date	2008-04-04
End Date	2008-05-25
Description	See document NAB08Float48SamplingMethodologyV1.pdf for complete information on Biofloat 48's modes, cycles, and sampling intervals for each sensor. BioFloat 48 was a Lagrangian float deployed during cruise B4-2008 of the vessel R/S Bjarni Saemundsson.

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Project Information

North Atlantic Bloom Experiment 2008 (NAB 2008)

Coverage: North Atlantic, 60 ° North

NAB2008 was a process experiment designed to study an important component of the oceanic carbon system - the North Atlantic spring bloom. The phytoplankton bloom occurring each spring in the North Atlantic, drives the uptake of carbon dioxide and is an important component of the biological pump (Bagniewski et al., 2010). Previous studies in this region have shown the importance of small temporal and spatial scales, i.e. ecosystem patchiness, during the bloom, but were restricted by the limitations of ship-based sampling. Recent advances in autonomous platforms and sensors presented an opportunity to study this important event in a new way. In addition to deployment of a diverse suite of *in situ* sampling devices, NAB2008 was also a test-bed for developing the strategies and knowledge needed to successfully use new methods to drive the next generation of ocean observations.

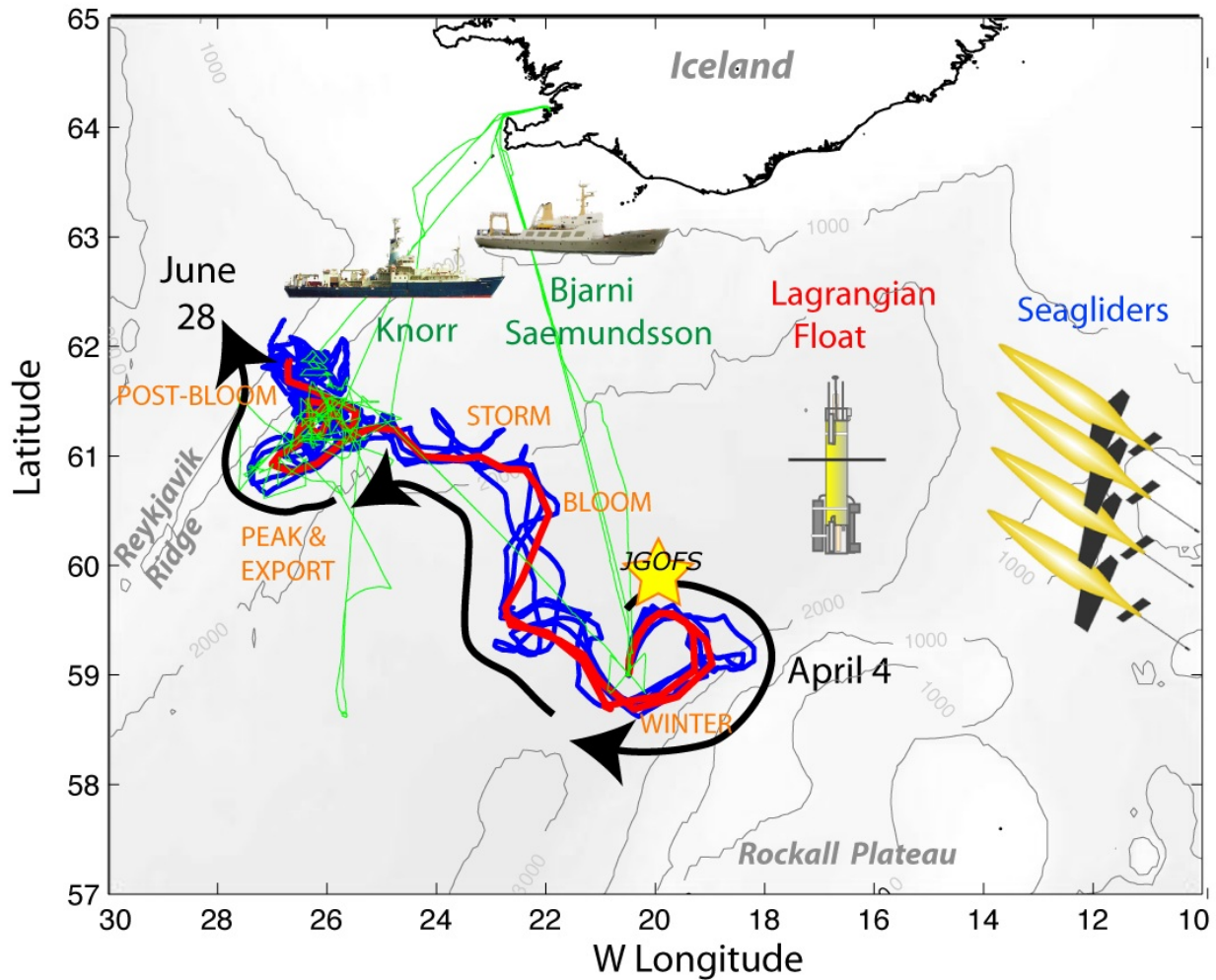
In 2008, a coordinated deployment of 1 float, 4 Seagliders and 2 research vessels sampled the evolution of the North Atlantic spring bloom along and surrounding the nearly Lagrangian path followed by the float. The autonomous measurements were continuous through the experimental period, and included CTD, chlorophyll fluorescence, optical backscatter, and oxygen on all platforms; and nitrate, optical attenuation, and various radiance measurements on the float. Velocities were determined from the vehicle motion, with the float extending to a depth of 230 meters and gliders to 1,000 meters. The autonomous vehicles were deployed, rescued, and recovered on three cruises of the Icelandic vessel Bjarni Saemundsson. A 21-day cruise of the R/V Knorr conducted more detailed measurements during the peak of the bloom in May. The R/V Knorr sampling program included optical profiles, ADCP data and analysis of water samples for nutrients, particulate organic carbon, pigments, micro-plankton composition, complemented by guest investigator analyses. Data from both ships were used to calibrate and validate the autonomous measurements.

References:

Bagniewski, W., Fennel, K., Perry, M. J., and D'Asaro, E. A. (2010) Optimizing models of the North Atlantic spring bloom using physical, chemical and bio-optical observations from a Lagrangian float, *Biogeosciences Discuss.*, 7, pp. 8477-8520, doi:10.5194/bgd-7-8477-2010

[NAB08 preprints](#)

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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-0628107
NSF Division of Ocean Sciences (NSF OCE)	OCE-0628379

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