

Standard stations from R/V Blue Heron BH07-09, BH07-17, BH07-19, BH08-01, BH08-11, BH08-19 in Lake Superior from 2007-2008 (CARGO project)

Website: <https://www.bco-dmo.org/dataset/3682>

Version: 03 August 2012

Version Date: 2012-08-03

Project

» [Primary Production and Grazing Dynamics In the Ultra-Oligotrophic Waters of Lake Superior](#) (CARGO)

Program

» [Laurentian Great Lakes Ecosystem Studies](#) (Laurentian Great Lakes Ecosystem Studies)

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Dataset Description

The project research team identified named sampling locations to facilitate repeat occupation of those locations and develop time-series data sets.

This is the list of all the standard stations occupied during the CARGO Project.

No attempt is made to make them cruise specific so any of the CARGO deployments will return all of the CARGO stations occupied.

Cruise specific station locations can be retrieved from datasets such as CTD Profiles or BioGeoChem using the Cruiseld or CRUISE_CODE.

Methods & Sampling

Compiled by Sternner, et al

Data Processing Description

The list of repeat sampling locations was contributed originally as an Excel spreadsheet. Some information was moved to the notes field, and negative signs prepended to longitudes to make them compatible with BCO-DMO database conventions.

BCO-DMO Edit History:

- Added station CH3 (occupied on CARGO2). Using lat/lon from Sterner e-mail - 03August2012/srg
- Added "Project" column identifying on which project(s) the station was occupied - 27July2012/srg
- Added station CB. Using Lat/Lon from CTD profile data - 25July2012/srg
- Added stations Grab 01 - Grab 10 and UMW from Sterner e-mail - 14June2012/srg
- Corrected Latitude position(degs) for WM7 (48 -> 46) - 07June2012/srg
- Changed stations Sterner A thru G to STE-A thru STE-G - 07June2012/srg
- Added stations UW1 - UW15, GRAB #9, GRAB #10 - 06June2012/srg
- Added station GRAB5 - 06March2012/srg

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Data Files

File
Standard_Stations_Project.csv (Comma Separated Values (.csv), 769 bytes) <small>MD5:f85174efb1a9eb17a0eaf81e6ae00f07</small> Primary data file for dataset ID 3682

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Parameters

Parameter	Description	Units
Lake_location	name of the lake	dimensionless
Station	Name of the standard station location.	dimensionless
lat	latitude in decimal degrees (positive is North)	decimal degrees
lon	longitude in decimal degrees (negative is West)	decimal degrees
water_col_depth	estimated depth of the water column at location	meters
dist_to_land	distance to land from location; estimated using Google Earth	kilometers
notes_and_comments	notes and comments	dimensionless
Project	Project or Projects on which the standard station was occupied for sampling	dimensionless

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Deployments

BH07-09

Website	https://www.bco-dmo.org/deployment/58792
Platform	R/V Blue Heron
Report	http://bcodata.whoi.edu/LaurentianGreatLakes_Chemistry/BH07-09_CARGO1_Synopsis.pdf
Start Date	2007-07-30
End Date	2007-08-01
Description	Cruise Name:CARGO 1 Dates: 30 July - 01 August 2007 Vessel: R/V Blue Heron UNOLS Cruise ID: BH07-09 (Not verified srg/13April2012) First cruise on Sea Grant project on production and grazing. The lake was stratified and a DCM was present. Participants: Sterner, Brovold, Seegers, Jeyasingh, and Stark

BH07-17

Website	https://www.bco-dmo.org/deployment/58793
Platform	R/V Blue Heron
Report	http://bcodata.whoi.edu/LaurentianGreatLakes_Chemistry/BH07-17_CARGO2_Synopsis.pdf
Start Date	2007-10-05
End Date	2007-10-07
Description	Cruise Name:CARGO 2 Dates: 05 - 07 October 2007 Vessel: R/V Blue Heron UNOLS Cruise ID: BH07-17 (Not verified srg/13April2012) Participants: R. Sterner, et al

BH07-19

Website	https://www.bco-dmo.org/deployment/58794
Platform	R/V Blue Heron
Report	http://bcodata.whoi.edu/LaurentianGreatLakes_Chemistry/BH07-19_CARGO3_Synopsis.pdf
Start Date	2007-11-07
End Date	2007-11-09
Description	Cruise Name:CARGO 3 Dates: 07 - 09 November 2007 Vessel: R/V Blue Heron UNOLS Cruise ID: BH07-19 (Not verified srg/13April2012) Participants: Sterner (Chief Scientist), Brovold, Seegers, Michelle McCrackin (ASU)

BH08-01

Website	https://www.bco-dmo.org/deployment/58795
Platform	R/V Blue Heron
Report	http://bcodata.whoi.edu/LaurentianGreatLakes_Chemistry/BH08-01_CARGO4_Cruise_Outline.pdf
Start Date	2008-04-29
End Date	2008-05-01
Description	Cruise Name:CARGO 4 Dates: 29 April - 01 May 2008 Vessel: R/V Blue Heron UNOLS Cruise ID: BH08-01 (Not verified srg/13April2012) Participants: R. Sterner, et al

BH08-11

Website	https://www.bco-dmo.org/deployment/58796
Platform	R/V Blue Heron
Report	http://bcodata.whoi.edu/LaurentianGreatLakes_Chemistry/BH08-11_CARGO5_Cruise_Outline.pdf
Start Date	2008-07-30
End Date	2008-08-01
Description	Cruise Name:CARGO 5 Dates: 30 July - 01 August 2008 Vessel: R/V Blue Heron UNOLS Cruise ID: BH08-11 (Not verified srg/13April2012) Participants: R. Sterner, et al

BH08-19

Website	https://www.bco-dmo.org/deployment/58797
Platform	R/V Blue Heron
Report	http://bcodata.whoi.edu/LaurentianGreatLakes_Chemistry/BH08-19_CARGO6_Cruise_Outline.pdf
Start Date	2008-09-16
End Date	2008-09-18
Description	Cruise Name:CARGO 6 Dates: 16 - 18 September 2008 Vessel: R/V Blue Heron UNOLS Cruise ID: BH08-19 (Not verified srg/13April2012) Participants: R. Sterner, et al

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Project Information

Primary Production and Grazing Dynamics In the Ultra-Oligotrophic Waters of Lake Superior (CARGO)

Website: <http://www.tc.umn.edu/~stern007/>

Coverage: Lake Superior

PRIMARY PRODUCTION AND GRAZING DYNAMICS IN THE ULTRA-OLIGOTROPHIC WATERS OF LAKE SUPERIOR ("CARGO" which stands for CARbon Gain and IOss)

All higher organisms including fish ultimately rely on carbon fixed by primary production for their growth. A major gap in our understanding of Lake Superior lies in a highly incomplete knowledge of the rates primary production and grazing in the lake's waters. This data gap impedes the progress of scientific understanding of the lake on many fronts. Primary production is the foundation for all food webs and is a large, perhaps the largest, term in the lake's carbon cycle. Over the years, there have been but a small handful of investigators who have measured primary production in this, Earth's largest lake by area. Attempts to construct comprehensive carbon budgets using literature values for major terms such as DOC import, sedimentation, etc. indicate a large imbalance in the C cycle in the lake. According to current best estimates, organic carbon disappears at much faster rate (14-40, Cotner et al. 2005) or (13-81, Urban et al. 2005) than its rate of input (5.3 Tg/y, Cotner et al. 2004) or (3-8 Tg/y, Urban et al. 2005) (all values in Tg/y). The budget is out of balance by a factor of about 2 to 27. Unless the lake is metabolizing vast quantities of old, "fossilized" carbon (implausible), current out-of-balance budgets must be wrong, meaning we do not have good estimates for one or more of these fundamental processes in the lake.

Of the possible terms in the carbon budget of the lake, a focus on primary production is appropriate because of the large magnitude of this term plus the dearth of actual measurements that have been performed and the many untested assumptions that lurk behind those few measurements. At the same time, a major loss of particulate organic carbon has been almost entirely ignored until now. That loss is the grazing rate, the rate of

consumption of lake particles (including bacteria and algae) by living organisms in the water column. As Banse (2002) has described for the oceans, though physical mixing and sinking contribute to the dynamics of phytoplankton and other small planktonic organisms, it is principally production and grazing which determine dynamics. To a first approximation, the rate of change of phytoplankton is equal to the difference between production and grazing.

This project comprises a two-year study that will focus on primary production and grazing in the world's largest lake by area. Primary production will be measured using ¹⁴C additions to shipboard incubations using a photosynthetron device. P-I curves plus other data will be used as input for numerical models of areal production. Production numbers so obtained will be compared to in situ incubations. Grazing assays will be based on the dilution series methods developed by Landry and Hassett (1982) and since employed by many others, including myself and my students; this method provides an overall measure of in situ particle turnover.

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Program Information

Laurentian Great Lakes Ecosystem Studies (Laurentian Great Lakes Ecosystem Studies)

Website: <http://www.tc.umn.edu/~stern007/>

Coverage: Laurentian Great Lakes

A series of studies concerned with the chemistry and biology of the Laurentian Great Lakes. These different studies share a focus on the dynamics of organic pools of carbon, nitrogen and phosphorus, and the stoichiometric linkages among these elements. At different times, work also has focused on trace metal dynamics and interactions with biota, the rates of primary production and herbivory, rates and patterns of primary productivity, and the century-long, steady trend of increasing nitrate in Earth's largest lake by area. Microbial populations have been investigated and linked to these chemical properties.

This Program was created by BCO-DMO staff to bring various Laurentian Great Lakes Research projects under one umbrella for improved discovery and access.

Dates: 1998 - 2014

Funding: NSF/OCE and Minnesota Sea Grant

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Funding

Funding Source	Award
Minnesota Sea Grant (MN Sea Grant)	unknown CARGO MN Sea Grant

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