CTD profiles, down/up casts from R/V Blue Heron cruises BH09-05, BH09-12, BH10-14, BH10-03 on Lake Superior; 2009-2010 (Lake Superior Radiocarbon project)

Website: https://www.bco-dmo.org/dataset/3911
Data Type: Cruise Results
Version: 1
Version Date: 2013-04-18

Project
» How important is quote old unquote Carbon in Lake Superior. A Radiocarbon Investigation (Lake Superior Radiocarbon)

Contributors	Affiliation	Role
Minor, Elizabeth C.	University of Minnesota Duluth	Principal Investigator, Contact
Werne, Josef P.	University of Minnesota Duluth	Co-Principal Investigator
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Abstract
CTD profiles, down/up casts from R/V Blue Heron cruises BH09-05, BH09-12, BH10-14, BH10-03 on Lake Superior; 2009-2010.

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Coverage

Spatial Extent: **N**:48.866667 **E**:-86.593333 **S**:46.891833 **W**:-91.194833
Temporal Extent: 2009-06-13 - 2010-09-01

Dataset Description

Multi Year CTD Profiles - Down/Up Casts - Binned

Methods & Sampling

(see individual deployments)

Data Processing Description

(see individual deployments)

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Data Files

File
CTD_Profiles.csv (Comma Separated Values (.csv), 4.66 MB) MD5:f5b78ddae7b78a243316b8720ef63ec7 Primary data file for dataset ID 3911

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Parameters

Parameter	Description	Units
CruiseId_MonYear	Dataset Identifier by CruiseId and MonYear of data collection	text
Dataset_Id	Dataset Id from CTD filename	text
Date_UTC	Date UTC in YYYYMMDD format.	unitless
Time_UTC	Time UTC	HHMMSS
Date_Local	Date Local (CDST) in YYYYMMDD format.	unitless
Time_Local	Time (Local (CDST)	HHMMSS
Latitude	Station Latitude (South is negative)	decimal degrees
Longitude	Station Longitude (West is negative)	decimal degrees
PrDM	Pressure Digiquartz	decibars
T0	Temperature ITS-90	degrees celsius
C0	Conductivity	uS/cm
Specc	Specific Conductance	uS/cm
Xmiss	Beam Transmission Chelsea/Seatech/Wetlab Cstar	percentage
WetStar	Fluorescence Wetlab Wetstar	mg/m^3
Dz_dt	Descent Rate	meters/sec
Ph	pH	dimensionless
Par	PAR/Irradiance Biospherical/Licor	uEinsteins/m^2/sec
Spar	SPAR/Surface Irradiance	uEinsteins/m^2/sec
Sal00	Salinity	PSU
Sbeox0Mm	Oxygen SBE 43 (umol)	umol/Kg
Sbeox0Mg	Oxygen SBE 43 (mg)	mg/l
Sbeox0PS	Oxygen SBE 43 [(% saturation)	percentage
WetCDOM	Fluorescence Wetlab CDOM	mg/m^3
Lat	Data Latitude (South is negative)	decimal degrees
Lon	Data Longitude (West is negative)	decimal degrees
Scan	Scan Count	dimensionless
TimeM	Time Elapsed	minutes
Nbin	Number of scans per bin	dimensionless
Flag	flag	dimensionless

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Instruments

Dataset-specific Instrument Name	CTD Sea-Bird SBE 911plus
Generic Instrument Name	CTD Sea-Bird SBE 911plus
Dataset-specific Description	SeaBird Model 911 plus CTD (deck unit) with D.O. sensor, pH/ORP sensor, fluorometer, CDOM, transmissometer, PAR sensor, and altimeter. Seabird 32 Carousel with 12 8-liter bottle capacity
Generic Instrument Description	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Niskin bottle
Generic Instrument Name	Niskin bottle
Dataset-specific Description	SeaBird Model 911 plus CTD (deck unit) with D.O. sensor, pH/ORP sensor, fluorometer, CDOM, transmissometer, PAR sensor, and altimeter. Seabird 32 Carousel with 12 8-liter bottle capacity
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

BH09-05

Website	https://www.bco-dmo.org/deployment/58713
Platform	R/V Blue Heron
Start Date	2009-06-12
End Date	2009-06-21

Description	**Methods & Sampling** * Sea-Bird SBE 9 Data File: * FileName = C:SeasaveRawCTD_2009Minor June 2009CM_CTD_1.dat * Software Version Seasave Win32 V 5.37d * Temperature SN = 2723 * Conductivity SN = 2271 * Number of Bytes Per Scan = 34 * Number of Voltage Words = 5 * Number of Scans Averaged by the Deck Unit = 1 * System UpLoad Time = Jun 15 2009 11:25:47 * NMEA Latitude = 48 00.97 N * NMEA Longitude = 087 45.21 W * NMEA UTC (Time) = Jun 15 2009 16:25:07 * Store Lat/Lon Data = Append to Every Scan ** Ship: ** Cruise: ** Station: ** Latitude: ** Longitude: # nquan = 19 # nvalues = 503 # units = specified # name 0 = prDM: Pressure, Digiquartz [db] # name 1 = t090C: Temperature [ITS-90, deg C] # name 2 = c0uS/cm: Conductivity [uS/cm] # name 3 = specc: Specific Conductance [uS/cm] # name 4 = xmiss: Beam Transmission, Chelsea/Seatech/Wetlab CStar [%] # name 5 = wetStar: Fluorescence, Wetlab Wetstar [mg/m^3] # name 6 = dz/dtM: Descent Rate [m/s] # name 7 = ph: pH # name 8 = par: PAR/Irradiance, Biospherical/Licor # name 9 = sal00: Salinity [PSU] # name 10 = sbeox0Mm/Kg: Oxygen, SBE 43 [umol/Kg] # name 11 = sbeox0Mg/L: Oxygen, SBE 43 [mg/l] # name 12 = wetCDOM: Fluorescence, Wetlab CDOM [mg/m^3] # name 13 = latitude: Latitude [deg] # name 14 = longitude: Longitude [deg] # name 15 = scan: Scan Count # name 16 = timeM: Time, Elapsed [minutes] # name 17 = nbin: number of scans per bin # name 18 = flag: flag # span 0 = 1.000, 252.000 # span 1 = 3.3312, 3.5927 # span 2 = 56.955257, 58.102174 # span 3 = 100.362, 101.742 # span 4 = 95.9077, 96.9382 # span 5 = 0.5104, 2.3463 # span 6 = -0.721, 0.395 # span 7 = 7.808, 7.939 # span 8 = 4.2599e+00, 9.9990e+03 # span 9 = 0.0435, 0.0442 # span 10 = 358.975, 380.987 # span 11 = 11.48714, 12.19150 # span 12 = 0.8379, 1.4231 # span 13 = 48.01626, 48.01738 # span 14 = -87.75522, -87.75362 # span 15 = 1288, 31988 # span 16 = 0.8939, 22.2133 # span 17 = 14, 76 # span 18 = 0.0000e+00, 0.0000e+00 # interval = decibars: 1 # start_time = Jun 15 2009 11:25:47 # bad_flag = -9.990e-29 # sensor 0 = Frequency 0 temperature, 2723, 12 Feb 2009 # sensor 1 = Frequency 1 conductivity, 2271, 10 Feb 2009, cpcor = -9.5700e-08 # sensor 2 = Frequency 2 pressure, 75869, 31 Mar 2009 # sensor 3 = Extrnl Volt 0 Oxygen, SBE, primary, 0471, 06 Feb 2009 # sensor 4 = Extrnl Volt 1 WET Labs, CDOM # sensor 5 = Extrnl Volt 2 pH, 270135, 30 Mar 2009 # sensor 6 = Extrnl Volt 3 oxidation reduction potential, 270135, 30 Mar 2009 # sensor 7 = Extrnl Volt 4 transmissometer, primary, CST-268PR, 25 Mar 2009 # sensor 8 = Extrnl Volt 5 WET Labs, WETStar fluorometer, WS3S-553P, 10 Mar 2009 # sensor 9 = Extrnl Volt 6 altimeter # sensor 10 = Extrnl Volt 7 irradiance (PAR), primary, 4554, 18 Mar 2009 # sensor 11 = Extrnl Volt 9 surface irradiance (SPAR), degrees = 0.0 # datcnv_date = Jun 20 2009 19:48:01, 5.37e # datcnv_in = C:SeasaveRawCTD_2009Minor June 2009CM_CTD_1.dat C:SeasaveConfiguration FilesMay2009-2.con # datcnv_skipover = 0 # filter_date = Jun 20 2009 20:13:20, 5.37e # filter_in = C:SeasaveConverted DataCM_CTD_1.cnv # filter_low_pass_tc_A = 0.150 # filter_low_pass_tc_B = 0.150 # filter_low_pass_A_vars = prDM # filter_low_pass_B_vars = # loopedit_date = Jun 20 2009 21:02:18, 5.37e # loopedit_in = C:SeasaveFilterCM_CTD_1f.cnv # loopedit_minVelocity = 0.100 # loopedit_surfaceSoak: do not remove # loopedit_excl_bad_scans = yes # binavg_date = Jun 20 2009 21:35:37, 5.37e # binavg_in = C:SeasaveLoop EditCM_CTD_1fl.cnv # binavg_bintype = decibars # binavg_binsize = 1 # binavg_excl_bad_scans = yes # binavg_skipover = 0 # binavg_surface_bin = no, min = 0.000, max = 0.000, value = 0.000 # file_type = ascii *END* **Processing Description** BCO-DMO Processing Notes - Awk written to reformat original .asc files contributed by Liz Minor to BCO-DMO formatted records - AWK: BH09-05_CTDasc_2_BCODMO.awk - Parameters for CTD data generated from .hdr files - BCO-DMO parameter header o/p from routine - Space delimited reformatted to tab delimited - Data o/p with a set of parameters common to all the years of Lake Superior Radiocarbon data - Data values as "nd" (not reported for this dataset): TimeM in datafile: BR_CTD_1flbina2.asc TimeM in datafile: BR_CTD_2flbina2.asc Spar Sbeox0PS

BH09-12

Website	https://www.bco-dmo.org/deployment/58714

Platform	R/V Blue Heron
Start Date	2009-08-14
End Date	2009-08-24

Description	**Methods & Sampling** * Sea-Bird SBE 9 Data File: * FileName = C:SeasaveRawCTD_2009Minor August 2009CM_CTD_3.dat * Software Version Seasave Win32 V 5.37d * Temperature SN = 2723 * Conductivity SN = 2271 * Number of Bytes Per Scan = 34 * Number of Voltage Words = 5 * Number of Scans Averaged by the Deck Unit = 1 * System UpLoad Time = Aug 17 2009 19:37:28 * NMEA Latitude = 48 01.46 N * NMEA Longitude = 087 44.18 W * NMEA UTC (Time) = Aug 18 2009 00:35:26 * Store Lat/Lon Data = Append to Every Scan ** Ship: ** Cruise: ** Station: ** Latitude: ** Longitude: # nquan = 18 # nvalues = 39 # units = specified # name 0 = prDM: Pressure, Digiquartz [db] # name 1 = t090C: Temperature [ITS-90, deg C] # name 2 = c0uS/cm: Conductivity [uS/cm] # name 3 = specc: Specific Conductance [uS/cm] # name 4 = xmiss: Beam Transmission, Chelsea/Seatech/Wetlab CStar [%] # name 5 = wetStar: Fluorescence, Wetlab Wetstar [mg/m^3] # name 6 = dz/dtM: Descent Rate [m/s] # name 7 = ph: pH # name 8 = par: PAR/Irradiance, Biospherical/Licor # name 9 = sal00: Salinity [PSU] # name 10 = sbeox0Mm/Kg: Oxygen, SBE 43 [umol/Kg] # name 11 = sbeox0Mg/L: Oxygen, SBE 43 [mg/l] # name 12 = wetCDOM: Fluorescence, Wetlab CDOM [mg/m^3] # name 13 = latitude: Latitude [deg] # name 14 = longitude: Longitude [deg] # name 15 = scan: Scan Count # name 16 = nbin: number of scans per bin # name 17 = flag: flag # span 0 = 1.000, 20.000 # span 1 = 7.0623, 12.0315 # span 2 = 64.132533, 73.646530 # span 3 = 99.383, 100.012 # span 4 = 91.6167, 92.9582 # span 5 = 2.8281, 3.5282 # span 6 = -0.545, 0.538 # span 7 = 8.881, 9.099 # span 8 = 2.1303e+01, 3.9394e+02 # span 9 = 0.0457, 0.0478 # span 10 = 323.448, 364.124 # span 11 = 10.34538, 11.65107 # span 12 = 0.5253, 0.7231 # span 13 = 48.02437, 48.02448 # span 14 = -87.73652, -87.73646 # span 15 = 257, 3550 # span 16 = 29, 118 # span 17 = 0.0000e+00, 0.0000e+00 # interval = decibars: 1 # start_time = Aug 17 2009 19:37:28 # bad_flag = -9.990e-29 # sensor 0 = Frequency 0 temperature, 2723, 12 Feb 2009 # sensor 1 = Frequency 1 conductivity, 2271, 10 Feb 2009, cpcor = -9.5700e-08 # sensor 2 = Frequency 2 pressure, 75869, 31 Mar 2009 # sensor 3 = Extrnl Volt 0 Oxygen, SBE, primary, 0471, 06 Feb 2009 # sensor 4 = Extrnl Volt 1 WET Labs, CDOM # sensor 5 = Extrnl Volt 2 pH, 270135, 30 Mar 2009 # sensor 6 = Extrnl Volt 3 oxidation reduction potential, 270135, 30 Mar 2009 # sensor 7 = Extrnl Volt 4 transmissometer, primary, CST-268PR, 25 Mar 2009 # sensor 8 = Extrnl Volt 5 WET Labs, WETStar fluorometer, WS3S-553P, 10 Mar 2009 # sensor 9 = Extrnl Volt 6 altimeter # sensor 10 = Extrnl Volt 7 irradiance (PAR), primary, 4554, 18 Mar 2009 # sensor 11 = Extrnl Volt 9 surface irradiance (SPAR), degrees = 0.0 # datcnv_date = Aug 24 2009 09:09:53, 5.37e # datcnv_in = C:SeasaveRawCTD_2009Minor August 2009CM_CTD_3.dat C:SeasaveConfiguration Files2009May2009-2.con # datcnv_skipover = 0 # filter_date = Aug 24 2009 09:50:29, 5.37e # filter_in = C:SeasaveConverted DataCM_CTD_3.cnv # filter_low_pass_tc_A = 0.150 # filter_low_pass_tc_B = 0.150 # filter_low_pass_A_vars = prDM # filter_low_pass_B_vars = # loopedit_date = Aug 24 2009 10:27:40, 5.37e # loopedit_in = C:SeasaveFilterCM_CTD_3f.cnv # loopedit_minVelocity = 0.100 # loopedit_surfaceSoak: do not remove # loopedit_excl_bad_scans = yes # binavg_date = Aug 24 2009 10:55:55, 5.37e # binavg_in = C:SeasaveLoop EditCM_CTD_3fl.cnv # binavg_bintype = decibars # binavg_binsize = 1 # binavg_excl_bad_scans = yes # binavg_skipover = 0 # binavg_surface_bin = no, min = 0.000, max = 0.000, value = 0.000 # file_type = ascii *END* **Processing Description** BCO-DMO Processing Notes - Awk written to reformat original .asc files contributed by Liz Minor to BCO-DMO formatted records - AWK: BH09-12_CTDasc_2_BCODMO.awk - Parameters for CTD data generated from .hdr files - BCO-DMO parameter header o/p from routine - Space delimited reformatted to tab delimited - Data o/p with a set of parameters common to all the years of Lake Superior Radiocarbon data - Data values as "nd" (not reported for this dataset): TimeM Spar Sbeox0PS Data Errors Noted: Dataset: PS_CTD_1flbina2 Dataset: EM_CTD_1flbina2 Dataset: EM_CTD_2_Pump_1flbina2 No UTC Date/Time .hdr file UTC time generated from local time (System Upload) No NMEA Lat/Lon in .hdr file Lat/Lon for station taken from cruise track Lat/Lon values in data are erroneous Dataset: WM_CTD_4_Pump_2flbina2 No .asc file contributed

Website	https://www.bco-dmo.org/deployment/59025
Platform	R/V Blue Heron
Start Date	2010-08-25
End Date	2010-09-01
Description	Original data are available from the NSF R2R data catalog **Methods & Sampling** * Sea-Bird SBE 9 Data File: * FileName = C:SeasaveRawCTD_2010Minor_AugustCM_03.hex * Software Version Seasave V 7.20c * Temperature SN = 2723 * Conductivity SN = 2271 * Number of Bytes Per Scan = 34 * Number of Voltage Words = 5 * Number of Scans Averaged by the Deck Unit = 1 * System UpLoad Time = Aug 31 2010 03:03:51 * NMEA Latitude = 48 01.62 N * NMEA Longitude = 087 43.99 W * NMEA UTC (Time) = Aug 31 2010 08:00:59 * Store Lat/Lon Data = Append to Every Scan ** Ship: ** Station: ** Operator: # nquan = 18 # nvalues = 41 # units = specified # name 0 = prDM: Pressure, Digiquartz [db] # name 1 = t090C: Temperature [ITS-90, deg C] # name 2 = c0uS/cm: Conductivity [uS/cm] # name 3 = specc: Specific Conductance [uS/cm] # name 4 = xmiss: Beam Transmission, Chelsea/Seatech/WET Labs CStar [%] # name 5 = wetStar: Fluorescence, WET Labs WETstar [mg/m^3] # name 6 = wetCDOM: Fluorescence, WET Labs CDOM [mg/m^3] # name 7 = par: PAR/Irradiance, Biospherical/Licor # name 8 = spar: SPAR/Surface Irradiance # name 9 = sbeox0Mg/L: Oxygen, SBE 43 [mg/l] # name 10 = sbeox0PS: Oxygen, SBE 43 [% saturation] # name 11 = dz/dtM: Descent Rate [m/s] # name 12 = ph: pH # name 13 = sal00: Salinity, Practical [PSU] # name 14 = latitude: Latitude [deg] # name 15 = longitude: Longitude [deg] # name 16 = scan: Scan Count # name 17 = flag: flag # span 0 = 1.000, 21.000 # span 1 = 14.0240, 17.0646 # span 2 = 78.101891, 84.432609 # span 3 = 100.060, 100.430 # span 4 = 90.8118, 92.3499 # span 5 = 1.7412, 2.7272 # span 6 = 0.8083, 0.9479 # span 7 = -5.148e-04, 4.0639e+00 # span 8 = 1.1907e+01, 1.4135e+01 # span 9 = 9.81720, 10.46532 # span 10 = 101.63972, 103.44044 # span 11 = -0.536, 0.747 # span 12 = 8.592, 8.711 # span 13 = 0.0488, 0.0500 # span 14 = 48.02707, 48.02780 # span 15 = -87.73320, -87.73316 # span 16 = -347, 4405 # span 17 = 0.0000e+00, 0.0000e+00 # interval = decibars: 1 # start_time = Aug 31 2010 08:00:59 # bad_flag = -9.990e-29 # # # # # 2723 # 24 Feb 2010 # 1 # 0.00000000e+000 # 0.00000000e+000 # 0.00000000e+000 # 0.00000000e+000 # 0.000 # 4.33286070e-003 # 6.42095668e-004 # 2.32440901e-005 # 2.26815230e-006 # 1000.000 # 1.00000000 # 0.0000 # # # # # # 2271 # 24 Feb 2010 # 1 # # 0.0000 # 2000.0000 # 0 # # 0.00000000e+000 # 0.00000000e+000 # 0.00000000e+000 # 0.00000000e+000 # 0.0 # 0.00000000e+000 # # # -1.04488660e+001 # 1.44573900e+000 # -1.72104845e-003 # 2.03207110e-004 # -9.57000000e-008 # 3.2500e-006 # # 0.00000000e+000 # # 1.00000000 # 0.00000 # # # # # # 75869 # 31 Mar 2009 # -8.206847e+003 # -1.514489e-001 # 2.337490e-003 # 5.245000e-002 # 0.000000e+000 # 3.045671e+001 # -3.560049e-004 # 3.341080e-006 # 2.507800e-009 # 0.99985000 # -0.12820 # 0.000000e+000 # 1.287830e-002 # -8.897580e+000 # # # # # # 0471 # 07-Apr-10p # 1 # # # 0.0000 # 0.0000e+000 # 0.0000 # 0.00e+000 # 0.0000 # 0.0 # # # # 4.9980e-001 # -0.5084 # -2.0487e-003 # 9.5571e-005 # -1.9119e-006 # 2.5826e+000 # 1.92630e-004 # -4.64800e-002 # 3.6000e-002 # 1.0100 # -3.3000e-002 # 5.0000e+003 # 1.4500e+003 # # # # # # # WSCD-1178 # 7 Apr 2010 # 63.200 # 0.070 # # # # # # 270135 # 18 Mar 2010 # 4.6237 # 2.5090 # # # # # # 270135 # 30 Mar 2009 # 2.498000 # -0.494500 # 0.0 # # # # # # CST-268PR # 25 Mar 2010 # 21.2179 # -1.2519 # 0.250 # # # # # # WS3S-553P # 7 Apr 2010 # 15.000 # 0.066 # # # # # # 802 # 20 MAR2004 # 15.000 # 0.000 # # # # # # 4554 # 23 Feb 2010 # 1.00000000 # 0.00000000 # 2994011976.00000000 # 1.00000000 # -0.50320676 # # # # # # # # # 20255 # 7-27-06 # 1796.88720329 # 1.00000000 # # # # datcnv_date = Sep 01 2010 04:07:18, 7.20f # datcnv_in = C:SeasaveRawCTD_2010Minor_AugustCM_03.hex

	C:SeasaveRawCTD_2010Minor_AugustCM_03.XMLCON # datcnv_skipover = 0 # datcnv_ox_hysteresis_correction = yes # datcnv_ox_tau_correction = yes # filter_date = Sep 01 2010 04:09:58, 7.20f # filter_in = C:SeasaveConverted DataCM_03.cnv # filter_low_pass_tc_A = 0.150 # filter_low_pass_tc_B = 0.000 # filter_low_pass_A_vars = prDM # filter_low_pass_B_vars = # loopedit_date = Sep 01 2010 04:26:26, 7.20f # loopedit_in = C:SeasaveFilterCM_03f.cnv # loopedit_minVelocity = 0.100 # loopedit_surfaceSoak: do not remove # loopedit_excl_bad_scans = yes # binavg_date = Sep 01 2010 04:29:05, 7.20f # binavg_in = C:SeasaveLoop EditCM_03fl.cnv # binavg_bintype = decibars # binavg_binsize = 1 # binavg_excl_bad_scans = yes # binavg_skipover = 0 # binavg_surface_bin = no, min = 0.000, max = 0.000, value = 0.000 # file_type = ascii *END* **Processing Description** BCO-DMO Processing Notes - Awk written to reformat original .asc files contributed by Liz Minor to BCO-DMO formatted records - AWK: BH10-14_CTDasc_2_BCODMO.awk - Parameters for CTD data generated from .hdr files - BCO-DMO parameter header o/p from routine - Space delimited reformatted to tab delimited - Data o/p with a set of parameters common to all the years of Lake Superior Radiocarbon data - Data values as "nd" (not reported for this dataset): TimeM NBin Sbeox0Mm

BH10-03

Website	https://www.bco-dmo.org/deployment/58719
Platform	R/V Blue Heron
Start Date	2010-05-28
End Date	2010-06-03

Description	Cruise pictures and info (for a general audience)Original data are available from the NSF R2R data catalog **Methods & Sampling** * Sea-Bird SBE 9 Data File: * FileName = C:SeasaveRawCTD_2010Minor_MayCM_03.hex * Software Version Seasave V 7.20c * Temperature SN = 2723 * Conductivity SN = 2271 * Number of Bytes Per Scan = 34 * Number of Voltage Words = 5 * Number of Scans Averaged by the Deck Unit = 1 * System UpLoad Time = May 30 2010 01:09:44 * NMEA Latitude = 48 01.82 N * NMEA Longitude = 087 44.67 W * NMEA UTC (Time) = May 30 2010 06:09:13 * Store Lat/Lon Data = Append to Every Scan ** Ship: ** Station: ** Operator: # nquan = 16 # nvalues = 35 # units = specified # name 0 = prDM: Pressure, Digiquartz [db] # name 1 = t090C: Temperature [ITS-90, deg C] # name 2 = c0uS/cm: Conductivity [uS/cm] # name 3 = specc: Specific Conductance [uS/cm] # name 4 = xmiss: Beam Transmission, Chelsea/Seatech/Wetlab CStar [%] # name 5 = wetStar: Fluorescence, Wetlab Wetstar [mg/m^3] # name 6 = dz/dtM: Descent Rate [m/s] # name 7 = ph: pH # name 8 = par: PAR/Irradiance, Biospherical/Licor # name 9 = sal00: Salinity [PSU] # name 10 = sbeox0Mm/Kg: Oxygen, SBE 43 [umol/Kg] # name 11 = sbeox0Mg/L: Oxygen, SBE 43 [mg/l] # name 12 = wetCDOM: Fluorescence, Wetlab CDOM [mg/m^3] # name 13 = scan: Scan Count # name 14 = nbin: number of scans per bin # name 15 = flag: flag # span 0 = 1.000, 18.000 # span 1 = 3.5020, 3.5116 # span 2 = 57.258570, 57.486605 # span 3 = 100.444, 100.810 # span 4 = 94.1896, 94.3707 # span 5 = 2.2865, 2.4841 # span 6 = -0.329, 0.331 # span 7 = 7.941, 7.995 # span 8 = 1.3952e-02, 5.5600e+00 # span 9 = 0.0436, 0.0438 # span 10 = 0.000, 0.000 # span 11 = 0.00000, 0.00000 # span 12 = 1.0241, 1.0991 # span 13 = 681, 4180 # span 14 = 58, 86 # span 15 = 0.0000e+00, 0.0000e+00 # interval = decibars: 1 # start_time = May 30 2010 01:09:44 # bad_flag = -9.990e-29 # sensor 0 = Frequency 0 temperature, 2723, 24 Feb 2010 # sensor 1 = Frequency 1 conductivity, 2271, 24 Feb 2010, cpcor = -9.5700e-08 # sensor 2 = Frequency 2 pressure, 75869, 31 Mar 2009 # sensor 3 = Extrnl Volt 0 Oxygen, SBE, primary, 0471, 07-Apr-10p # sensor 4 = Extrnl Volt 1 WET Labs, CDOM # sensor 5 = Extrnl Volt 2 pH, 270135, 18 Mar 2010 # sensor 6 = Extrnl Volt 3 oxidation reduction potential, 270135, 30 Mar 2009 # sensor 7 = Extrnl Volt 4 transmissometer, primary, CST-268PR, 25 Mar 2010 # sensor 8 = Extrnl Volt 5 WET Labs, WETStar fluorometer, WS3S-553P, 7 Apr 2010 # sensor 9 = Extrnl Volt 6 altimeter # sensor 10 = Extrnl Volt 7 irradiance (PAR), primary, 4554, 23 Feb 2010 # sensor 11 = Extrnl Volt 9 surface irradiance (SPAR), degrees = 0.0 # datcnv_date = Jun 03 2010 01:32:50, 5.37e # datcnv_in = C:SeasaveRawCTD_2010Minor_MayCM_03.hex C:SeasaveConfiguration Files2010CTDCon2010_alpha.con # datcnv_skipover = 0 # filter_date = Jun 03 2010 01:35:09, 5.37e # filter_in = C:SeasaveConverted DataCM_03.cnv # filter_low_pass_tc_A = 0.150 # filter_low_pass_tc_B = 0.150 # filter_low_pass_A_vars = prDM # filter_low_pass_B_vars = # loopedit_date = Jun 03 2010 01:37:57, 5.37e # loopedit_in = C:SeasaveFilterCM_03f.cnv # loopedit_minVelocity = 0.100 # loopedit_surfaceSoak: do not remove # loopedit_excl_bad_scans = yes # binavg_date = Jun 03 2010 01:39:31, 5.37e # binavg_in = C:SeasaveLoop EditCM_03fl.cnv # binavg_bintype = decibars # binavg_binsize = 1 # binavg_excl_bad_scans = yes # binavg_skipover = 0 # binavg_surface_bin = no, min = 0.000, max = 0.000, value = 0.000 # file_type = ascii *END* **Processing Description** BCO-DMO Processing Notes - Awk written to reformat original .asc files contributed by Liz Minor to BCO-DMO formatted records - AWK: BH10-03_CTDasc_2_BCODMO.awk - Parameters for CTD data generated from .hdr files - BCO-DMO parameter header o/p from routine - Space delimited reformatted to tab delimited - Data o/p with a set of parameters common to all the years of Lake Superior Radiocarbon data - Data values as "nd" (not reported for this dataset): TimeM Lat (data values) Lon (data values) Spar Sbeox0PS

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Project Information

How important is quote old unquote Carbon in Lake Superior. A Radiocarbon Investigation (Lake Superior Radiocarbon)

Coverage: Lake Superior

Organic carbon present in aquatic ecosystems has the potential to either be sequestered by sedimentary organic matter or recycled and contributed to the atmosphere through microbial respiration. Ultimately, the fate of organic matter is dependant upon its source, as well as the physical transport mechanisms and biogeochemical transformations it is exposed to in the water column. Because these processes vary significantly within aquatic systems, such as the ocean, it is difficult to assess the biogeochemical importance of organic carbon; however, it is a problem of critical importance whose results could be utilized to resolve key issues in global biogeochemical carbon cycles and to determine the net heterotrophy of most aquatic environments.

Scientists from the University of Minnesota-Duluth and Virginia Commonwealth University would address this problem by studying organic carbon dynamics in Lake Superior because its biogeochemistry is similar to that of the world ocean. Using Lake Superior as a natural laboratory, the researchers plan to carry out radiocarbon measurements of particulate organic carbon (POC), dissolved organic carbon (DOC), dissolved inorganic carbon (DIC), and bacterially-respired CO2, as well as obtain the chemical composition of DOC and POC during stratified and non-stratified periods. Results would be used to identify the sources of carbon in the lake and determined transformations of carbon between POC, DOC, DIC, and bacterially-respired CO2.

Educational impacts include workshops and presentation for K-12 audiences as well as research and training opportunities for graduate and undergraduate students in Water Resources Science and Biochemistry classes.

Cruise pictures and info (for a general audience)

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0825600

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