SAMI-CO2 pCO2 and temperature mooring time series data at LEO15 and MVCO moorings from Buzzards Bay and Martha's Vineyard Coastal Observatory Air-Sea Interaction Tower (41.325, -70.5667) 1999-2005 inclusive (LEO-15 project)

Website: https://www.bco-dmo.org/dataset/630470
Version: 05 January 2016
Version Date: 2016-01-05

Project
» Remote Real-Time Profiling of Surface Seawater CO2 at the LEO-15 Site (LEO-15)

Contributors	Affiliation	Role
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Gegg, Stephen R.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

SAMI-CO2 pCO_2 and Temperature mooring time series data collected on the LEO15. Buzzards Bay and MVCO moorings.

Methods & Sampling

The SAMI-CO2 sampled on a 30 minute interval, a non-absorbing blank measurement was taken every 3.5 days.

Related files and references:
DeGrandpre M.D. , Hammar T.R. , Smith S.P. , Sayles F.L., (1995), *In situ measurements of seawater pCO2 , Limnology and Oceanography, 40.*

M.D. DeGrandpre, G.J. Olbu, C.M. Beatty, T.R. Hammar,(2002), *Air–sea CO2 fluxes on the US Middle Atlantic Bight, Deep Sea Research Part II: Topical Studies in Oceanography*, 49(20)

Data Processing Description

Data Processing:
See DeGrandpre et al. (1995)

BCO-DMO Processing Notes

- Generated from the following list of original .xlsx files contributed by Cory Beatty
BBay_Sept 00-Jan 01_SAMI-CO2.xlsx
LEO15_Feb-April 2000_SAMI-CO2.xlsx
LEO15_July-Sept 2000_SAMI-CO2.xlsx
LEO15_June-Oct 2001_SAMI-CO2.xlsx
LEO15_Oct-Dec 1999_SAMI-CO2.xlsx
MVO(CBLAST)_2003_SAMI-CO2.xlsx
MVO_July 2005_SAMI-CO2.xlsx
MVO_Nov-Dec 2004_SAMI-CO2.xlsx
MVO_Nov-Dec 2004_SAMI-CO2.xlsx
- Parameter names edited to conform to BCO-DMO naming convention found at Choosing Parameter Name
- Params PAR, Fluorescence and Transmittance added to some datasets for compatibility
- If not collected PAR, Fluorescence and Transmittance assigned "NaN" values
- Date reformatted to YYYYMMDD
- Time reformatted to HHMMSS

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Data Files

File
LEO15_SITE.csv (Comma Separated Values (.csv), 2.84 MB) MD5:0d8735e2b985786f70d177c61ecc8332 Primary data file for dataset ID 630470

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Parameters

Parameter	Description	Units
Site	Site	text
Deployment	Deployment Id	text
Latitude	Latitude of Deployment (South is negative)	decimal degrees
Longitude	Longitude of Deployment (West is negative)	decimal degrees
Excel_Date	Excel Date	xxxxx.xxxx
Year_Day	Jan 1 = YD1	xxx.xxxx
Date	Date (UTC)	YYYYMMDD
Time	Time (UTC)	HHMMSS
Temp	Temperature	oC
pCO2	Partial Pressure of Carbon Dioxide	uatm
PAR	Photosynthetically Active Radiation (PAR)	uE m-2 sec-1
Fluorescence	Fluorescence	Intensity units
Transmittance	Transmittance	Intensity units

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Instruments

Dataset-specific Instrument Name	SAMI-CO2 pCO2
Generic Instrument Name	pCO2 Sensor
Dataset-specific Description	SAMI-CO2 pCO2 and Temperature mooring time series data collected on the Buzzards Bay mooring
Generic Instrument Description	A sensor that measures the partial pressure of CO2 in water (pCO2)

Dataset-specific Instrument Name	SAMI-CO2 pCO2
Generic Instrument Name	Submersible Autonomous Moored Instrument
Dataset-specific Description	SAMI-CO2 pCO2 and Temperature mooring time series data collected on the Buzzards Bay mooring
Generic Instrument Description	The Submersible Autonomous Moored Instrument (SAMI) measures and logs levels of dissolved chemicals in sea and fresh water. It is a plastic cylinder about 6 inches wide and 2 feet long that is self-powered and capable of hourly measurements for up to one year. All data collected are logged to an internal memory chip to be downloaded later. SAMI sensors usually are placed a few feet underwater on permanent moorings, while others on floating drifters sample the water wherever the wind and currents carry them. The instruments have been used by researchers around the globe in a variety of studies since 1999. Dr. Mike DeGrandpre, University of Montana, developed the SAMI between 1990 and 1993 during his postdoctoral work at the Woods Hole Oceanographic Institution (Woods Hole, MA, USA). For additional information, see URL: http://www.sunburstsensors.com/ from the manufacturer, Sunburst Sensors, LLC, 1226 West Broadway, Missoula, MT 59802.

Dataset-specific Instrument Name	SAMI-CO2 pCO2 and Temperature
Generic Instrument Name	Water Temperature Sensor
Dataset-specific Description	SAMI-CO2 pCO2 and Temperature mooring time series data collected on the Buzzards Bay mooring
Generic Instrument Description	General term for an instrument that measures the temperature of the water with which it is in contact (thermometer).

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Deployments

BBAY_Sept00-Jan01_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/630443
Platform	Buzzards Bay Mooring
Start Date	2000-09-01
End Date	2001-01-01

LEO15_Feb-April2000_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/630446
Platform	LEO15 Mooring
Start Date	2000-02-01
End Date	2001-10-31

LEO15_July-Sept2000_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/630449
Platform	LEO15 Mooring
Start Date	2000-07-01
End Date	2000-09-30

LEO15_June-Oct2001_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/630452
Platform	LEO15 Mooring
Start Date	2001-06-01
End Date	2001-10-31

LEO15_Oct-Dec1999_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/630455
Platform	LEO15 Mooring
Start Date	1999-10-01
End Date	1999-12-31

MVO_CBLAST_2003_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/632364
Platform	Martha's Vineyard Coastal Observatory
Start Date	2003-08-14
End Date	2003-10-06

MVO_July_2005_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/632373
Platform	Martha's Vineyard Coastal Observatory
Start Date	2005-07-07
End Date	2005-07-22

MVO_Nov-Dec_2004_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/632370
Platform	Martha's Vineyard Coastal Observatory
Start Date	2004-11-30
End Date	2004-12-16

MVO_Sept_2004_SAMI-CO2

Website	https://www.bco-dmo.org/deployment/632367
Platform	Martha's Vineyard Coastal Observatory
Start Date	2004-09-03
End Date	2004-10-04

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Project Information

Remote Real-Time Profiling of Surface Seawater CO2 at the LEO-15 Site (LEO-15)

Coverage: Rutgers University's Long-term Earth Observatory (LEO-15), Buzzards Bay Mooring and Martha's Vineyard Coastal Observatory

DeGrandpre Scientists at the Univ. of Montana, Rutgers University, and Woods Hole Oceanographic Institution will collaborate to develop an ocean CO2 profiling capability using underwater technology at Rutgers University's Long-term Earth Observatory (LEO-15) and secondly, to characterize CO2 variability at this coastal location. Work will consist of augmenting an existing profiling system so that it will acquire data from autonomous biogeochemical sensors, including a Submersible Autonomous Moored Instrument for CO2 (SAMI-CO2), O2 and light sensors, and a chlorophyll fluorometer. The profiling system will obtain time and depth-resolved PCO2 , calculated total CO2 (TCO2), dissolved 02, chlorophyll fluorescence and light intensity. The high resolution vertical measurements of CO2 , in combination with the other biogeochemical parameters, will provide necessary data for biogeochemical models and for estimating water column biogeochemical inventories. Real-time data acquisition and remote control of the profiler will be incorporated for testing specific questions regarding CO2 cycling. The work will determine if CO2 profiling significantly advances our ability to study and understand the marine CO2 cycle. If proven successful, the research may set the groundwork for a global scale network of in situ biogeochemical profilers to characterize ocean biogeochemical cycles.DeGrandpre, M.D., Baehr, M.M. and T.R. Hammar.. "Development of an optical chemical sensor for oceanographic applications: The Submersible Autonomous Moored Instrument for Seawater CO2.", 07/01/2000-07/01/2001, , M. Varney"*Chemical Sensors in Oceanography*", 2000, "Gordon and Breach publ., Amsterdam pp. 123-141.".

DeGrandpre, M.D., Hammar, T.R., and C.D. Wirick.. "Studies of coastal CO2 and O2 dynamics using moored autonomous sensors.", 07/01/2000-07/01/2001, "*Proceedings of the Marine Technology Society Ocean Community Conference*", 1998, "Baltimore, MD, 797-801.".

Stokey, R.. "Controlling and monitoring a vertical profiler using a WWW browser", 07/01/2000-07/01/2001, "*Proceedings Oceans 2000*", 2000, "pp. 349-352".

McGillis, W.R. and M.D. DeGrandpre. "Dissolved carbon dioxide in coastal waters", 07/01/2000-07/01/2001, "*Coastal Research Center Newsletter*", 2000, "v.4, pp. 3-4".

DeGrandpre, M.D., Baehr, M.M. and T.R. Hammar.. "Development of an optical chemical sensor for oceanographic applications: The Submersible Autonomous Moored Instrument for Seawater CO2.", 07/01/2001-07/01/2002, , M. Varney"*Chemical Sensors in Oceanography*", 2000, "Gordon and Breach publ., Amsterdam pp. 123-141.".

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Stokey, R.. "Controlling and monitoring a vertical profiler using a WWW browser", 08/15/1998-07/31/2002, "*Proceedings Oceans 2000*", 2000, "pp. 349-352".

McGillis, W.R. and M.D. DeGrandpre. "Dissolved carbon dioxide in coastal waters", 08/15/1998-07/31/2002, "*Coastal Research Center Newsletter*", 2000, "v.4, pp. 3-4".

Baehr, M.M.. "In situ chemical sensor measurements in a freshwater lake: an analysis of the short-term and seasonal effects of ice cover, ice out, and turnover on CO2 and O2.", 08/15/1998-07/31/2002, 2000, "The University of Montana".

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-9812513

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