

pCO₂ collected by SAMI-CO₂ sensors from Bodega Marine Laboratory Mooring in the nearshore surface waters off the central California coast from 2011-2012 (BOAR project)

Website: <https://www.bco-dmo.org/dataset/3537>

Data Type: Other Field Results

Version: 1

Version Date: 2013-10-22

Project

» [Bodega Ocean Acidification Research](#) (BOAR)

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Abstract

pCO₂ collected by SAMI-CO₂ sensors from Bodega Marine Laboratory Mooring in the nearshore surface waters off the central California coast from 2011-2012.

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Coverage

Spatial Extent: Lat:38.312 Lon:-123.083

Temporal Extent: 2011-05-29 - 2012-11-09

Dataset Description

Near-surface pCO₂ time series at BML mooring, offshore of Bodega Marine Laboratory, central California coast.

Dataset was updated on 10/22/13 with data from 2012.

Methods & Sampling

Hourly pCO₂ and temperature data using near surface (~1 m) Sunburst Sensors SAMI pCO₂ deployed during dates:

from 05/29/2011 to 07/15/2011

from 04/14/2012 to 06/05/2012

from 08/16/2012 to 11/09/2012

Data Processing Description

QA/QC not performed, these are raw data. The dates and times displayed in the 2011 data have been corrected due to a glitch between SAMI and Excel.

BCO-DMO Edits

- Parameter names modified to conform to BCO-DMO convention
- Date reformatted to YYYYMMDD
- Time reformatted to HHMM.mm
- 'nd' (no data) inserted in blank cells
- 30 March 2015: Restricted-only access and added ISO_DateTime field.

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Data Files

File
BML_pCO2.csv (Comma Separated Values (.csv), 528.85 KB) MD5:6b8bf6416ed641d6a900602c28de47e7
Primary data file for dataset ID 3537

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Parameters

Parameter	Description	Units
pCO ₂	CO ₂ in parts per million from Sunburst SAMI-pCO ₂ instrument.	ppm
mooring	Name of the mooring.	text
lat	Latitude in decimal degrees; North = positive.	decimal degrees
lon	Longitude in decimal degrees; East = positive.	decimal degrees
date_gmt	Date, GMT.	mm/dd/yy
month_gmt	2-digit month of year, GMT.	mm (01 to 12)
day_gmt	2-digit day of month, GMT.	dd (01 to 31)

year	Four-digit year (GMT).	YYYY
time_gmt	Time of day, 24-hour clock (GMT).	HHMM.mm
temp	Temperature from Sunburst SAMI-pCO2 instrument.	degrees C
pCO2_SAMI16	pCO2 measured by Sunburst SAMI16 instrument.	micro atmospheres (microatm)
temp_SAMI16	Temperature, in degrees C, as measured by Sunburst SAMI16 instrument.	degrees C
pCO2_SAMI78	pCO2 measured by Sunburst SAMI78 instrument.	micro atmospheres (microatm)
temp_SAMI78	Temperature, in degrees C, as measured by Sunburst SAMI78 instrument.	degrees C
ISO_DateTime_UTC	<p>Date and time formatted to ISO 8601 standard. This standard is based on ISO 8601:2004(E) and takes on the following format: YYYY-mm-ddTHH:MM:SS[.xx]Z (where T represent the start of the time string and Z indicates UTC)</p> <p>examples: 2009-08-30T09:05:00[.xx] (local time) 2009-08-30T14:05:00[.xx]Z (UTC time) 2009-08-30T14:05:00[.xx]-05:00</p> <p>The dashes and the colons can be dropped. The T can also be dropped "by mutual agreement", but one needs the trailing Z if the time is UTC.</p>	YYYY-MM-DDTHH:MM:SS[.xx]Z
start_date	Starting date of the deployment (4-digit year, 2-digit month, 2-digit day).	YYYYmmdd
end_date	Ending date of the deployment (4-digit year, 2-digit month, 2-digit day).	YYYYmmdd

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Instruments

Dataset-specific Instrument Name	Submersible Autonomous Moored Instrument
Generic Instrument Name	Submersible Autonomous Moored Instrument
Dataset-specific Description	Sunburst Systems Submersible Autonomous Moored Instrument for CO ₂ (SAMI-CO ₂) Range: 150-1500 uatm Accuracy: +/- 3 ppm based on lab calibration Precision: < 1 ppm From http://bml.ucdavis.edu/boon/bml_buoy.html
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.

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Deployments

BML Mooring

Website	https://www.bco-dmo.org/deployment/58721
Platform	Bodega Marine Laboratory Mooring
Start Date	2011-01-01
End Date	2012-11-18
Description	Offshore of Bodega Marine Laboratory; nearshore surface waters off the coast of central California (1 km from shore at 47 m isobath) 38.312N, 123.083W.

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Project Information

Bodega Ocean Acidification Research (BOAR)

Website: <http://bml.ucdavis.edu/research/research-programs/climate-change/oceanacidification/>

Coverage: Central California coast (northeast Pacific)

The absorption of human-produced CO₂ into the world's oceans is decreasing seawater pH and causing marked declines in the saturation state for calcium carbonate, a major building block for shells, skeletons, and tests of many marine species. Such changes (collectively termed "ocean acidification") have the potential to devastate a broad array of organisms, both at the level of individuals and at population and ecosystem scales. Although awareness of these issues is rapidly growing, most of what is known is based on studies of coral reef organisms and plankton.

The proposed work will enhance understanding of impacts from ocean acidification by providing rigorous data

on several new fronts applicable to temperate systems. The project will operate within one of the strongest upwelling centers of the eastern Pacific, where global trends in acidification are amplified by the presence of cold water characterized by already-high levels of aqueous CO₂. Using an integrated, comparative approach that exploits the expertise of oceanographers, marine chemists, and biologists, the project will explicitly couple moored and shipboard measurements of seawater chemistry to controlled laboratory and field studies of biological responses.

Two vital foundation species (the California mussel, *Mytilus californianus*, and the Olympia oyster, *Ostrea conchaphila*) will be targeted. These two species play disproportionately important roles in open-coast and estuarine systems, respectively. Larvae (which are often the most vulnerable stages) of mussels and oysters will be cultured under elevated-CO₂ conditions through the full pelagic period and into juvenile life. Growth and survivorship will be quantified, and water temperature and salinity will be varied to test for interactive effects of multiple factors. Intraspecific variation in response of larvae from different parental lineages will be examined. "Carry-over" effects that originate from exposure during the larval stage, but influence subsequent juvenile growth and survival, will be determined both in the laboratory and using field outplants. Because larval and juvenile stages play important roles as demographic age-structure bottlenecks, overall population consequences will be estimated through comparison of observed impacts on early life stages to other recognized sources of recruitment variation.

Data Status: Data will be reported from the BML offshore oceanographic moorings and from moorings within nearby Tomales Bay. The moorings will be outfitted with autonomously recording pH and pCO₂ sensors, and these measurements will be supplemented with discrete water samples collected monthly along two associated transects.

Live Data: For live-streaming data from Tomales Bay, visit <http://www.ipacoa.org/Explorer> and click on the icon in Tomales Bay.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0927255

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