SH70 SAMI pCO2 from SH70 mooring 2009-MI_LOCO-Lander, 2010-MI_LOCO-Lander in the SH70 mid-shelf time series station (Strawberry Hill): 44.25N, 124.50W from 2009-2010 (EAGER project)

Website: https://www.bco-dmo.org/dataset/3812
Version: 04 December 2012
Version Date: 2012-12-04

Project
» EAGER: Initiation of a pH/pCO2-sensing mooring platform on the Oregon coast (EAGER)

Program
» Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)

Contributors	Affiliation	Role
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Dataset Description

Time-series of pCO2 from a SAMI in-situ pCO2 sensor (serial# 84) deployed at 70m on the MILOCO lander

Methods & Sampling

SAMI pCO2 serial # 84, was serviced prior to deployment by the manufacturer. Data were calibrated against discrete gas-tight bottle samples collected and preserved with HgCl and analyzed via NDIR spectrophotometry in the analytical laboratory of Burke Hales (CEOAS OSU).

Data Processing Description

Data have been trimmed for initial deployment equilibration lags during sensor servicings and recalibrated against bottle samples.

BCO-DMO Processing/Edits
- Generated from original files "SH70_SAMI_pCO2_2009[2010].csv" contributed by Kristen Milligan
- Date reformatted to YYYYMMDD; Time reformatted to HHMM
- Parameter names modified to conform to BCO-DMO conventions (blanks to underscores, etc.)

- "-999" replaced with "nd" BCO-DMO standard for no data
- "nd" (no data) inserted in black cells

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Data Files

File
SAMI_pCO2.csv (Comma Separated Values (.csv), 1.29 MB) MD5:0b5919b35562769c72afbfb3478ba0aa Primary data file for dataset ID 3812

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Parameters

Parameter	Description	Units
Year	Year of Data/Deployment	YYYY
Sensor	Sensor Type	text
Platform	Platform Description	text
Location	Location Description	text
Latitude	Latitude of Station (South is Negative)	decimal degrees
Longitude	Longitude of Station (West is Negative)	decimal degrees
Depth	Depth of Station	meters
Date	Date of data (GMT)	YYYYMMDD
Time	Time of Data (GMT)	HHMM
Temperature	Temperature	degrees Celsius
pCO2	pCO2	microatm

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Instruments

Dataset-specific Instrument Name	SAMI pCO2 Sensor
Generic Instrument Name	pCO2 Sensor
Dataset-specific Description	SAMI pCO2 Sensor
Generic Instrument Description	A sensor that measures the partial pressure of CO2 in water (pCO2)

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Deployments

2009-MI_LOCO-Lander

Website	https://www.bco-dmo.org/deployment/58804
Platform	SH70 mooring
Start Date	2009-06-11
End Date	2009-08-03
Description	Mooring

2010-MI_LOCO-Lander

Website	https://www.bco-dmo.org/deployment/58805
Platform	SH70 mooring
Start Date	2009-04-12
End Date	2020-01-01
Description	Mooring

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Project Information

EAGER: Initiation of a pH/pCO2-sensing mooring platform on the Oregon coast (EAGER)

Coverage: Off the central Oregon coast, Inner shelf region of the California Current Large Marine Ecosystem (CCLME)

EAGER: Initiation of a pH/pCO2-sensing mooring platform on the Oregon coast

Ocean acidification (OA), the progressive decrease in ocean pH as atmospheric carbon dioxide (CO2) dissolves in sea water, is a looming issue with impacts that are still uncertain, but may disrupt ocean ecosystems. This project will deploy accurate and precise in-situ sensors that will begin the development of pH and pCO2 time series off the central Oregon coast - a region that is amongst the mostly strongly impacted by corrosive upwelled waters within the California Current system. These sensors, in conjunction with lower-frequency ship-based calibration as well as horizontal and vertical samples, will provide a detailed and integrated look at the scope and impacts of accelerated biogeochemical changes in a coastal inner-shelf ecosystem that is currently unmonitored for carbonate chemistry shifts.

Intellectual Merit: Coastal waters in upwelling regions will experience some of the earliest and most severe onsets of ocean acidification. Already, limited field surveys suggest that the portions of the California Current system (CCS) are experiencing low pH conditions during the summer upwelling season. Determination of the direct and indirect impact of ocean acidification on marine calcifiers and other pH or pCO2 sensitive organisms depends critically on accurate assessments of both current OA stress regimes and the likely scope of future

biogeochemical change. To date, we have virtually no such time series in the inner-shelf waters of upwelling shelves where the combined burdens of CO2 increase from anthropogenic and respiratory sources are maximal. This observational gap is a severe impediment to progress in the study of this major consequence of global climate change and its ecological consequences. This is due largely to the lack of accurate and reliable sensors that can be deployed in the field in inner shelf waters.

Recently, sensors for pH and pCO2 have been developed that are capable of providing the required accuracy, precision and reliability needed in instruments deployed in the challenging and dynamic environments of the inner shelf. For systems where biogeochemical signals are spatially heterogeneous, an important criterion for developing time series data is the ability to resolve spatial variations that are ecologically important and/or crucial for controlling for potential aliasing effects. OSU-PISCO (Oregon State University, Partnership for Interdisciplinary Studies of Coastal Oceans) has acquired funds for one sensor array, and in July 2009, will deploy the array on a mooring to begin the first pH and pCO2 time series in the inner shelf waters of the northern CCS. This EAGER project will allow deployment of a second sensor array.

The project has three goals: documenting spatial differences between pH and pCO2 between the two coastal sites, providing a contrasting monitored site for organismal and ecological impacts studies, and providing a regional "back-up" site in case of loss or failure of the first instruments. The expanded regional sensor array in Oregon will be linked to arrays at Bodega Marine Lab and in southern California to form the first stage of what we expect will be a west coast network of ocean acidification sensors. These will provide the first datasets available for establishing the contextual environmental information necessary for research on the ecological consequences of ocean acidification.

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Program Information

Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)

Website: http://www.piscoweb.org/

Coverage: West coast of North America from Mexico to Alaska

The Partnership for Interdisciplinary Studies of Coastal Oceans is a long-term ecosystem research and monitoring program established with the goals of:

- understanding dynamics of the coastal ocean ecosystem along the U.S. west coast
- sharing that knowledge so ocean managers and policy makers can make science based decisions regarding coastal and marine stewardship
- producing a new generation of scientists trained in interdisciplinary collaborative approaches

Over the last 10 years, PISCO has successfully built a unique research program that combines complementary disciplines to answer critical environmental questions and inform management and policy. Activities are conducted at the latitudinal scale of the California Current Large Marine Ecosystem along the west coast of North America, but anchored around the dynamics of coastal, hardbottom habitats and the oceanography of the nearshore ocean – among the most productive and diverse components of this ecosystem. The program integrates studies of changes in the ocean environment through ecological monitoring and experiments. Scientists examine the causes and consequences of ecosystem changes over spatial scales that are the most relevant to marine species and management, but largely unstudied elsewhere.

Findings are linked to solutions through a growing portfolio of tools for policy and management decisions. The time from scientific discovery to policy change is greatly reduced by coordinated, efficient links between scientists and key decision makers.

Core elements of PISCO are:

- Interdisciplinary ecosystem science
- Data archiving and sharing
- Outreach to public and decision-making user groups

- Interdisciplinary training
- Coordination of distributed research team

Established in 1999 with funding from The David and Lucile Packard Foundation, PISCO is led by scientists from core campuses Oregon State University (OSU); Stanford University's Hopkins Marine Station; University of California, Santa Cruz (UCSC); and University of California, Santa Barbara (UCSB). Collaborators from other institutions also contribute to leadership and development of PISCO programs. As of 2005, core PISCO activities are funded by collaborative grants from The David and Lucile Packard Foundation and the Gordon and Betty Moore Foundation. Core support, along with additional funding from diverse public and private sources, make this unique partnership possible.

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Funding

Funding Source	Award
David and Lucile Packard Foundation (Packard)	unknown EAGER Packard
NSF Division of Ocean Sciences (NSF OCE)	OCE-0956197
Gordon and Betty Moore Foundation (GBMF)	unknown EAGER Moore

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