Temperature, oxygen, pH, depth, and conductivity measured at 5 m depth at Hopkins Marine Station from 18-April 2013 to 14-June 2013

Website: https://www.bco-dmo.org/dataset/707023
Data Type: Other Field Results
Version: 1
Version Date: 2017-06-28

Project

» Ocean Acidification: Collaborative Research: Interactive effects of acidification, low dissolved oxygen and temperature on abalone population dynamics within the California Current (CA Current MS Abpop)

Program

» Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES): Ocean Acidification (formerly CRI-OA) (SEES-OA)

Contributors	Affiliation	Role
Barry, James P.	Monterey Bay Aquarium Research Institute (MBARI)	Principal Investigator
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Abstract

oxygen, pH, depth, and conductivity measured at 5 m depth at Hopkins Marine Station from 18-April 2013 to 14-June 2013.

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Coverage

Spatial Extent: **Lat**:36.6203 **Lon**:-121.9013
Temporal Extent: 2013-04-18 - 2013-06-14

Dataset Description

Temperature, oxygen, pH, depth, and conductivity measured at 5 m depth at Hopkins Marine Station from 18 April 2013 to 14 June 2013.

Acquisition Description

CTD (SeaBird model SeaCat 19Plus (SN 4210)) and pH sensor were deployed at the KFA site, Hopkins Marine Station (average depth = 5m). Added sensors:
-- Aanderra Oxygen Optode (model 4835, SN223),
-- Digital to Analog Converter model 3966 A/D adapter,
-- pH datalogger: Honeywell Model 07777D-06 Durafet III in-line pH electrode with Cap Adapter.

Processing Description

BCO-DMO Processing:
- added columns containing site name, lat, lon, and avg sensor depth (originally provided as header info on the spreadsheet);
- modified parameter names to conform with BCO-DMO naming conventions;
- converted original date/time to ISO8601 format;
- replaced "-999" with "nd" (no data).

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Parameters

Parameter	Description	Units
site	Name of the site	unitless
lat	Latitude of the site; positive values = north	decimal degrees
lon	Longitude of the site; negative values = west	decimal degrees
depth_avg	Average depth at which measurements were made	meters
ISO_DateTime_PDT	Date and time of measurement (Pacific Daylight Time, PDT) formatted to ISO8601 standard: yyyy-mm-ddTHH:MM:SS	unitless
temp_pH_sensor	Temperature measured by pH sensor	degrees Celsius
pH	pH (total pH scale)	unitless
cond_CTD	Conductivity measured by CTD	millisiemens per centimeter (mS/cm)
temp_CTD	Temperature measured by CTD	degrees Celsius
depth_CTD	Depth measured by CTD	meters
oxygen	Oxygen measured by Aanderra Oxygen Optode	micromoles O2 per liter (µmoles O2/liter)

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Instruments

Dataset-specific Instrument Name	Aanderra Oxygen Optode (model 4835, SN223)
Generic Instrument Name	Aanderaa Oxygen Optodes
Dataset-specific Description	Aanderra Oxygen Optode (model 4835, SN223)
Generic Instrument Description	Aanderaa Oxygen Optodes are instrument for monitoring oxygen in the environment. For instrument information see the Aanderaa Oxygen Optodes Product Brochure.

Dataset-specific Instrument Name	Honeywell Model 07777D-06 Durafet III
Generic Instrument Name	pH Sensor
Dataset-specific Description	pH datalogger: Honeywell Model 07777D-06 Durafet III in-line pH electrode with Cap Adapter
Generic Instrument Description	General term for an instrument that measures the pH or how acidic or basic a solution is.

Dataset-specific Instrument Name	SeaBird model SeaCat 19Plus (SN 4210)
Generic Instrument Name	CTD Sea-Bird SBE SEACAT 19plus
Dataset-specific Description	CTD: SeaBird model SeaCat 19Plus (SN 4210)
Generic Instrument Description	Self contained self powered CTD profiler. Measures conductivity, temperature and pressure in both profiling (samples at 4 scans/sec) and moored (sample rates of once every 5 seconds to once every 9 hours) mode. Available in plastic or titanium housing with depth ranges of 600m and 7000m respectively. Minature submersible pump provides water to conductivity cell.

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Deployments

HMS_CTD_2013

Website	https://www.bco-dmo.org/deployment/707057
Platform	Kelp Forest Array - Hopkins Marine Station
Start Date	2013-04-18
End Date	2013-06-14

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Project Information

Ocean Acidification: Collaborative Research: Interactive effects of acidification, low dissolved oxygen and temperature on abalone population dynamics within the California Current (CA Current MS Abpop)

Coverage: Southern Monterey Bay, CA, USA: 36.6205 N, 121.9045 W; Isla Natividad, Mexico:

27.8758 N, 115.1847 W

Ocean acidification is increasingly recognized as a significant driver of change in marine ecosystems. In particular, ecosystems in eastern boundary current systems, including the California Current Large Marine Ecosystem (CCLME), routinely experience upwelling driven low pH, low dissolved oxygen (DO) waters in shallow near shore habitats, and these occurrences have been increasing in magnitude and duration over the past decade. The goal of this project is to study the consequences of ocean acidification and other climate-related changes (dissolved oxygen(DO), temperature) in oceanographic conditions on near shore marine communities over a large scale oceanographic gradient in the CCLME. Understanding how the effects of ocean acidification combined with other climate-related changes on individual marine organisms or life stages will cascade to populations and the services they provide is a high priority for science, management, and policy. By integrating the results of oceanographic field measurements and laboratory experiments in a demographic and bio-economic modeling framework, the present project will advance our understanding of the role of oceanographic variability on the dynamics of marine populations and fisheries. In particular, this research will provide key insights regarding the interactive influences of simultaneous changes in pH, DO, and temperature on nearshore populations and fisheries. By investigating the effects of multiple stressors on coastal marine ecosystems, the project will allow us to better anticipate possible ecological and fishery impacts of increasing frequency and/or intensity of low pH and low DO events. A deeper understanding of the linkages among ocean acidification, coastal oceanographic processes and the health of nearshore marine ecosystems in the CCLME will inform adaptation strategies for future ocean conditions. The research program will implement a novel individual- to population-level approach to specifically investigate how the direct effects of ocean acidification, alone or in combination with low DO and temperature, on two model species of great ecological and commercial relevance, red and pink abalone, will manifest at the population level, and ultimately, the services these species provide to humans. Researchers will: 1) measure and characterize the temporal variability of pH, DO and temperature in nearshore abalone habitat in Monterey Bay, Central California, and Isla Natividad, Mexico, particularly in relation to the duration and intensity of extreme low pH, low DO events, under alternative scenarios of future climate change, 2) conduct laboratory experiments to investigate the effects of low pH, low DO conditions on the reproductive success, growth, calcification, and survival of juvenile red and pink abalone, and 3) develop demographic and bio-economic models to estimate the impacts of environmental and local anthropogenic stressors on the resilience of abalone populations and to assess what management and conservation strategies, including the implementation of networks of marine reserves, may contribute to buffering the negative effects of increased frequency and/or intensity of low pH and low DO events expected under near-future climate scenarios.

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Program Information

Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES): Ocean Acidification (formerly CRI-OA) (SEES-OA)

Website: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503477

Coverage: global

NSF Climate Research Investment (CRI) activities that were initiated in 2010 are now included under Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES). SEES is a portfolio of activities that highlights NSF's unique role in helping society address the challenge(s) of achieving sustainability. Detailed information about the SEES program is available from NSF (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504707). In recognition of the need for basic research concerning the nature, extent and impact of ocean acidification on oceanic environments in the past, present and future, the goal of the SEES: OA program is to understand (a) the chemistry and physical chemistry of ocean acidification; (b) how ocean acidification interacts with processes at the organismal level; and (c) how the earth system history informs our understanding of the effects of ocean acidification on the present day and future ocean. Solicitations issued under this program:NSF 10-530, FY 2010-FY2011NSF 12-500, FY 2012NSF 12-600, FY 2013NSF 13-586, FY 2014 NSF 13-586 was the final solicitation that will be released for this program. PI Meetings:1st U.S. Ocean Acidification PI Meeting(March 22-24, 2011, Woods Hole, MA)2nd U.S. Ocean Acidification PI Meeting(Sept. 18-20, 2013, Washington, DC) 3rd U.S. Ocean Acidification PI Meeting (June 9-11, 2015, Woods Hole, MA – Tentative) NSF media releases for the Ocean Acidification Program: Press Release 10-186 NSF Awards Grants to Study Effects of Ocean Acidification Discovery Blue Mussels "Hang On" Along Rocky Shores: For How Long? Discovery nsf.gov - National Science Foundation (NSF) Discoveries - Trouble in Paradise: Ocean Acidification This Way Comes - US National Science Foundation (NSF) Press Release 12-179 nsf.gov - National Science Foundation (NSF) News - Ocean Acidification: Finding New Answers Through National Science Foundation Research Grants - US National Science Foundation (NSF) Press Release 13-102 World Oceans Month Brings Mixed News for Oysters Press Release 13-108 nsf.gov - National Science Foundation (NSF) News - Natural Underwater Springs Show How Coral Reefs Respond to Ocean Acidification - US National Science Foundation (NSF) Press Release 13-148 Ocean acidification: Making new discoveries through National Science Foundation research grants Press Release 13-148 - Video nsf.gov - News -

Video - NSF Ocean Sciences Division Director David Conover answers questions about ocean acidification. - US National Science Foundation (NSF) Press Release 14-010 nsf.gov - National Science Foundation (NSF) News - Palau's coral reefs surprisingly resistant to ocean acidification - US National Science Foundation (NSF) Press Release 14-116 nsf.gov - National Science Foundation (NSF) News - Ocean Acidification: NSF awards $11.4 million in new grants to study effects on marine ecosystems - US National Science Foundation (NSF)

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1416877

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