Dissolved oxygen and temperature from Nearshore Isla Natividad, Baja California Mexico from July to August of 2018

Website: https://www.bco-dmo.org/dataset/872351
Data Type: Other Field Results
Version: 1
Version Date: 2022-03-24

Project
» Collaborative Research: Evaluating how abalone populations in the California Current are structured by the interplay of large-scale oceanographic forcing and nearshore variability (Abalone Safe Places)

Contributors	Affiliation	Role
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Abstract
Dissolved oxygen and temperature data collected as part of a Nearshore study conducted Isla Natividad, Baja California Mexico from July to August of 2018 that included currents, water level, wave data, temperature, and dissolved oxygen.

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Coverage

Spatial Extent: **N**:27.8903 **E**:-115.166 **S**:27.863 **W**:-115.215
Temporal Extent: 2018-07-25 - 2018-08-15

Methods & Sampling

Location: Isla Natividad, Baja California, Mexico (27º53.215 N, 115º11.325 W depth 15-30m)

From July - Aug of 2018, numerous instruments were deployed around Isla Natividad in Baja California Mexico. These included PME MiniDots that were deployed 1 meter above the bottom.

Folders and filenames included in this dataset contain transect and target depth identifiers.
Prefix letters represent a cross-shore transect line and the 2 numerals represent the approximate target depth of a mooring along that line. There were 4 transects (LG,PP, MP, BB) and moorings were targeted at 15, 20, and 25m on each transect. For example "BB15" indicates transect BB and target mooring depth of 15m. See the supplemental file "deploy_info.csv" for a list of transect-mooring deployments included in this dataset.

Data Processing Description

MATlab 2019 b is used for all QA/QC and processing. PME MiniDots output a Q for quality control. Any data where Q>0.7, data was defined with a NaN.

BCO-DMO Data Manager Processing Notes:

* .mat file context examined and example structures provided in data file descriptions.
* .mat and .txt vector and array exports provided by the submitter were bundled into .zip files and attached to dataset.
* deploy_info.csv was created by extracted the contents of every *_Info*.txt file within the provided file hierarchy. The Deployment ID was extracted from the filename of the _Info file.
* ISO_DateTime_UTC_Start was added as a column by converting start time in Mountain Time

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Data Files

File
MiniDOT data (matlab and vectors txt files) filename: MiniDots.zip (ZIP Archive (ZIP), 337.79 KB) MD5:7cee3eaca381a17498b56857863eed9e MiniDOT data. Contains matlab .mat files and txt files containing exported vectors from the .mat file. This file bundle contains subfolders named by deployment ID (transectID+target_depth). Each folder contains a file ending with _Info.txt which contains deployment information such as start and end time, lat,lon, depth, units. Within each folder is the .mat file for the deployment containing a structure "DATA" % example DATA struct % DATA 1x1 88288 struct % % Temp: [2738×1 double] % DO: [2738×1 double] % DO_sat: [2738×1 double] % Time: [2738×1 double] Units: temperature (Celcius), DO (mg/L), DO Saturation (%) Time is a matlab datenum type in time zone Mountain Time (MT).

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Supplemental Files

File
Deployment Information filename: deploy_info.csv (Comma Separated Values (.csv), 5.04 KB) MD5:85b804862d2c8f74418595fe27222216 Deployment Information for transects and moorings. Columns (parameter) info: Data_Type, Data type collected (e.g. MiniDOT,CTD) Deployment_ID, Deployment identifier. Prefix letters represent a cross-shore transect line and the 2 numerals represent the approximate target depth of a mooring along that line. Transect_ID, There were 4 transects (LG,PP, MP, BB). Target_Depth, Moorings targed deployment depth along transect. Targeted at 15, 20, and 25m on each transect. Start_Date,Start Date local time zone (MT) in format "%d-%b-%Y %H:%M:%S" End_Date, End Date local time zone (MT) in format "%d-%b-%Y %H:%M:%S" Time_Zone, Timezone (MT, mountain time) used for Start_Date and End_Date ISO_DateTime_UTC_Start, Start Date time zone UTC in ISO 8601 format "%Y-%m-%dT%H:%M:%SZ" Latitude, latitude in decimal degrees Longitude, longitude in decimal degrees Units,units used for the data type Depth, notes "Bottom(seafloor) or no value"

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Related Datasets

IsRelatedTo

Monismith, S. G., Woodson, C. B., Daly, M., Fong, D. (2023) **ADCP data from Nearshore Isla Natividad, Baja California Mexico from July to August of 2018.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2022-03-24 doi:10.26008/1912/bco-dmo.872339.1 [view at BCO-DMO]
Relationship Description: Data collected as part of the same study. A Nearshore study conducted Isla Natividad, Baja California Mexico from July to August of 2018 that included currents, water level, wave data, temperature, and dissolved oxygen.

Monismith, S. G., Woodson, C. B., Daly, M., Fong, D. (2023) **CTD data from Nearshore Isla Natividad, Baja California Mexico from July to August of 2018.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2022-03-24 doi:10.26008/1912/bco-dmo.872345.1 [view at BCO-DMO]
Relationship Description: Data collected as part of the same study. A Nearshore study conducted Isla Natividad, Baja California Mexico from July to August of 2018 that included currents, water level, wave data, temperature, and dissolved oxygen.

Monismith, S. G., Woodson, C. B., Daly, M., Fong, D. (2023) **Pressure data from Nearshore Isla Natividad, Baja California Mexico from July to August of 2018.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2022-03-24 doi:10.26008/1912/bco-dmo.872357.1 [view at BCO-DMO]
Relationship Description: Data collected as part of the same study. A Nearshore study conducted Isla Natividad, Baja California Mexico from July to August of 2018 that included currents, water level, wave data, temperature, and dissolved oxygen.

Monismith, S. G., Woodson, C. B., Daly, M., Fong, D. (2023) **Temperature data from Nearshore Isla Natividad, Baja California Mexico from July to August of 2018.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2022-03-24 doi:10.26008/1912/bco-dmo.872332.1 [view at BCO-DMO]
Relationship Description: Data collected as part of the same study. A Nearshore study conducted Isla Natividad, Baja California Mexico from July to August of 2018 that included currents, water level, wave data, temperature, and dissolved oxygen.

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Parameters

Parameters for this dataset have not yet been identified

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Instruments

Dataset-specific Instrument Name	PME MiniDots
Generic Instrument Name	PME MiniDOT Logger
Generic Instrument Description	The PME miniDOT logger is a submersible sensor designed to measure water temperature and dissolved oxygen concentration. Dissolved oxygen is measured by an optode that measures lifetime-based luminescence quenching of a thin membrane. The sensing foil contains a coating with a variable fluorescence depending on the oxygen concentration of the surrounding water. The miniDOT reports in milligrams per liter (mg/L) and logs all measurements to an internal SD card. Also featured is a temperature sensor and batteries. Data can be offloaded to a computer via USB cable. The logger has an accuracy of +/- 5 percent (+/- 0.3 mg/L) for oxygen, and +/- 0.1 degrees Celsius for temperature. Temperature range is 0 to 35 degrees Celsius, oxygen range is 0 to 150 percent saturation. Depth-rated to 300 meters. Instrument description from the manufacturer: https://www.pme.com/products/minidot

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Project Information

Collaborative Research: Evaluating how abalone populations in the California Current are structured by the interplay of large-scale oceanographic forcing and nearshore variability (Abalone Safe Places)

Coverage: Pacific Coast of Baja California (26 N to 32 N)

NSF Award Abstract:
Oceanographic variability is increasingly recognized as a driver of change in marine ecosystems. Understanding the effects of this oceanographic variability and its extremes on organisms, populations, ecosystems and the critical services they deliver is of great scientific interest and pivotal for resource management and policy. The overarching goal of this project is to determine how small-scale heterogeneity in habitat quality and site-specific vulnerability to extreme oceanographic conditions might help identify safe spaces and protect coastal populations and fisheries from the detrimental effects of increasing frequency, intensity and durations of extreme oceanographic conditions. This project will combine detailed nearshore oceanographic studies with ecological experiments and coupled biophysical modeling to advance understanding of the drivers of local oceanographic variability and consequent effects on coastal marine animals. The research will determine how multiple, potentially stressful, environmental drivers co-vary in the field and how such variation affects the population dynamics of coastal species. Specifically, this project will provide key insights regarding how changes in ocean acidification, dissolved oxygen and temperature will affect green and pink abalone, an ecologically and economically important resource in the southern California Current. Team members will work with partner non-governmental organizations, resource agencies, and fishing cooperative federations to disseminate results and incorporate data and insights into fisheries management and adaptation initiatives in Baja California, Mexico and in California, USA. This project will also support the training and professional development of underrepresented groups at the high school, undergraduate, graduate and postdoctoral levels through direct involvement in research, intensive courses and international workshops.

Despite large-scale drivers and regional perturbations, local variability in ocean conditions may be a major driver of the overall performance and vulnerability of coastal marine species. Research performed as part of this

project will test two specific hypotheses: (1) The relative influences of upwelling versus tides, as mediated by coastal geometry and structural complexity associated with rocky reefs and kelp forests act to create high local variability in physical conditions, at scales of 10s-1000s meters; and (2) Local variability in oceanographic conditions results in high local patchiness in the performance of sedentary marine organisms, providing for safe spaces in the face of escalating heat waves, hypoxia, and acidification, that have caused recent mass mortalities in multiple species across the California Current region. Integrated oceanographic-ecological field studies will be conducted along the coast of Baja California, Mexico, using green and pink abalone (Haliotis fulgens, H. corrugata) as model species. Complementary laboratory experiments will evaluate how different exposure regimes (frequency, intensity and duration of high temperature, and/or low dissolved oxygen and acidity events) may affect the demography and persistence of abalone populations under current and future environments. Coupled biophysical and population models will integrate results from the field and laboratory experiments to understand how local variability in ocean conditions affects population dynamics over longer periods. The research will advance the understanding of factors affecting the resilience coastal species by (1) ascertaining how large-scale oceanographic phenomena manifest in ocean conditions (dissolved oxygen, acidity, temperature) at local scales that are most relevant to coastal marine ecosystems and (2) determining the effects of current, and expected future, ocean conditions and variability on important marine species.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1736830

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