

# CTD with oxygen and fluorescence to 600 meters from R/V BIP XII and Shana Rae cruises in the Guaymas Basin, Gulf of California, Santa Cruz, CA in 2013 (Jumbo Squid El Nino Response project)

**Website:** <https://www.bco-dmo.org/dataset/615924>

**Version:** 15 October 2015

**Version Date:** 2015-10-15

## Project

» [Adaptable life history strategy of a migratory large predator in response to El Nino and climate change](#)  
(Jumbo Squid El Nino Response)

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## Dataset Description

CTD data from cruises BIP XII, Shana Rae 2013, and MBB Soledad 2014.

## Methods & Sampling

Data were collected with Seabird SBE19plusV2 (SN 01906222) equipped with the following sensors:

Temperature: ITS-90

Pressure: Strain Gauge

Oxygen: SBE43

Fluorescence: WET Labs ECO-AFL/FL

All sensors (except Fluorescence) are calibrated annually by Seabird Electronics, Inc.

## Data Processing Description

Data were processed by hand to remove unreliable measurements during the initial period of sensor stabilization at the surface before the cast (2 minutes). Binning to 1 m depth bins for the downcast was carried out during conversion from .hex files to ascii text (.cnv) files using the most current .con file provided by Seabird Electronics at the time of annual calibration.

BCO-DMO data processing:

- Re-formatted date and time.
- Replaced commas with semi-colons.

- Replaced blanks with "nd" to indicate "no data".
- Replaced spaces with underscores.
- Changed lon in positive degrees W to negative degrees E.
- Modified parameter names to conform with BCO-DMO naming conventions.

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## Data Files

File
<b>ctd.csv</b> (Comma Separated Values (.csv), 1.57 MB) MD5:b3d9416f375cf35d85f498c2a1b28bad Primary data file for dataset ID 615924

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## Parameters

Parameter	Description	Units
date	Date (local or GMT??)	mm/dd/YYYY
time_local	Time in hours and minutes (local time zone); 24-hour clock.	HHMM
time_gmt	Time in hours and minutes (GMT); 24-hr clock.	HHMM
ctd	CTD dataset ID number.	integer
cast	Cast number.	integer
lat	Latitude. Positive values = North.	decimal degrees
lon	Longitude. Positive values = East.	decimal degrees
location	Description of location.	text
vessel	Vessel name.	text
note	Notes.	text
jig_station	Jig station. For BIP XII data, squid jigging stations that correspond to the sites of CTD casts (and total number of squid captured at each site) are included. These jigging sites are cross-referenced to the "Squid Summary BIPXII" dataset ( <a href="http://www.bco-dmo.org/dataset/614736">http://www.bco-dmo.org/dataset/614736</a> ).	text
total_squid	Total squid.	integer
temp	Temperature.	degrees Celsius
cond	Conductivity.	Siemens per meter (S/m)
press	Pressure.	decibars (db)
O2	Oxygen.	micromoles per kilogram (umol/kg)
fluor	Fluorescence "chlorophyll".	milligrams per cubic meter (mg/m <sup>3</sup> )
pH	pH.	pH units.
turbidity	Turbidity, Seapoint.	FTU
density	Sigma-theta density.	kilograms per cubic meter (kg/m <sup>3</sup> )
depth	Depth.	meters
sal	Salinity.	practical salinity units (PSU)
flag	Flag.	nd
time_PDT	Time in hours and minutes (PDT time zone); 24-hour clock	HHMM

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## Instruments

<b>Dataset-specific Instrument Name</b>	Seabird SBE19plusV2
<b>Generic Instrument Name</b>	CTD Sea-Bird SBE SEACAT 19plus
<b>Dataset-specific Description</b>	Data were collected with Seabird SBE19plusV2 (SN 01906222).
<b>Generic Instrument Description</b>	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

### BIPXII\_10\_2013

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/520503">https://www.bco-dmo.org/deployment/520503</a>
<b>Platform</b>	R/V BIP XII
<b>Start Date</b>	2013-10-20
<b>End Date</b>	2013-10-25
<b>Description</b>	Central Gulf of California, Mexico: Santa Rosalia (27.3N 112.1W) to Bahia Las Animas (28.9N 113.3W to Guaymas (27.8N 111.3W)

### Shana Rae\_11\_2013

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/615971">https://www.bco-dmo.org/deployment/615971</a>
<b>Platform</b>	Shana Rae
<b>Start Date</b>	2013-11-11
<b>End Date</b>	2013-11-12
<b>Description</b>	Monterey Bay, CA, USA: Monterey (36.6N/121.9W) to MBARI M1 (36.7N/122.1W)

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## Project Information

### Adaptable life history strategy of a migratory large predator in response to El Nino and climate change (Jumbo Squid El Nino Response)

**Coverage:** Gulf of California and Monterey Bay

*Description from NSF award abstract:*

This project will examine the response of *Dosidicus gigas* (Humboldt squid) to an El Niño event in 2009-2010 that was accompanied by a collapse of the commercial fishery for this squid in the Guaymas Basin within the Gulf of California. This large squid is a major predator of great ecological and economic importance in the Gulf of California, the California Current, and Peru Current systems. In early 2010, these squid abandoned their

normal coastal-shelf habitats in the Guaymas Basin and instead were found in the Salsipuedes Basin to the north, an area buffered from the effects of El Niño by the upwelling of colder water. The commercial fishery also relocated to this region and large squid were not found in the Guaymas Basin from 2010-2012, instead animals that matured at an unusually small size and young age were abundant. A return to the large size-at-maturity condition has still not occurred, despite the apparent return of normal oceanographic conditions.

The El Niño of 2009-2010 presented an unforeseen opportunity to reveal an important feature of adaptability of *Dosidicus gigas* to an acute climatic anomaly, namely a large decrease in size and age at maturity. Now these investigators will have the opportunity to document recovery to the normal large size-at-maturity condition. The specific aims of this project are:

- 1) continue a program of acoustic surveys and direct sampling of squid that has already been established in the Gulf of California in order to assess distribution, biomass, life history strategy diet, and migratory and foraging behaviors relative to pre-El Niño conditions and
- 2) conduct analogous surveys in Monterey Bay, California in conjunction with long-term remote operated vehicle surveys of squid abundance.

The data from these studies will provide a comparison of recovery in the two different squid populations and yield valuable insights into what ecological effects an area is expected to experience with an invasion of either small or large Humboldt squid. As long-term climate change progresses, squid of both forms may expand northward into the California Current System.

Related Project: [Hypoxia and the ecology, behavior and physiology of jumbo squid, \*Dosidicus gigas\*](#)

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## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1338973</a>

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