CTD profile data from ROV Doc Ricketts and Ventana dives conducted during the R/V Western Flyer MBARI DEEPC cruises off the California coast from 2016 to 2021

Website: https://www.bco-dmo.org/dataset/685216
Data Type: Cruise Results
Version: 4
Version Date: 2022-01-27

Project
» Dimensions: Collaborative Research: Life at extremes: Linking the phylogenetic and genomic diversity of ctenophores to ecophysiological adaptations in the deep sea (DEEPC)

Contributors	Affiliation	Role
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Abstract
CTD profile data from ROV Doc Ricketts and Ventana dives conducted during the R/V Western Flyer MBARI DEEPC cruises off the California coast from 2016 to 2021. The data include samples taken by the ROV on the way down and up.

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Coverage

Spatial Extent: **N**:36.8024 **E**:-119.428 **S**:33.8358 **W**:-125.045
Temporal Extent: 2016-06-11 - 2021-10-30

Methods & Sampling

CTD files were collected with a Seabird CTD and other attached sensors mounted on the ROV Doc Ricketts during dives D856 to D861 offshore of California from the surface to 3600 meters.

Oxygen saturation quality flags:

0 Data known to be bad, sensor malfunctioned
1 Questionable data contain some spikes but no known problems with the sensor.
2 Auto-loaded data have been automatically loaded but not checked by human eyes
3 Sensors appear to be operating as specified, checked by sensor technician, data looks reasonable
4 Data are good, Scientist has verified the validity of the data

Data Processing Description

Retrieved from MBARI database and formatted into columns.

BCO-DMO Data Manager Processing Notes:

* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions
* changed "None" to "nd" for no data value
* converted date and time to ISO timestamp
* approximate lat lons added from ctenophore observations for all but cruise D856

Data version 2 (2017-10-17) replaced version 1 (2016-12-22):
* more dive data added
* Some variable names changed. Parameter descriptions updated to reflect this.
* lat_approx, lon_approx extracted from the ctenophore dataset removed
* Latitude and Longitude added (from new version of ctd files).

Data version 3 (2019-10-08):
* Data from 2017 to 2019 added to data from data version 2 which was 2016 data.
* Data sorted by time
* Latitude and longitude rounded to 5 decimal places.

Data version 4 (2022-01-27):
* Data from 2020-2021 added
* Data sorted by time
* Latitude and longitude rounded to 5 decimal places.

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Related Datasets

IsSupplementTo

Haddock, S. H. (2021) **Ctenophore observations from ROV Doc Ricketts dives during the R/V Western Flyer DEEPC cruises offshore of California, 2016-2020 (DEEPC project).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 2) Version Date 2020-12-14 doi:10.26008/1912/bco-dmo.685287.2 [view at BCO-DMO]

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Parameters

Parameter	Description	Units
RovDive	Dive identifier. Incrementing MBARI dive number for the vehicle. Dives with prefix "D" were ROV Doc Ricketts dives and the "V" prefix were ROV Ventana dives.	unitless
ISO_DateTime_UTC	IDate and time (UTC) in ISO 8601:2004(E) format YYYY-mm-ddTHH:MM:SSZ	unitless
Depth	Depth of sample	meters
Latitude	Approximate latitude of dive	decimal degrees
Longitude	Approximate longitude of dive; west is negative	decimal degrees
Temp	Temperature	degrees Celsius
Salin	Salinity	parts per thousand (ppt)
Oxygen	Oxygen saturation	milliliters per liter (ml/L)
OxyQual	Oxygen saturation quality flag (0-3; 3 is checked by chemist)	unitless
Transmiss	Light transmission at 660 nm	percent

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Instruments

Dataset-specific Instrument Name	CTD with transmissometer and oxygen sensor
Generic Instrument Name	CTD Sea-Bird
Dataset-specific Description	CTD files were collected with a Seabird CTD and other attached sensors mounted on the ROV
Generic Instrument Description	Conductivity, Temperature, Depth (CTD) sensor package from SeaBird Electronics, no specific unit identified. This instrument designation is used when specific make and model are not known. See also other SeaBird instruments listed under CTD. More information from Sea-Bird Electronics.

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Deployments

DEEPC_ROV_dives

Website	https://www.bco-dmo.org/deployment/685211
Platform	Doc Ricketts
Start Date	2016-06-11
End Date	2020-02-02
Description	Dives D856 to D861 note: no lat lon for D856 Ctenophore observations were recorded during ROV Doc Ricketts during dives D856 to D920 (2016), D959 to D965 (2017) and 1240 to 1245 (2019 and 2020) offshore of California from 200 to 4000 meters. **Methods & Sampling** ROV Doc Ricketts Dives D856 to D861

MBARI_DEEPC_Cruises

Website	https://www.bco-dmo.org/deployment/685282
Platform	R/V Western Flyer
Start Date	2016-06-11
End Date	2021-08-01
Description	location approximate MBARI Expedition #_____ (??) Biodiversity and Bio-optics 2015 Expedition July 7th-14th, 2015 Chief Sci: Steven Haddockhttps://www.mbari.org/at-sea/expeditions/biodiversity-and-biooptics-2015... MBARI Expedition # _____ (??) DEEPC Hawai'i Expedition 2018 November 1st-12th, 2018 Chief Sci: Steven Haddockhttps://www.mbari.org/deepc_hawaii_2018/ MBARI Expedition #467 Bioluminescience Expedition July 9th-17th, 2019 Chief Sci: Steven Haddockhttps://www.mbari.org/biodiversity-and-biooptics-2019-expedition-expedit... MBARI Expedition #483 Biodiversity and Bio-optics 2020 Expedition January 28th to February 2nd, 2020. Chief Sci Steven Haddockhttps://www.mbari.org/biodiversity-and-biooptics-2020-expedition/

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Project Information

Dimensions: Collaborative Research: Life at extremes: Linking the phylogenetic and genomic diversity of ctenophores to ecophysiological adaptations in the deep sea (DEEPC)

Coverage: Monterey Bay, Puget Sound, Florida, Global Ocean

The deep sea is more than 90 percent of the inhabitable space on Earth, yet life there is largely a mystery to science. Ctenophores, also known as comb jellies, are marine predators found in all oceans, inhabiting both deep and shallow seas. Although fragile and difficult to study, they are biologically important, in part because they appear to have been the first group of animals to split off from all other organisms during evolution, even before sponges and jellyfish. Over evolutionary time, many marine organisms have transitioned their home ranges to and from the deep sea despite the tremendous differences between these two habitats, including light, temperature, and hydrostatic pressure. Such habitat shifts required dramatic genetic and physiological changes to these animal lineages over time. The relationships between comb jelly species indicate that species from a variety of different families have evolved to live and thrive in the deep sea. This project will compare closely related deep and shallow species at biochemical, physiological and genetic levels to understand how these transitions came about. It will answer questions about the fundamental mechanisms of animal evolution and develop publicly available tools for analyzing genomic data sets. It will result in the training of cutting-edge techniques for two PhD students, a postdoc, two masters students, and numerous undergraduates. Public outreach involving biodiversity in the deep sea and gelatinous animals will help educate and inspire appreciation of marine life.

The main objective of this project is to understand evolution and diversification using cutting edge molecular

analyses to investigate the deep-sea habitat as the generating force of novel biological adaptations. Ctenophore specimens will be collected using blue-water SCUBA in surface waters and remotely operated submarines in the deep sea to generate complementary physiological and genomic data across the full phylogenetic and functional diversity of ctenophores. With samples taken across a range of habitats from shallow tropical waters to temperate bathypelagic zone, the team will measure physiological capabilities and sequence transcriptomes and genomes. This project will develop novel algorithms to identify genes involved in depth adaptation and examine the genetic events that underlie physiological tolerances and adaptations to high hydrostatic pressures in the deep sea. To confirm the theory-based predictions of how gene sequence affects the properties of enzymes, proteins will be expressed and characterized in the lab. Collaborations between the students, postdocs and PIs involved in this project will substantially enhance an interdisciplinary workforce trained in both classical and cutting edge skills needed for contemporary biodiversity investigations.

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Funding

Funding Source	Award
NSF Division of Environmental Biology (NSF DEB)	DEB-1542679

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