

# Ctenophore observations 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/685287>

**Data Type:** Cruise Results

**Version:** 3

**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)

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## Abstract

Ctenophore observations 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.

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## Coverage

**Spatial Extent:** N:36.80105 E:-117.717408 S:32.724904 W:-123.99958

**Temporal Extent:** 2016-06-11 - 2021-10-30

## Methods & Sampling

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). Ctenophores collected with the ROV Ventana were from dives 4213 to 4275 (2019 and 2020) in Monterey Bay offshore of California from 200 to 4000 meters.

The data include the species or lowest classification possible along with the date, time, depth, and temperature where the organism was observed. The timestamp (TapeTimeCode) on the recorded tape is also provided when available. The data include measurements taken by the ROV on the way down and up.

## Data Processing Description

### BCO-DMO Data Manager Processing Notes:

Data version 2016-12-22

- \* added a conventional header with dataset name, PI name, version date
- \* modified parameter names to conform with BCO-DMO naming conventions
- \* converted date and time to ISO timestamp
- \* rounded temperature and depth to two decimal places and lat/lon to five.

Data version 2017-10-17 replaces version 2016-12-22

- \* more data added from newer dives
- \* data parameter names changed, parameter section updated
- \* "D" added before dive number to be consistent with CTD dataset.
- \* observer parameter description removed as it was not included in this version of files.

Data version 2: 2020-12-14 replaces version 1:2017-10-17

- \* added data from 2019 and 2020 dives
- \* added D or V to DiveNumber for "Doc Ricketts" and "Ventana", respectively, to agree with CTD dataset.

Data version 3: 2021-01-27 replaces version 2: 2020-12-14

- \* added data from 2020 and 2021 dives
- \* added D or V to DiveNumber for "Doc Ricketts" and "Ventana", respectively, to agree with CTD dataset.
- \* Preserved format in column "DateTime24" which has a variable format ( yyyy-mm-dd HH:MM:SS or HH:MM). Filled in existing column from v1 and v2 "ISO\_DateTime\_UTC" with a consistent ISO 8601 format with time zone (yyyy-mm-ddTHH:MMZ).
- \* Lat lon rounded to five decimal places as was done in version 1.
- \* Made a unique taxa list using the "ConceptName" data column and matched names using the World Register of Marine Species taxa match tool. This will be attached as a supplemental file to this dataset and will include the matched taxonomic identifiers aphiaID, and LSID.

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## Related Datasets

### IsSupplementedBy

Haddock, S. H. (2021) **CTD profile data from ROV Doc Ricketts dives during R/V Western Flyer DEEPC cruises off the California coast from 2016 to 2019.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 3) Version Date 2019-10-08 doi:10.26008/1912/bco-dmo.685216.3 [[view at BCO-DMO](#)]

### IsRelatedTo

Haddock, S. H., Choy, C. A., Dunn, C. W. (2022) **Siphonophore specimens collected for the SiphWeb project from two ROVs during the R/V Western Flyer MBARI DEEPC cruises in 2019-2022.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 3) Version Date 2022-10-05 doi:10.26008/1912/bco-dmo.834100.3 [[view at BCO-DMO](#)]  
*Relationship Description: Siphonophore sample log from same ROV dives.*

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## Parameters

Parameter	Description	Units
DiveNumber	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
Latitude	Latitude of observation	decimal degrees
Longitude	Longitude of observation; west is negative	decimal degrees
Depth	Depth of observation	meters
Temperature	Temperature	degrees Celsius
Date	Date of observation (UTC) in format yyyy-mm-dd	unitless
DateTime24	Timestamp of observation (UTC) in either format "yyyy-mm-dd HH:MM" or "yyyy-mm-dd HH:MM:SS"	unitless
ISO_DateTime_UTC	ISO timestamp based on the ISO 8601:2004(E) standard in format YYYY-mm-ddTHH:MMZ (UTC)	unitless
ConceptName	Species or lowest classification for organism	unitless
TapeTimeCode	Time code on recording of dive	unitless
SampleRefName	Dive-Sampler number	unitless
RovName	ROV name	unitless

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## Instruments

<b>Dataset-specific Instrument Name</b>	video recorder
<b>Generic Instrument Name</b>	Camera
<b>Generic Instrument Description</b>	All types of photographic equipment including stills, video, film and digital systems.

<b>Dataset-specific Instrument Name</b>	CTD with transmissometer and oxygen sensor
<b>Generic Instrument Name</b>	CTD Sea-Bird
<b>Dataset-specific Description</b>	CTD files were collected with a Seabird CTD and other attached sensors mounted on the ROV
<b>Generic Instrument Description</b>	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.

<b>Dataset-specific Instrument Name</b>	
<b>Generic Instrument Name</b>	ROV Ventana
<b>Generic Instrument Description</b>	ROV Ventana is operated by the Monterey Bay Aquarium Research Institute (MBARI). ROV Ventana comes with two manipulators as standard equipment: a Schilling T4, seven-function spatially correspondent arm, and a seven-function Schilling/Oceanering Atlas Hybrid (rate and spatially correspondent.) Both manipulators can use a variety of end effectors. The ROV has forward-looking camera systems mounted on pan-and-tilt units. The vehicle also has a hydraulic swing arm that deploys from the port side. Ventana is equipped with a Sea-Bird 19plus V2 CTD package which includes a dissolved oxygen sensor and a transmissometer. Three spatial lasers are mounted on the main camera for quantitative calculations. For a full description, see <a href="https://www.mbari.org/at-sea/vehicles/remotely-operated-vehicles/rov-ven...">https://www.mbari.org/at-sea/vehicles/remotely-operated-vehicles/rov-ven...</a> .

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## Deployments

### DEEPC\_ROV dives

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/685211">https://www.bco-dmo.org/deployment/685211</a>
<b>Platform</b>	Doc Ricketts
<b>Start Date</b>	2016-06-11
<b>End Date</b>	2020-02-02
<b>Description</b>	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.  <b>Methods &amp; Sampling</b> ROV Doc Ricketts Dives D856 to D861

### MBARI\_DEEPC\_Cruises

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

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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**

<b>Funding Source</b>	<b>Award</b>
<a href="#">NSF Division of Environmental Biology (NSF DEB)</a>	<a href="#">DEB-1542679</a>

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