# CTD data for the SiphWeb project from two ROVs during the R/V Western Flyer MBARI DEEPC cruises in 2019-2021

**Website**: https://www.bco-dmo.org/dataset/834158
**Data Type**: Cruise Results
**Version**: 2
**Version Date**: 2021-11-19

**Project**
» Collaborative research: The effects of predator traits on the structure of oceanic food webs (SiphWeb)

| Contributors | Affiliation | Role |
|---|---|---|
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**Abstract**
This dataset includes CTD data collected y ROV Doc Ricketts and ROV Ventana during deployments that were conducted from the MBARI ship R/V Western Flyer, in 2019-2021.

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## Coverage

**Spatial Extent**: **N**:36.803023 **E**:-117.716047 **S**:32.724167 **W**:-125.035995
**Temporal Extent**: 2019-09-19 - 2021-08-01

### Methods & Sampling

CTD data recorded in 2019-2021 during dives by ROV Doc Ricketts and ROV Ventana in Monterey Bay offshore of California from the surface to approximately 4000 meters.

### Data Processing Description

**BCO-DMO Data Manager Processing Notes:**
- added a conventional header with dataset name, PI name, version date;
- converted date and time to ISO8601 format;
- added a column for Year;
- **2021-11-19**: appended additional data from dives D1335-D1371 and V4301-V4318; updated dataset version

number to v2.

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## Data Files

| File |
|---|
| **siph_ctd.csv** (Comma Separated Values (.csv), 47.45 MB)<br>MD5:fa40fd8439685db8a1615cdbb263eee0<br>Primary data file for dataset ID 834158 |

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## Related Datasets

### 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]

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## Parameters

| Parameter | Description | Units |
|---|---|---|
| RovDive | Dive identifier (Incrementing MBARI dive number for vehicle) | unitless |
| Year | Year of dive; format: YYYY | unitless |
| Depth | Depth of sample | meters (m) |
| ISO_DateTime_UTC | Date and time (UTC) in ISO 8601:2004(E) standard format: YYYY-MM-DDThh:mm:ssZ | unitless |
| Latitude | Approximate latitude of dive | decimal degrees North |
| Longitude | Approximate longitude of dive; west is negative | decimal degrees East |
| Temp | Temperature | degress Celsius |
| Salin | Salinity | parts per thousand (ppt) |
| Oxygen | Oxygen saturation | milliliters per liter (ml/L) |

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## Instruments

| | |
|---|---|
| **Dataset-specific Instrument Name** | |
| **Generic Instrument Name** | CTD Sea-Bird |
| **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. |

| | |
|---|---|
| **Dataset-specific Instrument Name** | ROV Doc Ricketts |
| **Generic Instrument Name** | ROV Doc Ricketts |
| **Generic Instrument Description** | The remotely operated vehicle (ROV) Doc Ricketts is operated by the Monterey Bay Aquarium Research Institute (MBARI). ROV Doc Ricketts is capable of diving to 4000 meters (about 2.5 miles). The R/V Western Flyer is the support vessel for Doc Ricketts and was designed with a center well whose floor can be opened to allow Doc Ricketts to be launched from within the ship into the water below. For a complete description, see: https://www.mbari.org/at-sea/vehicles/remotely-operated-vehicles/rov-doc... |

| | |
|---|---|
| **Dataset-specific Instrument Name** | ROV Ventana |
| **Generic Instrument Name** | ROV Ventana |
| **Generic Instrument Description** | 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/Oceaneering Atlas Hybrid (rate and spacially 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 https://www.mbari.org/at-sea/vehicles/remotely-operated-vehicles/rov-ven.... |

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## Deployments

**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

**Collaborative research: The effects of predator traits on the structure of oceanic food webs (SiphWeb)**

**Coverage**: North Pacific

Food webs describe who eats whom, tracing the flow of energy from plants up to large animals. While many connections in food webs on land are quite familiar (lions eat antelope and antelope eat grass, for example), there are large gaps in our understanding of ocean food webs. Closing these gaps is critical to understanding how nutrients and energy move through ocean ecosystems, how organisms interact in the ocean, and how best to manage ocean resources. This project will study ocean food web structure with a focus on siphonophores, an abundant group of predators in the open ocean that range in length from less than an inch to more than one hundred feet. Siphonophores are closely related to corals and many jellyfish. They are known to be important predators within ocean food webs, but they are difficult to study because they live across great ocean depths and are gelatinous and fragile. The details of what they eat, as well as many other features of their biology, remain poorly known. This project will combine direct observations of feeding, genetic analysis of siphonophore gut contents, and stable isotope analyses to identify what different species of siphonophores eat. The team will also examine why they eat what they do. This will provide a new understanding of how the structure of food webs arise, aiding in our ability to predict future changes to food webs as the global climate shifts. Siphonophores feed in a very unique manner--they have highly specialized tentacles that are used solely for capturing prey--thus, the prey captured is determined largely by the anatomy and function of these tentacles. The project will describe these tentacles, reconstruct their evolutionary history, and investigate how evolutionary shifts in tentacle structure have led to changes in diet. This project will train one PhD student, one Master's student, a postdoc, and undergraduate students, including individuals of underrepresented groups. This project will support the production of scientifically rigorous yet engaging videos, foster the expansion of a citizen-science program, and create K-12 teaching modules.

This project will advance three scientific aims: First, it will identify the diet of a diverse range of siphonophores using DNA metabarcoding of gut contents and prey field, remotely operated vehicle (ROV) video of prey encounters, and stable isotope analysis. These approaches are highly complementary and allow for extensive cross validation. Second, the project will characterize the selectivity of siphonophore diets by comparing them to the relative prey abundances in the habitats of each of these species. Third, the project will characterize the structure of the siphonophore prey capture apparatus across species through detailed morphological analysis of their tentacles and nematocysts. These data will be integrated in an ecological and evolutionary framework to identify predator features associated with prey specialization. In a larger context, addressing these questions will advance our understanding of oceanic predation by revealing how evolutionary changes in predator selectivity correspond to evolutionary changes in habitat and feeding apparatus and how these changes shape current food web structure in the open ocean. We will test and refine an integrated approach to describing the structure and origin of food web topology, and evaluate the potential for phylogenetic

relationships to explain prey selectivity.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

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## Funding


| Funding Source | Award |
| --- | --- |
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1829805 |


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