

Siphonophore specimens collected 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/834100>

Data Type: Cruise Results

Version: 2

Version Date: 2021-11-30

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 information about siphonophore specimens collected by ROV Doc Ricketts and ROV Ventana during deployments that were conducted from the MBARI ship R/V Western Flyer, in 2019-2021. The data include the species or lowest classification possible along with the date, time, depth, and temperature where the organism was observed.

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Coverage

Spatial Extent: N:36.761844 E:-117.717187 S:32.72497 W:-124.000811

Temporal Extent: 2019-09-19 - 2021-08-01

Acquisition Description

Siphonophore observations were recorded in 2019-2021 during ROV Doc Ricketts dives 1240 to 1371 and during the ROV Ventana dives 4213 to 4318 in Monterey Bay offshore of California from approximately 200 to 3000 meters.

Processing Description

BCO-DMO Data Manager Processing Notes:

- added a conventional header with dataset name, PI name, version date;
- added column for ISO DateTime format;
- rounded temperature and depth to two decimal places;
- added D or V to DiveNumber for 'Doc Ricketts' and 'Ventana' to agree with CTD dataset;
- **2021-11-18**: appended additional data from 2020-09-16 to 2021-08-01; updated dataset version number to v2.

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Related Datasets

IsRelatedTo

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](#)]

Relationship Description: Ctenophore sample log from same ROV dives.

Haddock, S. H., Choy, C. A., Dunn, C. W. (2021) **CTD data for SiphWeb project from ROV's during the R/V Western Flyer MBARI DEEPC cruises, 2019 and 2020**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2020-12-17 doi:10.26008/1912/bco-dmo.834158.1 [[view at BCO-DMO](#)]

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Parameters

Parameter	Description	Units
DateTime24	Timestamp of observation (UTC) in format: YYYY-MM-DD hh:mm:ss	unitless
RovName	Name of the ROV	unitless
DiveNumber	Dive identifier (incrementing MBARI dive number for vehicle)	unitless
ConceptName	Species or lowest classification for organism	unitless
Depth	Depth of observation	meters (m)
Temperature	Temperature	degrees Celsius
Latitude	Latitude of observation	decimal degrees North
Longitude	Longitude of observation; west is negative	decimal degrees East
ISO_DateTime_UTC	Timestamp of obseravtion (UTC) in ISO 8601:2004(E) standard format: YYYY-MM-DDThh:mm:ssZ	unitless

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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 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/Oceanering 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... .

Dataset-specific Instrument Name	ROV Doc Ricketts
Generic Instrument Name	ROV Doc Ricketts
Generic Instrument Description	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...

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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 Haddock https://www.mbari.org/at-sea/expeditions/biodiversity-and-biooptics-2015... MBARI Expedition # _____ (??) DEEPC Hawai'i Expedition 2018 November 1st-12th, 2018 Chief Sci: Steven Haddock https://www.mbari.org/deepc_hawaii_2018/ MBARI Expedition #467 Bioluminescence Expedition July 9th-17th, 2019 Chief Sci: Steven Haddock https://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 Haddock https://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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