CTD data for SiphWeb project from ROV's during the R/V Western Flyer MBARI DEEPC cruises, 2019 and 2020

Website: https://www.bco-dmo.org/dataset/834158
Data Type: Cruise Results
Version: 1
Version Date: 2020-12-17

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

Contributors	Affiliation	Role
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Abstract
CTD data for SiphWeb project from ROV's during the R/V Western Flyer MBARI DEEPC cruises, 2019 and 2020.

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Coverage

Spatial Extent: **N**:36.803023 **E**:-117.716047 **S**:32.724167 **W**:-122.250637
Temporal Extent: 2019-09-19 - 2020-02-13

Acquisition Description

CTD data from ROV Doc Ricketts during dives 1240 to 1245 and ROV Ventana dives 4213 to 4233 in Monterey Bay offshore of California from 200 to 1600 meters, late 2019 and early 2020.

Processing Description

BCO-DMO Data Manager Processing Notes:
- added a conventional header with dataset name, PI name, version date
- converted date and time to ISO DateTime format

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Related Datasets

IsSupplementTo

Haddock, S. H., Choy, C., Dunn, C. W. (2020) **Siphonophore specimens collected 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 http://lod.bco-dmo.org/id/dataset/834100 [view at BCO-DMO]

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Parameters

Parameter	Description	Units
RovDive	Dive identifier (Incrementing MBARI dive number for vehicle)	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)

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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	
Generic Instrument Name	ROV Ventana
Generic Instrument Description	For a full description, see https://www.mbari.org/at-sea/vehicles/remotely-operated-vehicles/rov-ven...

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Deployments

MBARI DEEPC Cruise

Website	https://www.bco-dmo.org/deployment/685282
Platform	R/V Western Flyer
Start Date	2016-06-11
End Date	2016-06-16
Description	location approximate

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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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