Pyrosome (Pyrosoma atlanticum) samples from MOCNESS tows in the Northern California Current

Website: https://www.bco-dmo.org/dataset/866663
Data Type: Cruise Results
Version: 1
Version Date: 2021-12-10

Project
» Collaborative Research: Mesozooplankton food webs in intermittent upwelling systems: An overlooked link in a productive ocean (MEZCAL)

Contributors	Affiliation	Role
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Abstract
Pyrosome (Pyrosoma atlanticum) samples from MOCNESS tows in the Northern California Current.

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Coverage

Spatial Extent: **N**:44.6529 **E**:-124.268 **S**:41.0459 **W**:-125.144
Temporal Extent: 2018-02-17 - 2018-07-11

Dataset Description

These data were published in Lyle, J.T. et al. Table II

Methods & Sampling

Pyrosoma atlanticum colonies were collected from coupled Multiple Opening and Closing Environmental Sensing System (MOCNESS) tows (Guigand et al., 2005). The nets had openings of 1 m2 and 4 m2 with mesh sizes of 333 µm and 1000 µm, respectively. The pair of nets sampled to 100 m depth in four separate 25-m bins, and a fifth net (“net 0”) was towed to 100 m during the downcast. Pyrosome colonies in each net were enumerated and their volume measured by displacement. Biovolume (mL•m-3) was calculated by dividing the total

pyrosome volume by the volume of water sampled in that tow. If pyrosomes were too numerous to count, a subset of 20 from each depth bin were measured for biovolume. Colony lengths were only measured during July 2018.

Multiple Opening/Closing Net and Environmental Sensing Systems (MOCNESS) fitted with a 4 m2 net with 1 mm mesh and a 1 m2 net with 333 µm mesh.

Data Processing Description

Pyrosome abundance and biovolume were processed in Excel (v.16.16.4). MOCNESS filtered volumes were sourced from this dataset: https://www.bco-dmo.org/dataset/783036

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Data Files

File	
pyrosomes_MOC.csv Primary data file for dataset ID 866663	(Comma Separated Values (.csv), 49.19 KB) MD5:0020a2def5f09d4f4813aa8e79476c4c
pyrosomes_MOC filename: pyrosomes_MOC.xlsx Same data table as served in https://www.bco-dmo.org/dataset/866663. The only difference is the length of the samples is kept in columns. This format might also be useful for users to reuse the data. This excel file contains a tab with parameter descriptions and another tab with the data itself.	(Octet Stream, 36.93 KB) MD5:bd5b816dd30caf88e616499f115816b5

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Related Publications

Guigand, C. M., Cowen, R. K., Llopiz, J. K., & Richardson, D. E. (2005). A Coupled Asymmetrical Multiple Opening Closing Net with Environmental Sampling System. Marine Technology Society Journal, 39(2), 22–24. doi:10.4031/002533205787444042
Methods

Lyle, J. T., Cowen, R. K., Sponaugle, S., & Sutherland, K. R. (2022). Fine-scale vertical distribution and diel migrations of Pyrosoma atlanticum in the northern California Current. Journal of Plankton Research, 44(2), 288–302. https://doi.org/10.1093/plankt/fbac006
Results

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Related Datasets

IsDerivedFrom

Cowen, R. K., Sponaugle, S., Sutherland, K. R. (2023) **Multiple Opening and Closing Net Environmental Sampling System (MOCNESS) water filtering volumes from 2018 and 2019 taken in the Northern California Current waters.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 2) Version Date 2023-02-16 doi:10.26008/1912/bco-dmo.783036.2 [view at BCO-DMO]
Relationship Description: MOCNESS filtered volumes were sourced from this dataset

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Parameters

Parameter	Description	Units
Cruise	Cruise identification number: S=summer; W=winter; 18=2018	unitless
Location	Sampling location: NH=Newport, OR; TR=Trinidad Head, CA	unitless
Station	Location along transect: 1=closest nearshore; 5=furthest offshore; D=day; N=night	unitless
Transect	Sampling transect: Ma=first transect; Mb=second transect	unitless
Date_Time_UTC	Date and time of the start of the net towing in UTC time zone	yyyy-mm-dd hh:mm:ss
Latitude	Latitude of tow start location, north is positive	decimal degrees
Longitude	Longitude of tow start location, west is negative	decimal degrees
Moc_size	Size of net for sample: 1=1m2 with 333um mesh; 4=4m2 with 1mm mesh	m^2
Net_number	Net open on MOCNESS: 0=oblique; 1=100-75m, 2=75-50m, 3=50-25m, 4=25-0m	unitless
Vol_filtered	Filtered volume during tow	m^3
Total_pyrosome_vol	Total volume of pyrosomes (Pyrosoma atlanticum) from net tow, measured by displacement	mL
Total_count	Total number of pyrosomes (Pyrosoma atlanticum) from net tow	count
Subsample_count	Number of pyrosomes (Pyrosoma atlanticum) used for subsample	count
Subsample_vol	Volume of pyrosomes (Pyrosoma atlanticum) in subsample, measured by displacement	mL
Est_total_count	Estimated total count of pyrosomes (Pyrosoma atlanticum), calculated for samples where total count is unknown	count
Abundance	Abundance of pyrosomes (Pyrosoma atlanticum) from net tow	count/m^3

Biovolume	Volume of pyrosomes (Pyrosoma atlanticum) per filtered volume during tow	ml/m^3
Colony_ID	Unique identifier for individual pyrosome colonies collected from net tows for length measurement. The field may be left blank if no colony lengths were measured.	unitless
Length	Length of Pyrosoma atlanticum colony in cm recorded from each net tow. No lengths were recorded on W18 cruise	cm

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Instruments

Dataset-specific Instrument Name	Multiple Opening/Closing Net and Environmental Sensing Systems (MOCNESS)
Generic Instrument Name	MOCNESS
Dataset-specific Description	Multiple Opening/Closing Net and Environmental Sensing Systems (MOCNESS) fitted with a 4 m2 net with 1 mm mesh and a 1 m2 net with 333 µm mesh.
Generic Instrument Description	The Multiple Opening/Closing Net and Environmental Sensing System or MOCNESS is a family of net systems based on the Tucker Trawl principle. There are currently 8 different sizes of MOCNESS in existence which are designed for capture of different size ranges of zooplankton and micro-nekton Each system is designated according to the size of the net mouth opening and in two cases, the number of nets it carries. The original MOCNESS (Wiebe et al, 1976) was a redesigned and improved version of a system described by Frost and McCrone (1974). (from MOCNESS manual)

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Deployments

SKQ201804S

Website	https://www.bco-dmo.org/deployment/783051
Platform	R/V Sikuliaq
Start Date	2018-02-17
End Date	2018-02-23

SR1810

Website	https://www.bco-dmo.org/deployment/783078
Platform	R/V Sally Ride
Start Date	2018-07-06
End Date	2018-07-11

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Project Information

Collaborative Research: Mesozooplankton food webs in intermittent upwelling systems: An overlooked link in a productive ocean (MEZCAL)

Coverage: Northern California Current

This project will examine the coastal ocean mesozooplankton community and their predation by early life stages of fish in the northern California Current. The goal is to understand how these predator-prey interactions change during different oceanographic regimes that vary seasonally in the region. This study will use a very high-resolution imaging system coupled with net samples to measure trophic interactions within the zooplankton community across a range of environmental parameters (e.g., temperature, relative timing and intensity of upwelling). The camera provides detailed information on the fine-scale abundance and spatial distributions of a wide diversity of plankton, while the net samples will provide biological samples for diet-related analyses. This project will train 12 undergraduate and two graduate students and one post-doctoral scholar. The research team will develop a variety of educational activities and products to facilitate greater outreach to public audiences. Plankton imagery from this project will be used to build the Global Plankton Imagery Library, an open-access repository for plankton imagery that will be a resource for the research community. The researchers will expand the imagery available in the Plankton Portal, a public website they developed in partnership with the Citizen Science Alliance's Zooniverse, that invites citizen scientists to participate in classifying plankton from field photographs. They will collaborate with Science Education specialists to include Plankton Portal kiosks in a new public exhibit at the Oregon State University's Hatfield Marine Science Center (HMSC) Visitor Center, which annually hosts 150,000 visitors of all ages. Importantly, this activity will not only educate K-12 and beyond, but will enable researchers to study what factors motivate citizen scientists, what characterizes "heavy-users", and how those users can be supported and encouraged into advanced collaborator roles. A multi-media artist will join the research cruises as part of the new Artist-At-Sea program. Their artwork will be displayed at the HMSC Visitor Center and University of Oregon's Charleston Marine Life Center and a scaled traveling show will tour Oregon metropolitan areas and underserved communities.

Eastern boundary currents are among the most productive marine ecosystems on the planet and support a significant proportion of global fisheries, yet there are unanswered questions about the role of non-crustacean zooplankton in transferring production through upwelling food webs. This study will answer key questions about the food web dynamics associated with mesozooplankton linkages, sources of carbon production, and consequences for upper trophic levels in different shelf upwelling systems. Not only is there a knowledge gap in how the food web currently functions in transition areas of major eastern boundary current systems, but there is increasing evidence that these systems are changing. Regional and global shifts in major currents, including upwelling strength, together with temperature-induced latitudinal shifts in species ranges that are already occurring and predicted to continue will have major effects on interactions among species, and consequently, food webs. Understanding these interactions and predicting future changes is highly relevant to science, society, and economies. The researchers plan to sample the winter and summer seasons in the northern California Current off central Oregon (intermittent upwelling) and northern California (continuous upwelling) with the high resolution In Situ Ichthyoplankton Imaging System to obtain an accurate description of mesozooplankton communities: their abundances, and horizontal and vertical spatial distributions, over contrasting upwelling/downwelling system dynamics. In parallel, they plan to collect depth-discrete mesozooplankton samples to quantify seasonal diets for larval fishes and gelatinous zooplankton and prey-specific growth rates of larval fishes. Stable isotope analysis of mesozooplankton predators and prey will reveal the relative role of new vs. regenerated production in sustaining food webs such major eastern boundary currents.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1737399
NSF Division of Ocean Sciences (NSF OCE)	OCE-1737364

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