Pyrosome (Pyrosoma atlanticum) counts from vertical video profiles in the Northern California Current acquired between February and July 2018.

Website: https://www.bco-dmo.org/dataset/866614
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) counts from vertical video profiles in the Northern California Current acquired between February and July 2018.

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Coverage

Spatial Extent: **N**:44.6532 **E**:-124.117 **S**:41.0575 **W**:-125.118
Temporal Extent: 2018-02-17 - 2018-07-12

Dataset Description

These data were published in Lyle, J.T. et al. 2021

Methods & Sampling

We mounted a GoPro Hero 4 (4K, 30fps) in a deep-water housing (GoDeep Aluminum, Sexton Inc.) and two 7500 lumen lights (BigBlue VL7500P) to the ship's onboard CTD rosette frame. At each station, simultaneous CTD and camera deployments captured fine-scale (1 m), *in situ* counts of pyrosomes to 100 m, or 5 m above the bottom at shallower stations. Camera frames were subsequently analyzed to determine pyrosome

distributions with depth. For each meter of depth, we extracted a still frame from the camera and counted all pyrosome colonies. We adjusted this count by subtracting colonies that were visible in the still frame of the previous meter to avoid double-counts.

In situ videos were captured using a GoPro Hero 4 (4K, 30fps) in a deep-water housing (GoDeep Aluminum, Sexton Inc.) with two 7500 lumen lights (BigBlue VL7500P) mounted to the ship's onboard CTD rosette frame. Video was aligned to depth information captured by the CTD (SBE 911).

Data Processing Description

Videos were processed using VirtualDub. Depth information was extracted from CTD files using SBE data processing (v.7.26.6).

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Data Files

File
pyrosomes_cam.csv (Comma Separated Values (.csv), 236.88 KB) MD5:92992337ac78592a3405b84914a78526 Primary data file for dataset ID 866614

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Related Publications

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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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	unitless
Latitude	Latitude of deployment start location, north is positive	decimal degrees
Longitude	Longitude of deployment start location, west is negative	decimal degrees
Depth	Depth of sampling in meters. Depth bins start at the surface to 100 m.	meters
Pyro_binned_count	Pyrosome counts from vertical video profiles in 1-m depth bins. Data may be missing near the surface due to visual disturbances, or at shallower stations where the bottom depth is < 100 m.	counts

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Instruments

Dataset-specific Instrument Name	CTD (SBE 911)
Generic Instrument Name	CTD Sea-Bird 911
Dataset-specific Description	In situ videos were captured using a GoPro Hero 4 (4K, 30fps) in a deep-water housing (GoDeep Aluminum, Sexton Inc.) with two 7500 lumen lights (BigBlue VL7500P) mounted to the ship’s onboard CTD rosette frame. Video was aligned to depth information captured by the CTD (SBE 911).
Generic Instrument Description	The Sea-Bird SBE 911 is a type of CTD instrument package. The SBE 911 includes the SBE 9 Underwater Unit and the SBE 11 Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). More information from Sea-Bird Electronics.

Dataset-specific Instrument Name	GoPro Hero 4 (4K, 30fps)
Generic Instrument Name	Underwater Camera
Dataset-specific Description	In situ videos were captured using a GoPro Hero 4 (4K, 30fps) in a deep-water housing (GoDeep Aluminum, Sexton Inc.) with two 7500 lumen lights (BigBlue VL7500P) mounted to the ship's onboard CTD rosette frame. Video was aligned to depth information captured by the CTD (SBE 911).
Generic Instrument Description	All types of photographic equipment that may be deployed underwater including stills, video, film and digital systems.

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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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