Concentration of anchovies from hypoxic waters of the Chesapeake Bay collected by R/V Hugh R. Sharp (HRS100524JP, HRS100819JP, HRS100920JP, HRS110525JP, HRS110719JP, HRS110922JP) from 2010-2011 (DeZoZoo project)

Website: https://www.bco-dmo.org/dataset/563428
Data Type: Cruise Results
Version: working
Version Date: 2015-07-29

Project
» Hypoxia in Marine Ecosystems: Implications for Neritic Copepods (DeZoZoo)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:39.5371 **E**:-74.9864 **S**:37.4565 **W**:-76.6289
Temporal Extent: 2010-05-24 - 2011-12-21

Dataset Description

These data represent a merging of electronic data collected from the MOCNESS sensor systems and the count data from the samples collected with the net tows. Some nets were used for zooplankton samples (see http://www.bco-dmo.org/dataset/564755) , while others were collected specifically to estimate bay anchovy concentrations. These are contained on different sheets, and the count data was merged individually. This dataset represents the bay anchovy counts and abundance.

Methods & Sampling

These data were collected with the MOCNESS system from the ship.

Data Processing Description

Electronic data was post-processed by PI Pierson. Zooplankton sorting data was analyzed, processed, and quality controlled in PI Pierson's lab. Bay Anchovy sorted data was analyzed, processed, and quality controlled in co-PI Houde's lab

DMO adjustments: removed station latitude and longitude because MOCNESS tow start latitudes and longitudes are better. Removed MOCNESS-recorded times and used GPS times instead, which is much more accurate . Removed MOCNESS min and max depths due to occasional blocked pressure sensor. (PI, personal communication)

Data Files

File
fish_DZZ_rs.csv(Comma Separated Values (.csv), 21.59 KB)   MD5:27b3bfc2ca9cded49eed1ceb4269746a   Primary data file for dataset ID 563428

Parameters

Parameter	Description	Units
cruiseid	official cruise name	text
cruise_informal	The Year and the cruise series. i.e. 1101 = the first cruise in 2011	text
tow	MOCNESS trawl series number	text
net	net number	text
year	year	time
month_local	month	time
day_local	day in local time	time
hour_local	hour in local time	time
minute_local	minutes in local time	time
seconds_local	seconds in local time	time
yrday_local	day of year in local time	time
lat_iffy	station latitude	decimal degrees; North is positive
lon_iffy	station longitude	decimal degrees; West is negative
vol_filt	filtration volume	cubic meters
temp	water temperature	degrees centrigrade
sal	water salinity; 50.000 indicates error for this channel.	PSU
O2_mg_L	dissolved Oxygen	milligrams per liter
fluor	Chlorophyll a concentration from Wetlabs FLNTU	milligrams per cubic meter
turbidity	turbidity measured in Nephelometric Turbidity Unites (NTU) from Wetlabs FLNTU	NTU
PAR	Photosynthetically available radiation	microEinsteins per square meter per second

lat_best	the latitude when a MOCNESS tow starts	decimal degrees
lat_end	the latitude when a MOCNESS tow ends	decimal degrees
lon_best	the longitude when a MOCNESS tow starts	decimal degrees
lon_end	the longitude when a MOCNESS tow ends	decimal degrees
depth_min	the surface depth of a net trawl	m
depth_max	the bottom depth of a net trawl	m
depth_mid	called the 'net depth'; the mid net depth	m
angle	MOCNESS trawl angle	degrees
dist	the tow distance	kilometers
area_net	the net mouth opening area	meters square
sample_id	Cruise_Date(YYYMMDD)_Station(Net Tow number)	text
site	sampling station: north or south	text
time_local	local time of day	HH:MM
depth_relative	the relative sampling depth: above = above the pycnoclines; below = below the pycnoclines	text
stage	lifestage in the development of the bay anchovy	text
vol_filt2	filtration volume	cubic meters
fish_num	the number of bay anchovies counted	number
fish_abund	bay anchovy concentration	the number of individuals per cubic meter
temp_sample	temp_sample	unknown
sal_sample	sal_sample	unknown

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Instruments

Dataset-specific Instrument Name	1/4 Meter MOC
Generic Instrument Name	MOCNESS.25
Dataset-specific Description	Had trouble communicating with the 1/4 m2 MOCNESS in the beginning of the first cruise. Picked up replacement parts and were able to get it working again with an underwater unit borrowed from BESS, the manufacturer of the MOCNESS system. (Subsequent analysis by BESS, Inc. showed that some damage to the underwater unit was caused when it was plugged into the sea cable with some charge still in the cable -- most likely from the Seabird deck unit still turned on.) -- from the Cruise Report
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. The MOCNESS-1/4 carries nine 1/4-m2 nets usually of 64 micrometer mesh and is used to sample the larger micro-zooplankton.

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Deployments

HRS100524JP

Website	https://www.bco-dmo.org/deployment/518664
Platform	R/V Hugh R. Sharp
Report	http://dmoserv3.bco-dmo.org/data_docs/DeZoZoo/DeZoZoo_1001_CruiseReport_FINAL.pdf
Start Date	2010-05-24
End Date	2010-06-01
Description	Cruise in Main Channel of Chesapeake Bay

HRS100819JP

Website	https://www.bco-dmo.org/deployment/518707
Platform	R/V Hugh R. Sharp
Start Date	2010-08-19
End Date	2010-08-26
Description	Cruise in main channel of Chesapeake Bay to collect zooplankton samples.

HRS100920JP

Website	https://www.bco-dmo.org/deployment/518709
Platform	R/V Hugh R. Sharp
Start Date	2010-09-21
End Date	2010-09-27
Description	One of a series of cruises in the main channel of the Chesapeake Bay to collect gelatinous zooplankton.

HRS110525JP

Website	https://www.bco-dmo.org/deployment/518711
Platform	R/V Hugh R. Sharp
Start Date	2011-05-24
End Date	2011-06-01
Description	One of six week-long cruises in the main channel of Chesapeake Bay to collect gelatinous zooplankton.

HRS110719JP

Website	https://www.bco-dmo.org/deployment/518842
Platform	R/V Hugh R. Sharp
Start Date	2011-07-19
End Date	2011-07-26
Description	One of six week-long cruises in the main channel of the Chesapeake Bay to collect gelatinous zooplankton

HRS110922JP

Website	https://www.bco-dmo.org/deployment/518904
Platform	R/V Hugh R. Sharp
Start Date	2011-09-21
End Date	2011-09-26
Description	One of 6 week-long cruises in the main channel of the Chesapeake Bay, collecting gelatinous zooplankton.

Project Information

Hypoxia in Marine Ecosystems: Implications for Neritic Copepods (DeZoZoo)

Website: http://www.planktoneer.com/research.html#HYPOX

Coverage: Chesapeake Bay

Description from NSF award abstract:
The occurrence of low-oxygen waters, often called "dead zones" in coastal ecosystems throughout the world is increasing. Despite these increases, the pelagic food-web consequences of low-oxygen waters remain poorly understood. Laboratory research has demonstrated that hypoxic water (< 2 mg l-1) can result in mortality, reduced fitness and lower egg production of planktonic copepods, a major link in food webs supporting pelagic fish. Observations in the sea indicate that hypoxic bottom waters usually have depressed abundances of copepods compared to normoxic waters (> 2 mg l-1). The gradient of declining oxygen concentration with respect to depth (oxycline) can be a critical interface in coastal pelagic ecosystems by altering the migratory behavior and depth distribution of copepods and their spatial coherence with potential predators and prey. This project will result in a mechanistic understanding of how behavior and fitness of copepods are affected by hypoxia. The PIs will compare bottom-up and top-down controls on the ecology of copepods in Chesapeake Bay waters experiencing seasonal hypoxia and those that are normoxic.

Specific objectives of this project are to:
1) analyze changes in migratory behavior and fine-scale (meter) distribution of copepods across the oxycline over hourly and diel time scales while simultaneously examining the distribution and abundance of their food (phytoplankton and microzooplankton) and predators (fish, gelatinous zooplankton);
2) estimate effects of hypoxia on the "fitness" of copepods using a suite of measurements (length/weight ratios, feeding, egg production, and egg hatching success) to develop condition indices of copepods captured at different times and depths in hypoxic and normoxic waters; and
3) evaluate effects of hypoxia on copepod mortality by hypoxia-induced, stage-specific copepod mortality in hypoxic bottom waters and by changes in top-down control of copepods from predation by fish and gelatinous zooplankton.

Oxyclines may be a barrier to vertical migration of copepods and thus disruptive to predator avoidance behavior. Faced with increased predation risk from fish and jellyfish, copepods may seek refuge in hypoxic waters for part of the day and/or make short-term vertical excursions between hypoxic and normoxic waters. By regulating vertical migrations, copepods may increase utilization of microzooplankton prey concentrated in the oxycline. Hypoxic waters may elevate consumption of copepods by jellyfish and depress consumption by pelagic fish. This project will evaluate copepod distribution and migration behavior, individual fitness and stage-specific mortality in hypoxic and normoxic waters. It will examine food-web consequences of increased or decreased spatial coherence of copepods and their predators and prey in regions with hypoxic bottom waters and will contribute to fundamental understanding of food-web processes in eutrophic coastal ecosystems.

Project acronym "DeZoZoo" = "Dead Zone Zooplankton"

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0961942