Zooplankton species abundance from ring nets at two times series stations from R/V Gulf Challenger in the Gulf of Maine Wilkinson Basin and Jeffreys Ledge, 2012-2013 (GoM_Calanus_2012-2013 project)

Website: https://www.bco-dmo.org/dataset/551832
Version: first
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Project
» RAPID: Effect of a Very Low NAO Event on the Abundance of the Lipid-Rich Planktonic Copepod, Calanus finmarchicus, in the Gulf of Maine (GoM_Calanus_2012-2013)

Contributors	Affiliation	Role
Runge, Jeffrey A.	University of Maine	Principal Investigator
Thompson, Cameron	University of Maine	Contact
Allison, Dicky	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

Abundance of zooplankton species caught in 200 micron vertically-towed ring nets at two time series stations in the Gulf of Maine (2012-2013).

These data are presented in two views: this one is levelized with the species as rows. This one has species abundance as columns with each species as its own column header.

Incorporated into the species names in both cases are the life stages according to this scheme:
CI: Copepodid stage 1
CII: Copepodid stage 2
CIII: Copepodid stage 3
CIV: Copepodid stage 4
CV: Copepodid stage 5
F: Adult Female
M: Adult Male
N: Nauplii
C: Copepodids
LA: Larvae
BalanusC = Cyprid
VEL: Veliger
AD: Adult
EGG: Egg
FU: Furcilia
CA: Calyptopsis
Z: Zoea
MN: Metanauplius

Access Restrictions:

Users are requested to consult with Jeffrey Runge prior to preparation of any manuscripts or reports, either written or online, that make use of zooplankton and hydrographic data originating from this study. . The data are freely available without need for consultation with Dr. Runge after October, 2017.

Methods & Sampling

Sampling and Analytical Methodology:

These deployments followed the AZMP protocols (Mitchell et al. 2002) as a guideline. Using a 0.75 meter diameter SEA-GEAR Model 9600 twin ring, 200µm mesh net, two vertical casts were made to within 5 meters of the bottom at each station. Two replicate samples from separate casts were preserved in a 4% seawater-buffered formaldehyde solution. In the laboratory, all formalin preserved zooplankton samples were split in half using a Folsom Plankton Splitter. Half of the sample was archived for identification and enumeration of zooplankton, and the other half was processed for biomass determination. To estimate abundances the archival split was diluted and sub-sampled with a 5 mL Stempel pipette. Depending on abundance in the sample, multiple subsamples were taken until a target number of 75-150 *C. finmarchicus* copepodids were enumerated and staged and in addition at least 200 specimens in total were counted and identified to the lowest possible taxa.

Mitchell, M. R., G. Harrison, K. Pauley, A. Gagné, G. Maillet, and P. Strain. (2002) Atlantic Zonal Monitoring Program Sampling Protocol. Canadian Technical Report of Hydrography and Ocean Sciences 223.

Data Processing Description

Data Processing:

The counts were normalized to abundance (number m-2), taking into account the subsample dilution, the split, and volume sampled by the net at the station. Because of unreliable flowmeter readings we calculated volume filtered by the net from net area and net depth. The filtered volume calculated geometrically, as we have done here, is closely related to the flowmeter volume when flowmeters were working properly.

Volume = Net Depth * Net Area

Abundance (number m-2) = ((count*Dilution Factor / Archival split) / Volume) *Station Depth

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Data Files

File
Zoop_GoM_rs.csv (Comma Separated Values (.csv), 371.83 KB) MD5:98bd67b99e9fd34bd4f263fa6c9956af Primary data file for dataset ID 551832

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Parameters

Parameter	Description	Units
station	WB-5 or WB-7	text
latitude	latitude	decimal degrees; North is positive
longitude	longitude	decimal degrees; West is negative
cruise	each deployment has its own cruise ID following this format: GC for R/V Gulf Challenger; followed by the date (mmddyy)	text
date_local	date local time	mmddyyyy
month_local	month local time	mm
day_local	day local time	dd
year	year	yyyy
yrday_local	day of year local time	number
depth_net	depth of the ring net according to length of wire out of the winch; as read by a meter wheel	meters
depth_w	water depth at the station according to depth sounder on vessel	meters
dilution	dilution factor = (water volume the sample is diluted into/volume of water subsampled)	no units
species	genus and species binomial identification of the animal collected; includes life stage (see dataset description for explanation)	text
abundance	abundance in the water column	numbers per square meter

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Instruments

Dataset-specific Instrument Name	Ring Net
Generic Instrument Name	Ring Net
Dataset-specific Description	This experiment used a 0.75 meter diameter SEA-GEAR Model 9600 twin ring, 200 micron mesh.
Generic Instrument Description	A Ring Net is a generic plankton net, made by attaching a net of any mesh size to a metal ring of any diameter. There are 1 meter, .75 meter, .25 meter and .5 meter nets that are used regularly. The most common zooplankton ring net is 1 meter in diameter and of mesh size .333mm, also known as a 'meter net' (see Meter Net).

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Deployments

GC_GoM_2012-2013

Website	https://www.bco-dmo.org/deployment/526864
Platform	R/V Gulf Challenger
Report	http://dmoserv3.whoi.edu/data_docs/GoM_Calanus_2012-2013/GoM_WBTS_CruiseReport.docx
Start Date	2012-04-06
End Date	2013-05-21
Description	This deployment is a collection of 17 one-day cruises to two stations in the Gulf of Maine between April 6, 2012 to May 21, 2013.

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Project Information

RAPID: Effect of a Very Low NAO Event on the Abundance of the Lipid-Rich Planktonic Copepod, Calanus finmarchicus, in the Gulf of Maine (GoM_Calanus_2012-2013)

Coverage: Gulf of Maine: Wilkinson Basin and Jeffrey's Ledge

"The copepod, *Calanus finmarchicus*, is a dominant member of the plankton in the Gulf of Maine, (GoM), despite its location at the southern edge of the species' subarctic range. Wilkinson Basin, one of the three deep basins in the GoM, harbors very high concentrations of the early developmental stages of *C. finmarchicus* in the summer through winter and serves as a source of *C. finmarchicus* to GoM coastal ledges and banks. A recent study based on *C. finmarchicus* habitat characteristics across the North Atlantic predicts that climate-driven change will force the distribution of *C. finmarchicus* northward out of the GoM over the next several decades. However, the oceanographic and life history responses of C. finmarchicus to environmental variability in the Gulf are complex and largely unknown. The research in this RAPID proposal takes advantage of a rare opportunity to test a hypothesis about the control of *C. finmarchicus* abundance in the GoM from climate change related external forcing. The hypothesis states that a distinctly lower *C. finmarchicus* abundance follows, with a two-year lag, the occurrence of a very negative North Atlantic Oscillation (NAO). The specific processes that causally connect low *C. finmarchicus* with the NAO are not known. The research here tests the prediction that *C. finmarchicus* abundance will be very low in Wilkinson Basin in 2012, two years after one of the most negative NAOs on record, dating back to the 1860?s. Field observations in the form of a time series of measurements of hydrography, food availability and *C. finmarchicus* stage abundance will be taken at a fixed

station in Wilkinson Basin and in the Maine coastal region, supported by measurements taken on the Scotian Shelf. A research survey, coordinated with a scheduled cruise in the Gulf of Maine in September, 2012, will take additional collections in Wilkinson Basin and throughout the GoM. Frozen and ethanol preserved samples of *C. finmarchicus* will also be collected for population genetic studies. The abundance results will be compared with historical time series and survey data collected over the past two decades, confirming or refuting the expectation of extreme NAO influence on GoM *C. finmarchicus* populations." *(from the Award abstract)*

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1235920

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