

# Calanus finmarchicus stages abundance from 200um vertical ring nets TimeSeries 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/544850>

**Version:** working

**Version Date:** 2015-01-14

## 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)

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## Dataset Description

Abundance of *Calanus finmarchicus* stages caught in 200um vertical ring nets(bottom to surface) at two time series stations in the Gulf of Maine (2012 - 2013).

**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

These deployments followed the AZMP protocols (Mitchell et al. 2002). 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

The counts were normalized to abundance (number m<sup>-2</sup>), 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<sup>-2</sup>) = ( (count\*Dilution Factor / Archival split) / Volume) \*Station Depth

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## Data Files

File
<b>Cfin_abund_GoM.csv</b> (Comma Separated Values (.csv), 4.45 KB) MD5:0b11441c6c5f5b9eca92c58ad659e486 Primary data file for dataset ID 544850

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## Parameters

Parameter	Description	Units
cruise	each deployment has its own cruise ID following this format: GC for R/V Gulf Challenger; followed by the date (mmddyy)	text
station	WB-5 or WB-7	text
site	either Jeffreys Ledge (WB-5) or Wilkinson Basin (WB-7)	text
lat	latitude	decimal degrees; North is positive
lon	longitude	decimal degrees; West is negative
date_local	date local time	mmddyyyy
month_local	month local time	mm

day_local	day local time	dd
year	year	yyyy
depth_net	depth of the ring net according to length of wire out of the winch; as read by a meter wheel	meters
depth_station	water depth at the station according to depth sounder on vessel	meters
num_ided	number of Calanus finmarchicus (including nauplii) that were counted and staged during analysis of the sample	integer
dil_factor	water volume the sample is diluted into / volume of water subsampled	number
nauplii	abundance of all naupliar stages in water column; note that the 200um mesh would let many young stages through	number per m2
stage_CI	abundance of copepodid stage 1	number per m2
stage_CII	abundance of copepodid stage 2	number per m2
stage_CIII	abundance of copepodid stage 3	number per m2
stage_CIV	abundance of copepodid stage 4	number per m2
stage_CV	abundance of copepodid stage 5; pre-adult stage	number per m2
female	abundance of females(copepodid stage 6) in water column	number per m2
male	abundance of males (copepodid stage 6)	number per m2
yrday_local	day of year local time	number

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## Instruments

<b>Dataset-specific Instrument Name</b>	Ring Net
<b>Generic Instrument Name</b>	Ring Net
<b>Dataset-specific Description</b>	0.75 meter diameter, SEA-GEAR Model 9600 twin-ring, 200um mesh net
<b>Generic Instrument Description</b>	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

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/526864">https://www.bco-dmo.org/deployment/526864</a>
<b>Platform</b>	R/V Gulf Challenger
<b>Report</b>	<a href="http://dmoserv3.whoi.edu/data_docs/GoM_Calanus_2012-2013/GoM_WBTS_CruiseReport.docx">http://dmoserv3.whoi.edu/data_docs/GoM_Calanus_2012-2013/GoM_WBTS_CruiseReport.docx</a>
<b>Start Date</b>	2012-04-06
<b>End Date</b>	2013-05-21
<b>Description</b>	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
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1235920</a>

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