Metadata for field dilution experiments to measure community microzooplankton grazing rates in Kaneohe Bay, HI from 2012-2013 (EAGER: Copepod nauplii project)

Website: https://www.bco-dmo.org/dataset/637670
Data Type: experimental
Version: 1
Version Date: 2016-02-04

Project
» EAGER: New molecular methods for studying copepod nauplii in the field (EAGER: Copepod nauplii)

Contributors	Affiliation	Role
Goetze, Erica	University of Hawaii at Manoa (SOEST)	Principal Investigator
Lenz, Petra H.	University of Hawaii at Manoa (SOEST)	Co-Principal Investigator
Selph, Karen E.	University of Hawaii at Manoa (SOEST)	Co-Principal Investigator
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Overview of community microzooplankton dilution experiments, and Chl-based growth and mortality rates. All experimental water taken from Kaneohe South Bay station and processed on shore within 2 hours of collection on the collection date. Samples for Chl a (fluorometric) filtered and frozen within 5 h of collection, after storage in dark bottles in a cooler. All rate data are adjusted for pigment photoadaptation during the incubation, using red fluorescence from parallel flow cytometry samples (see text for details). *March 2012 chlorophyll data are conservative estimates: most chlorophyll had degraded to phaeopigments when fluorometrically analyzed, so the values represent the sum of Chl a and phaeopigment. No rate data were calculated from these samples.

Table of Contents

Coverage

Spatial Extent: **Lat**:21.4322 **Lon**:-157.7797
Temporal Extent: 2012-03-16 - 2013-06-05

Methods & Sampling

Phytoplankton Rates: μ0, μN, m (gross growth rate, nutrient-amended gross growth rate, and mortality rate, respectively): Phytoplankton growth and mortality rates were determined with seawater dilution experimental manipulations of freshly collected surface seawater as originally described in Landry & Hassett (1982), with modifications as described by Selph et al. (2005).

Data Processing Description

BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date, reference information
- renamed parameters to BCO-DMO standard
- reformatted date from d-Mon-yy to yyyy-mm-dd
- replaced spaces with underscores
- added lat/lon columns

[table of contents | back to top]

Data Files

File
growth_KB.csv (Comma Separated Values (.csv), 734 bytes) MD5:6a687ea6221c5e37a0a4f5f9b80c08ba Primary data file for dataset ID 637670

[table of contents | back to top]

Related Publications

Jungbluth, M. J., Selph, K. E., Lenz, P. H., & Goetze, E. (2017). Incubation duration effects on copepod naupliar grazing estimates. Journal of Experimental Marine Biology and Ecology, 494, 54–62. doi:10.1016/j.jembe.2017.05.005
Results

Jungbluth, M., Selph, K., Lenz, P., & Goetze, E. (2017). Species-specific grazing and significant trophic impacts by two species of copepod nauplii, Parvocalanus crassirostris and Bestiolina similis. Marine Ecology Progress Series, 572, 57–76. doi:10.3354/meps12139
Results

Kolker, Galiel A. (2012) Microzooplankton grazing impact on phytoplankton after a storm event in Kaneohe Bay, Oahu. Undergraduate thesis, Global Environmental Science, BSc.
https://scholarspace.manoa.hawaii.edu/bitstream/10125/67760/Kolker%2C%20Galiel.pdf
Results

Landry, M. R., & Hassett, R. P. (1982). Estimating the grazing impact of marine micro-zooplankton. Marine Biology, 67(3), 283–288. doi:10.1007/bf00397668 https://doi.org/10.1007/BF00397668
Methods

Selph, K. E., Goetze, E., Jungbluth, M. J., Lenz, P. H., & Kolker, G. (2018). Microbial food web connections and rates in a subtropical embayment. Marine Ecology Progress Series, 590, 19-34.
https://doi.org/10.3354/meps12432
Results

Selph, K. E., Shacat, J., & Landry, M. R. (2005). Microbial community composition and growth rates in the NW Pacific during spring 2002. Geochemistry, Geophysics, Geosystems, 6(12), 20 pp. doi:10.1029/2005gc000983
https://doi.org/10.1029/2005GC000983
Methods

[table of contents | back to top]

Related Datasets

IsRelatedTo

Goetze, E., Lenz, P., Selph, K. E. (2021) **Flow cytometry results for naupliar grazing laboratory experiments conducted from 2012-2013 (EAGER: Copepod nauplii project).** Biological and Chemical

Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2016-02-04 doi:10.26008/1912/bco-dmo.637720.1 [view at BCO-DMO]

IsSupplementedBy

Goetze, E., Lenz, P., Selph, K. E. (2021) **Field conditions during grazing experiments in Kaneohe Bay, HI during 2012-2013 (EAGER: Copepod nauplii project).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2016-02-02 doi:10.26008/1912/bco-dmo.637695.1 [view at BCO-DMO]

[table of contents | back to top]

Parameters

Parameter	Description	Units
KBG_expt	experiment id	unitless
date_local	local date	yyyy-mm-dd
lat	latitude; north is positive	decimal degrees
lon	longitude; east is positive	decimal degrees
chla_init	initial chlorophyll-a concentration	micrograms/liter
growth_init	gross growth rate	per day
mortality	mortality rate	per day
r_squared	the coefficient of determination	unitless
growth_nuts	nutrient-amended gross growth rate	per day
comment	comments	unitless

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Flow Cytometer
Generic Instrument Description	Flow cytometers (FC or FCM) are automated instruments that quantitate properties of single cells, one cell at a time. They can measure cell size, cell granularity, the amounts of cell components such as total DNA, newly synthesized DNA, gene expression as the amount messenger RNA for a particular gene, amounts of specific surface receptors, amounts of intracellular proteins, or transient signalling events in living cells. (from: http://www.bio.umass.edu/micro/immunology/facs542/facswhat.htm)

Dataset-specific Instrument Name	
Generic Instrument Name	Fluorometer
Generic Instrument Description	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

[table of contents | back to top]

Deployments

Goetze_2012-2013

Website	https://www.bco-dmo.org/deployment/637678
Platform	lab UHawaii_SOEST
Start Date	2012-03-16
End Date	2013-06-05
Description	microzooplankton studies

[table of contents | back to top]

Project Information

EAGER: New molecular methods for studying copepod nauplii in the field (EAGER: Copepod nauplii)

Coverage: Kaneohe Bay, Oahu, Hawaii

Description from NSF Award Abstract:
The most abundant metazoans in the open sea are often the earliest developmental stages of copepods, their nauplii. Nauplii remain under-studied due to the limitations of conventional techniques and an historical emphasis on studying the larger mesozooplankton. However, there is increasing recognition that nauplii play important roles in food web dynamics, and considerable evidence that nauplii may be important trophic intermediaries between microbial and classical food webs due to their high abundance, high weight-specific ingestion rates, and ability to feed on relatively small particles. This team of investigators is developing a novel molecular approach to studying diverse populations of nauplii in mixed field samples based on quantitative Polymerase Chain Reaction (qPCR). They propose to complete development and validation of this qPCR-based technique for enumeration of nauplii, and evaluate its utility in the field. The specific objectives of this research are to identify and reduce technical and biological sources of error in the methodology, determine the accuracy of the method across a range of environmental conditions, and complete one paired field experiment that compares the grazing impact of naupliar and protozoan micro-grazers in a model subtropical coastal ecosystem.

Note: This project is funded by an NSF EAGER award.

Related publications:
Jungbluth, M.J., Goetze, E., and Lenz, P.H. 2013. Measuring copepod naupliar abundance in a subtropical bay using quantitative PCR. Marine Biology, 160: 3125-3141. doi: 10.1007/s00227-013-2300-y

Jungbluth, M.J., and Lenz, P.H. 2013. Copepod diversity in a subtropical bay based on a fragment of the mitochondrial COI gene. Journal of Plankton Research, 35(3): 630-643. doi: 10.1093/plankt/fbt015

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1255697

[table of contents | back to top]