Mesozooplankton community biomass (wet and dry weight) for 5 size classes and total for samples collected by ring net tows on R/V Melville cruise MV1008 in the Costa Rica Dome in 2010 (CRD FLUZiE project)

Website: https://www.bco-dmo.org/dataset/516587
Data Type: Cruise Results
Version: 1
Version Date: 2014-06-10

Project
» Costa Rica Dome FLUx and Zinc Experiments (CRD FLUZiE)

Programs
» Integrated Marine Biogeochemistry and Ecosystem Research -US (IMBER-US)
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
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Abstract
Mesozooplankton community biomass (wet weight and dry weight), for 5 size classes (0.2-0.5, 0.5-1, 1-2, 2-5, and >5 mm) and total. Samples were collected during ring net tows on the MV1008 cruise in the Costa Rica Dome (CRD) region of the Eastern Tropical Pacific Ocean.

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Coverage

Spatial Extent: **N**:10.3 **E**:-86.735 **S**:6.628 **W**:-92.987
Temporal Extent: 2010-06-23 - 2010-07-23

Dataset Description

Mesozooplankton community biomass (wet weight and dry weight), for 5 size classes (0.2-0.5, 0.5-1, 1-2, 2-5, and >5 mm) and total. Samples were collected during ring net tows on the MV1008 cruise in the Costa Rica Dome (CRD) region of the Eastern Tropical Pacific Ocean.

Methods & Sampling

Mesozooplankton net collections
Mesozooplankton sampling was conducted using a standard 1-m2 ring net with 202-um Nitex mesh, towed obliquely for 20 minutes at a ship speed of 1-2 kts. A General Oceanics flowmeter was attached across the net mouth to record volume filtered, and a Vemco depth meter was fastened to the net frame to record tow depth and duration. The target depth of tows was 150 m. Once on deck, the net was washed down with seawater and the contents of the cod end placed in a bucket with carbonated water to prevent gut evacuation. Separate splits (each of typically 1/8th of the sample) were used for biomass and gut-fluorescence determinations. Each of these subsample splits was wet sieved into five size classes of 0.2-0.5, 0.5-1, 1-2, 2-5, and >5 mm.

Biomass estimates
Each size-fractioned sample for biomass was concentrated onto a pre-weighed 202-um Nitex screen, rinsed with ammonium formate to remove interstitial sea salt, placed in Petri dishes and frozen at -80°C for later analysis on shore. The frozen samples were thawed, blotted on paper to remove excess water and weighed (wet weight) to 0.01 mg at room temperature on an analytical microbalance (Denver Instrument). Immediately afterwards, samples were dried in an oven at 60°C for at least 24 h, and weighed on the same instrument to obtain dry weight estimates. After subtracting the initial weight of the Nitex screen, the wet weight (WW) and dry weight (DW) of each size fraction were obtained by the appropriate multiplication factors for previous sub-sampling. Areal biomass estimates (i.e., g m-2) were computed from total net sample estimates by multiplying by the factor, *D*/*vol*, which reflects the water depth (*D*, m) and volume filtered (*vol*, m3).

Data Processing Description

BCO-DMO transposed size_class columns into rows.

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Data Files

File
mesozoo_biomass.csv (Comma Separated Values (.csv), 22.18 KB) MD5:da0459257e8fde38ff24fa62faee09c8 Primary data file for dataset ID 516587

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Parameters

Parameter	Description	Units
event	Number referring to the particular activity (event) on the FluZiE cruise.	integer
tow	Tow number.	integer
cycle	Type and number of cruise sampling event. Either "Stn_n" or "Cycle_n". A transect of stations was sampled from 29 June to 03 July. Five quasi-Lagrangian experiments called "cycles" were conducted during the remainder of the cruise.	text
time_of_day	Time of day. 1 = day; 2= night.	code
date_local	Date of tow (local time zone of UTC -6). in the format mmddyyyy	unitless
time_local	Time at start of tow (local time zone of UTC -6).	HHMM
lat	Latitude in degrees North.	decimal degrees
lon	Longitude in degrees East.	decimal degrees
depth_tow	Depth of the tow.	meters
size_class	Mesozooplankton size class. 0.2_to_0.5 = 02.-0.5 mm; 0.5_to_1 = 0.5-1 mm; 1_to_2 = 1-2 mm; 2_to_5 = 2-5 mm; gt5 = greater than 5 mm; total = total for all size classes.	millimeters (mm)
dry_biomass	Dry weight biomass estimates of mesozooplankton by size class.	grams per square meter (g m-2)
wet_biomass	Wet weight biomass estimates of mesozooplankton by size class.	grams per square meter (g m-2)

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Instruments

Dataset-specific Instrument Name	General Oceanics flowmeter
Generic Instrument Name	Flow Meter
Dataset-specific Description	A General Oceanics flowmeter was attached across the ring net mouth to record volume filtered.
Generic Instrument Description	General term for a sensor that quantifies the rate at which fluids (e.g. water or air) pass through sensor packages, instruments, or sampling devices. A flow meter may be mechanical, optical, electromagnetic, etc.

Dataset-specific Instrument Name	Ring Net
Generic Instrument Name	Ring Net
Dataset-specific Description	Mesozooplankton sampling was conducted using a standard 1-m2 ring net with 202-um Nitex mesh, towed obliquely for 20 min at a ship speed of 1-2 kts.
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).

Dataset-specific Instrument Name	Analytical microbalance
Generic Instrument Name	scale or balance
Dataset-specific Description	Samples were weighed on an analytical microbalance (Denver Instrument).
Generic Instrument Description	Devices that determine the mass or weight of a sample.

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Deployments

MV1008

Website	https://www.bco-dmo.org/deployment/58834
Platform	R/V Melville
Report	http://dmoserv3.whoi.edu/data_docs/CRD_FLUZiE/CRUISE_REPORT_Melville1008.pdf
Start Date	2010-06-22
End Date	2010-07-25
Description	Research on the cruise was aimed at acquiring a better understanding of plankton dynamics, carbon and nutrient fluxes, and potential trace element limitation in the Costa Rica Dome region of the eastern tropical Pacific. The specific science objectives were: 1) to assess grazing and trace metal/nutrient controls on primary production and phytoplankton standing stocks; 2) to quantify carbon and elemental fluxes and export rates from the euphotic zone; and 3) to measure microbial population, processes, stable isotope abundances associated with the OMZ and nitrite maxima. Operations included: 4-day sediment trap deployments, daily process experiments conducted on satellite-tracked drifters, CTD and trace-metal rosette sampling, shipboard grow-out experiments, net sampling for zooplankton biomass and grazing assessments, and MOCNESS stratified tows to 1000 m. BCO-DMO Note: March 2013 (CLC): The original CTD profile data (85 casts) have been submitted by R2R to NODC. Jim Moffett (USC) was a participant on this cruise and is interested in getting a copy of the full set of CTD cast data (deep and shallow casts). He plans to contact SIO ODF group or Mike Landry (Chief Scientist). Original cruise data are available from the NSF R2R data catalog.

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Project Information

Costa Rica Dome FLUx and Zinc Experiments (CRD FLUZiE)

Coverage: Costa Rica Dome, Eastern Tropical Pacific Ocean

Research was aimed at improved understanding of plankton dynamics, carbon and nutrient fluxes, and potential trace element limitation in the Costa Rica Dome region of the eastern tropical Pacific. The specific science objectives of the 2010 R/V Melville cruise (MV1008) were:
1) to assess grazing and trace metal/nutrient controls on primary production and phytoplankton standing stocks;
2) to quantify carbon and elemental fluxes and export rates from the euphotic zone; and
3) to measure microbial population, processes, stable isotope abundances associated with the OMZ and nitrite maxima.

Additional information about MV1008 can be found in the cruise report (PDF).

NOTE: The original proposal and award abstract are not relevant. The project was originally funded by NSF as experimental tests of phytoplankton controls in the Arabian Sea. Piracy concerns in the region led to the cancellation of the research cruise in 2009, and a Change of Scope request was approved to focus the project on related issues in the Costa Rica Dome (CRD).

Though this project is not formally affiliated with any large program, it aligns with IMBER's emphasis on community ecology and biogeochemistry, and the OCB focus on carbon-based measurements of production, grazing and export processes.

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Program Information

Integrated Marine Biogeochemistry and Ecosystem Research -US (IMBER-US)

Website: http://www.imber.info/

Coverage: global

The BCO-DMO database includes data from IMBER endorsed projects lead by US funded investigators. There is no dedicated US IMBER project or data management office. Those functions are provided by US-OCB and BCO-DMO respectively.

The information in this program description pertains to the Internationally coordinated IMBER research program. The projects contributing data to the BCO-DMO database are those funded by US NSF only. The full IMBER data catalog is hosted at the Global Change Master Directory (GCMD).

IMBER Data Portal: The IMBER project has chosen to create a metadata portal hosted by the NASA's Global Change Master Directory (GCMD). The GCMD IMBER data catalog provides an overview of all IMBER endorsed and related projects and links to datasets, and can be found at URL http://gcmd.nasa.gov/portals/imber/.

IMBER research will seek to identify the mechanisms by which marine life influences marine biogeochemical cycles, and how these, in turn, influence marine ecosystems. Central to the IMBER goal is the development of a predictive understanding of how marine biogeochemical cycles and ecosystems respond to complex forcings, such as large-scale climatic variations, changing physical dynamics, carbon cycle chemistry and nutrient fluxes, and the impacts of marine harvesting. Changes in marine biogeochemical cycles and ecosystems due to global change will also have consequences for the broader Earth System. An even greater challenge will be drawing together the natural and social science communities to study some of the key impacts and feedbacks between the marine and human systems.

To address the IMBER goal, four scientific themes, each including several issues, have been identified for the IMBER project: Theme 1 - Interactions between Biogeochemical Cycles and Marine Food Webs; Theme 2 - Sensitivity to Global Change: How will key marine biogeochemical cycles, ecosystems and their interactions, respond to global change?; Theme 3 - Feedback to the Earth System: What are the roles of the ocean biogeochemistry and ecosystems in regulating climate?; and Theme 4 - Responses of Society: What are the relationships between marine biogeochemical cycles, ecosystems, and the human system?

Ocean Carbon and Biogeochemistry (OCB)

Website: http://us-ocb.org/

Coverage: Global

The Ocean Carbon and Biogeochemistry (OCB) program focuses on the ocean's role as a component of the global Earth system, bringing together research in geochemistry, ocean physics, and ecology that inform on and advance our understanding of ocean biogeochemistry. The overall program goals are to promote, plan, and coordinate collaborative, multidisciplinary research opportunities within the U.S. research community and with international partners. Important OCB-related activities currently include: the Ocean Carbon and Climate Change (OCCC) and the North American Carbon Program (NACP); U.S. contributions to IMBER, SOLAS, CARBOOCEAN; and numerous U.S. single-investigator and medium-size research projects funded by U.S. federal agencies including NASA, NOAA, and NSF.

The scientific mission of OCB is to study the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change through studies of marine biogeochemical cycles and associated ecosystems.

The overarching OCB science themes include improved understanding and prediction of: 1) oceanic uptake and release of atmospheric CO2 and other greenhouse gases and 2) environmental sensitivities of biogeochemical cycles, marine ecosystems, and interactions between the two.

The OCB Research Priorities (updated January 2012) include: ocean acidification; terrestrial/coastal carbon fluxes and exchanges; climate sensitivities of and change in ecosystem structure and associated impacts on biogeochemical cycles; mesopelagic ecological and biogeochemical interactions; benthic-pelagic feedbacks on

biogeochemical cycles; ocean carbon uptake and storage; and expanding low-oxygen conditions in the coastal and open oceans.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0826626

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