Abundances of copepod species in each net from MOCNESS tows in the Eastern Tropical North Pacific collected on four research cruises from 2007-2017

Website: https://www.bco-dmo.org/dataset/855395
Data Type: Cruise Results
Version: 1
Version Date: 2021-07-09

Project
» Collaborative Research: Zooplankton in the Redoxcline of the Cariaco Basin: Impact on Biogeochemical Cycling (ETP)
» Collaborative Research: A metabolic index to predict the consequences of climate change for midwater ecosystems (Metabolic Index)

Program
» Ocean Carbon and Biogeochemistry (OCB)

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Abstract
This dataset includes abundances of copepod species in each net from MOCNESS tows in the Eastern Tropical North Pacific collected on four research cruises (KN195-02, OC1604B, SJ07, and SKQ201701S) from 2007-2017. Data are from vertically-stratified MOCNESS tows (8 or 9 nets per tow) through and within the Oxygen Minimum Zone (OMZ). Tows sampled various depth ranges between 1200 m to the surface and included paired day and night tows for many strata. Abundances for each species were calculated for each net after accounting for split size and volume filtered and are reported as numbers per 1000 cubic meters of water filtered.

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Coverage

Spatial Extent: **N**:22.233 **E**:-89.915 **S**:8.868 **W**:-120.258

Temporal Extent: 2007-10-28 - 2017-02-08

Methods & Sampling

Data are from vertically-stratified MOCNESS tows (8 or 9 nets per tow) through and within the Oxygen Minimum Zone (OMZ). Tows sampled various depth ranges between 1200 m to the surface and included paired day and night tows for many strata. Sampling intervals ranged from 100 or 200 m thick in standardized tows from 1000 m depth, and from 25, 50, or 150 m thick in fine-scale tows covering narrower depth intervals. Zooplankton collection occurred on the upcast portion of a tow. Several horizontally-sequenced tows were also done at specific mesopelagic depths within the OMZ. Large water volumes were filtered for most deeper and OMZ nets where abundances were low. MOCNESS sensors including a flowmeter provided environmental data. Tows were done over the course of a decade (2007 - 2017) during 4 cruises. See published papers below for details of tows and sampling schemes.

Net mesh size was 153 µm or 222 µm. Upon retrieval, samples or splits were stored in 4% sodium borate-buffered formaldehyde seawater. Sorting and identifications of whole samples or splits occurred later onshore by a trained technician using stereo- and compound microscopes. The copepod species shown in this dataset were selected to highlight different types of distributional responses to OMZ variability and are the basis for the Wishner et al. (2020) paper (Table S1 in that paper).

Data Processing Description

Data Processing: Abundances for each species were calculated for each net after accounting for split size and volume filtered and are reported as numbers per 1000 cubic meters of water filtered.

Column names:
Abundances are reported as the number of individual copepod species in each net (#/1000 m3).
Column names are shortened for ease of use (see parameter descriptions below for complete names).
Most abundances are for adults only, but for some species, younger life history stages are also shown.
Adults = total of adult males and females.
"C" numbers are copepodite life history stages (C1 – C5) for some species.
M = males, F = females
nd = no data (those species were not searched for in those nets)

BCO-DMO Processing:
- joined the abundance data with the corresponding event logs or MOCNESS logs to obtain the sampling latitude, longitude, date, time, and day/night columns;
- converted Date_Local to YYYY-MM-DD format;
- added date/time UTC fields in ISO8601 format;
- added column denoting the local time zone;
- renamed fields to comply with BCO-DMO naming conventions (removed spaces and special characters).

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Data Files

File
copepod_abund_moc.csv (Comma Separated Values (.csv), 67.75 KB) MD5:da3889556a96d900adce4d95cba41941 Primary data file for dataset ID 855395

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Related Publications

Davis, C. V., Wishner, K., Renema, W., & Hull, P. M. (2021). Vertical distribution of planktic foraminifera through

an oxygen minimum zone: how assemblages and test morphology reflect oxygen concentrations. Biogeosciences, 18(3), 977–992. doi:10.5194/bg-18-977-2021
Methods

Maas, A. E., Frazar, S. L., Outram, D. M., Seibel, B. A., & Wishner, K. F. (2014). Fine-scale vertical distribution of macroplankton and micronekton in the Eastern Tropical North Pacific in association with an oxygen minimum zone. Journal of Plankton Research, 36(6), 1557–1575. doi:10.1093/plankt/fbu077
Methods

Williams, R. L., Wakeham, S., McKinney, R., & Wishner, K. F. (2014). Trophic ecology and vertical patterns of carbon and nitrogen stable isotopes in zooplankton from oxygen minimum zone regions. Deep Sea Research Part I: Oceanographic Research Papers, 90, 36–47. doi:10.1016/j.dsr.2014.04.008
Methods

Wishner, K. F., Outram, D. M., Seibel, B. A., Daly, K. L., & Williams, R. L. (2013). Zooplankton in the eastern tropical north Pacific: Boundary effects of oxygen minimum zone expansion. Deep Sea Research Part I: Oceanographic Research Papers, 79, 122–140. doi:10.1016/j.dsr.2013.05.012
Methods

Wishner, K. F., Seibel, B. A., Roman, C., Deutsch, C., Outram, D., Shaw, C. T., … Riley, S. (2018). Ocean deoxygenation and zooplankton: Very small oxygen differences matter. Science Advances, 4(12), eaau5180. doi:10.1126/sciadv.aau5180
Methods

Wishner, K. F., Seibel, B., & Outram, D. (2020). Ocean deoxygenation and copepods: coping with oxygen minimum zone variability. Biogeosciences, 17(8), 2315–2339. doi:10.5194/bg-17-2315-2020
Results

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Related Datasets

IsRelatedTo

Seibel, B., Roman, C., Wishner, K. (2021) **Respirometry data for pelagic crustaceans, cephalopods, and fish collected on R/V Sikuliaq cruise SKQ201701S from January to February 2017.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-07-22 doi:10.26008/1912/bco-dmo.855732.1 [view at BCO-DMO]

Wishner, K., Roman, C., Seibel, B. (2021) **Event log from R/V Sikuliaq SKQ201701S from January to February 2017.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2019-01-10 doi:10.26008/1912/bco-dmo.755088.1 [view at BCO-DMO]

Wishner, K., Seibel, B. (2020) **Date, time, location, and depth range for MOCNESS tows from R/V Oceanus in the Eastern Tropical Pacific, Tropical Eastern Pacific from 2016-04-17 to 2016-05-02.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2020-01-30 doi:10.1575/1912/bco-dmo.787329.1 [view at BCO-DMO]

Wishner, K., Seibel, B. (2020) **Date, time, location, and depth range for MOCNESS tows from the R/V Seward Johnson, R/V Knorr in the Eastern Tropical North Pacific from 2007-10-25 to 2009-01-01.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2020-01-30 doi:10.1575/1912/bco-dmo.786098.1 [view at BCO-DMO]

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Parameters

Parameter	Description	Units
Cruise	Cruise ID	unitless

Station	Station number; note: station numbers are cruise-specific (not necessarily the same location between cruises)	unitless
Station_Name	Station name; corresponds to station names in Table 1 of Wishner et al. (2020): TB = Tehuantepec Bowl (SJ07 and KN0819502 cruises); CRD = Costa Rica Dome (SJ07 and KN0819502 cruises); OC = Oceanus cruise station; SKQ = Sikuliaq cruise station.	unitless
Tow	MOCNESS tow number	unitless
Net_ID	Identifying number for each of the 8 or 9 nets in a MOCNESS tow. The first 3 digits are the Tow number and the last digit is the net number. Most tows were done with a vertically-stratified sampling scheme, with the first net being the deepest one and the following nets sequentially shallower. Some tows were horizontally-sequenced or had other sampling profiles.	unitless
Start_Depth	Depth at which net was opened	meters (m)
End_Depth	Depth at which net was closed	meters (m)
Vol_Filt	Volume of water filtered through net, based on electronic flowmeter data	cubic meters (m^3)
Dis_pal_Adults	Abundance of Disseta palumbii (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Dis_pal_C5	Abundance of Disseta palumbii (C5 stage) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Eua_mag_Adults	Abundance of Euaugaptilus magnus (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Eua_nod_Adults	Abundance of Euaugaptilus nodifrons (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)

Euc_cal_Adults	Abundance of Eucalanus californicus (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_cal_C4_M	Abundance of Eucalanus californicus (C4 stage males) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_cal_C5_M	Abundance of Eucalanus californicus (C5 stage males) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_cal_C5_F	Abundance of Eucalanus californicus (C5 stage females) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_ine_Adults	Abundance of Eucalanus inermis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_ine_C1	Abundance of Eucalanus inermis (C1 stage) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_ine_C2	Abundance of Eucalanus inermis (C2 stage) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_ine_Imm_C3_C4F_C5F	Abundance of Eucalanus inermis (immature, C3 stage, C4 stage females, and C5 stage females) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)

Euc_ine_C4_M	Abundance of Eucalanus inermis (C4 stage males) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_ine_C5_M	Abundance of Eucalanus inermis (C5 stage males) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Euc_spi_Adults	Abundance of Eucalanus spinifer (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Gae_kru_Adults	Abundance of Gaetanus kruppi (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Gae_pse_Adults	Abundance of Gaetanus pseudolatifrons (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Hal_lon_Adults	Abundance of Haloptilus longicornis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Het_lon_Adults	Abundance of Heterostylites longicornis/longioperculus (adults) in the net. (probably a mixture of two species that cannot be reliably separated by light microscopy).	number of individuals per 1000 cubic meters (#/1000 m^3)
Lop_fro_Adults	Abundance of Lophothrix frontalis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)

Luc_fla_Adults	Abundance of Lucicutia flavicornis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Luc_hul_Adults	Abundance of Lucicutia hulsemannae (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Luc_ova_Adults	Abundance of Lucicutia ovalis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Mec_cla_Adults	Abundance of Mecynocera clausi (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Met_bre_Adults	Abundance of Metridia brevicauda (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Met_pri_Adults	Abundance of Metridia princeps (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Par_cal_Adults	Abundance of Paraeuchaeta californica (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Ple_abd_Adults	Abundance of Pleuromamma abdominalis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)

Ple_joh_Adults	Abundance of Pleuromamma johnsoni (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Ple_qua_Adults	Abundance of Pleuromamma quadrungulata (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Sca_mag_Adults	Abundance of Scaphocalanus magnus (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Sub_sub_Adults	Abundance of Subeucalanus subtenuis (adults) in the net	number of individuals per 1000 cubic meters (#/1000 m^3)
Date_Local	Date (local) of MOCNESS tow; added from the cruise event log or MOCNESS event log; format: YYYY-MM-DD	unitless
Time_In_Local	Time (local) at start of MOCNESS deployment; added from the cruise event log or MOCNESS event log; format: hhmm	unitless
Time_Out_Local	Time (local) of end of MOCNESS deployment; added from the cruise event log or MOCNESS event log; format: hhmm	unitless
Lat_In	Latitude at start of MOCNESS deployment; added from the cruise event log or MOCNESS event log	decimal degrees North
Lon_In	Longitude at start of MOCNESS deployment; added from the cruise event log or MOCNESS event log	decimal degrees East
Lat_Out	Latitude at end of MOCNESS deployment; added from the cruise event log or MOCNESS event log	decimal degrees North
Lon_Out	Longitude at end of MOCNESS deployment; added from the cruise event log or MOCNESS event log	decimal degrees East

Day_Night	Designates if the cast was during the day (D) or night (N); added from the cruise event log or MOCNESS event log	unitless
In_ISO_DateTime_UTC	Date and time (UTC) at start of MOCNESS deployment in ISO8601 format: YYYY-MM-DDThh:mmZ	unitless
Out_ISO_DateTime_UTC	Date and time (UTC) at end of MOCNESS deployment in ISO8601 format: YYYY-MM-DDThh:mmZ	unitless
local_time_zone	Local time zone represented as number of hours offset from UTC	unitless

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Instruments

Dataset-specific Instrument Name	stereo- and compound microscopes
Generic Instrument Name	Microscope - Optical
Dataset-specific Description	Sorting and identifications of whole samples or splits occurred onshore by a trained technician using stereo- and compound microscopes.
Generic Instrument Description	Instruments that generate enlarged images of samples using the phenomena of reflection and absorption of visible light. Includes conventional and inverted instruments. Also called a "light microscope".

Dataset-specific Instrument Name	1 m2 MOCNESS
Generic Instrument Name	MOCNESS1
Dataset-specific Description	The first two cruises used the classic MOCNESS with its standard deck unit and sensors. The two later cruises used an upgraded MOCNESS with a Sea-Bird 911CTD for sensors and modified software. (See Wishner et al. (2020) for more details.)
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 carries nine 1-m2 nets usually of 335 micrometer mesh and is intended for use with the macrozooplankton. All nets are black to reduce contrast with the background. A motor/toggle release assembly is mounted on the top portion of the frame and stainless steel cables with swaged fittings are used to attach the net bar to the toggle release. A stepping motor in a pressure compensated case filled with oil turns the escapement crankshaft of the toggle release which sequentially releases the nets to an open then closed position on command from the surface. -- from the MOCNESS Operations Manual (1999 + 2003).

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Deployments

SJ07

Website	https://www.bco-dmo.org/deployment/651160
Platform	R/V Seward Johnson
Start Date	2007-10-18
End Date	2007-11-17
Description	Cruise from Panama City to Panama City Figure 1. Station locations in the eastern tropical north Pacific overlaid on a MODIS (Moderate-resolution Imaging Spectroradiometer) image of ocean color during October 2007. Image courtesy of Inia Soto (USF). SJ07 Cruise Summary (ROSCOP)

KN195-02

Website	https://www.bco-dmo.org/deployment/651161
Platform	R/V Knorr
Start Date	2008-12-08
End Date	2009-01-06
Description	Figure 1. Station locations in the eastern tropical north Pacific overlaid on a MODIS (Moderate-resolution Imaging Spectroradiometer) image of ocean color during December 2008. Image courtesy of Inia Soto (USF). KN195-02 Cruise Summary (ROSCOP) See additional information from R2R: https://www.rvdata.us/search/cruise/KN195-02

OC1604B

Website	https://www.bco-dmo.org/deployment/786136
Platform	R/V Oceanus
Start Date	2016-04-16
End Date	2016-05-06
Description	See additional cruise information from R2R: https://www.rvdata.us/search/cruise/OC1604B

SKQ201701S

Website	https://www.bco-dmo.org/deployment/755461
Platform	R/V Sikuliaq
Start Date	2017-01-19
End Date	2017-02-15
Description	See additional cruise information from R2R: https://www.rvdata.us/search/cruise/SKQ201701S

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Project Information

Collaborative Research: Zooplankton in the Redoxcline of the Cariaco Basin: Impact on Biogeochemical Cycling (ETP)

Coverage: Eastern tropical Pacific

This project aims to characterize the spatial and interannual variability of physical, chemical, and biological properties between low productivity and high productivity regions of the eastern tropical Pacific. In particular, we will investigate the physiology of bacteria, phytoplankton, and zooplankton and food web interactions in relation to the oxygen minimum zone. Our results also will provide information on how marine carbon and nitrogen cycles are modified in suboxic regions of the ocean. Measurements include: ADCP, temperature, salinity, O2, pH, total DIC, fCO2, nutrients, CDOM, POC/N, methane oxidation rates, denitrification rates, chlorophyll, phytoplankton C&N uptake rates, bacteria abundance/growth rates/molecular fingerprinting, lipid biomarkers, microzooplankton grazing rates, mesozooplankton abundance, distribution, and physiology, and particle flux rates.

NSF abstract:

The CARIACO (CArbon Retention In A Colored Ocean) Program is a time-series programs, with the central goal to better understand seasonal to decadal time-scales of processes governing ocean biogeochemistry. The CARIACO site is situated in the tropics on a productive continental margin off Venezuela, the basin is anoxic, and the site is strongly connected to paleoclimate investigations. Thus, CARIACO has the additional goal of relating modern oceanographic processes with the production, transformation, and preservation of particulate matter in the sediment record.

Zooplankton composition, behavior, and physiological rates are important components of the biological pump. Recent findings from the Cariaco Basin and other regions with pelagic redoxclines (suboxic and anoxic interfaces) suggest that they are active regions of biogeochemical cycling, in which C may be directly transferred from bacterial production to zooplankton grazers.

The goals of this project are to determine the vertical and horizontal distributions of zooplankton in relation to the redoxcline during two seasons using discrete-depth net samples and a vertical-profiling laser-line scan camera system. Anaerobic and aerobic respiration and metabolites, excretion, and egestion rates will be experimentally determined for vertical migrators and resident species nearsurface and at suboxic and anoxic depths to determine whether zooplankton differ in their release of metabolic and egested products, due to differences in their metabolism and/or composition of food resources. Grazing experiments, in combination with lipid biomarkers and stable isotopic compositions, will be used to assess in situ diet and long-term feeding history of zooplankton. Fecal pellet composition will be compared with pellets in sediment traps. Time-series zooplankton samples also will be analyzed to obtain temporal information on zooplankton community dynamics and allow a seasonal estimate of the zooplankton contribution to elemental fluxes.

Intellectual Merit. One of the grand challenges of oceanography is to understand the processes that control the transformation and fate of organic carbon in marine systems. Meeting this challenge is hindered by a lack of basic information about factors that govern the response of biological activity to environmental forcing and climate change. In particular, the role of the marine biosphere in the global carbon cycle remains poorly constrained, in part due to uncertainties about biological controls on the quality and quantity of carbon export. This project will contribute to our knowledge of the role of mesozooplankton in biogeochemical cycles, especially in relation to how processes may be modified in regions with anoxic or suboxic layers and strong redox gradients, and will help to correctly understand the links between water column processes and climate history as recorded in the varved sediments of the Cariaco Basin.

Broader Impacts. The zooplankton time-series will provide information on patterns of marine biodiversity and ecological interactions from a poorly known region. The CARIACO Program has an ongoing impact in technology transfer and human resource development in Venezuela. This project will help train personnel in Venezuela and will support several graduate students. The lead investigators and students will develop materials on the project for dissemination through the NSF-Center for Ocean Science Education Excellence (COSEE) located at USF.

Note [2019-12-17]: BCO-DMO Project page updated to reflect information at nfs.gov for this collaborative award.
* Project tile changed from "Eastern Tropical Pacific" to the NSF award title "Collaborative Research: Zooplankton in the Redoxcline of the Cariaco Basin: Impact on Biogeochemical Cycling."
* The other award number in this collaborative award added to the page OCE-0526502
* Person roles on the page updated to reflect the NSF award roles (PI or Co-PI) all others on the page changed to "Scientist" from "Co-PI" if not listed as a Co-PI on the NSF award.

Collaborative Research: A metabolic index to predict the consequences of climate change for midwater ecosystems (Metabolic Index)

Coverage: Eastern Tropical North Pacific

Description from NSF award abstract:
With climate change, ocean temperatures are expected to increase which in turn will reduce oxygen availability and increase metabolic oxygen demand in marine organisms. The investigators will conduct shipboard physiological experiments for various marine organisms and determine their distributions in relation to environmental conditions within an oxygen minimum zone (OMZ) in the Eastern Pacific Ocean. The goal will be to model and map a Metabolic Index (MI) to predict how vertical and horizontal distributions for these species might change throughout the world's oceans in the future. The MI is defined as the ratio between environmental oxygen supply and temperature-dependent oxygen demand. Oxygen supply includes both the environmental oxygen concentration across a habitat range and the physiological features of organisms that facilitate oxygen uptake, such as gills and circulatory systems. Thus, the MI will integrate measured tolerance and environmental exposure to low oxygen with environmental data. The investigators will measure tolerance to low oxygen, focusing on under-studied organisms, including the effect of temperature and organism size. They will sample along a natural gradient in oxygen content south of the California Current in the Eastern Pacific. The science team and a videographer will develop a blog about deep-sea biology and climate change using web-based and video technologies. Four graduate students will be funded on this project, and in conjunction with a recently developed course in pelagic ecology, several undergraduates will have the opportunity to participate in seagoing research.

This research fills a critical need for a physiology-based metric that can be used to predict changing marine communities as the oceans warm and hypoxic zones expand. Modern OMZs are extensive and characterized by deep-water (300-800 m) oxygen partial pressures lethal to most marine organisms, yet thriving communities exist there. Climate change is predicted to further deplete oxygen. The investigators will model and map a Metabolic Index (MI) for diverse marine species to help predict how in vertical and horizontal distributions of species may change throughout the world's oceans in the future. The MI will derive oxygen supply and demand data from published and planned measurements of the minimum environmental partial pressure of oxygen to which individual species are exposed (based on their distributions in the water column) and the minimum requirements to support routine aerobic metabolic demand (from shipboard respiration measurements of individuals). During research cruises in the Eastern Pacific along a gradient of OMZ intensity, the investigators will conduct shipboard physiological measurements to determine metabolic demand for understudied mesozooplankton and gelatinous taxa and determine the size- and temperature dependence for diverse species for incorporation into the MI. Vertically-stratified net sampling and in situ photography will identify and characterize unique OMZ community features, such as the lower oxycline biomass peak present in some OMZs and the oxygen-dependence of day and night habitat depths for vertically-migrating species. The MI will be mapped using climatological data to both test and generate hypotheses about the response of oceanic communities to climate change. In preliminary analysis, the MI suggests a metabolic constraint at a MI of ~2 that may act to limit vertical and horizontal habitat ranges.

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Program Information

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-0526545
NSF Division of Ocean Sciences (NSF OCE)	OCE-1459243
NSF Division of Ocean Sciences (NSF OCE)	OCE-0526502

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