

# Benthic foraminiferal abundances of Mud Patch multicores from R/V Endeavor EN524 in the continental shelf off New England; 40.43 N 70.5 W from May 2013 (OA, Hypoxia and Warming project)

**Website:** <https://www.bco-dmo.org/dataset/670458>

**Data Type:** Cruise Results

**Version:**

**Version Date:** 2016-12-16

## Project

» [Ocean Acidification, Hypoxia and Warming: Experimental Investigations into Compounded Effects of Global Change on Benthic Foraminifera](#) (OA, Hypoxia and Warming)

## Program

» [Science, Engineering and Education for Sustainability NSF-Wide Investment \(SEES\): Ocean Acidification \(formerly CRI-OA\)](#) (SEES-OA)

Contributors	Affiliation	Role
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## Dataset Description

This dataset includes abundance data of benthic forams collected in the Mud Patch.

To serve this dataset on BCO-DMO, the original Excel multi-tiered table had to be extensively re-formatted. Access the [originally formatted Excel sheet](#).

## Methods & Sampling

Foraminiferal bearing sediments were collected using MC800 multicorer, and sliced into selected 1-cm intervals. For samples collected on EN524, surface samples were incubated in CellTracker Green CMFDA. After fixation in buffered formalin, sediments were sieved and all foraminifera were picked from the >125 µm fraction. Specimens from surface samples were examined wet with a Leica MZFLIII epifluorescence microscope to distinguish living from dead individuals. All “hardshelled” specimens were air dried on micropaleontological slides; “softshelled” specimens were kept in small vials containing formalin. The core collected on OC326 was an archival core and not incubated in CellTracker Green or fixed in formalin.

Values presented are number of specimens per 10 cubic centimeters. Counts are not given because picked samples varied in volume.

## Data Processing Description

### BCO-DMO Processing Notes:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- replaced spaces with underscores
- reformatted the data to form a flat table
- added cruise\_id column
- version 2017-01-25 replaced version 2016-12-13: in species column, "Total\_specimens\_#/cc" was replaced with "Total\_specimens\_#/10cc"

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## Data Files

File
<b>foram_density.csv</b> (Comma Separated Values (.csv), 26.91 KB) MD5:32f8aa9388b3fa800d52356ed0cb30fa Primary data file for dataset ID 670458

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## Parameters

Parameter	Description	Units
cruise_id	cruise identifier	unitless
sample	sample identifier: cruise-id_event-number_core-type_sediment-depth_live-or-dead: CTG = core designated for CellTracker Green processing; DC= core designated for downcore analyses	unitless
multicore	multicore identifier: cruise id_ event number(_core type)	unitless
date	date formatted as yyyy-mm-dd	unitless
time	UTC time formatted as HH:MM	unitless
lat	latitude; north is positive	decimal degrees
lon	longitude; east is positive	decimal degrees
depth_w	depth of water	meters
depth_sediment_core	sample depth range of with the multicore	centimeters
specimen_type	whether cells were were incubated in CellTracker Green or non-fluorescent	unitless
species	foraminiferan species	unitless
abundance	density of foraminiferans in samples	number of specimens per 10 cubic centimeters
yrday_utc	UTC day and decimal time:eg. 326.5 for the 326th day of the year or November 22 at 1200 hours (noon)	julian day and fraction of day
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted based on ISO 8601:2004(E) with format YYYY-mm-ddTHH:MM:SS[.xx]Z	year;month;day;hour;minute;second

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## Instruments

<b>Dataset-specific Instrument Name</b>	Leica MZFLIII epifluorescence microscope
<b>Generic Instrument Name</b>	Fluorescence Microscope
<b>Dataset-specific Description</b>	To examine specimens
<b>Generic Instrument Description</b>	Instruments that generate enlarged images of samples using the phenomena of fluorescence and phosphorescence instead of, or in addition to, reflection and absorption of visible light. Includes conventional and inverted instruments.

<b>Dataset-specific Instrument Name</b>	MC800 multicorer
<b>Generic Instrument Name</b>	Multi Corer
<b>Generic Instrument Description</b>	The Multi Corer is a benthic coring device used to collect multiple, simultaneous, undisturbed sediment/water samples from the seafloor. Multiple coring tubes with varying sampling capacity depending on tube dimensions are mounted in a frame designed to sample the deep ocean seafloor. For more information, see Barnett et al. (1984) in Oceanologica Acta, 7, pp. 399-408.

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## Deployments

### EN524

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/59031">https://www.bco-dmo.org/deployment/59031</a>
<b>Platform</b>	R/V Endeavor
<b>Start Date</b>	2013-05-19
<b>End Date</b>	2013-05-22
<b>Description</b>	UNOLS cruise request: <a href="http://strs.unols.org/Public/diu_project_view.aspx?project_id=103010">http://strs.unols.org/Public/diu_project_view.aspx?project_id=103010</a> The May cruise is the first for the NSF OCE funded Ocean Acidification, Hypoxia and Warming project also known by the project researchers as "OA Propagule". The cruise was timed such that samples would be collected soon after the spring bloom. During the cruise, investigators plan to collect CTD profile data, including dissolved oxygen, bottom water with Niskin bottles deployed on the CTD rosette, MC800 multicores, and Soutar boxcores from the "Mud Patch" study site. The study area is located on the continental shelf approximately 50 nm south of Martha's Vineyard (40.43 N 70.5 W). The original cruise event log and other underway data submitted by the vessel operator will be available from the NSF R2R cruise catalog. Cruise track image from the University of Rhode Island, the vessel operator.

### OC326

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/670473">https://www.bco-dmo.org/deployment/670473</a>
<b>Platform</b>	R/V Oceanus
<b>Start Date</b>	1998-07-06
<b>End Date</b>	1998-07-23

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## Project Information

### **Ocean Acidification, Hypoxia and Warming: Experimental Investigations into Compounded Effects of Global Change on Benthic Foraminifera (OA, Hypoxia and Warming)**

**Coverage:** continental shelf off New England

#### **from the NSF award abstract:**

The average sea surface temperature (SST) has increased over the last 100 years, rising atmospheric partial pressure of carbon dioxide (pCO<sub>2</sub>) is lowering the pH of the oceans, and the extent and intensity of low-oxygen bottom waters is growing, at least in certain regions. The biological impacts of these ongoing changes - warming, acidification, and hypoxia -- have each been studied independently, but few studies have explored the possible interactions among these stressors.

This research, led by a scientist from the Woods Hole Oceanographic Institution, studies the compounded effects of ocean acidification, hypoxia, and warming on an assemblage of benthic foraminifera collected from the continental shelf off New England. Foraminifera are an ideal organism for this work because they (1) are relatively small, allowing experimentation on statistically significant populations; (2) have both calcareous and non-calcareous representatives; (3) are relatively short-lived so experiments include a major portion of their life cycle; (4) include aerobes and anaerobes; and (5) provide a fossil record allowing comparisons across time. Laboratory culturing experiments will be used to determine the response of benthic foraminifera, in terms of survival and growth, to co-varying parameters of pH and oxygen, and to explore the influence of increased temperature on these responses. The researchers will examine the relative effects of higher pCO<sub>2</sub>, lower [O<sub>2</sub>], and higher temperature (T) on both calcareous and non-calcareous benthic foraminifera. In addition, they will examine the pre-Industrial benthic foraminiferal assemblage at the field site, and will compare that assemblage to those produced in the experiments under pre-Industrial (lower than current day) and elevated pCO<sub>2</sub> levels.

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## Program Information

### **Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES): Ocean Acidification (formerly CRI-OA) (SEES-OA)**

**Website:** [https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503477](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503477)

**Coverage:** global

NSF Climate Research Investment (CRI) activities that were initiated in 2010 are now included under Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES). SEES is a portfolio of activities that highlights NSF's unique role in helping society address the challenge(s) of achieving sustainability. Detailed information about the SEES program is available from NSF ([https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=504707](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504707)).

In recognition of the need for basic research concerning the nature, extent and impact of ocean acidification on oceanic environments in the past, present and future, the goal of the SEES: OA program is to understand (a) the chemistry and physical chemistry of ocean acidification; (b) how ocean acidification interacts with processes at the organismal level; and (c) how the earth system history informs our understanding of the effects of ocean acidification on the present day and future ocean.

#### **Solicitations issued under this program:**

[NSF 10-530](#), FY 2010-FY2011

[NSF 12-500](#), FY 2012

[NSF 12-600](#), FY 2013

[NSF 13-586](#), FY 2014

NSF 13-586 was the final solicitation that will be released for this program.

#### **PI Meetings:**

[1st U.S. Ocean Acidification PI Meeting](#)(March 22-24, 2011, Woods Hole, MA)

[2nd U.S. Ocean Acidification PI Meeting](#)(Sept. 18-20, 2013, Washington, DC)

3rd U.S. Ocean Acidification PI Meeting (June 9-11, 2015, Woods Hole, MA - Tentative)

#### **NSF media releases for the Ocean Acidification Program:**

[Press Release 10-186 NSF Awards Grants to Study Effects of Ocean Acidification](#)

[Discovery Blue Mussels "Hang On" Along Rocky Shores: For How Long?](#)

[Discovery nsf.gov - National Science Foundation \(NSF\) Discoveries - Trouble in Paradise: Ocean Acidification This Way Comes - US National Science Foundation \(NSF\)](#)

[Press Release 12-179 nsf.gov - National Science Foundation \(NSF\) News - Ocean Acidification: Finding New Answers Through National Science Foundation Research Grants - US National Science Foundation \(NSF\)](#)

[Press Release 13-102 World Oceans Month Brings Mixed News for Oysters](#)

[Press Release 13-108 nsf.gov - National Science Foundation \(NSF\) News - Natural Underwater Springs Show How Coral Reefs Respond to Ocean Acidification - US National Science Foundation \(NSF\)](#)

[Press Release 13-148 Ocean acidification: Making new discoveries through National Science Foundation research grants](#)

[Press Release 13-148 - Video nsf.gov - News - Video - NSF Ocean Sciences Division Director David Conover answers questions about ocean acidification. - US National Science Foundation \(NSF\)](#)

[Press Release 14-010 nsf.gov - National Science Foundation \(NSF\) News - Palau's coral reefs surprisingly resistant to ocean acidification - US National Science Foundation \(NSF\)](#)

[Press Release 14-116 nsf.gov - National Science Foundation \(NSF\) News - Ocean Acidification: NSF awards \\$11.4 million in new grants to study effects on marine ecosystems - US National Science Foundation \(NSF\)](#)

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## **Funding**

<b>Funding Source</b>	<b>Award</b>
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1219948</a>

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