

# Mud Patch sediment age dating with Lead-210 and Cesium-137 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/670631>

**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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## Table of Contents

- [Dataset Description](#)
  - [Methods & Sampling](#)
  - [Data Processing Description](#)
- [Data Files](#)
- [Parameters](#)
- [Instruments](#)
- [Deployments](#)
- [Project Information](#)
- [Program Information](#)
- [Funding](#)

## Methods & Sampling

Sediments were collected using MC800 multicorer, and sliced into selected 1-cm intervals. Aliquots were dried, ground into fine powder, and placed in glass vials. Samples were analyzed on a Canberra model GL2020RS low energy Germanium (LeGe) planar detector coupled with low background cryostats in low background shields, in Jeff Donnelly's lab at WHOI using standard procedures.

## 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
- reformatted date from d-Mon-yy to yyyy-mm-dd
- reduced number of significant digits of Pb and Cs due to sampling precision methods
- added yrday\_utc and ISO\_DateTime\_UTC

[ [table of contents](#) | [back to top](#) ]

## Data Files

File
<b>sediment_age.csv</b> (Comma Separated Values (.csv), 2.70 KB) MD5:0f146a15d006eba80b92c25b20939e75 Primary data file for dataset ID 670631

[ [table of contents](#) | [back to top](#) ]

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## Parameters

Parameter	Description	Units
sample	sample identifier	unitless
cruise	cruise identifier	unitless
event	event number	unitless
lat	latitude; north is positive	decimal degrees
lon	longitude; east is positive	decimal degrees
date	date formatted as yyyy-mm-dd	unitless
time	UTC time formatted as HH:MM	unitless
yday_utc	UTC day and decimal time:eg. 326.5 for the 326th day of the year or November 22 at 1200 hours (noon)	unitless
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted based on ISO 8601:2004(E) with format YYYY-mm-ddTHH:MM:SS[.xx]Z	unitless
depth	sample depth	meters
depth_sediment	sample depth range of with the multicore	centimeters
Pb_210	Pb-210 concentration	Becquerel per gram sediment (Bq/g)
Pb210_stdev	Pb-210 concentration standard deviation	Becquerel per gram sediment (Bq/g)
Pb_214	Pb-214 concentration	Becquerel per gram sediment (Bq/g)
Pb214_stdev	Pb-214 concentration standard deviation	Becquerel per gram sediment (Bq/g)
Cs_137	Cs-137 concentration	Becquerel per gram sediment (Bq/g)
Cs137_stdev	Cs-137 concentration standard deviation	Becquerel per gram sediment (Bq/g)

## Instruments

<b>Dataset-specific Instrument Name</b>	Canberra model GL2020RS low energy Germanium (LeGe) planar detector
<b>Generic Instrument Name</b>	Gamma Ray Spectrometer
<b>Dataset-specific Description</b>	Samples were analyzed on a Canberra model GL2020RS low energy Germanium (LeGe) planar detector coupled with low background cryostats in low background shields, in Jeff Donnelly's lab at WHOI using standard procedures
<b>Generic Instrument Description</b>	Instruments measuring the relative levels of electromagnetic radiation of different wavelengths in the gamma-ray waveband.

<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.

[ [table of contents](#) | [back to top](#) ]

## 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

[ [table of contents](#) | [back to top](#) ]

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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.

[ [table of contents](#) | [back to top](#) ]

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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 \(NSF\)](#)

[ [table of contents](#) | [back to top](#) ]

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## **Funding**

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

[ [table of contents](#) | [back to top](#) ]