

# CTD profile data from R/V Endeavor cruise EN524 along the continental shelf of New England in 2013 (OA, Hypoxia and Warming project)

**Website:** <https://www.bco-dmo.org/dataset/3955>

**Version:** 1

**Version Date:** 2013-06-18

## 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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## Abstract

CTD profile data from R/V Endeavor cruise EN524 along the continental shelf of New England in 2013.

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## Coverage

**Spatial Extent:** N:40.443 E:-70.4893 S:40.4312 W:-70.5035

**Temporal Extent:** 2013-05-19 - 2013-05-21

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## Dataset Description

Data from 4 CTD casts made during the May 2013 EN524 cruise aboard R/V Endeavor. Data have been preliminarily processed by the ship's technician during the cruise for initial sensor check. No post-cruise processing or calibrations have been applied.

## Methods & Sampling

Notes from the ship's technician:

No CTD "in water" tests were done during the cruise. Four CTD "on deck" tests were done during the cruise. Sampling casts were to ~72m, or shallower ~4m above bottom. The PAR and SPAR sensors were not installed at all during the cruise. Unless otherwise requested, only Primary Cond is advanced in deck unit. However, our Version 2 of SBE Model 11 plus deck unit can advance both. The Secondary Cond is advanced in processing.

Max winch speed was 30 m/min. 12 place frame with 12 OTE external tension sample bottles were used.

CTD gets GPS from bridge switch. Whatever GPS they have selected is the unit that is used (most likely Northstar/Furuno WAAS or Furuno WAAS). 4800 baud.

The seas were calm for most of the cruise with rain and winds to ~25kts on 20 May 2013.

The CTD for all four casts had Pressure, dual Temperature and Conductivity sensors and Pumps, WET Labs C-Star 25cm Transmissometer, WET Labs ECO Fluorometer, Benthos Altimeter, SBE43 Oxygen 1, Oxygen 2 sensors and 12 OTE 10L Niskin bottles on the smaller (12pl) of GSO's SBE frames. CTD was horizontally mounted.

## Data Processing Description

Notes from the ship's technician:

Data have been preliminarily processed by the ship's technician during the cruise for initial sensor check. No post-cruise processing or calibrations have been applied. Pressure and blocked transmissometer values from a deck test were used to create con files with updated pressure and transmissometer sensor coefficients. All casts were processed with updated con files (con file used named "EN524\_0444d\_NoPS.xmlcon").

Configuration Reports (PDF files):

[CTD con report](#)

[CTD psa report](#)

BCO-DMO Processing Notes:

Modified parameter names to conform with BCO-DMO naming conventions;

Removed several columns from data display: flag (all values were 0), nbin, pump\_status (all values were 1), voltages, DepSM2 (all values identical to DepSM), scan;

Added starting date, time, lat, and lon from the CTD file headers.

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## Data Files

File
<b>ctd.csv</b> (Comma Separated Values (.csv), 79.26 KB) MD5:3f29bfa31d361fd59bdcd6ed78c82aa8
Primary data file for dataset ID 3955

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## Parameters

Parameter	Description	Units
sci_event	Event number designation provided by science party.	integer
date	Date of CTD cast event.	mmddYYYY
time_start	Time (UTC) at start of CTD cast.	HHMM.mm
lat_start	Latitude at start of cast. Positive values = North.	decimal degrees
lon_start	Longitude at start of cast. Negative values = West.	decimal degrees
ISO_DateTime_UTC_start	Start date/time (UTC) formatted to ISO 8601 standard. T indicates start of time string; Z indicates UTC.	YYYY-mm-ddTHH:MM:SS.ssZ
press	Pressure (Digiquartz); originally named 'PrDM'.	decibars
depth	Depth; originally named 'DepSM'.	meters

alt	Altitude of instrument above the bottom; originally named 'AltM'.	meters
lat	Latitude. Positive values = North.	decimal degrees
lon	Longitude. Negative values = West.	decimal degrees
time_elapsed	Time elapsed; originally named 'TimeS'.	seconds
temp	Temperature (ITS-90) from primary sensor; originally named 'T090C'.	degrees Celsius
temp2	Temperature (ITS-90) from secondary sensor; originally named 'T190C'.	degrees Celsius
temp_diff	Temperature difference; secondary - primary (temp2 - temp); originally named 'T2-T190C'.	degrees Celsius
cond	Conductivity from primary sensor; originally named 'C0S/m'.	siemens per meter (S/m)
cond2	Conductivity from secondary sensor; originally named 'C1S/m'.	siemens per meter (S/m)
cond_diff	Conductivity difference; secondary - primary (cond2 - cond); originally named 'C2-C1S/m'.	siemens per meter (S/m)
sal	Salinity from primary sensor; originally named 'Sal00'.	PSU
sal2	Salinity from secondary sensor; originally named 'Sal11'.	PSU
O2	Oxygen from from primary SBE 43 sensor; originally named 'Sbeox0ML/L'.	milliliters per liter (mL/L)
O2_2	Oxygen from secondary SBE 43 sensor; originally named 'Sbeox1ML/L'.	milliliters per liter (mL/L)
O2_v	Raw oxygen (volts) from primary SBE 43 sensor; originally named 'Sbeox0V'.	volts
O2_v2	Raw oxygen (volts) from secondary SBE 43 sensor; originally named 'Sbeox1V'.	volts
beam_c	Beam Attenuation from WET Labs C-Star; originally named 'CStarAt0'.	reciprocal meters (1/m)
trans	Beam Transmission from WET Labs C-Star; originally named 'CStarTr0'.	%
fluor	Fluorescence from WET Labs ECO-AFL/FL; originally named 'FIECO-AFL'.	milligrams per cubic meter (mg/m <sup>3</sup> )
sigma_0	Density (sigma-theta) from primary sensor; originally named 'Sigma-e00'.	kilograms per cubic meter (kg/m <sup>3</sup> )
sigma_0_2	Density (sigma-theta) from secondary sensor; originally named 'Sigma-e11'.	kilograms per cubic meter (kg/m <sup>3</sup> )
potemp	Potential Temperature (ITS-90) from primary sensor; originally named 'Potemp090C'.	degrees Celsius
sound_vel	Sound velocity (Chen-Millero) from primary sensor; originally named 'SvCM'.	meters per second (m/s)
sound_vel2	Sound velocity (Chen-Millero) from secondary sensor; originally named 'SvCM1'.	meters per second (m/s)
descent_rate	Descent rate; originally named 'Dz/dtM'.	meters per second (m/s)
geop_anomaly	Geopotential anomaly; originally named 'Gpa'.	joules per kilogram (J/kg)

## Instruments

<b>Dataset-specific Instrument Name</b>	CTD Sea-Bird SBE 911plus
<b>Generic Instrument Name</b>	CTD Sea-Bird SBE 911plus
<b>Dataset-specific Description</b>	Sea-Bird 911+ CTD w/ 12 OTE 10L water samplers.
<b>Generic Instrument Description</b>	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

## 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.

## 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

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

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