

Event log for R/V Tioga TI725 in the Gulf of Maine from January 2014 (Gulf of Maine Pteropods project)

Website: <https://www.bco-dmo.org/dataset/491325>

Version: 2014-02-13

Project

» [Seasonal and Ontogenetic Effects of Ocean Acidification on Pteropods in the Gulf of Maine](#) (Gulf of Maine Pteropods)

Program

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

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Table of Contents

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

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

Data Files

File
TI725_eventlog.csv (Comma Separated Values (.csv), 2.19 KB) MD5:da2b013d92e8c39bebbb02b4a2675672
Primary data file for dataset ID 491325

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

Parameters

Parameter	Description	Units
event	event or sampling operation number	
inst	Instrument used to collect data, see: instrument list	
cast	cast number	
station	consecutive station number	
day_local	day of month, local time	
month_local	month of year, local time	
time_local	time of day, local time, using 2400 clock format	
se_flag	sampling operation start (s) or end (e) flag	
lat	latitude, negative = South	
lon	longitude, negative = West	
depth_w	depth of water	meters
depth	depth of sample	meters
comments	free text comments	
year	year	
timediff	The number of hours added to local time to convert to UTC.	hours
ISO_DateTime.UTC	Date/Time (UTC) ISO formatted. This standard is based on ISO 8601:2004(E). e.g. 2009-08-30T14:05:00[.xx]Z (UTC time)	YYYY-MM-DDTHH:MM:SS[.xx]Z
mon_utc	month of year, UTC	1 to 12
day_utc	day of month, UTC	1 to 31
time_utc	time, UTC	HHMM

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

Instruments

Dataset-specific Instrument Name	CTD
Generic Instrument Name	CTD - profiler
Generic Instrument Description	<p>The Conductivity, Temperature, Depth (CTD) unit is an integrated instrument package designed to measure the conductivity, temperature, and pressure (depth) of the water column. The instrument is lowered via cable through the water column. It permits scientists to observe the physical properties in real-time via a conducting cable, which is typically connected to a CTD to a deck unit and computer on a ship. The CTD is often configured with additional optional sensors including fluorometers, transmissometers and/or radiometers. It is often combined with a Rosette of water sampling bottles (e.g. Niskin, GO-FLO) for collecting discrete water samples during the cast. This term applies to profiling CTDs. For fixed CTDs, see https://www.bco-dmo.org/instrument/869934.</p>

Dataset-specific Instrument Name	
Generic Instrument Name	Pump
Dataset-specific Description	A "Little Giant" brand pump was used to retrieve water from depth for animal culture. This goal is to have large amounts of water of the appropriate salinity, DIC/TA and temperature to replicate the conditions the animals experience in situ. To achieve this, six "pteropod ptransporter" garbage cans were brought onboard and held in a plastic cage.
Generic Instrument Description	A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. Pumps can be classified into three major groups according to the method they use to move the fluid: direct lift, displacement, and gravity pumps

Dataset-specific Instrument Name	Reeve Net
Generic Instrument Name	Reeve Net
Dataset-specific Description	150 micron mesh. The objective of Reeve net sampling was to gently collect live specimens to be sampled for culturing experiments. These trawls were short in duration and aimed to maximize pteropod catch.
Generic Instrument Description	A Reeve Net is a conventional ring net with a very large acrylic cylindrical cod-end (30 liters) designed to collect fragile gelatinous animals. The net is lowered to a particular depth and then hauled slowly back to the surface (5-10 m/min). Reeve (1981) also described a double net system with no bridle and flotation at the net mouth that is attached to a roller mechanism that rides on a tow wire. The roller system is locked in place by a pressure release device. Once below a set pressure, the roller and nets are released and they float slowly up the wire, gently collecting the zooplankton, without being influenced by the motion of the vessel and associated vertical wire movements. (from Wiebe and Benfield, 2003)

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

Deployments

TI725

Website	https://www.bco-dmo.org/deployment/491406
Platform	R/V Tioga
Report	http://bcodata.whoi.edu/GoME_Pteropods/cruise_reports/Tioga725_Cruise_Report.pdf
Start Date	2014-01-10
End Date	2014-01-10
Description	Cruise to collect live Limacina retroversa pteropods for physiological studies.

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

Project Information

Seasonal and Ontogenetic Effects of Ocean Acidification on Pteropods in the Gulf of Maine (Gulf of Maine Pteropods)

Website: <http://www.whoi.edu/people/glawson/>

Coverage: Gulf of Maine

This project will involve a series of five short cruises in 2013 and 2014, during which a variety of hydrographic, chemical, and biological data and samples will be collected, as well as a number of laboratory experiments examining pteropod physiology and gene expression.

From NSF proposal abstract:

Dissolution of excess anthropogenic CO₂ into the ocean is causing the marine environment to decrease in pH. This "ocean acidification" is predicted to threaten a broad variety of marine organisms, particularly calcifying animals such as the thecosome (i.e., shelled) pteropods. These pelagic gastropods form an aragonite shell, are prey for a number of commercially important fish, and are significant contributors to carbon biogeochemistry. Their ecosystem importance, abundance, and sensitivity to dissolution position them as an important group for investigating the impacts of acidification. Our understanding of the effect of high CO₂ on pteropods and the pelagic ecosystem, however, is limited primarily to short-term studies of adult calcification and respiration response in the polar ecosystems. There have been no seasonal studies of sensitivity and our understanding of the effect of CO₂ on pteropod early life stages is limited. *Limacina retroversa* is a particularly abundant thecosome pteropod in the North Atlantic, where it is prey for a number of fisheries species and other top predators. This species is also the most common pteropod in the Gulf of Maine (GoM) where it is present year round. *L. retroversa* thus offers the prospect of a useful model pteropod species, given both its ecological importance and its abundance in readily accessible waters. The investigators will conduct a series of short cruises to sample *L. retroversa* on a seasonal basis from local waters of the GoM near Cape Cod. The carbonate chemistry of the GoM fluctuates seasonally, providing the opportunity to assess the response of wild caught pteropods to natural changes in CO₂. By characterizing the carbonate chemistry of the water column and measuring the metabolic rate, shell quality, and gene expression of pteropods throughout the year, the researchers will achieve a time series of pteropod sensitivity to CO₂. Subsequently, using experimental manipulations the investigators will explore the effect of seasonal acclimation on pteropod response to short- and medium-term exposure to enhanced CO₂. Pteropods frequently lay eggs in captivity, and at WHOI there is institutional expertise in maintaining these individuals in the laboratory. Building on these strengths, the researchers will also study the effect of CO₂ on embryonic and larval development in *L. retroversa*. These earliest life-stages of marine calcifiers are thought to be especially sensitive since initial shell precipitation and the highly energetic processes of growth and development are impeded by CO₂ exposure. They will also document mortality, shell production, abnormality, and developmental rate of clutches of pteropod embryos exposed to increased CO₂.

Intellectual Merit: Thecosome pteropods are an abundant group of calcifying zooplankters that have been chronically understudied, particularly in temperate regions. Due to its accessibility and ecological importance, *L. retroversa* can be developed as a valuable model, interesting both as the dominant pteropod in the commercially-important GoM region and also an abundant pteropod in the temperate waters of the North Atlantic. The goal of this research is to augment our knowledge of the distribution of *L. retroversa*, to attain an understanding of their seasonal sensitivity to natural variability in CO₂, and to see how this exposure impacts responses to both short- and medium-term CO₂ exposure. Using powerful transcriptomic technologies, the research will transform our understanding of this group by investigating the molecular mechanisms of response in *L. retroversa* to both seasonality and varying durations and intensities of acidification, contextualized by ecosystem- and organism-level metrics. Furthermore the study will examine the effect of CO₂ on the eggs of pteropods for the first time, providing insight into their sensitivity to an acidifying environment.

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

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

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).

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](#)]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1316040

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