

# Oxygen concentrations measured at increasing distances over coral-algal interactions at Moorea, French Polynesia (Vermetids\_Corals project)

**Website:** <https://www.bco-dmo.org/dataset/720822>

**Data Type:** Other Field Results

**Version:** 2017-10-05

## Project

» [Spatial patterns of coral-vermetid interactions: short-term effects and long-term consequences](#)

(Vermetids\_Corals)

Contributors	Affiliation	Role
<a href="#">Brown, Anya L.</a>	University of Georgia (UGA)	Principal Investigator, Contact
<a href="#">Osenberg, Craig</a>	University of Georgia (UGA)	Co-Principal Investigator
<a href="#">Biddle, Mathew</a>	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

## Table of Contents

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

## Coverage

**Spatial Extent:** N:-17.47279 E:-149.78277 S:-17.48365 W:-149.84698

## Dataset Description

Belongs to set of datasets that evaluate how vermetid (*Ceraesignum maximum*) modify physical and chemical conditions above coral-algal interactions (i.e., light, flow and oxygen).

### Related Datasets:

- BrownOsenberg\_2018- Fluorescein dye: <https://www.bco-dmo.org/dataset/717831>
- BrownOsenberg\_2018- FIDyeSurvey: <https://www.bco-dmo.org/dataset/720777>
- BrownOsenberg\_2018- InitO2\_DBLthick: <https://www.bco-dmo.org/dataset/720822> (The current page)
- BrownOsenberg\_2018- LightSensor: <https://www.bco-dmo.org/dataset/720874>
- BrownOsenberg\_2018- OxygenConcentrations: <https://www.bco-dmo.org/dataset/720960>

## Methods & Sampling

Experiments and surveys were conducted in the field to determine how vermetids affect light, flow and oxygen concentrations. Below are the methods for the experiment:

Samples are cores removed from the field with intact interactions (half massive Porites corals and half algal turf). Samples were removed with pneumatic drill with a hole saw attachment.

Oxygen concentration profiles were measured using a PreSens needle microsensor oxygen probe (diameter:

<50 µm) attached to a PreSens Microx TX3 system (PreSens Precision Sensing GmbH). The probe was attached to a micromanipulator, which allowed fine-scale, precise motion to measure oxygen concentration profiles. The probe was lowered through the net to the coral surface. From the raw oxygen concentration profiles, data were then separated by core, and in R, DBL thicknesses and initial oxygen (starting point O<sub>2</sub>) concentrations were extracted.

## Data Processing Description

DBL thicknesses were determined by the height at which oxygen concentrations reached 99% of the bulk oxygen concentration. Initial oxygen concentrations are the oxygen concentrations at the surface of the coral, algae and interface. Data extraction completed in R.

### BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions

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

---

## Parameters

Parameter	Description	Units
samp_num	core from which samples were taken	unitless
flow	flow speed (low/high)	unitless
light_dark	Light type (light or dark)	unitless
surface	surface over which measurements were taken (coral; algae; interaction)	unitless
net_pres	Presence or absence of net (Net or NoNet)	unitless
intr_oxy	surface oxygen concentration (%air saturation)	percent air saturation (%air saturation)
dbl_thick	Thickness of diffusive boundary layer	um (microns)

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

---

## Instruments

<b>Dataset-specific Instrument Name</b>	
<b>Generic Instrument Name</b>	Diving Mask and Snorkel
<b>Generic Instrument Description</b>	A diving mask (also half mask, dive mask or scuba mask) is an item of diving equipment that allows underwater divers, including, scuba divers, free-divers, and snorkelers to see clearly underwater. Snorkel: A breathing apparatus for swimmers and surface divers that allows swimming or continuous use of a face mask without lifting the head to breathe, consisting of a tube that curves out of the mouth and extends above the surface of the water.

<b>Dataset-specific Instrument Name</b>	PreSens needle microsensor oxygen probe
<b>Generic Instrument Name</b>	Oxygen Sensor
<b>Dataset-specific Description</b>	Oxygen concentration profiles were measured using a PreSens needle microsensor oxygen probe (diameter:
<b>Generic Instrument Description</b>	An electronic device that measures the proportion of oxygen (O <sub>2</sub> ) in the gas or liquid being analyzed

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

---

## Deployments

### Osenberg et al Moorea

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/644752">https://www.bco-dmo.org/deployment/644752</a>
<b>Platform</b>	Osenberg et al Moorea
<b>Start Date</b>	2003-05-19
<b>End Date</b>	2015-07-12

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

---

## Project Information

### Spatial patterns of coral-vermetid interactions: short-term effects and long-term consequences (Vermetids\_Corals)

**Coverage:** Moorea, French Polynesia (-17.48 degrees S, -149.82 degrees W)

#### *Description from NSF abstract:*

Ecological surprises are most likely to be manifest in diverse communities where many interactions remain uninvestigated. Coral reefs harbor much of the world's biodiversity, and recent studies by the investigators suggest that one overlooked, but potentially important, biological interaction involves vermetid gastropods. Vermetid gastropods are nonmobile, tube-building snails that feed via an extensive mucus net. Vermetids reduce coral growth by up to 80%, and coral survival by as much as 60%. Because effects vary among coral taxa, vermetids may substantially alter the structure of coral communities as well as the community of fishes and invertebrates that inhabit the coral reef.

The investigators will conduct a suite of experimental and observational studies that: 1) quantify the effects of four species of vermetids across coral species to assess if species effects and responses are concordant or idiosyncratic; 2) use meta-analysis to compare effects of vermetids relative to other coral stressors and determine the factors that influence variation in coral responses; 3) determine the role of coral commensals that inhabit the branching coral, Pocillopora, and evaluate how the development of the commensal assemblage modifies the deleterious effects of vermetids; 4) determine how vermetid mucus nets affect the local environment of corals and evaluate several hypotheses about proposed mechanisms; and 5) assess the long-term implications of vermetids on coral communities and the fishes and invertebrates that depend on the coral.

**Note:** The Principal Investigator, Dr. Craig W. Osenberg, was at the University of Florida at the time the NSF award was granted. Dr. Osenberg moved to the University of Georgia during the summer of 2014 ([current contact information](#)).

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

---

## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1130359</a>

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