Oxygen concentrations measured at increasing distances over coral-algal interactions at Moorea, French Polynesia (Vermetids_Corals project)

Website: https://www.bco-dmo.org/dataset/720960
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
Brown, Anya L.	University of Georgia (UGA)	Principal Investigator, Contact
Osenberg, Craig	University of Georgia (UGA)	Co-Principal Investigator
Biddle, Mathew	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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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).

Oxygen concentrations measured at increasing distances over coral-algal interactions in the presence and absence of vermetid mucus nets in the light, in low and high flow.

Related Datasets:

- BrownOsenberg_2018- Fluorescein dye: https://www.bco-dmo.org/dataset/717831
- BrownOsenberg_2018- FlDyeSurvey: https://www.bco-dmo.org/dataset/720777
- BrownOsenberg_2018- InitO2_DBLthick: https://www.bco-dmo.org/dataset/720822
- BrownOsenberg_2018- LightSensor: https://www.bco-dmo.org/dataset/720874
- BrownOsenberg_2018- OxygenConcentrations: https://www.bco-dmo.org/dataset/720960 (The current page.)

Methods & Sampling

Experiments and surveys were conducted in the field to determine how vermtetids 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.

Data Processing Description

BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- added ISO Date format generated from date and time values

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Parameters

Parameter	Description	Units
Height	Distance from the surface (starting at 0)	UNKNOWN (REQUESTING FROM SUBMITTER)
ID_15LNetHiAT	Core ID 15; Light; Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_15LNonHiAT	Core ID 15; Light; No Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_18LNetHiAT	Core ID 18; Light; Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_18LNonHiAT	Core ID 18; Light; No Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_20LNetHiAT	Core ID 20; Light; Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_20LNonHiAT	Core ID 20; Light; No Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_21LNetHiAT	Core ID 21; Light; Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_21LNonHiAT	Core ID 21; Light; No Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_22LNetHiAT	Core ID 22; Light; Net; High Flow; Algal Turf	micromole per liter (umol/L)

ID_22LNonHiAT	Core ID 22; Light; No Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_29LNetHiAT	Core ID 29; Light; Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_29LNonHiAT	Core ID 29; Light; No Net; High Flow; Algal Turf	micromole per liter (umol/L)
ID_5LNetLoAT	Core ID 5; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_5LNoNLoAT	Core ID 5; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_14LNetLoAT	Core ID 14; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_14LNoNLoAT	Core ID 14; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_15LNetLoAT	Core ID 15; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_15LNoNLoAT	Core ID 15; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_18LNetLoAT	Core ID 18; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_18LNoNLoAT	Core ID 18; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_20LNetLoAT	Core ID 20; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_20LNoNLoAT	Core ID 20; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_21LNetLoAT	Core ID 21; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_21LNoNLoAT	Core ID 21; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_22LNetLoAT	Core ID 22; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_22LNoNLoAT	Core ID 22; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)

ID_29LNetLoAT	Core ID 29; Light; Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_29LNoNLoAT	Core ID 29; Light; No Net; Low Flow; Algal Turf	micromole per liter (umol/L)
ID_14LNetHiCor	Core ID 14; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_14LNoNHiCor	Core ID 14; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_15LNetHiCor	Core ID 15; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_15LNoNHiCor	Core ID 15; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_18LNetHiCor	Core ID 18; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_18LNoNHiCor	Core ID 18; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_21LNetHiCor	Core ID 21; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_21LNoNHiCor	Core ID 21; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_22LNetHiCor	Core ID 22; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_22LNoNHiCor	Core ID 22; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_29LNetHiCor	Core ID 29; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_29LNoNHiCor	Core ID 29; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_37LNetHiCor	Core ID 37; Light; Net; High Flow; Coral	micromole per liter (umol/L)
ID_37LNoNHiCor	Core ID 37; Light; No Net; High Flow; Coral	micromole per liter (umol/L)
ID_15LNetLoCor	Core ID 15; Light; Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_15LNoNLoCor	Core ID 15; Light; No Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_18LNetLoCor	Core ID 18; Light; Net; Lo Flow; Coral	micromole per liter (umol/L)

ID_18LNoNLoCor	Core ID 18; Light; No Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_21LNetLoCor	Core ID 21; Light; Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_21LNoNLoCor	Core ID 21; Light; No Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_22LNetLoCor	Core ID 22; Light; Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_22LNoNLoCor	Core ID 22; Light; No Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_29LNetLoCor	Core ID 29; Light; Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_29LNoNLoCor	Core ID 29; Light; No Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_37LNetLoCor	Core ID 37; Light; Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_37LNoNLoCor	Core ID 37; Light; No Net; Lo Flow; Coral	micromole per liter (umol/L)
ID_5LNetHiInt	Core ID 5; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_5LNoNHiInt	Core ID 5; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_14LNetHiInt	Core ID 14; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_14LNoNHiInt	Core ID 14; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_15LNetHiInt	Core ID 15; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_15LNoNHiInt	Core ID 15; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_18LNetHiInt	Core ID 18; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_18LNoNHiInt	Core ID 18; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_20LNetHiInt	Core ID 20; Light; Net; High Flow; Interface	micromole per liter (umol/L)

ID_20LNoNHiInt	Core ID 20; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_21LNetHiInt	Core ID 21; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_21LNoNHiInt	Core ID 21; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_22LNetHiInt	Core ID 22; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_22LNoNHiInt	Core ID 22; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_29LNetHiInt	Core ID 29; Light; Net; High Flow; Interface	micromole per liter (umol/L)
ID_29LNoNHiInt	Core ID 29; Light; No Net; High Flow; Interface	micromole per liter (umol/L)
ID_5LNetLoInt	Core ID 5; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_5LNoNLoInt	Core ID 5; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)
ID_14LNetLoInt	Core ID 14; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_14LNoNLoInt	Core ID 14; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)
ID_15LNetLoInt	Core ID 15; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_15LNoNLoInt	Core ID 15; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)
ID_18LNetLoInt	Core ID 18; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_18LNoNLoInt	Core ID 18; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)
ID_20LNetLoInt	Core ID 20; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_20LNoNLoInt	Core ID 20; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)

ID_21LNetLoInt	Core ID 21; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_21LNoNLoInt	Core ID 21; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)
ID_22LNetLoInt	Core ID 22; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_22LNoNLoInt	Core ID 22; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)
ID_29LNetLoInt	Core ID 29; Light; Net; Low Flow; Interface	micromole per liter (umol/L)
ID_29LNoNLoInt	Core ID 29; Light; No Net; Low Flow; Interface	micromole per liter (umol/L)

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Instruments

Dataset-specific Instrument Name	PreSens needle microsensor oxygen probe
Generic Instrument Name	Oxygen Sensor
Dataset-specific Description	Oxygen concentration profiles were measured using a PreSens needle microsensor oxygen probe (diameter:
Generic Instrument Description	An electronic device that measures the proportion of oxygen (O2) in the gas or liquid being analyzed

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Deployments

Osenberg_et_al_Moorea

Website	https://www.bco-dmo.org/deployment/644752
Platform	Osenberg et al Moorea
Start Date	2003-05-19
End Date	2015-07-12

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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).

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1130359

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