

Barnacle respiration data from University of Washington Friday Harbor Laboratories, Friday Harbor WA, Cantilever Point; 2010-2013 (Intertidal Temp Effects project)

Website: <https://www.bco-dmo.org/dataset/505843>

Version: 28 March 2014

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Project

» [The effects of temperature on ecological processes in a rocky intertidal community: a mechanistic approach](#)
(Intertidal Temp Effects)

Contributors	Affiliation	Role
Carrington, Emily	University of Washington (FHL)	Principal Investigator
Nishizaki, Michael T.	University of Guelph	Contact
Gegg, Stephen R.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

Barnacle Respiration - Experiment examining effects of water temperature and velocity on barnacle respiration.

Methods & Sampling

Oxygen concentrations were measured using a fiber-optic oxygen sensor equipped with a needle-like probe tip of 1.5 mm diameter (FOXY-R, Ocean Optics, Dunedin, FL, USA). Water velocities along the centerline of the testing chamber were estimated by tracking the displacement of glass microbeads at each flow setting (mean particle diameter = 9 μ m, density = 2.0 g cm⁻³, Potters Industries, Malvern, PA, USA). Water temperatures were regulated with a re-circulating water chiller (0.1C; Ecoline RE 106, Lauda, Germany).

Related files and references: Michael T. Nishizaki and Emily Carrington. (in press). The effect of water temperature and flow on respiration in barnacles: patterns of mass transfer versus kinetic limitation *J Exp Biol*
<http://jeb.biologists.org/content/early/2014/03/04/jeb.101030.abstract>

Data Processing Description

BCO-DMO Processing Notes

- Generated from original file "Data_archive_respiration2.xlsx" contributed by Michael Nishizaki
- Approx Lat/Lon of FHL appended to enable data discovery in MapServer
- Parameter names edited to conform to BCO-DMO naming convention found at [Choosing Parameter Name](#)

Data Files

File
Respiration.csv (Comma Separated Values (.csv), 3.82 KB) MD5:ac19ec08387150c48baa5b80d8fc6c5c
Primary data file for dataset ID 505843

Parameters

Parameter	Description	Units
Lab_Id	Laboratory identifier where experiments were conducted	text
Lat	Latitude position of platform (South is negative)	decimal degrees
Lon	Longitude position of platform (West is negative)	decimal degrees
Temperature	Water temperature	degrees C
Water_velocity	Water velocity	cm/s
Respiration_AVG	Respiration average	umol/g/h
Respiration_SE	Respiration Std Err	umol/g/h
Extended_beating_AVG	Extended beating average	percentage
Abbreviated_beating_AVG	Abbreviated beating average	percentage
Extended_beating_SE	Extended beating Std Err	percentage
Abbreviated_beating_SE	Abbreviated beating Std Err	percentage
Reynolds_number	Reynolds number	dimensionless
Sherwood_1	Sherwood 1	dimensionless
Sherwood_2	Sherwood 2	dimensionless

Instruments

Dataset-specific Instrument Name	Dissolved Oxygen Sensor
Generic Instrument Name	Oxygen Sensor
Dataset-specific Description	Oxygen concentrations were measured using a fiber-optic oxygen sensor equipped with a needle-like probe tip of 1.5 mm diameter (FOXY-R, Ocean Optics, Dunedin, FL, USA).
Generic Instrument Description	An electronic device that measures the proportion of oxygen (O2) in the gas or liquid being analyzed

Deployments

lab_UW_FHL_OAEL_Carrington

Website	https://www.bco-dmo.org/deployment/59061
Platform	lab UW FHL OAEL
Report	http://depts.washington.edu/fhl/oael.html
Start Date	2010-09-01
End Date	2013-08-31
Description	FHL Ocean Acidification Environmental Laboratory (OAEL) Overview FHL completed construction of a new 1500 sq. ft. experimental facility for ocean acidification research in summer 2011. The facility was funded by an award from NSF's Field Stations and Marine Laboratories (FSML) program, matching funds from the University of Washington, and private donors. The experimental facility currently includes an analytical chemistry laboratory, indoor mesocosms fed by a custom seawater-CO2 blending system and temperature control, laboratory space, as well as outdoor in-water mesocosms. Led by Dr. Emily Carrington, OAEL Director (ecarring@uw.edu), this state-of-the-art ocean acidification facility offers unique research and instructional opportunities for experimental manipulations with on-site monitoring of carbonate system parameters. FHL's location, facilities, and educational mission combine to make an ideal site for the experimental mesocosm and analytical facility.

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Project Information

The effects of temperature on ecological processes in a rocky intertidal community: a mechanistic approach (Intertidal Temp Effects)

Website: <http://depts.washington.edu/nucella/>

Coverage: San Juan Islands, Washington, USA

(Extracted from the NSF Award abstract)

Temperature influences organismal physiology, behavior, community interactions, and ecosystem function; yet rarely are the mechanisms understood. Accurately predicting the consequences of temperature for a species requires knowledge of: local climatic conditions, the relationship between climate and organismal body temperature, and the physiological and ecological consequences of body temperature. Few studies to date have explored all three areas concurrently. This project will examine in detail the biophysical, physiological, and ecological effects of temperature on a rocky intertidal community, a marine ecosystem that has emerged as a model system for studying the ecological consequences of temperature. It will focus on three major species, representative of rocky marine shore species worldwide: the barnacle, *Balanus glandula*, its predator *Nucella ostrina*, and the rockweed *Fucus gardneri*, which provides shelter for both species. The research is centered around three major goals: to develop biophysical models to explicitly link local climate to organismal body temperatures; to develop energy budget models to relate organismal body temperature to individual performance; and to identify the effect of temperature on interactions among the three species through a series of laboratory and field experiments. This research will provide a model system for understanding the effects of temperature on both individual performance and species interactions. It represents a significant contribution to understanding basic ecological questions, such as the role of temperature in structuring communities, and will also contribute to a more mechanistic understanding of the ecological consequences of future climate changes.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0824903

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