Snail foraging and temperature: maximum temperature 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/553753
Version: 16 March 2015
Version Date: 2015-03-16

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

Contributors	Affiliation	Role
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Dataset Description

Experimental shoreline data on snail foraging, temperature, and tidal cycling - Max Temps Data

Methods & Sampling

Experimental field experiment conducted in rocky intertidal. Please see related reference.

Related files and reference:
Hayford HA, SE Gilman, and E Carrington (2015) Foraging behavior minimizes heat exposure in a complex thermal landscape. Marine Ecology Progress Series. 518:165-175

Data Processing Description

See related files and reference:
Hayford HA, SE Gilman, and E Carrington (2015) Foraging behavior minimizes heat exposure in a complex thermal landscape. Marine Ecology Progress Series. 518:165-175

BCO-DMO Processing Notes
- Generated from original file "Fig 2 473867 HH 3-16-15.xlsx", Sheet: "Fig 2b" contributed by Hilary Hayford
- Approx Lat/Lon of experiment locale appended to enable data discovery in MapServer
- Date formatted as YYYYMMDD
- Time formatted as HHMM

- Parameter names edited to conform to BCO-DMO naming convention found at Choosing Parameter Name

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Data Files

File
Max_Temps.csv (Comma Separated Values (.csv), 7.00 KB) MD5:20e2d388dc28c2fb8f1c95222396bc58 Primary data file for dataset ID 553753

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Parameters

Parameter	Description	Units
Experiment_Location	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
date	date of measurement	YYYYMMDD
block_1W_Tmax	maximum temperature of block 1 substrate - western face	degrees C
block_2W_Tmax	maximum temperature of block 2 substrate - western face	degrees C
block_3W_Tmax	maximum temperature of block 3 substrate - western face	degrees C
block_4W_Tmax	maximum temperature of block 4 substrate - western face	degrees C
block_5W_Tmax	maximum temperature of block 5 substrate - western face	degrees C
block_1E_Tmax	maximum temperature of block 1 substrate - eastern face	degrees C
block_2E_Tmax	maximum temperature of block 2 substrate - eastern face	degrees C
block_3E_Tmax	maximum temperature of block 3 substrate - eastern face	degrees C
block_4E_Tmax	maximum temperature of block 4 substrate - eastern face	degrees C
block_5E_Tmax	maximum temperature of block 5 substrate - eastern face	degrees C

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Instruments

Dataset-specific Instrument Name	HOBO TidBit v.2
Generic Instrument Name	Onset HOBO TidbiT v2 (UTBI-001) temperature logger
Dataset-specific Description	Temperatures of the eastern and western faces of each block were recorded at 2 min intervals by one Hobo Tidbit v. 2 datalogger (Onset Computer) per face, adjacent to barnacle prey.
Generic Instrument Description	A temperature logger that measures temperatures over a wide temperature range. It is designed for outdoor and underwater environments and is waterproof to 300 m. A solar radiation shield is required to obtain accurate air temperature measurements in sunlight (RS1 or M-RSA Solar Radiation Shield). With an operational temperature range between -20 degrees Celsius and +70 degrees Celsius, the TidbiT v2 has an accuracy of +/-0.21 and a resolution of 0.02 degrees Celsius.

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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

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.

This research will promote a broader understanding of how temperature affects organisms and communities among scientists, students, and the general public in at least four ways. First, the research themes address a basic, yet poorly resolved, question in ecology: the influence of temperature on organismal performance and species interactions. This multiscale, integrated approach has the potential to transform current paradigms of how environmental change affects species and communities. Understanding the role of temperature in structuring communities is directly relevant to Biological Oceanography's special emphasis on biological diversity in marine systems. Second, the project is highly interdisciplinary by nature, and will forge new research partnerships among three female scientists (the PI, a postdoc, and a collaborator at an RUI institution) and will provide new educational opportunities for several graduate and undergraduate students. The investigators will offer undergraduate research opportunities to underrepresented groups with their continued participation in the FHL Blinks Program to Enhance Diversity each summer, and expect to provide several REU experiences as well (separate NSF proposal resubmission pending). Third, The PI will incorporate research results and techniques into her undergraduate and graduate courses at FHL and the UW Seattle campus. The FHL undergraduate course integrates public outreach into the curriculum; these activities are part of FHL's broader Science Outreach Program that promotes science education and environmental stewardship. Finally, the results of this project will be incorporated into ongoing conservation and monitoring efforts conducted in the upper Puget Sound region by the University of Washington and the Friday Harbor Laboratories. The project will also enhance understanding of the ecological consequences of climate change, a significant societal problem.

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Funding

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

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