Ocean temperature from Onset loggers at 7 sites in the Galápagos archipelago collected from March 2018 to August 2020

Website: https://www.bco-dmo.org/dataset/838851
Data Type: Other Field Results
Version: 1
Version Date: 2021-01-27

Project
» The Role of Temperature in Regulating Herbivory and Algal Biomass in Upwelling Systems (Temperature and Herbivory)

Contributors	Affiliation	Role
Bruno, John	University of North Carolina at Chapel Hill (UNC-Chapel Hill)	Principal Investigator
Rauch, Shannon	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Ocean temperature from Onset loggers at 7 sites in the Galápagos archipelago collected from March 2018 to August 2020. These data are published in Figure 3 of Romero et al., 2021 (doi: 10.1007/s00227-021-03836-9).

Table of Contents

Coverage

Spatial Extent: **N**:0.543972 **E**:-82.581667 **S**:-1.291444 **W**:-91.435833
Temporal Extent: 2018-03-26 - 2020-08-26

Methods & Sampling

Onset HOBO U22-001 Underwater Temperature Data Loggers were placed on the benthos at 8 m depth by attaching them to a stainless steel eye bolt.

Data Processing Description

Data Processing:
Hoboware Version 3.7.21 and R Studio Version 1.1.383 were used to process data.

BCO-DMO Processing:
- changed Date_Time column to ISO8601 format: YYYY-MM-DDThh:mmZ

[table of contents | back to top]

Data Files

File
temperature_logger.csv (Comma Separated Values (.csv), 4.28 MB) MD5:c9c494f154791270e4572624bd4504d9 Primary data file for dataset ID 838851

[table of contents | back to top]

Related Publications

Silva Romero, I., Bruno, J. F., Silbiger, N. J., & Brandt, M. (2021). Local conditions influence thermal sensitivity of pencil urchin populations (Eucidaris galapagensis) in the Galápagos Archipelago. Marine Biology, 168(3). doi:10.1007/s00227-021-03836-9
Results

[table of contents | back to top]

Parameters

Parameter	Description	Units
Measurement	Measurement ID number	unitless
Date_Time	Date and time (GMT); format: YYYY-MM-DDThh:mmZ	unitless
Temp_C	Water temperature	degrees Celsius
Site	Site name	unitless
Lat	Latitude	degrees North
Long	Longitude	degrees East

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	Onset HOBO U22-001 Underwater Temperature Data Logger
Generic Instrument Name	Onset HOBO Pro v2 temperature logger
Generic Instrument Description	The HOBO Water Temp Pro v2 temperature logger, manufactured by Onset Computer Corporation, has 12-bit resolution and a precision sensor for ±0.2°C accuracy over a wide temperature range. It is designed for extended deployment in fresh or salt water. Operation range: -40° to 70°C (-40° to 158°F) in air; maximum sustained temperature of 50°C (122°F) in water Accuracy: 0.2°C over 0° to 50°C (0.36°F over 32° to 122°F) Resolution: 0.02°C at 25°C (0.04°F at 77°F) Response time: (90%) 5 minutes in water; 12 minutes in air moving 2 m/sec (typical) Stability (drift): 0.1°C (0.18°F) per year Real-time clock: ± 1 minute per month 0° to 50°C (32° to 122°F) Additional information (http://www.onsetcomp.com/) Onset Computer Corporation 470 MacArthur Blvd Bourne, MA 02532

[table of contents | back to top]

Deployments

2018-08_Bruno

Website	https://www.bco-dmo.org/deployment/838840
Platform	R/V Queen Mabel
Description	August 2018 research cruise in the Galápagos archipelago aboard the vessel Queen Mabel.

[table of contents | back to top]

Project Information

The Role of Temperature in Regulating Herbivory and Algal Biomass in Upwelling Systems (Temperature and Herbivory)

Website: http://github.com/johnfbruno/Galapagos_NSF.git

NSF Award Abstract:
A well-known pattern in coastal marine systems is a positive association between the biomass of primary producers and the occurrence or intensity of upwelling. This is assumed to be caused by the increase in nutrient concentration associated with upwelling, enabling higher primary production and thus greater standing algal biomass. However, upwelling also causes large, rapid declines in water temperature. Because the metabolism of fish and invertebrate herbivores is temperature-dependent, cooler upwelled water could reduce consumer metabolism and grazing intensity. This could in turn lead to increased standing algal biomass. Thus upwelling could influence both bottom-up and top-down control of populations and communities of primary producers. The purpose of this study is to test the hypothesis that grazing intensity and algal biomass are, in part, regulated by temperature via the temperature-dependence of metabolic rates. Broader impacts include the training and retention of minority students through UNC's Course Based Undergraduate Research program, support of undergraduate research, teacher training, and various outreach activities.

The investigators will take advantage of the uniquely strong spatiotemporal variance in water temperature in the Galápagos Islands to compare grazing intensity and primary production across a natural temperature gradient. They will combine field monitoring, statistical modeling, grazing assays, populations-specific metabolic measurements, and in situ herbivore exclusion and nutrient addition to measure the effects of temperature on pattern and process in shallow subtidal communities. The researchers will also test the hypothesis that grazer populations at warmer sites and/or during warmer seasons are less thermally sensitive, potentially due to acclimatization or adaptation. Finally, the investigators will perform a series of mesocosm experiments to measure the effect of near-future temperatures on herbivores, algae, and herbivory. This work could change the way we view upwelling systems, particularly how primary production is regulated and the temperature-dependence of energy transfer across trophic levels.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1737071

[table of contents | back to top]