

Water temperature at coral colony locations in American Samoa between 2013 and 2016 (Mass Bleaching American Samoa project)

Website: <https://www.bco-dmo.org/dataset/676132>

Data Type: Other Field Results

Version: 1

Version Date: 2017-01-24

Project

» [Ecological, evolutionary and physiological responses of corals to a mass bleaching event in American Samoa](#)
(Bleaching American Samoa)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: N:-14.173292 E:-169.647579 S:-14.1835 W:-169.66109

Temporal Extent: 2013-01-04 - 2016-08-21

Dataset Description

This dataset includes water temperature at the time of sampling for coral colonies in American Samoa between 2013-01-04 and 2016-08-21.

Methods & Sampling

Temperature data was collected using Hobo Pendant data logger which collected temperature every 10 minutes for deployments between 2013 to 2016.

The data parameter "transect" refers to where the sample was collected. There are 10 transects in each pool. Pool (300/400) refers to the geographic pools as detailed in Craig et al. (2001).

Data Processing Description

Temperature data from individual hobos was aligned by date and time for comparison across multiple colonies.

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Data Files

File
water_temps.csv (Comma Separated Values (.csv), 519.92 MB) MD5:acea7a57cfeffa4f4e0b1afb374d8e2d
Primary data file for dataset ID 676132

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Related Publications

Craig, P., Birkeland, C., & Belliveau, S. (2001). Erratum to: High-temperatures tolerated by a diverse assemblage of shallow-water corals in American Samoa. *Coral Reefs*, 20(4), 433–433. doi:[10.1007/s00338-001-0196-3](https://doi.org/10.1007/s00338-001-0196-3)

Methods

Ruiz-Jones, L., & Palumbi, S. (2016, August 21). Field coral transcriptomics. Retrieved from <https://osf.io/9h5pq/>

Related Research

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Parameters

Parameter	Description	Units
colony_tag	Individual identifier for a coral colony	unitless
species	Scientific name	unitless
colony_code	Colony code made up of a two letter scientific name shorthand and the colony tag	unitless
transect	The transect number where the sample was collected. See acquisition description section for more details.	unitless
pool	Geographic pool as detailed in Craig et al. (2001); see acquisition description for more details	unitless
latitude	Latitude of coral colony	decimal degrees
longitude	Longitude of coral colony	decimal degrees
bleach_percent	Bleaching score (percent bleached) in April 2015	unitless
deployment_id	deployment date range (start date yyyy-mm - end date yyyy-mm)	unitless
date	Date of temperature sample in format yyyy-mm-dd	unitless
time	Time of temperature sample in format hh:mm	unitless
ISO_DateTime_UTC	Timestamp based on the ISO 8601:2004(E) standard in format YYYY-mm-ddTHH:MM:SS[.xx]Z (UTC)	unitless

Instruments

Dataset-specific Instrument Name	Hobo Pendant data logger
Generic Instrument Name	Temperature Logger
Generic Instrument Description	Records temperature data over a period of time.

Deployments

Palumbi_AmSamoa_2013-2015

Website	https://www.bco-dmo.org/deployment/676237
Platform	American_Samoa
Start Date	2013-01-04
End Date	2015-08-21
Description	Coral colony samples, temperature, DNA/RNA, bleaching metrics.

Project Information

Ecological, evolutionary and physiological responses of corals to a mass bleaching event in American Samoa (Bleaching American Samoa)

Coverage: American Samoa

Description from NSF award abstract:

The strongest coral bleaching event in nearly 20 years began in American Samoa in January 2015. Coral bleaching occurs when ocean water temperatures exceed a coral's normal heat tolerance. But bleaching events usually show an unexplained pattern - colonies next to one another can show very different levels of bleaching - from pure white to the normal tan color of a healthy coral. The investigators have observed this pattern among 280 corals on reefs in American Samoa that have been studied for years. This system will be used to test four major hypotheses about what causes some corals to bleach and some not: differences in 1) species, 2) the temperature the corals experienced, 3) the symbiont they harbor, and 4) the genotype of the coral host. In addition, the investigators will return to American Samoa at regular intervals to measure the rate of recovery of each coral colony and conduct the same tests as above for recovery rate. The stark-white reefs left behind by bleaching events are one of the most common signals of increased ocean warming. This work will take advantage of years of prior study and the advent of a coral bleaching event to understand the rules for survival on reefs.

The reefs of American Samoa began showing a major bleaching event starting in January 2015, including 62 corals that have been intensively studied for coral thermal resistance, field temperatures, and symbiont type. In April 2015 the investigators monitored bleaching status of these and additional corals, totaling 280 corals from four species, and uncovered marked variation in bleaching extent within and between species and within and between reef regions. The team will test the relative importance of microclimate to bleaching state by examining records of approximately 50 temperature loggers in place since before the bleaching event. They will test the influence of symbiont type and host gene expression profiles by examining samples of 60 colonies taken at four time points after bleaching. The investigators will also examine the full suite of 280 corals for genetic variation to estimate the relationship between bleaching state, recovery rate and genetic polymorphism. These data will be used to test micro-climate, symbiont, and coral genetics as determinants of

bleaching and bleaching recovery. Because the investigators have samples from these 280 colonies before bleaching mortality, this study will provide the first estimate for the evolutionary impact of a bleaching event on coral populations.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1547921

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