

# Temperature time-series data from 4 depths in the Central California kelp forest, measured at the Stillwater Cove Mooring from 2010-2012 (Climate Change Kelp project)

Website: <https://www.bco-dmo.org/dataset/4049>

Data Type: Other Field Results

Version: 1

Version Date: 2014-01-24

## Project

» [Effects of ocean climate change on recruitment of kelp populations](#) (Climate Change Kelp)

Contributors	Affiliation	Role
<a href="#">Graham, Michael H</a>	Moss Landing Marine Laboratories (MLML)	Principal Investigator
<a href="#">Harley, Christopher</a>	University of British Columbia (UBC-Zoo)	Co-Principal Investigator
<a href="#">Muth, Arley</a>	Moss Landing Marine Laboratories (MLML)	Contact
<a href="#">Rauch, Shannon</a>	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

## Abstract

Temperature data from 4 depths at the study site in the giant kelp forest habitat of the Central California Coast. Temperature was recorded every 5 minutes from June 2010 to October 2012.

---

## Table of Contents

- [Coverage](#)
  - [Dataset Description](#)
    - [Acquisition Description](#)
    - [Processing Description](#)
  - [Parameters](#)
  - [Instruments](#)
  - [Deployments](#)
  - [Project Information](#)
  - [Funding](#)
-

## Coverage

**Spatial Extent:** Lat:36.560731 Lon:-121.9459

**Temporal Extent:** 2010-06-14 - 2012-09-28

---

## Dataset Description

Temperature data from 4 depths at the study site in the giant kelp forest habitat of the Central California Coast. Temperature was recorded every 5 minutes from June 2010 to October 2012.

## Acquisition Description

Onset Stowaway Tidbits (+/- 0.2C) were positioned at 0.5, 4.8, 8, and 13.5 m along a mooring line at the study site. The loggers were set to record temperature every 5 minutes and were swapped out approximately every 3 months by divers.

Related publications and references:

Fox, M.D. 2013 Resource translocation drives  $\delta^{13}\text{C}$  fractionation during recovery from disturbance in giant kelp, *Macrocystis pyrifera*. *Journal of Phycology* 49(5), 811-815. DOI: [10.1111/jpy.12099](https://doi.org/10.1111/jpy.12099)

## Processing Description

Data were downloaded in the lab and converted to tab delimited text files. Data were quality controlled and trimmed to fit accurate temperature recordings and cut to minimize the data gaps between collection and deployment of new loggers. After deployment the loggers took approximately 2 hours to equilibrate to ambient water temperature. Comparison between the temperature data on a logger just prior to collection and the temperature data at the time of deployment for a logger collected the following month were used to identify accurate data measurements and outliers were removed from the data set. Occasionally an entire record for a particular depth was lost due to instrument failure.

Files were named labeled with a letter indicating which depth in the water column they were collected (S=surface (0.5 m), T=top (4.8 m), M=Middle (8 m), B=bottom (13.5 m)). Dates in the file names indicate the dates of deployment to retrieving the tidbits.

Missing Dates:

Surface - June 2010 to September 2010

Top - July 2012 to September 2012

## Parameters

Parameter	Description	Units
site	Name of the study site.	text
site_descrip	Description of the study site.	text
lat	Latitude of the study site.	decimal degrees
lon	Longitude of the study site.	decimal degrees
depth	Depth in the water column at which the temperature logger was positioned.	meters
depth_comment	Description of the depth within the water column at which the temperature logger was positioned.	text
month_local	2-digit month (Pacific Standard Time) of the temperature record.	mm (01 to 12)
year_local	4-digit year (Pacific Standard Time) of the temperature record.	YYYY
day_local	2-digit day (Pacific Standard Time) of the temperature record.	dd (01 to 31)
time_local	Local time (Pacific Standard Time) in hours, minutes, and decimal minutes of the temperature record.	HHMM.mm
temp	Water temperature in degrees Celsius.	degrees Celsius
ISO_DateTime_Local	Date and time formatted to ISO8601 standard. Dates and times are local (Pacific Standard Time).	YYYY-mm-ddTHH:MM:SS.ss
yday_local	Local day and decimal time, as 326.5 for the 326th day of the year at noon, or November 22 at 1200 hours.	dimensionless

## Instruments

<b>Dataset-specific Instrument Name</b>	Water Temperature Sensor
<b>Generic Instrument Name</b>	Water Temperature Sensor
<b>Dataset-specific Description</b>	Onset Stowaway Tidbits (+/- 0.2C) were deployed at 0.5, 4.8, 8, and 13.5 meters depth.
<b>Generic Instrument Description</b>	General term for an instrument that measures the temperature of the water with which it is in contact (thermometer).

[ [table of contents](#) | [back to top](#) ]

---

## Deployments

### SCove\_Moor\_MHG

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/59094">https://www.bco-dmo.org/deployment/59094</a>
<b>Platform</b>	Stillwater Cove Mooring
<b>Start Date</b>	2010-06-14
<b>End Date</b>	2012-10-03
<b>Description</b>	Onset Stowaway Tidbits (+/- 0.2C) were positioned at 0.5, 4.8, 8, and 13.5 m along a mooring line.

[ [table of contents](#) | [back to top](#) ]

---

## Project Information

### Effects of ocean climate change on recruitment of kelp populations (Climate Change Kelp)

NSF Award Abstract: Kelps inhabit a narrow band of the Earth's ocean margins, yet they sustain some of the most diverse and productive ecosystems on the planet. Despite over 50 years of intensive field and laboratory research, however, much remains to be understood about the processes that determine the dynamics of kelp populations, and the subsequent

consequences for the diversity and productivity of their associated communities. This limitation is due largely to the fact that processes regulating kelp system productivity, dynamics, and diversity are determined by how different kelp species interact with environmental variability over ecological and evolutionary timescales. In the face of imminent ocean climate change, how will individual kelp taxa respond to rising ocean temperatures or decreasing nutrients? This project will use a combination of laboratory and field studies to understand interactive effects of changing temperature and nutrients on gametogenesis, fertilization, and sporophyte recruitment of kelp. This project will use 9 kelp taxa from California, British Columbia, Australia, Mexico, South Africa, and Chile to test for local adaptation vs. phylogenetic patterns in these traits and to understand whether the level of stress experienced by a population determines regional tolerance patterns. The project will integrate research activities into a novel curriculum at Moss Landing Marine Laboratory and will involve students in laboratory and field studies. These activities will help students to develop good laboratory skills and facilitate the development of critical-thinking as it pertains to the comparative analysis of kelp life histories, conceptual models of life history evolution, and ecological implications of climate change. Publications resulting from this research: Demes, K.W., Graham, M.H., and Suskiewicz, T.S. 2009. Phenotypic plasticity reconciles incongruous molecular and morphological taxonomies: The giant kelp, *Macrocystis* (Laminariales, Phaeophyceae), is a monospecific genus. *Journal of Phycology*, v.45, p. 1266. doi: 10.1111/j.1529-8817.2009.00752.x Demes, K. W. and Graham, M. H. 2011. Abiotic regulation of investment in sexual versus vegetative reproduction in the clonal kelp *Laminaria sinclairii* (Laminariales, Phaeophyceae). *Journal of Phycology*, v.47. doi: 10.1111/j.1529-8817.2011.00981.x Henriquez, L.A., Buschmann, A.H., Maldonado, M.A., Graham, M.H., Hernandez-Gonzalez, M.C., Pereda, S.V., and Bobadilla, M.I. 2011. Grazing on giant kelp microscopic phases and the recruitment success of annual populations of *Macrocystis pyrifera* (Laminariales, Phaeophyceae) in southern Chile. *Journal of Phycology*, v.47, p. 252. doi: 10.1111/j.1529-8817.2010.00955.x

[ [table of contents](#) | [back to top](#) ]

---

## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-0752523</a>

[ [table of contents](#) | [back to top](#) ]