# Weather Station data from University of Washington Friday Harbor Laboratories, Friday Harbor WA, Cantilever Point from 2006 to 2021

**Website**: https://www.bco-dmo.org/dataset/491262
**Data Type**: Other Field Results
**Version**: 3
**Version Date**: 2022-08-16

## 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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## Abstract
This dataset includes parameters measured by a weather station at the University of Washington Friday Harbor Laboratories, Friday Harbor WA, Cantilever Point from 2006 to 2021.

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## Coverage

**Spatial Extent**: **Lat**:48.5461 **Lon**:-123.007
**Temporal Extent**: 2006-08-11 - 2021-12-31

## Dataset Description

Data are collected at the Friday Harbor Laboratories (FHL) Weather Station University of Washington Friday Harbor Laboratories, Friday Harbor WA, Cantilever Point (Latitude = 48.5461 North; Longitude = -123.007 East).

**Methods & Sampling**

**Data Gaps: all data streams**
- June 20, 2007 to October 28, 2007: Lost data/failure to log data.
- November 25, 2009 to December 2, 2010: Weather station repaired after electrical storm.
- July 13, 2012 to July 27, 2012: Weather station repaired after electrical storm.

**Data Gaps: Total Radiation**
There are several gaps in the Total Radiometer data stream, due to instrument maintenance issues. These gaps are all filled with "nd":
- 2006 to August, 24 2009 23:59 software issue (calculation error)
- May 21, 2014 14:45 to May 22, 2014 9:45
- December 29, 2015 5:45 to January 3, 2016 12:15
- October 6, 2016 onward due to maintenance difficulties, the Total Radiometer was removed permanently.

**Data calibration: Solar Radiation_PAR**
The Solar Radiation_PAR meter drifted out of calibration from 2013 to 2021, evidenced by a steady decline in slope when the data were plotted against Solar Radiation_Energy. Rad_PAR were adjusted in these years using an annual correction factor that restored the expected linear relationship between Rad_PAR and Rad_Energy (2.112, the mean of slopes from 2006-2012). The correction factor for each year is a follows: 2013: 1.189, 2014: 1.235, 2015: 1.252, 2016: 1.254, 2017: 1.320, 2018: 1.336, 2019: 1.406, 2020: 1.366, 2021: 1.364.

**Data availability:**
These data are live streamed to the FHL website: http://wx.fhl.washington.edu/vdv/VV_Frame.php
These data are also archived in near real-time at NANOOS (http://nvs.nanoos.org/Explorer) as asset FHL_friharbor1.

The data available here at BCO-DMO differ from the above in that they are presented in yearly blocks and have been fully verified.

**Data Processing Description**

**BCO-DMO Processing Notes:**
**Version 1:**
- Generated from original files contributed by Emily Carrington and Emily Roberts;
- Approx Lat/Lon of FHL Weather Station appended to enable data discovery in MapServer;
- Time Stamp split into separate Date and Time fields;
- Date formatted as YYYYMMDD;
- Time formatted as hhmmss;
- Parameter names were edited to conform to BCO-DMO naming conventions.

**Version 2; updated on 2017-08-30:**
- Additional data from 2015-01-01 through 2017-06-30 submitted by Emily Carrington;
- Time Stamp split into separate Date and Time fields;
- Date formatted as YYYYMMDD;
- Time formatted as hhmmss;
- Parameter names were edited to conform to BCO-DMO naming conventions;
- All "NaN" and "NAN" values were converted to "nd" to be compliant with the BCO-DMO system.

**Version 3; updated on 2022-08-16:**
- Generated from original files contributed by Emily Carrington and Grace Leuchtenberger;
- replaced #N/A" and "#VALUE!" with "nd" (no data);
- concatenated all files (one per year) into one dataset;
- converted all Time values to hhmmss format;
- added ISO8601 date-time fields (local and UTC);
- added Platform_Id, Lat, and Lon to the data;
- renamed fields to comply with BCO-DMO naming conventions.

## Data Files

| File |
| --- |
| **FHL_Weather_All.csv** (Comma Separated Values (.csv), 70.00 MB)<br>MD5:41459a2a9e44fc5033b5c099ffd4dc85<br><br>Primary data file for dataset ID 491262 |

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## Parameters

| Parameter | Description | Units |
| --- | --- | --- |
| Platform_ID | Name of data collection platform/site | unitless |
| Lat | Latitude position of platform (South is negative) | degrees North |
| Lon | Longitude position of platform (West is negative) | degrees East |
| Year | 4-digit year of data collection | unitless |
| ISO_DateTime_UTC | Date and time (UTC) in ISO8601 format: YYYY-MM-DDThh:mm:ssZ | unitless |
| ISO_DateTime_PST | Date and time (local time zone of PST) in ISO8601 format: YYYY-MM-DDThh:mm:ss | unitless |
| Date_PST | Date (local time zone of PST) in format YYYYMMDD | unitless |
| Time_PST | Time (local time zone of PST) in format hhmmss | unitless |
| Air_Temp | Air Temperature; averaged over 15 minutes; sampled every 30 seconds | degrees Celsius |
| RH | Relative humidity; averaged over 15 minutes; sampled every 30 seconds | percent (%) |
| Rad_PAR | Solar Radiation_PAR; averaged over 15 minutes; sampled every 30 seconds | micromoles per square meter per second (? mol m-2 s-1) |
| Rad_Energy | Solar Radiation_Energy; averaged over 15 minutes; sampled every 30 seconds | watts per square meter (W m-2) |
| Rad_tot | Total Radiation (solar + sky); averaged over 15 minutes; sampled every 30 seconds. Note: Total Radiation Energy parameter data are not good until August 25th 2009 (values before then are "nd"); caused by software issue (calculation error) | watts per square meter (W m-2) |
| Rain | Rainfall; total over 15 minutes; sampled every 30 seconds | millimeters (mm) |
| Wind_speed | Wind Speed; averaged over 15 minutes; sampled every 30 seconds | meters per second (m s-1) |
| Wind_direction | Wind direction; averaged over 15 minutes; sampled every 30 seconds | degrees (relative to true N) |
| Wind_Chill | Wind Chill; averaged over 15 minutes; sampled every 30 seconds | degrees Celsius |

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## Instruments

| Dataset-specific Instrument Name | Friday Harbor Labs - Weather Station |
|---|---|
| Generic Instrument Name | Automated Weather Station |
| Dataset-specific Description | FHL Weather Station Contact: Emily Carrington (ecarring@uw.edu) University of Washington Friday Harbor Laboratories Friday Harbor WA, Cantilever Point Lat = 48.5461 Long = -123.007 |
| Generic Instrument Description | Land-based AWS systems are designed to record meteorological information. |

## Deployments

**FHL_WeatherStation**

| Website | https://www.bco-dmo.org/deployment/491259 |
|---|---|
| Platform | Friday_Harbor |
| Report | https://depts.washington.edu/fhl/wx.html |
| Start Date | 2006-08-11 |
| End Date | 2017-06-30 |
| Description | FHL Weather Station Contact: Emily Carrington University of Washington Friday Harbor Laboratories Friday Harbor WA, Cantilever Point Lat = 48.5461    Long = -123.007 Data Gaps Jun 20 2007 - Oct 28 2007: Lost data/failure to log data Nov 25 2009 - Dec 2 2010: Weather station repaired after electrical storm July 13 2012 - July 27 2012: Weather station repaired after electrical storm |

## 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.

## Funding