

# pCO<sub>2</sub> and temperature recorded from 2018-2020 from a sensor array that measures pH, pCO<sub>2</sub>, temperature, salinity, dissolved oxygen, chlorophyll, turbidity, and current velocity at Friday Harbor Laboratories Ocean Observatory (FHLOO)

**Website:** <https://www.bco-dmo.org/dataset/808567>

**Data Type:** Other Field Results

**Version:** 1

**Version Date:** 2020-05-12

## Project

» [FSML: Instrumentation at UW Friday Harbor Laboratories for Studies of the Biological Impacts of Ocean Acidification and Ocean Change](#) (FHLOO)

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## Abstract

pCO<sub>2</sub> and temperature recorded from 2018-2020 from a sensor array that measures pH, pCO<sub>2</sub>, temperature, salinity, dissolved oxygen, chlorophyll, turbidity, and current velocity at Friday Harbor Laboratories Ocean Observatory (FHLOO).

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## Coverage

**Spatial Extent:** Lat:48.5461 Lon:-123.007

**Temporal Extent:** 2018-01-31 - 2020-05-06

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## Dataset Description

pCO<sub>2</sub> and temperature recorded from 2018-2020 from a sensor array that measures pH, pCO<sub>2</sub>, temperature, salinity, dissolved oxygen, chlorophyll, turbidity, and current velocity at Friday Harbor Laboratories Ocean Observatory (FHLOO).

## Acquisition Description

Data are collected from a Sunburst SAMI-pCO<sub>2</sub> deployed at a floating dock at ~2-3 m water depth located at the University of Washington Friday Harbor Laboratories, Friday Harbor, WA (Lat = 48.5461, Long = -123.007). This dataset contains values of pCO<sub>2</sub>, the partial pressure of CO<sub>2</sub> in seawater, reported in parts per million (ppm), and water temperature reported in degrees Celsius.

## Processing Description

### BCO-DMO Processing:

- concatenated separate data files (.txt) into one;
- added ISO 8601 date/time format;
- added latitude and longitude as columns; values originally provided in dataset metadata.

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## Parameters

Parameter	Description	Units
Date	Date (UTC); format: MM/DD/YY	unitless
Time.UTC	Time (UTC); format: hh:mm AM/PM	unitless
Time.PST	Time (local time zone, PST/PDT); format: hh:mm AM/PM	unitless
pCO <sub>2</sub>	Partial Pressure of CO <sub>2</sub> in seawater	microatmospheres (uatm)
Sea_Temp	Water temperature	degrees Celsius
ISO_DateTime.UTC	Date and time (UTC) formatted to ISO 8601 standard; format: yyyy-mm-ddTHH:MMZ	unitless
orig_file_name	Original file name	unitless
Latitude	Latitude of sampling location	degrees North
Longitude	Longitude of sampling location (negative = west)	degrees East

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## Instruments

<b>Dataset-specific Instrument Name</b>	Sunburst SAMI-pCO2
<b>Generic Instrument Name</b>	Submersible Autonomous Moored Instrument
<b>Dataset-specific Description</b>	Sunburst SAMI-pCO2 (pCO2 and temperature)
<b>Generic Instrument Description</b>	The Submersible Autonomous Moored Instrument (SAMI) measures and logs levels of dissolved chemicals in sea and fresh water. It is a plastic cylinder about 6 inches wide and 2 feet long that is self-powered and capable of hourly measurements for up to one year. All data collected are logged to an internal memory chip to be downloaded later. SAMI sensors usually are placed a few feet underwater on permanent moorings, while others on floating drifters sample the water wherever the wind and currents carry them. The instruments have been used by researchers around the globe in a variety of studies since 1999. Dr. Mike DeGrandpre, University of Montana, developed the SAMI between 1990 and 1993 during his postdoctoral work at the Woods Hole Oceanographic Institution (Woods Hole, MA, USA). For additional information, see URL: <a href="http://www.sunburstsensors.com/">http://www.sunburstsensors.com/</a> from the manufacturer, Sunburst Sensors, LLC, 1226 West Broadway, Missoula, MT 59802.

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## Deployments

### FHLOO

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/808585">https://www.bco-dmo.org/deployment/808585</a>
<b>Platform</b>	Friday_Harbor
<b>Description</b>	Friday Harbor Laboratories Ocean Observatory (FHLOO) located at the University of Washington Friday Harbor Laboratories, Friday Harbor WA. Data are collected from an array of sensors from a floating dock at ~2-3 m water depth. Lat = 48.5461 Long = -123.007

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## Project Information

### **FSML: Instrumentation at UW Friday Harbor Laboratories for Studies of the Biological Impacts of Ocean Acidification and Ocean Change (FHLOO)**

**Coverage:** University of Washington Friday Harbor Laboratories, Friday Harbor WA

Ocean change, including ocean acidification (OA), poses an unprecedented threat to oceanic and coastal ecosystems and to the societies that depend on them. The scale and complexity of the OA problem requires new spatially distributed data collection, and an integrated programmatic approach to OA research. The Salish Sea region, fed by waters of the Northeast Pacific, is particularly vulnerable to OA

events associated with ocean upwelling and is already experiencing pH ranges that other areas will not see for many decades; commercial fisheries and shellfish aquaculture already appear to be affected or at risk. OA is further complicated in estuaries such as the Salish Sea by local processes including respiration, production, anoxia, and mixing, resulting in wide pH and pCO<sub>2</sub> variation in time and space. Long-range plans for ocean change research at FHL focus on integrated ocean carbonate system observations, utilizing new advances in the development of ocean sensors and instruments, and incorporating biological response studies under laboratory and field conditions. Field conditions will be simulated using environmental and ecosystem modeling studies, and our findings will provide information for assessment of policy, and socio-economic responses. Societal needs will be fully integrated with our research, merging the relevance of the problem and the need for human adaptation to OA. FHL will engage in knowledge transfer, with data and information flowing to and from policy makers, affected communities, scientists, and the general public. The shellfish aquaculture community will benefit economically from the new data and tribal governments will accrue benefits that could help sustain traditional food sources. The public will benefit through targeted education activities that improve general understanding of ocean processes and especially ocean acidification. UW and FHL will train a workforce that is ready to discover and deal with the impacts of OA and to realize adaptive responses that will allow affected industries and communities to thrive in the presence of this threat. Users include groups engaged in marine resource-based economies, members of coastal tribes, managers of marine resources, researchers in academic and government laboratories, and both formal and informal educators. FHL education programs reach broadly, from high school teachers and their students to undergraduate and graduate students and postdoctoral researchers. At the graduate level, FHL will prepare students for careers inside and outside of academia. Underrepresented minorities (URM) are fully integrated into FHL activities, with the objective of increasing their representation in oceanography, biology, fisheries and other OA and ocean-related fields. We will leverage existing programs (UW IGERT in Ocean Change, FHL Blinks and REU site programs, FHL Research Apprenticeships, NSF BEACON at UW) and create new programs to recruit, mentor, and prepare a community of URM students both on and off the university campus. We will expand our ongoing engagement of Native American students in ocean change research and education, near their own college campus (NWIC) and with their own instructors, in a culturally respectful way.

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## Funding

Funding Source	Award
<a href="#">NSF Division of Biological Infrastructure (NSF DBI)</a>	<a href="#">FSML-1418875</a>

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