

# Physical and optical measurements from Wirewalker profiling moorings WW\_M19, WW\_WQM2, and WW\_ESP in the Continental shelf offshore of Huntington Beach, California in 2012 (SoCalPlumeEx2012 project)

**Website:** <https://www.bco-dmo.org/dataset/546074>

**Version:** 21 January 2015

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## Project

» [Assessing the Ecophysiological and Biogeochemical Response to Deliberate Nutrient Loading in the Southern California Bight](#) (SoCalPlumeEx2012)

Contributors	Affiliation	Role
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## Table of Contents

- [Dataset Description](#)
  - [Methods & Sampling](#)
  - [Data Processing Description](#)
- [Data Files](#)
- [Parameters](#)
- [Instruments](#)
- [Deployments](#)
- [Project Information](#)
- [Funding](#)

## Dataset Description

Physical and optical data from 3 wave-powered profiling moorings (WireWalkers) (*.mat files*)

Data are collected onboard the profilers. Those data were collected by a CTD with additional channels. The data are provided as vectors (upcast only). The .idx field indicates the start and end of each individual profile. The channels are, as follows:

### Upcast only time series:

T = Temperature, degrees C (Seabird 49 CTD or Seabird 52 for ww\_esp)

P = Pressure, meters (Seabird 49 CTD or Seabird 52 for ww\_esp)

time = Time (matlab datenum format)

C = conductivity (milliSiemens per meter) (Seabird 49 CTD or Seabird 52 for ww\_esp)

S = salinity (PSU) (Seabird 49 CTD or Seabird 52 for ww\_esp)

F\_chla = Chlorophyll fluorescence (Relative Fluorescence Units) (Turner Designs Cyclops 7 chlorophyll fluorometer)

### or for ww\_esp:

C3\_chla: Chlorophyll fluorescence (Relative Fluorescence Units) (Turner Designs C3 fluorometer)

C3\_cdom: Chromophoric Dissolved Organic Material (Relative Fluorescence Units) (Turner Designs C3 fluorometer)

C3\_turb: Turbidity (Relative Fluorescence Units) (Turner Designs C3 fluorometer)

## Methods & Sampling

### Sampling and Analytical Methodology:

These data come from a set of wave-powered profiling moorings. > 8,000 profiles were collected at each mooring. The downcast have been excised due to low data quality. The CTDs were recently calibrated, while the fluorometers are reported as RFU (rather than chlorophyll concentrations) given uncertainties associated with non-photochemical quenching.

ww\_m19 and ww\_wqm2 CTDs sampled at 16 Hz, while ww\_esp CTD sampled at 1Hz. ww\_esp also had compromised salinity for much of the deployment due to fouling in the conductivity cell.

The moorings were at the following depths: ww\_m19 = 50m, ww\_wqm2 = 22m, ww\_esp = 22m.

### Data Processing Description

#### Data Processing:

The data have been processed by removing the downcast (e.g. resulting data is only from profiler upcasts). Individual upcasts are indexed in the .idx field. Otherwise the data are unprocessed.

#### BCO-DMO Processing Notes

- Generated from original files contributed by Andrew Lucas

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

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### Data Files

File
<b>WireWalker_Moorings.csv</b> (Comma Separated Values (.csv), 717 bytes) MD5:86ee5e71e107687edf4777525214291f Primary data file for dataset ID 546074

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

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### Parameters

Parameter	Description	Units
Deployment	Mooring Deployment Identifier	text
Location	Mooring Location Description	text
Start_Date	Start Date of Data Collection	YYYYMMDD
End_Date	End Date of Data Collection	YYYYMMDD
Latitude	Latitude Position of Mooring (South is negative)	decimal degrees
Longitude	Longitude Position of Mooring (West is negative)	decimal degrees
Depth	Depth of Mooring	meters
Data_File	Link to Data File (.mat file)	text
T	Temperature degrees C (Seabird 49 CTD or Seabird 52 for ww_esp)	degrees C
P	Pressure meters (Seabird 49 CTD or Seabird 52 for ww_esp)	meters
time	Time (matlab datenum format)	matlab datenum format
C	conductivity (milliSiemens per meter) (Seabird 49 CTD or Seabird 52 for ww_esp)	milliSiemens per meter
S	salinity (PSU) (Seabird 49 CTD or Seabird 52 for ww_esp)	PSU
F_chla	Chlorophyll fluorescence (Relative Fluorescence Units) (Turner Designs Cyclops 7 chlorophyll fluorometer)	Relative Fluorescence Units
C3_chla	Chlorophyll fluorescence (Relative Fluorescence Units) (Turner Designs C3 fluorometer) (for ww_esp only)	Relative Fluorescence Units
C3_cdom	Chromophoric Dissolved Organic Material (Relative Fluorescence Units) (Turner Designs C3 fluorometer) (for ww_esp only)	Relative Fluorescence Units
C3_turb	Turbidity (Relative Fluorescence Units) (Turner Designs C3 fluorometer) (for ww_esp only)	Relative Fluorescence Units

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

## Instruments

<b>Dataset-specific Instrument Name</b>	CTD Sea-Bird
<b>Generic Instrument Name</b>	CTD Sea-Bird
<b>Dataset-specific Description</b>	Seabird 49 CTD or Seabird 52 for ww_esp
<b>Generic Instrument Description</b>	Conductivity, Temperature, Depth (CTD) sensor package from SeaBird Electronics, no specific unit identified. This instrument designation is used when specific make and model are not known. See also other SeaBird instruments listed under CTD. More information from Sea-Bird Electronics.

<b>Dataset-specific Instrument Name</b>	Turner Designs Cyclops 7 chlorophyll fluorometer
<b>Generic Instrument Name</b>	Fluorometer
<b>Dataset-specific Description</b>	Turner Designs Cyclops 7 chlorophyll fluorometer
<b>Generic Instrument Description</b>	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

<b>Dataset-specific Instrument Name</b>	Turner Designs C3 fluorometer
<b>Generic Instrument Name</b>	Fluorometer
<b>Dataset-specific Description</b>	Turner Designs C3 fluorometer
<b>Generic Instrument Description</b>	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

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

## Deployments

### WW\_M19

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/546034">https://www.bco-dmo.org/deployment/546034</a>
<b>Platform</b>	Wirewalker Profiler
<b>Report</b>	<a href="http://dmoserv3.whoi.edu/data_docs/SoCalPlumeEx2012/Wire_Walker.pdf">http://dmoserv3.whoi.edu/data_docs/SoCalPlumeEx2012/Wire_Walker.pdf</a>
<b>Start Date</b>	2012-09-09
<b>End Date</b>	2012-09-09
<b>Description</b>	Wave-powered profiling vehicle ww_m19: Mooring associated with M19 location Lat: 33.587176 Lon: -117.985154 Depth: 50meters

### WW\_WQM2

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/546035">https://www.bco-dmo.org/deployment/546035</a>
<b>Platform</b>	Wirewalker Profiler
<b>Report</b>	<a href="http://dmoserv3.whoi.edu/data_docs/SoCalPlumeEx2012/Wire_Walker.pdf">http://dmoserv3.whoi.edu/data_docs/SoCalPlumeEx2012/Wire_Walker.pdf</a>
<b>Start Date</b>	2012-09-09
<b>End Date</b>	2012-09-09
<b>Description</b>	Wave-powered profiling vehicle ww_wqm2: Mooring associated with WQM2 location Lat: 33.599870 Lon: -117.956343 Depth: 22meters

#### WW\_ESP

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/546036">https://www.bco-dmo.org/deployment/546036</a>
<b>Platform</b>	Wirewalker Profiler
<b>Report</b>	<a href="http://dmoserv3.whoi.edu/data_docs/SoCalPlumeEx2012/Wire_Walker.pdf">http://dmoserv3.whoi.edu/data_docs/SoCalPlumeEx2012/Wire_Walker.pdf</a>
<b>Start Date</b>	2012-09-09
<b>End Date</b>	2012-09-09
<b>Description</b>	Wave-powered profiling vehicle ww_esp: Mooring associated with ESP location Lat: 33.595482 Lon: -117.942806 Depth: 22meters

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

## Project Information

### Assessing the Ecophysiological and Biogeochemical Response to Deliberate Nutrient Loading in the Southern California Bight (SoCalPlumeEx2012)

**Website:** <http://oceandatacenter.ucsc.edu/MBHAB/hotspots/>

**Coverage:** Southern California Bight [33-33.75° N, 117.25-118.5° W]

In autumn 2012, Orange County Sanitation District (OCS D) will divert ~150 million gallons/day of secondarily-treated effluent to a nearshore (1 mile offshore) outfall pipe over a period of ~4 weeks. No discharges of this magnitude have been conducted in decades. The planned diversion is expected to create a buoyant surface plume that will spread over much of the coastal region. Because OCS D plans to "super-chlorinate" and then dechlorinate the discharge, the effect of the plume should be predominantly a nutrient addition rather than direct addition of intact microbial populations. The PIs propose to address two broad questions through a study of the plume:

First, what happens ecologically and physiologically to the phytoplankton assemblage when nutrients are discharged in the surface ocean for extended periods of time?

Second, can this dynamic and shifting environment be sampled by deploying multiple technologies to identify the physical/chemical drivers of the biological response at ecologically relevant space and time scales?

#### **They will test two hypotheses:**

**H1:** Continual discharge of nutrients to the surface ocean results in a dinoflagellate-dominated bloom which leads to dampening or cessation of vertical migration of the dinoflagellates and drives a shift to net heterotrophy.

**H2:** The bloom will initially result in a strong local sink for carbon dioxide which gradually develops into a strong source as heterotrophy develops.

The study is expected to provide a time-evolving picture of interactions within and between autotrophic and heterotrophic communities and will illustrate the short-term biogeochemical and ecological consequences of sustained nutrient discharge to a shallow coastal site. The planned diversion provides an unprecedented

opportunity to study the ecophysiological response in a natural setting over a period of weeks, including the interaction of biology, chemistry, and physics, and it will contribute to basic understanding of anthropogenic nutrient loading to the coastal ocean. Undergraduate and graduate education and training will be furthered through active participation in lab, field, and data synthesis activities involving academic, government, and industry partners.

Affiliated Programs or Projects:

- NOAA ECOHAB Project (NA11NOS4780030): A Regional Comparison of Upwelling and Coastal Land Use Patterns on the Development of HAB Hotspots Along the California Coast
- Southern California Coastal Ocean Observing System
- Central and Northern California Coastal Ocean Observing System

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

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## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1251573</a>
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1251547</a>

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