

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>

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Project

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

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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

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Data Files

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

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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

Instruments

Dataset-specific Instrument Name	CTD Sea-Bird
Generic Instrument Name	CTD Sea-Bird
Dataset-specific Description	Seabird 49 CTD or Seabird 52 for ww_esp
Generic Instrument Description	A Conductivity, Temperature, Depth (CTD) sensor package from SeaBird Electronics. This instrument designation is used when specific make and model are not known or when a more specific term is not available in the BCO-DMO vocabulary. Refer to the dataset-specific metadata for more information about the specific CTD used. More information from: http://www.seabird.com/

Dataset-specific Instrument Name	Turner Designs Cyclops 7 chlorophyll fluorometer
Generic Instrument Name	Fluorometer
Dataset-specific Description	Turner Designs Cyclops 7 chlorophyll fluorometer
Generic Instrument Description	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.

Dataset-specific Instrument Name	Turner Designs C3 fluorometer
Generic Instrument Name	Fluorometer
Dataset-specific Description	Turner Designs C3 fluorometer
Generic Instrument Description	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.

Deployments

WW_M19

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

WW_WQM2

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

WW_ESP

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

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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 (OCSD) 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 OCSD 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

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1251573
NSF Division of Ocean Sciences (NSF OCE)	OCE-1251547

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