

Surface Fluorescence from C3 fluorometer on G5 WaveGlider from fishing vessels in the Southern California Bight off Huntington Beach in 2012 (SoCalPlumeEx2012 project)

Website: <https://www.bco-dmo.org/dataset/537764>

Version: 04 November 2014

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Project

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

Contributors	Affiliation	Role
Kudela, Raphael M.	University of California-Santa Cruz (UCSC)	Principal Investigator, Contact
Lucas, Andrew J.	University of California-San Diego Scripps (UCSD-SIO)	Co-Principal Investigator
Gegg, Stephen R.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

Fluorescence data from G5 WaveGlider (surface only)

Data are described in the following manuscript:

Kudela, R.M., Lucas, A.J., Negrey, K.H., Howard, M. McLaughlin, K. Submitted to Estuaries, Coasts, Shelf Science (October 2014).. Death from below: Investigation of inhibitory factors in bloom development during a wastewater effluent diversion

Methods & Sampling

Sampling and Analytical Methodology:

Data collected on a G5 WaveGlider. Data are essentially raw, no processing other than calibration applied. Turner Designs C3 fluorometer equipped to measure chlorophyll fluorescence (460 nm ex/696 nm em; reported in fluorescence units), turbidity (850 nm ex./850 nm.; units= NTU; Nephelometric Turbidity Units), and colored dissolved organic material (CDOM ; 325 nm ex/410-600 nm em.). Sensors were calibrated by Liquid Robotics (chl fluorescence = 1.0119 mg ml⁻¹ Basic Blue 3; turbidity= 3000 NTU turbidity standard) as per Turner Designs recommendation.

Data Processing Description

Data Processing:

Raw data, no processing.

BCO-DMO Processing Notes

- Generated from original file: "SoCalPlumeEx2012_WaveGlider_C3.csv" contributed by Raphael Kudela
- Parameter names edited to conform to BCO-DMO naming convention found at [Choosing Parameter Name](#)
- Date reformatted from MM/DD/YY to YYYYMMDD
- Time reformatted from HH:MM:SS to HHMMSS

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Data Files

File
WaveGlider_C3.csv (Comma Separated Values (.csv), 1.01 MB) MD5:3c2a8be2ec3f5189d78ec03b33fe4838
Primary data file for dataset ID 537764

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Parameters

Parameter	Description	Units
DATE	Date (GMT)	YYYYMMDD
TIME	Time (GMT)	HHMMSS
Latitude	Latitude Position (South is negative)	decimal degrees
Longitude	Longitude Position (West is negative)	decimal degrees
Depth	Depth	meters
FL	Chlorophyll Fluorescence (FL)	RFU
CDOM	CDOM fluorescence (CDOM)	RFU
Turbidity	Turbidity	RFU

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Instruments

Dataset-specific Instrument Name	Turner Designs C3 fluorometer
Generic Instrument Name	Fluorometer
Dataset-specific Description	Data collected on a G5 WaveGlider. Data are essentially raw, no processing other than calibration applied. Turner Designs C3 fluorometer equipped to measure chlorophyll fluorescence (460 nm ex/696 nm em; reported in fluorescence units), turbidity (850 nm ex./850 em.; units= NTU; Nephelometric Turbidity Units), and colored dissolved organic material (CDOM ; 325 nm ex/410-600 nm em.). Sensors were calibrated by Liquid Robotics (chl fluorescence = 1.0119 mg ml ⁻¹ Basic Blue 3; turbidity= 3000 NTU turbidity standard) as per Turner Designs recommendation.
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	Wave Glider G5
Generic Instrument Name	Wave Glider G5
Dataset-specific Description	Wave Glider G5
Generic Instrument Description	Wave Glider G5

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Deployments

SoCalPlumeEx2012

Website	https://www.bco-dmo.org/deployment/537425
Platform	Fishing Vessels
Start Date	2012-09-06
End Date	2012-10-17
Description	Multiple vessels used for this effort. R/V Yellowfin R/V Nerissa

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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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