

# Profile data from WireWalker deployments at Mission Beach, California in 2016 at a 50m depth

Website: <https://www.bco-dmo.org/dataset/742124>

Data Type: Other Field Results

Version: 1

Version Date: 2018-07-24

## Project

» [Quantifying plankton dynamics in the internal tide using swarms of buoyancy-controlled robots](#) (QuIPP)

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## Abstract

Profile data from WireWalker deployments at Mission Beach, California in 2016 at a 50m depth.

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## Coverage

**Spatial Extent:** Lat:32.7685 Lon:-117.2922

**Temporal Extent:** 2016-06-13 - 2016-06-28

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## Dataset Description

Profile data from WireWalker deployments at Mission Beach, California in 2016 at a 50m depth.

The default data format served through the BCO-DMO data system is tabular. These data are available to download as matrices in NetCDF (.nc) and Matlab (.mat) files in the "Data Files" section of this page.

Related Datasets (Jun 2016, Mission Beach, CA)

\* Thermistor chain <https://www.bco-dmo.org/dataset/742137>

\* ADCP <https://www.bco-dmo.org/dataset/742132>

## Acquisition Description

Instruments were mounted on a WireWalker profiler (<http://delmarocean.com/wirewalker/>) and data collected during ascent only. The interval between profiles was dependent on sea state. The WireWalker instrument was deployed on 50-m depth contour off Mission Beach, CA near a thermistor chain and in line with Internal Waves on the Continental Margin (IWAVES) stations. For more information about IWAVES stations see Lerczark, 2001.

## Processing Description

Data interpolated on common depth and time grid.

Issues: Aquadopp data was corrupted and so was omitted.

BCO-DMO Data Manager Processing Notes:

\* added a conventional header with dataset name, PI name, version date

\* modified parameter names to conform with BCO-DMO naming conventions

\* blank values in this dataset are displayed as "nd" for "no data." nd is the default missing data

identifier in the BCO-DMO system.

\* created tabular version of data by converting Matlab struct to a Matlab Table type then exported as csv.

\* rounded matlab double values to three decimal places before writing to csv.

\* On the first day (2018-06-13) records are omitted in the tabular version of the data. All values (except depth & time) were NaN values.

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## Related Publications

Lerczak, J. A., Hendershott, M. C., & Winant, C. D. (2001). Observations and modeling of coastal internal waves driven by a diurnal sea breeze. *Journal of Geophysical Research: Oceans*, 106(C9), 19715–19729. doi:10.1029/2001jc000811

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## Parameters

Parameter	Description	Units
dnum	Matlab time/date format (datenum, UTC)	unitless
date	Date (UTC) in format 'yyyy-mm-dd'	unitless
time	Time (UTC) in format 'HH:MM:SS'	unitless
ISO_DateTime_UTC	Timestamp (UTC) in standard ISO 8601:2004(E) format YYYY-mm-ddTHH:MMZ	unitless
depth	depth	meters (m)
DO	dissolved oxygen saturation	percent (%)
B	backscatter	counts
chl	chlorophyll (fluorescence)	counts
phyco	phycoerythrin	counts

C	conductivity	millisiemens per centimeter (mS/cm)
T	temperature	degrees Celsius
P	pressure	decibars (dbar)
S	salinity	Practical Salinity Units (PSU)
rho	density	kilograms per meter cubed (kg/m <sup>3</sup> )
n <sup>2</sup>	buoyancy frequency	per seconds squared (s <sup>-2</sup> )
dPt	dPdt	decibars per second (dbar/s)
mask	Mask (values 0 or 1) indicating the reliability of interpolated values. NaN values in the mask indicate times when there was a significant gap between profiles, and where the interpolation may be less reliable. For best data, one should focus on points when the mask value is equal to 1.	unitless

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## Instruments

<b>Dataset-specific Instrument Name</b>	WET Labs fluorometer and ECO puck
<b>Generic Instrument Name</b>	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>	RINKO III
<b>Generic Instrument Name</b>	Dissolved Oxygen Sensor
<b>Generic Instrument Description</b>	An electronic device that measures the proportion of oxygen (O <sub>2</sub> ) in the gas or liquid being analyzed

<b>Dataset-specific Instrument Name</b>	RBRMaestro
<b>Generic Instrument Name</b>	Data Logger
<b>Generic Instrument Description</b>	Electronic devices that record data over time or in relation to location either with a built-in instrument or sensor or via external instruments and sensors.

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## Deployments

QuIPP\_2016

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/742542">https://www.bco-dmo.org/deployment/742542</a>
<b>Platform</b>	shoreside Calif_shore
<b>Start Date</b>	2016-06-10
<b>End Date</b>	2016-06-28
<b>Description</b>	ADCP, T-chain, WireWalker deployments.

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## Project Information

### Quantifying plankton dynamics in the internal tide using swarms of buoyancy-controlled robots (QuIPP)

Coastal waters are among the most heavily used and threatened systems on the planet. Successful prediction and management of coastal resources can only come from a deep understanding of the dynamics of the species in these regions. Fluctuations of coastal invertebrate and vertebrate populations are often driven by the supply of planktonic larvae to the adult habitat by ocean currents. Numerous studies have associated the cross-shelf transport of plankton - including the larvae of economically valuable species - with the internal tide: a wave in the ocean's interior that oscillates at the tidal frequency. Though the interactions of plankton with internal waves have been studied for decades, it has not been possible to track individual plankton underwater. Thus, the dynamics underlying the cross-shelf transport of plankton in internal waves and internal tides remain conjectural. This project will use undersea swarms of novel, autonomous plankton-mimicking drifting robots to quantify, in situ, the cross-shore transport of plankton driven by high-frequency internal waves and the internal tide. This research will significantly enhance our understanding of the distributions, settling patterns, and population connectivity of coastal species. One PhD student will be supported and educational outreach in collaboration with the Ocean Discovery Program in San Diego will support curricula creation, after-school programs, and teacher development. These researchers have recently gained the capability to deploy swarms of plankton-mimicking, autonomous, drifting robots in the ocean. These robots, Autonomous Underwater Explorers (AUEs), are 1.5-liter cylinders with temperature and pressure sensors, a hydrophone, and a piston that regulates buoyancy. Subsurface three-dimensional localization is accomplished through an acoustic long-baseline navigation system. The three-dimensional position of each AUE is obtained every 12 seconds with ~1 m horizontal and

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## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1459393</a>

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