

Absorption coefficients and fluorescence measurements from CTD bottle samples collected during the R/V Kilo Moana cruise KM1427 in the North Pacific Ocean in December of 2014

Website: <https://www.bco-dmo.org/dataset/735970>

Data Type: Cruise Results

Version: 1

Version Date: 2018-05-11

Project

» [Relating the Optical Properties of CDOM within the Ocean Basins to Source and Structure](#) (CDOM Optical Properties)

Contributors	Affiliation	Role
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Abstract

Bottle samples were collected during 0-4500 meter depth CTD deployments during R/V Kilo Moana cruise KM1427 in the North Pacific Ocean in December of 2014. Absorption coefficients and fluorescence measurements were made using the bottle samples.

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Coverage

Spatial Extent: Lat:22.75 Lon:-158

Temporal Extent: 2014-12 - 2014-12

Dataset Description

This dataset has been submitted to BCO-DMO and is in the process of being served.

Related Datasets:

CTD profiles: <https://www.bco-dmo.org/dataset/734763>

TOC: <https://www.bco-dmo.org/dataset/735956>

Methods & Sampling

Water samples were collected using a CTD rosette with Niskin bottles and immediately transferred into acid rinsed carboys (20 L). Samples were then filtered through a 0.2 mm maxi capsule filter (Pall Corporation) prior to the acquisition of measurements.

Absorption measurements were collected with a WPI spectrometer while fluorescence measurements were gathered with a Horiba Fluoromax-4 luminescence spectrometer.

Data Processing Description

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

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Related Publications

Cartisano, C. M., Del Vecchio, R., Bianca, M. R., & Blough, N. V. (2018). Investigating the sources and structure of chromophoric dissolved organic matter (CDOM) in the North Pacific Ocean (NPO) utilizing optical spectroscopy combined with solid phase extraction and borohydride reduction. *Marine Chemistry*.

doi:[10.1016/j.marchem.2018.05.005](https://doi.org/10.1016/j.marchem.2018.05.005)

Results

,

Methods

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Parameters

Parameter	Description	Units
Depth	Water depth	meters (m)
Spec_Slope	unknown	per nanometer (nm-1)
a280	absorption coefficient at 280 nm	per meter (m-1)
a350	absorption coefficient at 350 nm	per meter (m-1)
sp_a280	specific absorption coefficient at 280 nm	m-1 mg-1 C L
sp_a350	specific absorption coefficient at 280 nm	m-1 mg-1 C L
F280_305	fluorescence emission (exc280/em305)	quinine sulphate units (QSU)
F350_450	fluorescence emission (exc350/em450)	quinine sulphate units (QSU)
pH	pH	pH units

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Benchtop pH Meter
Dataset-specific Description	Thermo-Scientific micro pH electrode coupled to an Orion 4 Star pH ISE benchtop meter
Generic Instrument Description	An instrument consisting of an electronic voltmeter and pH-responsive electrode that gives a direct conversion of voltage differences to differences of pH at the measurement temperature. (McGraw-Hill Dictionary of Scientific and Technical Terms) This instrument does not map to the NERC instrument vocabulary term for 'pH Sensor' which measures values in the water column. Benchtop models are typically employed for stationary lab applications.

Dataset-specific Instrument Name	SBE 911plus / 917plus CTD
Generic Instrument Name	CTD Sea-Bird SBE 911plus
Generic Instrument Description	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Horiba Fluoromax-4 luminescence spectrometer
Generic Instrument Name	Spectrometer
Generic Instrument Description	A spectrometer is an optical instrument used to measure properties of light over a specific portion of the electromagnetic spectrum.

Dataset-specific Instrument Name	WPI spectrometer
Generic Instrument Name	Spectrometer
Generic Instrument Description	A spectrometer is an optical instrument used to measure properties of light over a specific portion of the electromagnetic spectrum.

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Deployments

KM1427

Website	https://www.bco-dmo.org/deployment/734731
Platform	R/V Kilo Moana
Start Date	2014-12-08
End Date	2014-12-12
Description	Project: Center for Microbial Oceanography (C-MORE) 2014, Leg 5 Original cruise data are available from the NSF R2R data catalog: https://www.rvdata.us/search/cruise/KM1427

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Project Information

Relating the Optical Properties of CDOM within the Ocean Basins to Source and Structure (CDOM Optical Properties)

Coverage: Station Aloha-Hawaii-North Pacific Ocean

Chromophoric dissolved organic matter (CDOM) is optically measured material in the oceans resulting from the degradation of organic matter. While the importance of CDOM in the optical properties and biogeochemistry of marine waters has been well established over the last several decades, the source and structure of this material within the ocean basins remains unclear. Some studies indicate that CDOM is produced primarily in situ from either the chemical or biological processing of marine materials, while others have provided evidence that CDOM is primarily a remnant of terrestrial matter that has been diluted and modified during transit to and within the oceans. In this study, researchers from the University of Maryland Center for Environmental Studies will use complete spectral absorption and emission properties combined with chemical and mass spectral tests on samples from the North Pacific Ocean to determine the source and structure of CDOM. The results will be compared with those previously acquired, or to be acquired, from the Delaware Bay, the Middle Atlantic Bight, and the Equatorial Atlantic. By employing this multifaceted approach, the researchers will significantly advance our knowledge of CDOM.

Broader Impacts: This project will provide support for graduate and undergraduate student training, and results will be broadly disseminated through peer-reviewed research publications and presentations at national meetings, where student-led presentations will be emphasized.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1357411

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