

Discrete water sampling data collected from the OOI Global Irminger Sea Array (OOI Water Sample Data project)

Website: <https://www.bco-dmo.org/dataset/911407>

Data Type: Cruise Results

Version: 1

Version Date: 2023-10-24

Project

» [OOI Discrete CTD and Water Sampling Cruise Data](#) (OOI Cruise Data)

Program

» [Ocean Observatories Initiative](#) (OOI)

Contributors	Affiliation	Role
Plueddemann, Albert	Woods Hole Oceanographic Institution (WHOI)	Data Publisher
Newman, Sawyer	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

The hydrographic sampling performed by OOI-CGSN as part of each Array turn represents a significant collection of valuable physical, chemical, and biological information. In addition to the CTD, collected hydrographic data include discrete oxygen, salinity, nutrient (nitrate, nitrite, silicate, phosphate, ammonium), chlorophyll, and carbon system measurements. These data serve several important functions. First, they are necessary for the calibration and evaluation of the moored instrumentation at each Array. Furthermore, the annual (Global) or biannual (Coastal) collection of data at the same locations provides a unique timeseries of a large set of water properties following established community standards and methods, independent of its association with the OOI moorings. The analysis of collected water samples for the parameters listed above are performed by a number of outside labs on behalf of OOI-CGSN. Consequently, the water sampling data for a given cruise is distributed among a number of different files. The Discrete Sampling Summary integrates the related CTD, metadata, and discrete water sample data into a single file. Additionally, it synthesizes qualitative and quantitative information about the quality of a measurement into data quality flags for each associated parameter which follow WOCE-standards. The final product is the Discrete Sampling Summary spreadsheet which contains the metadata, CTD data and discrete water sample data into a single spreadsheet with data quality flags.

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Dataset Description

There should be one row for each station-cast-niskin bottle. Multiple samples for the same parameter from a single niskin bottle are split into separate rows, with the associated CTD data copied to the new row. The first row of the file is the column headers.

Methods & Sampling

Salinity

Salinity measurements are performed following the methodology outlined in the WHOI Hydrography Blue Book

Automated Oxygen Titration and Salinity Determination (Knapp et al. 1990). Measurements are performed using a Guildline Autosol model 8400B salinometer (Guildline Instruments of Canada). Manufacturer stated accuracy and precision at 35 psu is +/- 0.003 psu and 0.0002 psu. IAPSO standard seawater is used to standardize the Autosol daily before runs.

Oxygen

Dissolved oxygen measurements are performed following the methodology outlined in the WHOI Hydrography Blue Book Automated Oxygen Titration and Salinity Determination (Knapp et al. 1990). Measurements are performed using a Metrohm Model 888 Titrando dosing device, with the titration endpoint determined amperometrically. Stated accuracy is 0.02 ml/l, with a precision of 0.001 ml/l.

Nutrients

All nutrient values are reported as the average of triplicate analysis on a single collected sample.

Carbon System

Carbon system measurements are performed by the Wang lab (Woods Hole Oceanographic Institution). DIC and TA measurements follow the methodology of Wang and Cai (2004) with uncertainties of 2 umol/kg. DIC measurements are performed with an Apollo Sci-Tech AS-C3. TA measurements are performed with an Apollo Sci-Tech AS-ALK2 and ROSS electrode. pH measurements follow the methodology of Clayton and Byrne (1993) with an uncertainty of 0.002 pH units using an Agilent 8453.

Chlorophyll and Phaeo

[Notes pending.]

Data Processing Description

Data Flag Description

The data flags are presented in the summary sheet as a 16-bit array, read from right-to-left, where a 1 in a particular bit position indicates a particular flag meaning applies. For example, a flag of 0000000000000010 for the column **CTD File Flag** indicates that the cast was a data cast only. Additionally, these data flags are an assessment of the collection and processing of the relevant data or samples, and are not an assessment of the *accuracy* of the data. For example, a conductivity sensor which has the correct calibration coefficients and functions normally will receive a quality flag of 000000000000100 (acceptable measurement). However, the calibration coefficients may be out of date and off with respect to the discrete salinity results; this does not affect the assigned flag.

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Parameters

Parameters for this dataset have not yet been identified

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Project Information

OOI Discrete CTD and Water Sampling Cruise Data (OOI Cruise Data)

Website: <https://oceanobservatories.org/>

The hydrographic sampling performed by the Ocean Observatories Initiative (OOI) as part of each research array turn represents a significant collection of valuable physical, chemical, and biological information. The collected hydrographic data include oxygen, salinity, nutrient (nitrate, nitrite, silicate, phosphate, ammonium),

chlorophyll, and carbon system (dissolved inorganic carbon, total alkalinity, pH and partial pressure of CO₂) measurements. These data serve several important functions. First, they are necessary for the validation and evaluation of the moored instrumentation at each Array. Furthermore, the annual (Global Arrays and the Regional Cabled Array (RCA) or biannual (Coastal Arrays and the Endurance Array) collection of data at the same locations provides a unique timeseries of a large set of water properties following established community standards and methods, independent of its association with the OOI instrumentation.

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Program Information

Ocean Observatories Initiative (OOI)

Website: <http://oceanobservatories.org/>

The Ocean Observatories Initiative (OOI) is a science-driven ocean observing network that delivers real-time data to address critical science questions regarding the world's oceans. Funded by the National Science Foundation to encourage scientific investigation, OOI data are freely available online to anyone with an Internet connection. OOI was designed as a long-term project to collect ocean data for up to 30 years. This longevity makes it possible to measure and directly observe both short-lived episodic events and longer-term changes occurring in the ocean. Such data make it possible to better understand ocean processes and how the ocean is changing.

The OOI has five active research arrays that comprise the three major observatory elements linked together by instrument, infrastructure, and information management systems. Global Ocean Arrays consist of moored arrays and autonomous vehicles that provide time-series observations and mesoscale spatial sampling at sparsely sampled, high-latitude regions critical to our understanding of climate, the carbon cycle, and ocean circulation. The Regional Cabled Array consists of fiber-optic cables off the Oregon coast that provide unprecedented power, bandwidth, and communication to seafloor instrumentation and profiler moorings, enabling monitoring of volcanic and hydrothermal activity, methane seeps, earthquakes, and myriad ocean processes in coastal and blue water environments. Coastal Arrays consist of cross-shelf moored arrays and autonomous vehicles that observe the dynamic coastal environment, enabling examination of upwelling, shelf break fronts, and cross-shelf exchanges.

These marine arrays are outfitted with more than 900 instruments — of 45 different types — measuring more than 200 different parameters. These instruments gather physical, chemical, geological, and biological data — from the air-sea interface to the seafloor. The data collected are transmitted through a cyberinfrastructure, an information management system that allows users to access real- to near real-time data from suites of sensors. The OOI provides annotations and automated quality control for data streams and is working to meet the IOOS Quality Assurance of Real Time Ocean Data (QARTOD) standards.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1026342
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