Vessel CTD profiles in the outer reaches of the Damariscotta River Estuary in the mid-coast region of Maine from June 2017 to July 2018

Website: https://www.bco-dmo.org/dataset/809309
Data Type: Cruise Results
Version: 1
Version Date: 2022-04-07

Project
» Collaborative Proposal: Assessment of the Colloidal Iron Size Spectrum in Coastal and Oceanic Waters (Colloidal Metals)

Contributors	Affiliation	Role
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Abstract
This dataset includes vessel CTD profiles from the outer reaches of the Damariscotta River Estuary in the mid-coast region of Maine collected from June 2017 to July 2018.

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Coverage

Spatial Extent: **N**:43.904 **E**:-69.497 **S**:43.761 **W**:-69.577
Temporal Extent: 2017-06-22 - 2018-07-03

Methods & Sampling

Vessel CTD profiles were conducted from the outer reaches of the Damariscotta River Estuary in the mid-coast region of Maine from June 2017 to July 2018. Standard CTD profiling methods were used from the vessel.

Data Processing Description

Standard CTD data processing software from SeaBird.

BCO-DMO 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)

- removed Type column, PI stated not applicable
- added column "station_name" to coincide with station ID numbers
- converted Dates supplied to YYYY-MM-DD format
- set Types for each data column

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Data Files

File
vessel_ctd.csv(Comma Separated Values (.csv), 454.89 KB) MD5:aa91933d20c6b060214a210eae5d815c Primary data file for dataset ID 809309

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Parameters

Parameter	Description	Units
Station_ID	Station identifier	unitless
Station_Name	The name of the fixed sampling station	unitless
Date	Date of water sample collection; filtration; and in situ measurements in format: YYYY-MM-DD	unitless
Latitude	Latitude, North is positive	decmial degrees
Longitude	Longitude, East (West is negative)	decmial degrees
Depth	Exact depth where the in situ measurements were made	meters (m)
Density	In-situ Density of water (T, S, Depth) in kilograms per cubic meter	kg/m^3
Fluorescence	In situ chlorophyll fluorescence	mg/m^3
Oxygen	In situ dissolved oxygen	mg/L
Oxygen_pct_sat	Oxygen saturation state	% saturation
Salinity	In situ salinity	PSU
Temperature	In situ temperature	degrees Celsius
Turbidity	In situ turbidity	NTU
Specific_Conductance	In situ conductivity	uS/cm
PAR_Irradiance	In situ photosynthetically active radiation	uEinsteins/m^2/s
Beam_Attenuation	In situ light scattering by particles	1/m
Beam_Transmission	In situ light transmission	%
flag	notation where questionable data may occur; bad flag = -9.99e-29	unitless

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Instruments

Dataset-specific Instrument Name	Sea-Bird Electronics (SBE) CTD
Generic Instrument Name	CTD Sea-Bird
Generic Instrument Description	Conductivity, Temperature, Depth (CTD) sensor package from SeaBird Electronics, no specific unit identified. This instrument designation is used when specific make and model are not known. See also other SeaBird instruments listed under CTD. More information from Sea-Bird Electronics.

Dataset-specific Instrument Name	Biospherical scalar PAR sensor
Generic Instrument Name	LI-COR Biospherical PAR Sensor
Generic Instrument Description	The LI-COR Biospherical PAR Sensor is used to measure Photosynthetically Available Radiation (PAR) in the water column. This instrument designation is used when specific make and model are not known.

Dataset-specific Instrument Name	
Generic Instrument Name	Niskin bottle
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

Dataset-specific Instrument Name	SBE dissolved oxygen sensor
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	
Generic Instrument Name	WET Labs {Sea-Bird WETLabs} C-Star transmissometer
Generic Instrument Description	The C-Star transmissometer has a novel monolithic housing with a highly intgrated opto-electronic design to provide a low cost, compact solution for underwater measurements of beam transmittance. The C-Star is capable of free space measurements or flow-through sampling when used with a pump and optical flow tubes. The sensor can be used in profiling, moored, or underway applications. Available with a 6000 m depth rating. More information on Sea-Bird website: https://www.seabird.com/c-star-transmissometer/product?id=60762467717

Dataset-specific Instrument Name	ECO-FLNTU (optical backscattering at 700 nm; chlorophyll fluorescence)
Generic Instrument Name	WETLabs ECO-FLNTU
Generic Instrument Description	The ECO FLNTU is a dual-wavelength, single-angle sensor for simultaneously determining both chlorophyll fluorescence and turbidity.

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Deployments

IC_DMC_2017-2018

Website	https://www.bco-dmo.org/deployment/809604
Platform	R/V Ira C.
Start Date	2017-06-22
End Date	2018-07-03
Description	This deployment is a collection of 4 one-day cruises to two stations reached from the University of Maine's Darling Marine Center (DMC) (June 22, 2017, October 27, 2017, November 13, 2017, and July 3, 2018). The DMC is located on the Damariscotta River Estuary. The first station (Bg) is within the river with a depth of approximately 25 meters. The second station (Bt) is roughly 5 nm outside the mouth of the estuary at approximately 100 m depth.

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Project Information

Collaborative Proposal: Assessment of the Colloidal Iron Size Spectrum in Coastal and Oceanic Waters (Colloidal Metals)

Coverage: Coastal Maine

NSF abstract:

Bioavailable iron is arguably the most important nutrient for shaping the distribution and composition of marine primary productivity and, in turn, the magnitude of ocean carbon export. Iron exists in many phases throughout the world's oceans, and colloidal, or non-soluble, phases comprise a significant fraction of dissolved iron. However, the size and physical/chemical character of these phases is presently poorly understood. To better understand this key part of iron cycling, researchers will use new analytical chemistry

methods to quantitatively separate the colloidal iron sizes present in a sample and measure the composition of these colloidal portions in shelf and oceanic waters. Results from this study will help hone future studies to better link the source and fate of iron in the marine environment. A postdoctoral researcher will serve as a principal investigator on the project, providing a unique professional development opportunity. In addition, the project will support the education and research training of one undergraduate student each year, and the researchers will conduct outreach activities to K-12 students and teachers.

The colloidal phase of iron may serve as a biological source of stored iron, a primary conveyance for stripping iron into sinking particulate matter (removing it from the pelagic biosphere), or, more likely, a dynamic balance of these roles that fluctuates with the source and character of iron input. The current methods to investigate marine colloidal matter involve operationally defining the bulk colloidal phase using single cutoff filters, a practical decision based on little or no evidence. More problematic, these methods homogenize the colloidal phase, obscuring what almost certainly is a reactivity spectrum of colloidal species tied to their size and compositional character. In this study, the researchers will use Flow Field-Flow Fractionation coupled to Multi-Angle Laser Light Scattering to make measurements of the uniformity or uniqueness of the colloidal size spectrum, and the physical/chemical character of these phases. The findings will have broad implications to the fields of marine ecology and biogeochemistry and, ultimately, to modeling studies of ocean-atmospheric coupling and climate change.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1435021

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