Suspended particles from ship’s surface intake samples collected on R/V Kilo Moana cruise KM1910 in June 2019

Website: https://www.bco-dmo.org/dataset/852242
Data Type: Cruise Results
Version: 1
Version Date: 2021-05-25

Project
» EAGER Collaborative Research: Early career chief scientist training for biological and chemical oceanographers (Chief Sci KM1910)

Contributors	Affiliation	Role
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Abstract
Surface particulate carbon concentration, nitrogen concentration, and bulk isotope composition (C and N) from underway clean water intake during June 2019 at station ALOHA during cruise KM1910. Suspended particulates were collected while underway using the ship's clean surface water intake (~0 to 5 m ocean depth) in the hydro lab sink aboard RV Kilo Moana.

Table of Contents

Coverage

Spatial Extent: **N**:22.8348 **E**:-157.9229 **S**:22.2037 **W**:-158.3938
Temporal Extent: 2019-06-16 - 2019-06-21

Dataset Description

Surface particulate carbon concentration, nitrogen concentration, and bulk isotope composition (C and N) from underway clean water intake during June 2019 at station ALOHA during cruise KM1910.

Acquisition Description

Suspended particulates were collected while underway using the ship's clean surface water intake (~0 to 5 m ocean depth) in the hydro lab sink aboard RV Kilo Moana. Water was passed through three separate filter holders containing 1) an acid-washed 53um mesh screen pre-filter followed by 2), a combusted (4.5hrs 450 degrees C) 142mm GF/F (Whatman nominal pore size 0.7um) and finally followed by 3), a combusted 142mm GF75 (Advantec nominal pore size 0.3um). Samples were folded (active side in) and stored in clean (combusted) foil at -20 degrees C until subsampled with metal cork borer (subsamples were not acidified so PC and d13C represents total C). Subsamples were oven-dried overnight at 55-60 degrees C then packed in 9x11 tin capsules for analysis on EA IRMS. Six blank (dry) filters were analyzed for background C and N and subtracted from measured PC and PN sample values.

EA-IRMS: a Vario ISOTOPE select (Elementar Isoprime) was used to quantify total C, N, and d13C and d15N. Samples are combusted/reduced at high temperature to create gases (CO2 and N2); column chromatography separates the gases; a thermal conductivity detector determines the carbon and nitrogen concentrations, followed by an isotope ratio mass spectrometer for bulk isotope composition. Measurements were calibrated with an in-house aminocaproic acid standard (ACROS) and four USGS standards (#41, #41a, #65, #25). Analytical uncertainty (determined from standards with similar isotope values) was 0.2‰ for delta-15N and 0.1‰ for delta-13C.

Known problems

Lat and Lon was not recorded at end of sample starting at 11:51 and ending at 15:30 on 190617

Processing Description

BCO-DMO Processing:
- converted date_HST to YYYY-MM-DD format;
- created UTC date/time field in ISO8601 format.

[table of contents | back to top]

Related Publications

Heal, K. R., Maloney, A. E., Ingalls, A. E., & Bundy, R. M. (2021). Diverse arsenic-containing lipids in the surface ocean. doi:10.1101/2021.03.22.436501
Results

[table of contents | back to top]

Parameters

Parameter	Description	Units
cruise_id	Cruise identifier	unitless
Start_ISO_DateTime_UTC	Datetime (UTC) at start of collection; in ISO8601 format: YYYY-MM-DDThh:mmZ	unitless
date_start_HST	Local date (HST) at start of collection; format: YYYY-MM-DD	unitless
time_start_HST	Local time (HST) (24 hour) at start of collection; format: hhmm	unitless
End_ISO_DateTime_UTC	Datetime (UTC) at end of collection; in ISO8601 format: YYYY-MM-DDThh:mmZ	unitless

date_end_HST	Local date (HST) at end of collection; format: YYYY-MM-DD	unitless
time_end_HST	Local time (HST) (24 hour) at end of collection; format: hhmm	unitless
sta	Station number	unitless
lon_start	Longitude (degrees E) at start of collection	decimal degrees
lat_start	Latitude (degrees N) at start of collection	decimal degrees
lon_end	Longitude (degrees E) at end of collection	decimal degrees
lat_end	Latitude (degrees N) at end of collection	decimal degrees
samplesize_L	Liters of water through entire filter	liters (L)
subsamplesize_L	Liters of water through filter punch subsample	liters (L)
PC_GFF	Total Particulate Carbon (PC) [umol/L] on first filter GF/F (nominal pore size 0.7um), prefiltered with 53um mesh, size range = 53 to 0.7um; filter punches not acidified before analysis; measurements corrected for 6 blank (dry) filters	micromole per liter (umol/L)
PC_GF75	Particulate Carbon (PC) [umol/L] on second filter GF75 (nominal pore size 0.3um), size range = 0.7 to 0.3um, filter punches not acidified before analysis; measurements corrected for 6 blank (dry) filters	micromole per liter (umol/L)
P13C_GFF	Delta-13C of PC (permil vs. VPDB) on first filter GF/F (nominal pore size 0.7um), prefiltered with 53um mesh, size range = 53 to 0.7um; filter punches not acidified before analysis. Analytical uncertainty 0.1 permil	permil vs. VPDB
P13C_GF75	Delta-13C of PC (permil vs. VPDB) on second filter GF75 (nominal pore size 0.3um) size range = 0.7 to 0.3um, filter punches not acidified before analysis. Analytical uncertainty 0.1 permil	permil vs. VPDB
PN_GFF	Particulate Nitrogen (PN) [umol/L] on first filter GF/F (nominal pore size 0.7um), prefiltered with 53um mesh, size range = 53 to 0.7um; filter punches not acidified before analysis; measurements corrected for 6 blank (dry) filters	micromole per liter (umol/L)
PN_GF75	Particulate Nitrogen (PN) [umol/L] on second filter GF75 (nominal pore size 0.3um), size range = 0.7 to 0.3um, filter punches not acidified before analysis; measurements corrected for 6 blank (dry) filters	micromole per liter (umol/L)
P15N_GFF	Delta-15N of PN (permil vs. air-N2) on first filter GF/F (nominal pore size 0.7um), prefiltered with 53um mesh, size range = 53 to 0.7um; filter punches not acidified before analysis. Note there is no P15N_GF75 data, all samples from the second filter were below detection, detection limit ~0.75 micromol N. Analytical uncertainty 0.2 permil	permil vs. air-N2

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Isotope-ratio Mass Spectrometer
Dataset-specific Description	Bulk isotope composition was determined with an isotope ratio mass spectrometer.
Generic Instrument Description	The Isotope-ratio Mass Spectrometer is a particular type of mass spectrometer used to measure the relative abundance of isotopes in a given sample (e.g. VG Prism II Isotope Ratio Mass-Spectrometer).

Dataset-specific Instrument Name	
Generic Instrument Name	Gas Chromatograph
Generic Instrument Description	Instrument separating gases, volatile substances, or substances dissolved in a volatile solvent by transporting an inert gas through a column packed with a sorbent to a detector for assay. (from SeaDataNet, BODC)

Dataset-specific Instrument Name	
Generic Instrument Name	Conductivity Meter
Generic Instrument Description	Conductivity Meter - An electrical conductivity meter (EC meter) measures the electrical conductivity in a solution. Commonly used in hydroponics, aquaculture and freshwater systems to monitor the amount of nutrients, salts or impurities in the water.

Dataset-specific Instrument Name	
Generic Instrument Name	Elemental Analyzer
Dataset-specific Description	A Vario ISOTOPE select (Elementar Isoprime) was used to quantify total C, N, and d13C and d15N.
Generic Instrument Description	Instruments that quantify carbon, nitrogen and sometimes other elements by combusting the sample at very high temperature and assaying the resulting gaseous oxides. Usually used for samples including organic material.

[table of contents | back to top]

Deployments

KM1910

Website	https://www.bco-dmo.org/deployment/841636
Platform	R/V Kilo Moana
Start Date	2019-06-15
End Date	2019-06-24
Description	NSF Chief Scientist Training Cruise. For more information, see Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/KM1910 (cruise DOI: 10.7284/908380)

[table of contents | back to top]

Project Information

EAGER Collaborative Research: Early career chief scientist training for biological and chemical oceanographers (Chief Sci KM1910)

Coverage: Station ALOHA (22.75N, 158W), North Pacific Ocean

NSF Award Abstract:

Intellectual Merit
The PIs request funds to provide training in leading and organizing research cruises to early career researchers in the areas of Biological and Chemical Oceanography. Participants in this training program would be introduced to pre-cruise planning and logistics, receive training in commonly used oceanographic sampling equipment, and conduct shipboard measurements during a 10-day oceanographic cruise to the North Pacific Subtropical Gyre (NPSG). The goal of this training program is to prepare early career scientists for leading and participating in interdisciplinary oceanographic research at sea.

Broader Impacts
The proposed program addresses the broader impacts criteria successfully. The research cruise and follow-up reports and publications focus on interdisciplinary questions important for advancing the field. Given the rapid changes that oceanic systems are undergoing, it is important to have a cadre of junior scientists who are adept at managing interdisciplinary collaborations and conducting research at sea. The PIs are considering ways to connect with diverse audiences in recruiting participants. The impact on early career oceanographers will be very strong. This will create an experience that will be a major impact on the careers of the trainees, especially if they stay in the oceanography field.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1911831
NSF Division of Ocean Sciences (NSF OCE)	OCE-1911990

[table of contents | back to top]