Chemical parameters measured on fog water samples from land and ocean locations on California coast from May 2014 to August 2017.

Website: https://www.bco-dmo.org/dataset/726198
Data Type: Other Field Results
Version: 1
Version Date: 2018-02-02

Project
» Collaborative Research: Investigations on the Cycling of Mercury from the Ocean to Fog and Deposition to Land in Coastal California (Mercury in Fog)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:42.8585 **E**:-121.5967 **S**:36.0723 **W**:-126.8567
Temporal Extent: 2014-05-23 - 2017-08-15

Dataset Description

Complete methodology, sampling, and analytical procedures are explained in Weiss-Penzias P. S., Coale K., Heim W., Fernandez D., Oliphant A., Dodge C., Hoskins D., Farlin J., Moranville R. and Olson A. (2016) Total- and monomethyl-mercury and major ions in coastal California fog water: Results from two years of sampling on land and at sea. Elementa 4, 000101. doi: 10.12952/journal.elementa.000101

Other relevant publications:

Coale, K.H., Heim, W.A., Negrey, J., Weiss-Penzias, P., Fernandez, D., Olson, A., Chiswell, H., Byington, A., Bonnema, A., Martenuk, S., Newman, A., Beebe, C. and Till, C. (in review). The distribution and speciation of mercury in the California Current: Implications for mercury transport via fog to land. Deep Sea Research II.

M. Fernandez, Daniel & Torregrosa, Alicia & S. Weiss-Penzias, Peter & June Zhang, Bong & Sorensen, Deckard & E. Cohen, Robert & Mckinley, Gareth & Kleingartner, Justin & Oliphant, Andrew & Bowman, Matthew. (2017). Fog Water Collection Effectiveness: Mesh Intercomparisons. Aerosol and Air Quality Research: 18. doi: 10.4209/aaqr.2017.01.0040.

Methods & Sampling

Fog water samples were collected with a Caltech active strand cloudwater collector. Total Hg was measured with a Tekran 2600 and monomethylmercury was measured with a Tekran 2700. Inorganic ions were measured with an Dionex ion chromatograph with suppressed conductivity detection using 29 mM KOH eluent.

Data Processing Description

The data were processed using Microsoft Excel, Microsoft Access, ArcGIS 9.0, and OriginLab Origin 2016.

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Data Files

File
726198.csv (Comma Separated Values (.csv), 54.97 KB) MD5:906801d302f0e14bab08a5aac51a194c Primary data file for dataset ID 726198

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Parameters

Parameter	Description	Units
Sample_ID	Sample identifier on bottle	no units
Date_collected	Date collected in format mm/dd/yy	unitless
Sample_type	field blank,rain sample, or fog sample	no units
Sample_type_2	aliquot,filtered,incubated	no units
Sample_location	Location ID. BCR- Big Creek Reserve; BML- Bodega Marine Labs; FRF- Fritzche Field; HSU- Humboldt State University Marine Labs; LML- Long Marine Lab; MTA- Montara Lighthouse; OCE- Pacific Ocean, various locations; PPW- Pepperwood Preserve; SFSU- San Francisco State University; UCSC- University of California, Santa Cruz	no units
Latitude	Latitude	decimal degrees
Longitude	Longtitude	decimal degrees
Sample_vol	Sample volume	mL

HgT	Total mercury	ng/L
MMHg	Monomethyl mercury	ng/L
Ammonium	Ammonium ion	mg/L
Chloride	Chloride ion	mg/L
Sulfate	Sulfate ion	mg/L
Nitrate	Nitrate ion	mg/L
pH	pH	pH scale
bank_flag	Flag was set to 1 if the field blank was > 20% of sample concentration	no units
volume_flag	Flag was set to 1 if sample volume was > 10 mL	no units
TOC	Total organic carbon	ppb
UCSC_HgT	Total mercury measured at UCSC lab	ng/L
UCSC_MMHg	Momomethyl mercury measured at UCSC lab	ng/L
HM_SO4	Sulfate ion measured at Harvey Mudd lab	mg/L
HM_NO3	Nitrate ion measured at Harvey Mudd lab	mg/L
delO18	Deviation of oxygen-18 ratio from a standard (which standard???)	per mille

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Instruments

Dataset-specific Instrument Name	Tektran 2600; Tektran 2700
Generic Instrument Name	Automated Mercury Analysis System
Generic Instrument Description	Examples include Tekran Models 2600 and 2700

Dataset-specific Instrument Name	Caltech active strand cloudwater collector
Generic Instrument Name	Cloudwater collector

Dataset-specific Instrument Name	Dionex ion chromatograph with suppressed conductivity detection using 29 mM KOH eluent
Generic Instrument Name	Ion Chromatograph
Generic Instrument Description	Ion chromatography is a form of liquid chromatography that measures concentrations of ionic species by separating them based on their interaction with a resin. Ionic species separate differently depending on species type and size. Ion chromatographs are able to measure concentrations of major anions, such as fluoride, chloride, nitrate, nitrite, and sulfate, as well as major cations such as lithium, sodium, ammonium, potassium, calcium, and magnesium in the parts-per-billion (ppb) range. (from http://serc.carleton.edu/microbelife/research_methods/biogeochemical/ic....)

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Project Information

Collaborative Research: Investigations on the Cycling of Mercury from the Ocean to Fog and Deposition to Land in Coastal California (Mercury in Fog)

Website: http://fognet.ucsc.edu

Coverage: Coastal California

NSF abstract:

Monomethyl mercury (MMHg) is a highly toxic form of mercury in the marine environment, with the ability to bio-concentrate in aquatic food webs and threaten human health. Recent studies have indicated that fog deposition of MMHg may represent an important source of this toxic compound to terrestrial ecosystems that are impacted by fog, however these processes are poorly understood. Researchers from the University of California Santa Cruz, California State University Monterey Bay, and San Jose State University will conduct experiments using a network of fog observation sites (FogNet) along the California coast to examine the spatial and temporal distribution of MMHg in fog and its potential sources. Results from this study will help to better elucidate the role of fog in transporting MMHg to terrestrial ecosystems.

Broader Impacts: This study will provide scientific training for undergraduate and graduate students, including individuals from underrepresented groups, in a number of universities in California. FogNet will create a collaborative research network between state universities, federal entities, and non-governmental organizations. Results from this study will benefit society at large through furthering general knowledge on the cycling of toxic mercury.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1333738
NSF Division of Ocean Sciences (NSF OCE)	OCE-1334252
NSF Division of Ocean Sciences (NSF OCE)	OCE-1333976

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