Scientific sampling event log from the US GEOTRACES Pacific Meridional Transect (PMT) cruise (GP15) from September to November 2018

Website: https://www.bco-dmo.org/dataset/776755
Data Type: Cruise Results
Version: 4
Version Date: 2021-03-25

Project
» US GEOTRACES Pacific Meridional Transect (GP15) (U.S. GEOTRACES PMT)

Program
» U.S. GEOTRACES (U.S. GEOTRACES)

Contributors	Affiliation	Role
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Abstract
Scientific sampling event log from the US GEOTRACES Pacific Meridional Transect (PMT) cruise (GP15) from September to November 2018. GP15 was carried out on the R/V Roger Revelle and was split into two legs: RR1814 (Seattle, WA to Hilo, HI) and RR1815 (Hilo, HI to Papeete, French Polynesia).

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Coverage

Spatial Extent: **N**:57 **E**:-129 **S**:-20 **W**:-157
Temporal Extent: 2018-09-19 - 2018-11-23

Dataset Description

Scientific sampling event log from the US GEOTRACES Pacific Meridional Transect (PMT) cruise (GP15) from September to November 2018.

Methods & Sampling

Event description codes:
nd = unknown/not entered
30-ODF = 30L Niskin Rosette
GS = 36pl 10L Rosette
Be-7 = Beryllium-7
GT-C = GEOTRACES carousel
GeoF = GeoFish w/ GEOTRACES #; TM diss/uf

McL-Prof = McLane pump profile
Aeros = Aerosol sampler
Argo = Argo Float deployment
NEMO = NEMO Float deployment
Ra/Th/Pig = Ra/Th/Pigment Niskin Cast
Surf Ra Pump = Surface Ra pump
Rain = Rain sample
MTC = Multi-Corer
Mono = Mono-Corer
XBT = XBT
XCTD = XCTD
Buoy = Buoy deployment
UWay = Ship's Underway system sample

Sample description codes:
nd = unknown/not recorded
diss = dissolved samples
diss+part = dissolved and particulate samples
unfilt = unfiltered seawater
filter = filter for particulates
diss+UF = Dissolved TM, Mn; Unfiltered TM
Argo = Argo Float deployment
dirt = Sediments
part = Particle
none = none

Data Processing Description

Event Log Editing History (yyyy-mm-dd):
2019-05-14. PJL. Filled in some missing McLane pump entries (in red) and corrected some typos.
2019-07-15. LMO. Corrections and additions f/cast sheets.
2019-09-24. CSB. Filled in missing Aerosol and rain info.
2019-09-24. MS. Filled in missing Be-7 info.
2019-09-24. ELR. Filled in missing Ra pump data.
2019-09-24. VS. Filled in missing underway data.
2019-10-01. LBA/JL. Filled in missing underway and GeoF data.
2019-10-06. KLC. Collated and rechecked.
2019-10-10. BC. Filled missing underway sample info.
2019-10-10. PJL. Filled missing McLane pump info.
2019-10-14. KLC. Filled 'nd' ('not determined') for info that could exist, but was not collected; and 'na' ('not applicable') for info that is not applicable, or does not exist.
2020-03-02. KLC. Fixed time, cast #, and author on initial underway sample at station 5.

2020-07-22. SMR/BCO-DMO:
- modified parameter names;
- formatted times to hh:mm;
- formatted dates to yyyy-mm-dd;
- filled blank comments with "na" (not applicable);
- EVENTNO 6990 date_start was 11/19118; changed to 2018-11-19;
- EVENTNO 6931 date_start was 11/13/13; changed to 2018-11-13;
- EVENTNO 6917 date_start was 11/11/16; changed to 2018-11-11;
- EVENTNO 6621 date_start was 10/07/17; changed to 2018-10-07;
- EVENTNO 6723 date_end had extra slash, 10//17/18; fixed and re-formatted;
- EVENTNO 6900 date_end was 11/10/19; changed to 2018-11-10;
- EVENTNO 6901 date_end was 11/10/19; changed to 2018-11-10;
- EVENTNO 6904 date_end was 11/10/19; changed to 2018-11-10;
- EVENTNO 6936 date_end was 11/13/16; changed to 2018-11-13;
- EVENTNO 6790 date_end was 10/28/17; changed to 2018-10-17.

2021-03-25. SMR/BCO-DMO. Made the following corrections to dates/time based on correspondence with BODC & the cruise chief scientist:
- EVENTNO 6774 date_end was 2018-10-21; changed to 2018-10-25;
- EVENTNO 6963 date_end was 2018-11-15; changed to 2018-11-16;
- EVENTNO 6840 date_end was 2018-11-01; changed to 2018-11-02;
- EVENTNO 6817 date_start was 2018-10-31; changed to 2018-10-30;

- EVENTNO 6559 date_end was 2018-09-28; changed to 2018-09-29;
- EVENTNO 6540 time_end_utc was 19:26; changed to 19:46 (approximate end time);
- EVENTNO 6839 date_end was 2018-11-02; changed to 2018-11-02;
- EVENTNO 6960 time_end_utc was 19:24; changed to 19:54 (approximate end time);
- EVENTNO 7006 date_end was 2018-11-20; changed to 2018-11-21.

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Data Files

File
GP15_Event_Log.csv (Comma Separated Values (.csv), 58.38 KB) MD5:830711a7a013f91c03d480323026f511 Primary data file for dataset ID 776755

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Parameters

Parameter	Description	Units
EVENTNO	Event number	unitless
STNNBR	Station number	unitless
CASTNO	Cast number	unitless
Event_Descrip	Event description: nd = unknown/not entered 30-ODF = 30L Niskin Rosette GS = 36pl 10L Rosette Be-7 = Beryllium-7 GT-C = GEOTRACES carousel GeoF = GeoFish w/ GEOTRACES #; TM diss/uf McL-Prof = McLane pump profile Aeros = Aerosol sampler Argo = Argo Float deployment NEMO = NEMO Float deployment Ra/Th/Pig = Ra/Th/Pigment Niskin Cast Surf Ra Pump = Surface Ra pump Rain = Rain sample MTC = Multi-Corer Mono = Mono-Corer XBT = XBT XCTD = XCTD Buoy = Buoy deployment UWay = Ship's Underway system sample	unitless
date_start	Date (UTC) at start of event; format: yyyy-mm-dd	unitless
time_start_utc	Time (UTC) at start of event; format: hh:mm	unitless
date_end	Date (UTC) at end of event; format: yyyy-mm-dd	unitless
time_end_utc	Time (UTC) at end of event; format: hh:mm	unitless
sample_depth_min	Minimum sampling depth	meters (m)
sample_depth_max	Maximum sampling depth	meters (m)
Latitude	Latitude; positive values = North	decimal degrees
Longitude	Longitude; positive values = East	decimal degrees
bottom_depth	Bottom depth	meters (m)
samples_taken	Description of samples taken: nd = unknown/not recorded diss = dissolved samples diss+part = dissolved and particulate samples unfilt = unfiltered seawater filter = filter for particulates diss+UF = Dissolved TM, Mn; Unfiltered TM Argo = Argo Float deployment dirt = Sediments part = Particle none = none	unitless
GEOTRC_SAMPNO_Range	Range of GEOTRACES sample ID numbers applicable to the event	unitless
author	Initials of the person recording the event	unitless
comment	Notes/comments about the event	unitless

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Deployments

RR1814

Website	https://www.bco-dmo.org/deployment/776913
Platform	R/V Roger Revelle
Report	https://datadocs.bco-dmo.org/docs/geotraces/GEOTRACES_PMT/casciotti/data_docs/GP15_Cruise_Report_with_ODF_Report.pdf
Start Date	2018-09-18
End Date	2018-10-21
Description	Additional cruise information is available from the Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/RR1814

RR1815

Website	https://www.bco-dmo.org/deployment/776917
Platform	R/V Roger Revelle
Report	https://datadocs.bco-dmo.org/docs/geotraces/GEOTRACES_PMT/casciotti/data_docs/GP15_Cruise_Report_with_ODF_Report.pdf
Start Date	2018-10-24
End Date	2018-11-24
Description	Additional cruise information is available from the Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/RR1815

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Project Information

US GEOTRACES Pacific Meridional Transect (GP15) (U.S. GEOTRACES PMT)

Website: http://www.geotraces.org/

Coverage: Pacific Meridional Transect along 152W (GP15)

A 60-day research cruise took place in 2018 along a transect form Alaska to Tahiti at 152° W. A description of the project titled "*Collaborative Research: Management and implementation of the US GEOTRACES Pacific Meridional Transect*", funded by NSF, is below. Further project information is available on the US GEOTRACES website and on the cruise blog. A detailed cruise report is also available as a PDF.

Description from NSF award abstract:
GEOTRACES is a global effort in the field of Chemical Oceanography in which the United States plays a major role. The goal of the GEOTRACES program is to understand the distributions of many elements and their isotopes in the ocean. Until quite recently, these elements could not be measured at a global scale. Understanding the distributions of these elements and isotopes will increase the understanding of processes that shape their distributions and also the processes that depend on these elements. For example, many "trace elements" (elements that are present in very low amounts) are also important for life, and their presence or absence can play a vital role in the population of marine ecosystems. This project will launch the next major U.S. GEOTRACES expedition in the Pacific Ocean between Alaska and Tahiti. The award made here would support all of the major infrastructure for this expedition, including the research vessel, the sampling equipment, and some of the core oceanographic measurements. This project will also support the personnel needed to lead the expedition and collect the samples.

This project would support the essential sampling operations and infrastructure for the U.S. GEOTRACES Pacific Meridional Transect along 152° W to support a large variety of individual science projects on trace element and isotope (TEI) biogeochemistry that will follow. Thus, the major objectives of this management proposal are: (1) plan and coordinate a 60 day research cruise in 2018; (2) obtain representative samples for a wide variety of TEIs using a

conventional CTD/rosette, GEOTRACES Trace Element Sampling Systems, and in situ pumps; (3) acquire conventional CTD hydrographic data along with discrete samples for salinity, dissolved oxygen, algal pigments, and dissolved nutrients at micro- and nanomolar levels; (4) ensure that proper QA/QC protocols are followed and reported, as well as fulfilling all GEOTRACES intercalibration protocols; (5) prepare and deliver all hydrographic data to the GEOTRACES Data Assembly Centre (via the US BCO-DMO data center); and (6) coordinate all cruise communications between investigators, including preparation of a hydrographic report/publication. This project would also provide baseline measurements of TEIs in the Clarion-Clipperton fracture zone (~7.5°N-17°N, ~155°W-115°W) where large-scale deep sea mining is planned. Environmental impact assessments are underway in partnership with the mining industry, but the effect of mining activities on TEIs in the water column is one that could be uniquely assessed by the GEOTRACES community. In support of efforts to communicate the science to a wide audience the investigators will recruit an early career freelance science journalist with interests in marine science and oceanography to participate on the cruise and do public outreach, photography and/or videography, and social media from the ship, as well as to submit articles about the research to national media. The project would also support several graduate students.

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Program Information

U.S. GEOTRACES (U.S. GEOTRACES)

Website: http://www.geotraces.org/

Coverage: Global

GEOTRACES is a SCOR sponsored program; and funding for program infrastructure development is provided by the U.S. National Science Foundation.

GEOTRACES gained momentum following a special symposium, S02: Biogeochemical cycling of trace elements and isotopes in the ocean and applications to constrain contemporary marine processes (GEOSECS II), at a 2003 Goldschmidt meeting convened in Japan. The GEOSECS II acronym referred to the Geochemical Ocean Section Studies To determine full water column distributions of selected trace elements and isotopes, including their concentration, chemical speciation, and physical form, along a sufficient number of sections in each ocean basin to establish the principal relationships between these distributions and with more traditional hydrographic parameters;

* To evaluate the sources, sinks, and internal cycling of these species and thereby characterize more completely the physical, chemical and biological processes regulating their distributions, and the sensitivity of these processes to global change; and

* To understand the processes that control the concentrations of geochemical species used for proxies of the past environment, both in the water column and in the substrates that reflect the water column.

GEOTRACES will be global in scope, consisting of ocean sections complemented by regional process studies. Sections and process studies will combine fieldwork, laboratory experiments and modelling. Beyond realizing the scientific objectives identified above, a natural outcome of this work will be to build a community of marine scientists who understand the processes regulating trace element cycles sufficiently well to exploit this knowledge reliably in future interdisciplinary studies.

Expand "Projects" below for information about and data resulting from individual US GEOTRACES research projects.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1657781
NSF Division of Ocean Sciences (NSF OCE)	OCE-1658318
NSF Division of Ocean Sciences (NSF OCE)	OCE-1657944

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