Scientific sampling event log from the US GEOTRACES GP17-OCE cruise on R/V Roger Revelle (RR2214) from December 2022 to January 2023

Website: https://www.bco-dmo.org/dataset/927550
Data Type: Cruise Results
Version: 2
Version Date: 2025-06-06

Project
» US GEOTRACES GP17 Section: South Pacific and Southern Ocean (GP17-OCE) (GP17-OCE)

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

Contributors	Affiliation	Role
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Abstract
This dataset is the scientific sampling event log from the US GEOTRACES GP17-OCE cruise on R/V Roger Revelle (RR2214). The expedition departed Papeete, Tahiti (French Polynesia) on December 1st, 2022 and arrived in Punta Arenas, Chile on January 25th, 2023. The cruise took place in the South Pacific and Southern Oceans aboard the R/V Roger Revelle with a team of 34 scientists led by Ben Twining (Chief Scientist), Jessica Fitzsimmons, and Greg Cutter (Co-Chief Scientists). GP17 was planned as a two-leg expedition, with its first leg (GP17-OCE) as a southward extension of the 2018 GP15 Alaska-Tahiti expedition and a second leg (GP17-ANT; December 2023-January 2024) into coastal and shelf waters of Antarctica's Amundsen Sea.

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Coverage

Location: South Pacific and Southern Ocean
Spatial Extent: **N**:-17.536523 **E**:-73.514377 **S**:-67.009839 **W**:-152.000291
Temporal Extent: 2022-11-28 - 2023-01-24

Methods & Sampling

The event log was recorded during the cruise using the R2R ELOG system (https://www.rvdata.us/about/event-log).

BCO-DMO Curation Notes

Version 1:
Version date: 2024-09-30
Description: The original version of the dataset published at BCO-DMO.

- Imported the BCO-DMO modified file (originally "R2R_ELOG_rr2214_FINAL_EVENTLOG_20230126_135207_cleaned for BCODMO.xlsx") into the BCO-DMO system.
- Flagged "NaN" as a missing data identifier (missing data are empty/blank in the final CSV file.)
- Replaced "rr2214" with "RR2214" in the "Cruise" column.
- Cleaned up "Transect" column by moving information to the "Comment" column. For rows where a station number was entered in "Transect", moved that station number to the "Station" column.
- In "Station" column: replaced "Station 3" with "3", replaced "STN14" with "14", and replaced "test station 1" with "Test 1".
- Renamed fields to comply with BCO-DMO naming conventions.
- Replaced year of "2032" with "2023" in the "DateTimeUTC" column.
- Replaced "4191 m" in Seafloor column with "4191".
- Converted both date/time columns to ISO 8601 (UTC) format.
- Saved the final file as "927550_v1_gp17-oce_event_log.csv".

Version 2:
Version date: 2025-06-06
Description: This version contains corrections to cast numbers for two events.

- Imported the version 1 data file, "927550_v1_gp17-oce_event_log.csv", into the BCO-DMO data processing system.
- Made the following corrections:
-- for event 20221209.1853.001 at Station 4, changed the Cast number from 2 to 3
-- for event 20230124.0535.001 at station 38, changed the Cast number from 3 to 4
- Saved the final file as "927550_v2_gp17-oce_event_log.csv".

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Data Files

File	
927550_v2_gp17-oce_event_log.csv	(Comma Separated Values (.csv), 123.46 KB) MD5:3a48eec1e631af429d2589465af70bd5
Primary data file for dataset ID 927550, version 2	

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Supplemental Files

File
Fish scanned log sheets filename: Fish scanned log sheets-20250602T215609Z-1-001.zip (ZIP Archive (ZIP), 22.35 MB) MD5:5475efc2b28092d4a5ff0c23cbccbb9a Supplemental file for GP17-OCE datasets; this folder contains PDFs of the original GeoFish log sheets. Files are named starting with 3 digits representing station number followed by 2 digits representing cast number; a trailing "-5" indicates the station number ends in ".5" (e.g. 00401 = station 4, cast 1; and 00401-5 = station 4.5, cast 1).
GTC CTD scanned log sheets filename: GTC scanned log sheets-20250602T215617Z-1-001.zip (ZIP Archive (ZIP), 152.53 MB) MD5:23f9739b03b567f47e8ab636029a11dc Supplemental file for GP17-OCE datasets; this folder contains PDFs of the original GTC CTD console and sample logs. Files are named starting with 3 digits representing station number followed by 2 digits representing cast number (e.g. 00302 = station 3, cast 2).
ODF CTD scanned log sheets filename: ODF scanned log sheets-20250602T215625Z-1-001.zip (ZIP Archive (ZIP), 150.75 MB) MD5:d7b09179e4cb3e5d8d285faa756e319d Supplemental file for GP17-OCE datasets; this folder contains PDFs of the original ODF CTD console and sample logs. Files are named starting with 3 digits representing station number followed by 2 digits representing cast number (e.g. 02014 = station 2, cast 14).
Pump scanned log sheets filename: Pump scanned log sheets-20250602T215630Z-1-001.zip (ZIP Archive (ZIP), 4.30 MB) MD5:014213e7726815e69a1ab247e7e8c1fd Supplemental file for GP17-OCE datasets; this folder contains PDFs of the original McLane pump log sheets. Files are named starting with 3 digits representing station number followed by 2 digits representing cast number (e.g. 00605 = station 6, cast 5).

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Related Datasets

IsRelatedTo

Hawco, N. J. (2025) **Concentration of labile dissolved zinc (dZn) from trace metal clean samples collected on the GEOTRACES GP17 expedition across the South Pacific and Southern Oceans in December 2022 to January 2023 on the R/V Revelle (RR2214).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2025-07-30 http://lod.bco-dmo.org/id/dataset/969915 [view at BCO-DMO]

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Parameters

Parameter	Description	Units
Cruise	Cruise name/ID	unitless
Event	Event number	unitless

Instrument	Instrument: 36pl Rosette = ODF CTD Rosette. Aerosol Sampler = High-volume aerosol sampler. Argo = Deployment of Argo float. Be 7 = Collection of large volumes (ca. 700L) of water from multiple depths in the upper 200m using a deck-mounted centrifugal pump attached to tubing. bio-Argo = Bio Argo float. GeoFish = A towed near surface (<2 m) sampling system for collection of trace metal clean seawater. Geotraces C = GEOTRACES CTD Rosette. McLane = Dual-flow McLane Research in-situ pumps (WTS-LV). NEMO = Deployment of a PROVOR NEMO float. Other = Deep Argo float deployments; see the Comment column. Ship = Used for test event. Surf Ra Pump = Hand-deployed surface pump to collected ca. 1500L of surface water for measurement of Radium isotopes. Underway = Used to mark the beginning and end of sampling of surface water via the ship's through-hull clean sampling system.	unitless
Action	Description of the event/action, e.g. deploy, recover, start, end, etc.	unitless
Transect	Transect number or descripton; primarily used for Aerosol events	unitless
Station	Station number. Station numbers starting with "C" indicate the 3 stations sampled for a Chilean collaborator after the final official station. The C stands for "coastal".	unitless
Cast	Cast number	unitless
Latitude	Latitude of event; negative values = South	decimal degrees
Longitude	Longitude of event; negative values = West	decimal degrees
sample_depth_min	Minimum sample depth	meters (m)
sample_depth_max	Maximum sample depth	meters (m)
GEOTRACES_ID_Num_Range	Range of GEOTRACES sample ID numbers applicable to the event	unitless
Seafloor	Bottom depth	meters (m)
Author	Person recording the event in the event log	unitless
Comment	Comments/notes about the event	unitless

DateTimeUTC	Date and time (UTC) of the event in format YYYYmmdd.HHMM	unitless
ISO_DateTime_UTC	Date and time (UTC) of the event in ISO 8601 format	unitless
GPS_Time	Date and time (UTC) according to the GPS in ISO 8601 format	unitless
Revisions	History of revisions to the event made during the cruise	unitless

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Deployments

RR2214

Website	https://www.bco-dmo.org/deployment/905754
Platform	R/V Roger Revelle
Report	https://www.bodc.ac.uk/resources/inventories/cruise_inventory/reports/rogerrevelle_rr2214.pdf
Start Date	2022-12-01
End Date	2023-01-25
Description	The U.S. GEOTRACES GP17-OCE expedition departed Papeete, Tahiti (French Polynesia) on December 1st, 2022 and arrived in Punta Arenas, Chile on January 25th, 2023. The cruise took place in the South Pacific and Southern Oceans aboard the R/V Roger Revelle with a team of 34 scientists led by Ben Twining (Chief Scientist), Jessica Fitzsimmons, and Greg Cutter (Co-Chief Scientists). GP17 was planned as a two-leg expedition, with its first leg (GP17-OCE) as a southward extension of the 2018 GP15 Alaska-Tahiti expedition and a second leg (GP17-ANT; December 2023-January 2024) into coastal and shelf waters of Antarctica's Amundsen Sea. The GP17-OCE section encompassed three major transects: (1) a southbound pseudo-meridional section (~152-135 degrees West) from 20 degrees South to 67 degrees South; (2) an eastbound zonal transect from 135 degrees West to 100 degrees West; (3) and a northbound section returning to Chile (100-75 degrees West). Additional cruise information is available from the following sources: R2R: https://www.rvdata.us/search/cruise/RR2214 CCHDO: https://cchdo.ucsd.edu/cruise/33RR20221201 More information can also be found at: https://usgeotraces.ldeo.columbia.edu/content/gp17-oce

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Project Information

US GEOTRACES GP17 Section: South Pacific and Southern Ocean (GP17-OCE) (GP17-OCE)

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

Coverage: Papeete, Tahiti to Punta Arenas, Chile

The U.S. GEOTRACES GP17-OCE expedition departed Papeete, Tahiti (French Polynesia) on December 1st, 2022 and arrived in Punta Arenas, Chile on January 25th, 2023. The cruise took place in the South Pacific and Southern Oceans aboard the R/V Roger Revelle (cruise ID RR2214) with a team of 34 scientists lead by Ben Twining (Chief Scientist), Jessica Fitzsimmons and Greg Cutter (Co-Chief Scientists). GP17 was planned as a two-leg expedition, with its first leg (GP17-OCE) as a southward extension of the 2018 GP15 Alaska-Tahiti

expedition and a second leg (GP17-ANT; December 2023-January 2024) into coastal and shelf waters of Antarctica's Amundsen Sea.

The South Pacific and Southern Oceans sampled by GP17-OCE play critical roles in global water mass circulation and associated global transfer of heat, carbon, and nutrients. Specific oceanographic regions of interest for GP17-OCE included: the most oligotrophic gyre in the global ocean, the Antarctic Circumpolar Current (ACC) frontal region, the previously unexplored Pacific- Antarctic Ridge, the Pacific Deep Water (PDW) flow along the continental slope of South America, and the continental margin inputs potentially emanating from South America.

Further information is available on the US GEOTRACES website and in the cruise report (PDF).

NSF Project Title: Collaborative Research: Management and Implementation of US GEOTRACES GP17 Section: South Pacific and Southern Ocean (GP17-OCE)

NSF Award Abstract:
This award will support the management and implementation of a research expedition from Tahiti to Chile that will enable sampling for a broad suite of trace elements and isotopes (TEI) across oceanographic regions of importance to global nutrient and carbon cycling as part of the U.S. GEOTRACES program. GEOTRACES is a global effort in the field of Chemical Oceanography, the goal of which is to understand the distributions of trace elements and their isotopes in the ocean. Determining the distributions of these elements and isotopes will increase understanding of processes that shape their distributions, such as ocean currents and material fluxes, and also the processes that depend on these elements, such as the growth of phytoplankton and the support of ocean ecosystems. The proposed cruise will cross the South Pacific Gyre, the Antarctic Circumpolar Current, iron-limited Antarctic waters, and the Chilean margin. In combination with a proposed companion GEOTRACES expedition on a research icebreaker (GP17-ANT) that will be joined by two overlapping stations, the team of investigators will create an ocean section from the ocean's most nutrient-poor waters to its highly-productive Antarctic polar region - a region that plays an outsized role in modulating the global carbon cycle. The expedition will support and provide management infrastructure for additional participating science projects focused on measuring specific external fluxes and internal cycling of TEIs along this section.

The South Pacific Gyre and Pacific sector of the Southern Ocean play critical roles in global water mass circulation and associated global transfer of heat, carbon, and nutrients, but they are chronically understudied for TEIs due to their remote locale. These are regions of strong, dynamic fronts where sub-surface water masses upwell and subduct, and biological and chemical processes in these zones determine nutrient stoichiometries and tracer concentrations in waters exported to lower latitudes. The Pacific sector represents an end member of extremely low external TEI surface fluxes and thus an important region to constrain inputs from the rapidly-changing Antarctic continent. Compared to other ocean basins, TEI cycling in these regions is thought to be dominated by internal cycling processes such as biological uptake, regeneration, and scavenging, and these are poorly represented in global ocean models. The cruise will enable funded investigators to address research questions such as: 1) what are relative rates of external TEI fluxes to this region, including dust, sediment, hydrothermal, and cryospheric fluxes? 2) What are the (micro) nutrient regimes that support productivity, and what impacts do biomass accumulation, export, and regeneration have on TEI cycling and stoichiometries of exported material? 3) What are TEI and nutrient stoichiometries of subducting water masses, and how do scavenging and regeneration impact these during transport northward? This management project has several objectives: 1) plan and coordinate a 55-day research cruise in 2021-2022; 2) use both conventional and trace-metal 'clean' sampling systems to obtain TEI samples, as well as facilitate sampling for atmospheric aerosols and large volume particles and radionuclides; 3) acquire hydrographic data and samples for salinity, dissolved oxygen, algal pigments, and macro-nutrients; and deliver these data to relevant repositories; 4) ensure that proper QA/QC protocols, as well as GEOTRACES intercalibration protocols, are followed and reported; 5) prepare the final cruise report to be posted with data; 6) coordinate between all funded cruise investigators, as well as with leaders of proposed GP17-ANT cruise; and 7) conduct broader impact efforts that will engage the public in oceanographic research using immersive technology. The motivations for and at-sea challenges of this work will be communicated to the general public through creation of immersive 360/Virtual Reality experiences, via a collaboration with the Texas A&M University Visualization LIVE Lab. Through Virtual Reality, users will experience firsthand what life and TEI data collection at sea entail. Virtual reality/digital games and 360° experiences will be distributed through GEOTRACES outreach websites, through PI engagement with local schools, libraries, STEM summer camps, and adult service organizations, and through a collaboration with the National Academy of Sciences.

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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-2023315
NSF Division of Ocean Sciences (NSF OCE)	OCE-2023206
NSF Division of Ocean Sciences (NSF OCE)	OCE-2023237

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