

CTD-ODF profiles from GEOTRACES-Arctic Section cruise HLY1502, August to October 2015

Website: <https://www.bco-dmo.org/dataset/700817>

Data Type: Cruise Results

Version: 2

Version Date: 2022-12-15

Project

» [U.S. Arctic GEOTRACES Study \(GN01\)](#) (U.S. GEOTRACES Arctic)

Program

» [U.S. GEOTRACES](#) (U.S. GEOTRACES)

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Abstract

These data are from the ODF CTD rosette operated on the GEOTRACES Arctic cruise (GN01) on USCGC Healy from August to October 2015.

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Coverage

Spatial Extent: N:90 E:-148 S:60 W:167

Temporal Extent: 2015-08-12 - 2015-10-07

Dataset Description

CTD profile data using the GEOTRACES ODF system, GEOTRACES-Arctic cruise HLY1502. 20160310CCHSIOSEE

Methods & Sampling

Note there were three separate rosette/CTD systems used on HLY1502. The GOSHIP rosette (coded GS in the event log) was also used for the Ra/Th/pigments profiles after station 10. There was a separate rosette that was loaded with 12 30-liter Niskins, but we only used that until station 10 (and once again at station 26). The

[GEOTRACES cruise report](#) (PDF) mentions this, but does not provide detailed sensor information.

Data Processing Description

BCO-DMO Processing:

- added conventional header with dataset name; PI name; version date
- added cruise_id column plus information from headers: EXPOCODE, SECT_ID, STNNBR, CASTNO, GEOTRC_EVENTNO, DATE, TIME, LATITUDE, LONGITUDE, BTMDEPTH, INSTRUMENT_ID
- added column ISO_DateTime_UTC, calculated from Date and Time columns.
- 2022-12-15: made the CDMF and CDMF_FLAG_W columns public (were previously hidden)

Version History:

2017-05-22 (v1) - dataset made available from BCO-DMO; considered validated/final
2022-12-15 (v2) - CDMF and CDMF_FLAG_W made public.

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Data Files

File
CTD_profiles_ODF_v2017_05_22_CDOM.csv (Comma Separated Values (.csv), 30.69 MB) MD5:e3c4d018a61277229602e3a6aff316e8 Primary data file for dataset ID 700817

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Supplemental Files

File
ARC01 (HLY1502, GN01) cruise report filename: ARC01-report.pdf (Portable Document Format (.pdf), 4.02 MB) MD5:371276af63d6b2d7f9127446e3b2c66e U.S. Arctic GEOTRACES cruise report
HLY1502 PAR sensor calibration sheet filename: HLY1502_PAR_QCP2300HP-70444-1506.pdf(Portable Document Format (.pdf), 942.50 KB) MD5:255fcef28120415eb1f00ec3c2d70494 PAR sensor calibration sheet for HLY1502 CTD ODF profile data.

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Parameters

Parameter	Description	Units
cruise_id	Cruise identification	unitless
EXPOCODE	expedition code assigned by the CCHDO: NODCSHIPCodeYearMonthDay	unitless
SECT_ID	cruise section identification number	unitless

GEOTRC_EVENTNO	GEOTRACES Event Number	unitless
STNNBR	Station Number	unitless
CASTNO	Cast Number	unitless
DATE	Station Date (GMT) in format YYYYMMDD	unitless
TIME	Station Time (GMT) in format HHMM	unitless
LATITUDE	Station Latitude (South is negative)	decimal degrees
LONGITUDE	Station Longitude (West is negative)	decimal degrees
BTMDEPTH	Multibeam bottom depth of the cast	meters
INSTRUMENT_ID	Instrument Id (from CTD profile data headers)	unitless
CTDPRS	CTD Pressure	decibars (DBARS)
CTDPRS_FLAG_W	CTD pressure quality flag (see WOCE Hydrographic Program Quality Flags)	unitless
CTDTMP	CTD Temperature; ITS-90	degrees Celsius
CTDTMP_FLAG_W	CTD temperature quality flag (see WOCE Hydrographic Program Quality Flags)	unitless
CTDSAL	CTD Salinity	PSS-78
CTDSAL_FLAG_W	CTD salinity quality flag (see WOCE Hydrographic Program Quality Flags)	unitless
CTDOXY	CTD Oxygen	UMOL/KG
CTDOXY_FLAG_W	CTD oxygen quality flag(see WOCE Hydrographic Program Quality Flags)	unitless
XMISS	Light Transmission (0-5VDC)	volts

XMISS_FLAG_W	Light Transmission quality flag (see WOCE Hydrographic Program Quality Flags)	unitless
FLUOR	Fluorescence (0-5VDC)	volts
FLUOR_FLAG_W	Fluorescence quality flag (see WOCE Hydrographic Program Quality Flags)	unitless
CDOMF	CDOM sensor units in volts (range 0-5V)	volts
CDOMF_FLAG_W	CDOMF flag (see WOCE Hydrographic Program Quality Flags)	unitless
PAR	Photosynthetically Available [Active] Radiation; downwelling irradiance. PAR sensor calibration sheet (pdf)	volts
PAR_FLAG_W	PAR quality flag (see WOCE Hydrographic Program Quality Flags)	unitless
CTDNOBS	CTD Number of Observations	unitless
CTDETIME	CTD Elapsed Time	SECONDS
ISO_DateTime.UTC	Date/Time (UTC) in ISO 8601 format: YYYY-MM-DDTHH:MM:SS[.xx]Z	unitless
TIMESTAMP	Timestamp/version of data file provided to BCO-DMO	unitless
PREVIOUS_TIMESTAMP	Timestamp/version of data file provided to BCO-DMO	

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	CTD Sea-Bird SBE 911plus
Dataset-specific Description	The system included Seabird carousel/CTD with 12-place 30L Niskin bottles (coded 30-ODF in event log) and a 36-place 10L Niskin bottles (coded Ra/Th/pigments in event log). The PAR calibration sheet is available (pdf)
Generic Instrument Description	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

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Deployments

HLY1502

Website	https://www.bco-dmo.org/deployment/638807
Platform	USCGC Healy
Report	https://datadocs.bco-dmo.org/docs/302/geotraces/GEOTRACES_ARCTIC/data_docs/cruise_reports/healy1502.pdf
Start Date	2015-08-09
End Date	2015-10-12
Description	Arctic transect encompassing Bering and Chukchi Shelves and the Canadian, Makarov and Amundsen sub-basins of the Arctic Ocean. The transect started in the Bering Sea (60°N) and traveled northward across the Bering Shelf, through the Bering Strait and across the Chukchi shelf, then traversing along 170-180°W across the Alpha-Mendeleev and Lomonosov Ridges to the North Pole (Amundsen basin, 90°N), and then back southward along ~150°W to terminate on the Chukchi Shelf (72°N). Additional cruise information is available in the GO-SHIP Cruise Report (PDF) and from the Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/HLY1502

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Project Information

U.S. Arctic GEOTRACES Study (GN01) (U.S. GEOTRACES Arctic)

Website: <https://www.geotraces.org/>

Coverage: Arctic Ocean; Sailing from Dutch Harbor to Dutch Harbor (GN01)

Description from NSF award abstract:

In pursuit of its goal "to identify processes and quantify fluxes that control the distributions of key trace elements and isotopes in the ocean, and to establish the sensitivity of these distributions to changing

environmental conditions", in 2015 the International GEOTRACES Program will embark on several years of research in the Arctic Ocean. In a region where climate warming and general environmental change are occurring at amazing speed, research such as this is important for understanding the current state of Arctic Ocean geochemistry and for developing predictive capability as the regional ecosystem continues to warm and influence global oceanic and climatic conditions. The three investigators funded on this award, will manage a large team of U.S. scientists who will compete through the regular NSF proposal process to contribute their own unique expertise in marine trace metal, isotopic, and carbon cycle geochemistry to the U.S. effort. The three managers will be responsible for arranging and overseeing at-sea technical services such as hydrographic measurements, nutrient analyses, and around-the-clock management of on-deck sampling activities upon which all participants depend, and for organizing all pre- and post-cruise technical support and scientific meetings. The management team will also lead educational outreach activities for the general public in Nome and Barrow, Alaska, to explain the significance of the study to these communities and to learn from residents' insights on observed changes in the marine system. The project itself will provide for the support and training of a number of pre-doctoral students and post-doctoral researchers. Inasmuch as the Arctic Ocean is an epicenter of global climate change, findings of this study are expected to advance present capability to forecast changes in regional and global ecosystem and climate system functioning.

As the United States' contribution to the International GEOTRACES Arctic Ocean initiative, this project will be part of an ongoing multi-national effort to further scientific knowledge about trace elements and isotopes in the world ocean. This U.S. expedition will focus on the western Arctic Ocean in the boreal summer of 2015. The scientific team will consist of the management team funded through this award plus a team of scientists from U.S. academic institutions who will have successfully competed for and received NSF funds for specific science projects in time to participate in the final stages of cruise planning. The cruise track segments will include the Bering Strait, Chukchi shelf, and the deep Canada Basin. Several stations will be designated as so-called super stations for intense study of atmospheric aerosols, sea ice, and sediment chemistry as well as water-column processes. In total, the set of coordinated international expeditions will involve the deployment of ice-capable research ships from 6 nations (US, Canada, Germany, Sweden, UK, and Russia) across different parts of the Arctic Ocean, and application of state-of-the-art methods to unravel the complex dynamics of trace metals and isotopes that are important as oceanographic and biogeochemical tracers in the sea.

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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-1355913
NSF Division of Ocean Sciences (NSF OCE)	OCE-1355833
NSF Division of Ocean Sciences (NSF OCE)	OCE-1356008
NSF Division of Ocean Sciences (NSF OCE)	OCE-1455924

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