

CTD profiles from GEOTRACES cruise KN193-06 for Intercalibration of sensors aboard R/V Knorr in the Sargasso Sea (GEOTRACES IC project)

Website: <https://www.bco-dmo.org/dataset/3498>

Version: 27 June 2011

Version Date: 2011-06-27

Project

» [GEOTRACES InterCalibration](#) (GEOTRACES IC)

Program

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

Contributors	Affiliation	Role
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Dataset Description

CTD profile data from GEOTRACES Intercalibration cruise KN193-06; CTD casts are identified as "KnoR" events in the cruise sampling event log.

Methods & Sampling

Data were acquired with Seabird 9 CTD equipped with dual Temperature/Conductivity sensors, SBE 43 Oxygen sensor, transmissometer, fluorometer, and turbidity sensor.

Data Processing Description

Standard Seabird processing routines were used to create 1-meter averaged profiles.

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Data Files

File
CTD_IC1.csv (Comma Separated Values (.csv), 4.41 MB) MD5:7a334dff3e20c4d8ce201ab2ff321390
Primary data file for dataset ID 3498

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Parameters

Parameter	Description	Units
Cruise_ID	Cruise identifier	dimensionless
date	Date of sample	YYYYMMDD
lon	longitude	decimal degrees
lat	latitude	decimal degrees
Zmax	Maximum depth of profile	dimensionless
cast	cast id	dimensionless
depth	sampling	meter
temp	Temperature	degrees Celsius
temp_S	Temperature from Secondary Sensor	degrees Celsius
cond	Conductivity	dimensionless
cond_S	Conductivity from secondary sensor	dimensionless
sal	Salinity	dimensionless
sal_S	Salinity from Secondary sensor	dimensionless
sigma_0	water potential density - 1000	kg m ⁻³
O2_ml_L	dissolved oxygen concentration	ml per liter
trans	transmissivity	percent
flvolt	fluorometer	volts
turbidity	turbidity	Nephelometric Turbidity Units (NTU)
turbid_v	turbidity	volts
trans_v	transmissivity	volts
altimeter	altimeter	meters
sigma_0	sigma_theta	kilograms/meter ³
sigma_t	sigma-t	kilograms/meter ³
density	density	kilograms/meter ³
potemp	potential temperature	degrees Celsius
potemp_S	potential temperature from secondary sensors	degrees Celsius
sal_diff	salinity difference	dimensionless
sound_vel	sound velocity	meters per second
event	event ID	dimensionless

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Instruments

Dataset-specific Instrument Name	Altimeter
Generic Instrument Name	Altimeter
Generic Instrument Description	An instrument that measures height above a fixed surface. The data can be used to map ocean-surface topography and generate gridded surface height fields.

Dataset-specific Instrument Name	CTD Sea-Bird 911
Generic Instrument Name	CTD Sea-Bird 911
Generic Instrument Description	The Sea-Bird SBE 911 is a type of CTD instrument package. The SBE 911 includes the SBE 9 Underwater Unit and the SBE 11 Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). More information from Sea-Bird Electronics.

Dataset-specific Instrument Name	SBE 43 Dissolved Oxygen Sensor
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Transmissometer
Generic Instrument Name	Transmissometer
Generic Instrument Description	A transmissometer measures the beam attenuation coefficient of the lightsource over the instrument's path-length. This instrument designation is used when specific manufacturer, make and model are not known.

Dataset-specific Instrument Name	Wet Labs ECO-AFL/FL Fluorometer
Generic Instrument Name	Wet Labs ECO-AFL/FL Fluorometer
Generic Instrument Description	The Environmental Characterization Optics (ECO) series of single channel fluorometers delivers both high resolution and wide ranges across the entire line of parameters using 14 bit digital processing. The ECO series excels in biological monitoring and dye trace studies. The potted optics block results in long term stability of the instrument and the optional anti-biofouling technology delivers truly long term field measurements. more information from Wet Labs

Dataset-specific Instrument Name	Wet Labs CSTAR Transmissometer
Generic Instrument Name	WET Labs {Sea-Bird WETLabs} C-Star transmissometer
Generic Instrument Description	The C-Star transmissometer has a novel monolithic housing with a highly integrated opto-electronic design to provide a low cost, compact solution for underwater measurements of beam transmittance. The C-Star is capable of free space measurements or flow-through sampling when used with a pump and optical flow tubes. The sensor can be used in profiling, moored, or underway applications. Available with a 6000 m depth rating. More information on Sea-Bird website: https://www.seabird.com/c-star-transmissometer/product?id=60762467717

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Deployments

KN193-06

Website	https://www.bco-dmo.org/deployment/58676
Platform	R/V Knorr
Start Date	2008-06-29
End Date	2008-07-12

Description	<p>GEOTRACES intercalibration cruise 1 (June 2008) Original cruise data are available from the NSF R2R data catalog GEOTRACES completed the first Intercalibration cruise from June 8 to July 12, 2008, collecting water and particle samples for analysis and intercalibration. This intercalibration exercise aimed to provide reference materials that could be distributed to the international community and reference profiles of Trace Elements and their Isotopes to ensure compatibility and consistency of GEOTRACES data. The exercise involved a two leg cruise with the first (KN193-5) focusing on the collection of seawater reference material and the second (KN193-6) on particles. The R/V Knorr departed Norfolk, Virginia USA and transected to the BATS station southeast of Bermuda where the bulk of sampling took place. Scientific crew change for the second leg of the cruise was in Bermuda on June 27 and particle sampling began at BATS with underway sampling during the return leg to Norfolk, arriving on July 12. The research performed on this cruise was designed to support the three primary objectives of the U.S. GEOTRACES Intercalibration effort: (1) Develop and test the US GEOTRACES sampling systems and procedures for dissolved and particulate TEIs. Results will comprise a community resource for use in all future US GEOTRACES' cruises; (2) Using these systems, conduct a thorough intercalibration for all the key GEOTRACES TEIs, and as many others as possible, in the dissolved and particulate phases through the participation of the worldwide TEI community; (3) Establish a GEOTRACES Baseline Station in the western North Atlantic, specifically at the Bermuda Atlantic Time Series Station, as part of the Intercalibration Cruise. This research is a collaborative effort among 3 Principal Investigators (Cutter, Old Dominion U.; Bruland, U. of California, Santa Cruz; R. Sherrell, Rutgers U.), but participation in the intercalibration component of GEOTRACES is international and will involve at least 80 other laboratories. If you are interested in participating in this exercise, note that selected samples for intercalibration will also be available after the cruise. For general information about the intercalibration effort please contact Greg Cutter Sampling Activities: Intercalibration cruise with CTD's, several water pump systems, and trace metal water collecting Cruise Participants: (from the pre-cruise letter) Dr. Gregory Cutter, Chief Scientist, Old Dominion University Dr. Edward Boyle, Massachusetts Institute of Technology Dr. Seth John, California Institute of Technology Dr. Kenneth Bruland, University of California, Santa Cruz Mr. Matthew Brown, University of California, Santa Cruz Ms. Sherry Lippiatt, University of California, Santa Cruz Dr. Maeve Lohan, University of Plymouth, UK Mr. Geoffrey Smith, University of California, Santa Cruz Ms. Bettina Sohst, University of California, Santa Cruz Mr. Juan Santos-Echeandia, Marine Research Institute (IIM-CSIC), Spain Dr. Jay Cullen, University of Victoria, Canada Mr. Curtis Barnes, Old Dominion University Mr. Peter Morton, Old Dominion University Mr. Brandon Gipson, Old Dominion University Ms. Carie Lingle, Old Dominion University Dr. Carl Lamborg, Woods Hole Oceanographic Institution Dr. William Landing, Florida State University Ms. Kathleen Gosnell, Florida State University Dr. Robert Mason, University of Connecticut Ms. Susan Gichuki, University of Connecticut Mr. Maxime Grand, University of Hawaii Dr. Mariko Hatta, University of Hawaii Dr. Hajime Obata, University of Tokyo Dr. Robert Sherrell, Rutgers University Ms. Tali Babila, Rutgers University Ms. Christine Theodore, Rutgers University Dr. Silke Severmann, University of California, Riverside Dr. Kazuhiro Norisue, Institute for Chemical Research, Kyoto University, Japan Dr. Jingfeng Wu, University of Alaska, Fairbanks Dr. Chundi Li, South China Sea Institute of Oceanology Dr. Robert Rember, University of Alaska, Fairbanks Dr. Ana Aguilar-Islas, University of Alaska, Fairbanks Mr. James Avery, Woods Hole Oceanographic Institution Ms. Amy Simoneau, Woods Hole Oceanographic Institution</p>
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Project Information

GEOTRACES InterCalibration (GEOTRACES IC)

Website: <http://www.geotraces.org/science/intercalibration>

Coverage: Sargasso Sea, eastern North Pacific

An international intercalibration effort has been assigned a high priority during the initial phase of GEOTRACES to ensure that results from different cruises, and from different labs, can be compared in a meaningful way.

While the original data from the Intercalibration cruises are not available online, consensus values for the SAFe and North Atlantic GEOTRACES Reference Seawater Samples are available from the GEOTRACES Program Office: [Standards and Reference Materials](#)

The ultimate goal for the intercalibration component of the international GEOTRACES program is to achieve the best accuracy possible (lowest random and systematic errors) for the suite of GEOTRACES' Trace Elements and Isotopes (TEI) as a prelude to the sampling program, and continuing effort throughout the sampling and analysis program. To achieve this goal, there will be two primary efforts:

(1) Evaluate and develop GEOTRACES sample acquisition, handling, and storage protocols during initial Intercalibration Cruises;

(2) Identify existing GEOTRACES primary standards and certified reference materials (CRMs) for the TEI suite (and where needed, producing reference materials or primary standards), including the establishment of GEOTRACES Baseline Stations that can be used to evaluate accuracy from sampling to analysis (to facilitate intercalibration for TEIs that do not have CRMs).

Tentative schedule of Intercalibration events:

- June - July 2008. 1st Intercalibration cruise (Sargasso Sea): evaluate sampling apparatus and handling methods (diss and part), collect and distribute intercalibration samples, sample storage experiments, establish Baseline Station at BATS
- Dec. 2008. Second Intercalibration workshop (AGU): evaluate and interpret intercalibration results, planning for 2nd cruise
- Spring 2009. 2nd Intercalibration cruise (eastern North Pacific): final testing of complete sampling system and procedures, intercalibrate with other (non-US) sampling systems, speciation + total TEI intercalibration, determine the time to occupy one GEOTRACES station (for cruise planning purposes)
- Jan.-Feb 2010. Third Intercalibration workshop: finalize complete intercalibration results, begin assembling GEOTRACES User Manuals

GEOTRACES intercalibration cruise 1 June 2008

GEOTRACES completed the first Intercalibration cruise from June 8 to July 12, 2008 to collect intercalibration water and particle samples. This intercalibration exercise aimed to provide reference materials that could be distributed to the international community and reference profiles of Trace Elements and their Isotopes to ensure compatibility and consistency of GEOTRACES data.

GEOTRACES intercalibration cruise 2 May 2009

The second intercalibration cruise is planned for May 2009 in the eastern North Pacific and will include sampling near the North Pacific SAFe Station at 30°N, 140°W.

If you are interested in participating in this exercise, note that selected samples for intercalibration will also be available after the cruise. For general information about the intercalibration effort please contact Greg Cutter.

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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-0648408

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