Scientific sampling event log from R/V Knorr cruises KN193-05 and KN193-06 in the Sargasso Sea (GEOTRACES IC project)

Website: https://www.bco-dmo.org/dataset/3029
Version: 28 June 2011
Version Date: 2011-06-28

Project
» GEOTRACES InterCalibration (GEOTRACES IC)

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

Contributors	Affiliation	Role
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Dataset Description

Scientific sampling event log from the first GEOTRACES Intercalibration Cruise.

Methods & Sampling

Description of sampling event codes:
Code for GEOTRACES Cruise Sampling Device
GT-C = GEOTRACES carousel
CL-R = CLIVAR rosette
30-G = 30L GoFlo
Hg-G = Mercury GoFlo
GeoF = Geo's fish
SherF = Rob's fish F-v1/-v2/-v3
MIT VANE = MIT-vane (MITESS vane samplers)
UAF VANE = UAF-vane
KnoR = Knorr rosette

Additional codes for IC 1 Cruise KNORR 193 Sampling Devices (recorded in event log, but not documented):

McLane Pump = (Buesseler's McLane pumps;
guess: McLane WTS-LV Large Volume, High Accuracy, Oceanographic Sampling Pump)
MULVFS = MULVFS pumping system sampling device
UH GoFlos = (guess: University of Hawaii GoFlo bottles)
ship's seawater = presumably a sampling event from the ship's seawater system
and Ex-N (UoT's Ex-Niskins) events are not recorded in the event log.

Additional codes for IC 2 Cruise KNORR 195 Sampling Devices:

Aeros = ?unknown? Aerosols sampling?
Knorr fly deck = ?unknown?

Sampling gear is discussed in these notes from the ship operator scheduling system at WHOI:
This was a trace metal cruise, so everything had to be 'clean', no painting or paint chipping during cruise, etc.

1. We will be using the ship's standard CTD/rosette and winch again.
2. We will also need to spool ca. 5000 m of 8mm synthetic line (purchased by Ken Buesseler at WHOI so get details from him) onto the other hydro winch (the bare drum needs to be cleaned, maybe with fresh epoxy paint, and all the sheaves need to be cleaned) for deployment off the retracting hydro boom. This line will be used for deploying Buesseler's McLane pumps individually and on his rosette frame, as well as the MITESS vane samplers.
3. The main system we will be using on this cruise will be a trace metal-clean GEOTRACES carousel just like in 2008. This will be deployed using the newly developed method described by Glosten Associates. The Dynacon winch has be fully service and the new 7800 m conducting Kevlar cable spooled. This system will be used a lot, up to 10 casts per day. The GEOTRACES Sampling van (20' UNOLS) will have to be as close to this rosette as practical to avoid long walks to transfer the GO-Flos.
4. We will be using a towed/stationary fish (depressor and weighted torpedo) for pumping trace metal clean water to the MLML sampling and GEOTRACES clean vans. It will be deployed using our aluminum pivoting boom just like in 2008. We will be testing several different towed fish during the transits.
5. Just like in 2008, in the aft hangar we will be installing one trace metal clean 500L plastic tank for homogenizing water samples to be then placed into separate storage containers.. the intercalibration part of the cruise. We will be building a clean area around these tanks (with 2x4s and plastic sheeting). Water to fill these tanks will be from the GO-Flos and the surface fish. The water from these tanks is then pumped into the MLML sampling van that needs to be close to the hangar. The MULVFS pumps will be stored/secured in the aft hangar as well.
6. The MULFVS pumping system (http://www-ocean.lbl.gov/MULVFSops.html) will be used on this cruise again. Jim Bishop will want to use the trawl crane rather than the A frame this time, but we'll see as this will require disconnecting the GEOTRACES system.

Data Processing Description

28 June 2011 (CLC): cruise ID added to identify leg 5 and leg 6 events

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Data Files

File
log_IC1.csv (Comma Separated Values (.csv), 13.16 KB) MD5:e758dfe62e1817c7852d9295124ee2fb Primary data file for dataset ID 3029

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Parameters

Parameter	Description	Units
event	unique sampling event number; sequential from the beginning of the cruise	dimensionless
date	start date of event (YYYYMMDD)	dimensionless
time	start time of event (HHMM)	dimensionless
date_end	end date of event (YYYYMMDD)	dimensionless
time_end	end time of event (HHMM)	dimensionless
lat	latitude at start of event (positive=North)	decimal degrees
lon	longitude at start of event (negative=West)	decimal degrees
activity_and_comments	brief description of sampling event	dimensionless
location	general location of event	dimensionless
depth_min	minimum depth of sampling event (integer depths are in meters)	dimensionless
depth_max	maximum depth of sampling event (integer depths are in meters)	dimensionless
event_description	brief description of sampling event	dimensionless
samples_taken	description of samples taken	dimensionless
GEOTRACES_ID	GEOTRACES ientification number	dimensionless
cruise_ID	Cruise identification for leg 5 and 6 of Knorr cruise 193	dimensionless

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Deployments

KN193-05

Website	https://www.bco-dmo.org/deployment/57841
Platform	R/V Knorr
Start Date	2008-06-08
End Date	2008-06-27
Description	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

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	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

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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 apparati 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-0726319
NSF Division of Ocean Sciences (NSF OCE)	OCE-0648408

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