

Scientific sampling event log associated with the US GEOTRACES North Atlantic Transect from the R/V Knorr KN199-04 cruise in the subtropical N. Atlantic during 2010 (U.S. GEOTRACES NAT project)

Website: <https://www.bco-dmo.org/dataset/3485>

Data Type: Cruise Results

Version: 3

Version Date: 2011-07-25

Project

» [U.S. GEOTRACES North Atlantic Transect](#) (U.S. GEOTRACES NAT)

Program

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

Contributors	Affiliation	Role
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Abstract

Scientific sampling event log associated with the US GEOTRACES North Atlantic Transect from the R/V Knorr KN199-04 cruise in the subtropical N. Atlantic during 2010 (U.S. GEOTRACES NAT project).

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Coverage

Spatial Extent: N:38.33641 E:-9.66 S:17.3367 W:-24.6116

Temporal Extent: 2010-10-15 - 2010-11-03

Dataset Description

Scientific Sampling Event Log for KN199-04 (2010 GEOTRACES cruise). Station numbers, Events, Dates/Times,

Lat/Lons and Event descriptions are provided for each station.

NOTE: No event log maintained for KN199-05

Acquisition Description

Generated aboard vessel by science party.

Event Description Codes:

nd = unknown/not entered
GT-C = GEOTRACES carousel
30-ODF = 30L Niskin Rosette
GeoF = Geos fish
RaPUW = Radium UW pump
MITv2 = MIT-vane
UAFv = UAF-vane
KnoR = Knorr rosette
MastUp = NASA solar reference mast UP
MastDown = NASA solar reference mast DOWN
McL-Ros = McLane pump rosette
McL-Prof = McLane pump profile
Aeros = Aerosol sampler
AOP = Apparent Optical Properties cast
NASAsurf = NASA surface pump water sample
NEMO = NEMO Float Deployment
Ra/Th/Pig = Ra/Th/Pigment Niskin Cast

Codes for Samples Taken:

nd = unknown/not recorded
diss = dissolved samples
diss+part = dissolved and particulate samples
unfilt = unfiltered seawater
filter = filter for particulates
none = none

Processing Description

BCO-DMO Processing Notes

- Generated from original .xlsx file "KN199-4 event log sheet.xlsx" contributed by Bill Jenkins
- Lat/Lon converted from degs, decimal minutes to decimal degrees
- Lon values signed negative for West
- Date reformatted to YYYYMMDD
- Time reformatted to HHMM
- "nd" (no data) value inserted in blank cells
- "n/a" replaced with "nd"
- Commas in text fields converted to semicolons
- Parameter names modified to conform to BCO-DMO convention<

- End dates for events 2003, 2004, 2005, 2006, 2007 changed from 2010/10/16 to 2010/10/15 (25July2011/srg)

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Parameters

Parameter	Description	Units
event	event number	integer
location	location descriptor (typically station id)	text
date_start	Start date (GMT)	YYYYMMDD
time_start	Start time (GMT)	HHMM
date_end	End date (GMT)	YYYYMMDD
time_end	End time (GMT)	HHMM
lat	Latitude (South is negative)	decimal degrees
lon	Longitude (West is negative)	decimal degrees
depth_min	Minimum depth	meters
depth_max	Maximum depth	meters
event_description	Code Event description nd unknown/not entered GT-C GEOTRACES carousel 30-ODF 30L Niskin Rosette GeoF Geo's fish RaPUW Radium UW pump MITv2 MIT-vane UAFv UAF- vane KnoR Knorr rosette MastUp NASA solar reference mast UP MastDown NASA solar reference mast DOWN McL-Ros McLane pump rosette McL-Prof McLane pump profile Aeros Aerosol sampler AOP Apparent Optical Properties cast NASA surf NASA surface pump water sample NEMO NEMO Float Deployment Ra/Th/Pig Ra/Th/Pigment Niskin Cast	text
samples_taken	Code Samples Taken nd unknown/not recorded diss dissolved samples diss+part dissolved and particulate samples unfilt unfiltered seawater filter filter for particulates none none	text
GEOTRACES_ID_Num_Range	GEOTRACES ID Number and Range	text
comment	Event comment	text

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Deployments

KN199-04

Website	https://www.bco-dmo.org/deployment/58066
Platform	R/V Knorr
Report	http://bcodata.whoi.edu/US_GEOTRACES/AtlanticSection/Cruise_Report_for_Knorr_199_Final_v3.pdf
Start Date	2010-10-15
End Date	2010-11-04
Description	<p>KN199-04 is the US GEOTRACES Zonal North Atlantic Survey Section cruise planned for late Fall 2010 from Lisboa, Portugal to Woods Hole, MA, USA. 4 November 2010 update: Due to engine failure, the scheduled science activities were canceled on 2 November 2010. On 4 November the R/V KNORR put in at Porto Grande, Cape Verde and is scheduled to depart November 8, under the direction of Acting Chief Scientist Oliver Wurl of Old Dominion University. The objective of this leg is to carry the vessel in transit to Charleston, SC while conducting science activities modified from the original plan. Planned scientific activities and operations area during this transit will be as follows: the ship's track will cross from the highly productive region off West Africa into the oligotrophic central subtropical gyre waters, then across the western boundary current (Gulf Stream), and into the productive coastal waters of North America. During this transit, underway surface sampling will be done using the towed fish for trace metals, nanomolar nutrients, and arsenic speciation. In addition, a port-side high volume pumping system will be used to acquire samples for radium isotopes. Finally, routine aerosol and rain sampling will be done for trace elements. This section will provide important information regarding atmospheric deposition, surface transport, and transformations of many trace elements. The vessel is scheduled to arrive at the port of Charleston, SC, on 26 November 2010. The original cruise was intended to be 55 days duration with arrival in Norfolk, VA on 5 December 2010. funding: NSF OCE award 0926423</p> <p>Science Objectives are to obtain state of the art trace metal and isotope measurements on a suite of samples taken on a mid-latitude zonal transect of the North Atlantic. In particular sampling will target the oxygen minimum zone extending off the west African coast near Mauritania, the TAG hydrothermal field, and the western boundary current system along Line W. In addition, the major biogeochemical provinces of the subtropical North Atlantic will be characterized. For additional information, please refer to the GEOTRACES program Web site (GEOTRACES.org) for overall program objectives and a summary of properties to be measured. Science Activities include seawater sampling via GoFLO and Niskin carousels, in situ pumping (and filtration), CTDO2 and transmissometer sensors, underway pumped sampling of surface waters, and collection of aerosols and rain. Hydrography, CTD and nutrient measurements will be supported by the Ocean Data Facility (J. Swift) at Scripps Institution of Oceanography and funded through NSF Facilities. They will be providing an additional CTD rosette system along with nephelometer and LADCP. A trace metal clean Go-Flo Rosette and winch will be provided by the group at Old Dominion University (G. Cutter) along with a towed underway pumping system. List of cruise participants: [PDF] Cruise track: JPEG image (from Woods Hole Oceanographic Institution, vessel operator) Additional information may still be available from the vessel operator: WHOI cruise planning synopsis Cruise information and original data are available from the NSF R2R data catalog. ADCP data are available from the Currents ADCP group at the University of Hawaii: KN199-04 ADCP</p>

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Project Information

U.S. GEOTRACES North Atlantic Transect (U.S. GEOTRACES NAT)

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

Coverage: Subtropical western and eastern North Atlantic Ocean

Much of this text appeared in an article published in OCB News, October 2008, by the OCB Project Office. The first U.S. GEOTRACES Atlantic Section will be specifically centered around a sampling cruise to be carried out in the North Atlantic in 2010. Ed Boyle (MIT) and Bill Jenkins (WHOI) organized a three-day planning workshop that was held September 22-24, 2008 at the Woods Hole Oceanographic Institution. The main goal of the workshop, sponsored by the National Science Foundation and the U.S. GEOTRACES Scientific Steering Committee, was to design the implementation plan for the first U.S. GEOTRACES Atlantic Section. The primary cruise design motivation was to improve knowledge of the sources, sinks and internal cycling of Trace Elements and their Isotopes (TEIs) by studying their distributions along a section in the North Atlantic (Figure 1). The North Atlantic has the full suite of processes that affect TEIs, including strong meridional advection, boundary scavenging and source effects, aeolian deposition, and the salty Mediterranean Outflow. The North Atlantic is particularly important as it lies at the "origin" of the global Meridional Overturning Circulation. It is well understood that many trace metals play important roles in biogeochemical processes and the carbon cycle, yet very little is known about their large-scale distributions and the regional scale processes that affect them. Recent advances in sampling and analytical techniques, along with advances in our understanding of their roles in enzymatic and catalytic processes in the open ocean provide a natural opportunity to make substantial advances in our understanding of these important elements. Moreover, we are motivated by the prospect of global change and the need to understand the present and future workings of the ocean's biogeochemistry. The GEOTRACES strategy is to measure a broad suite of TEIs to constrain the critical biogeochemical processes that influence their distributions. In addition to these "exotic" substances, more traditional properties, including macronutrients (at micromolar and nanomolar levels), CTD, bio-optical parameters, and carbon system characteristics will be measured. The cruise starts at Line W, a repeat hydrographic section southeast of Cape Cod, extends to Bermuda and subsequently through the North Atlantic oligotrophic subtropical gyre, then transects into the African coast in the northern limb of the coastal upwelling region. From there, the cruise goes northward into the Mediterranean outflow. The station locations shown on the map are for the "fulldepth TEI" stations, and constitute approximately half of the stations to be ultimately occupied. Figure 1. The proposed 2010 Atlantic GEOTRACES cruise track plotted on dissolved oxygen at 400 m depth. Data from the World Ocean Atlas (Levitus et al., 2005) were plotted using Ocean Data View (courtesy Reiner Schlitzer). [click on the image to view a larger version] Hydrography, CTD and nutrient measurements will be supported by the Ocean Data Facility (J. Swift) at Scripps Institution of Oceanography and funded through NSF Facilities. They will be providing an additional CTD rosette system along with nephelometer and LADCP. A trace metal clean Go-Flo Rosette and winch will be provided by the group at Old Dominion University (G. Cutter) along with a towed underway pumping system. The North Atlantic Transect cruise began in 2010 with KN199 leg 4 (station sampling) and leg 5 (underway sampling only) (Figure 2). KN199-04 Cruise Report (PDF) Figure 2. The red line shows the cruise track for the first leg of the US Geotraces North Atlantic Transect on the R/V Knorr in October 2010. The rest of the stations (beginning with 13) will be completed in October-December 2011 on the R/V Knorr (courtesy of Bill Jenkins, Chief Scientist, GNAT first leg). [click on the image to view a larger version] The section completion effort resumed again in November 2011 with KN204-01A,B (Figure 3). KN204-01A,B Cruise Report (PDF) Figure 3. Station locations occupied on the US Geotraces North Atlantic Transect on the R/V Knorr in November 2011. [click on the image to view a larger version] Data from the North Atlantic Transect cruises are available under the Datasets heading below, and consensus values for the SAFE and North Atlantic GEOTRACES Reference Seawater Samples are available from the GEOTRACES Program Office: Standards and Reference Materials ADCP data are available from the Currents ADCP group at the University of Hawaii at the links below:KN199-04 (leg 1 of 2010 cruise; Lisbon to Cape Verde)KN199-05 (leg 2 of 2010 cruise; Cape Verde to Charleston, NC)KN204-01A (part 1 of 2011 cruise; Woods Hole, MA to Bermuda)KN204-01B (part 2 of 2011 cruise; Bermuda to Cape Verde)

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.

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0926423
NSF Division of Ocean Sciences (NSF OCE)	OCE-0926092