CTD profiles for OC449-03 from R/V Oceanus cruise OC449-03 in the Coastal transect between Cape Verde and Mauritanian coast from 2008 to 2008 (SIRENA project)

Website: https://www.bco-dmo.org/dataset/3469
Version: 18 May 2011
Version Date: 2011-05-18

Project
» Sources of Iron to the EasterN tropical Atlantic (SIRENA)

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
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Dataset Description

CTD profile data for OC449-03 Up/Down Casts

PI's Note/09May2011:
In comparing my pump seacat CTD to the ship's CTD, I've discovered that the ship's CTD's fluorescence and beam attenuation are no good, at least for OC449-3. The ship's fluorometer was clearly just not working. The ship's transmissometer misbehaved in a more subtle manner--oceanographically consistent, but of a different pattern than my pump seacat data. I concluded that my pump seacat CTD's transmissometer is the "correct" one by comparing to discrete particulate carbon measurements on particles collected on my pumps. Both particulate carbon concentrations and beam attenuation from my pump seacat CTD show a minimum at 500m at OC449-3 station 3, whereas the ship's CTD shows an anomalous minimum in subsurface beam attenuation at station 2, which is not seem in the particulate carbon concentrations.

Methods & Sampling

* Sea-Bird SBE 9 Data File:
* FileName = C:dataoc449-03_001.hdr
* Software Version Seasave V 7.14c
* Temperature SN = 2265
* Conductivity SN = 2304
* Number of Bytes Per Scan = 40
* Number of Voltage Words = 5
* Number of Scans Averaged by the Deck Unit = 1
* System UpLoad Time = Sep 08 2008 20:13:41
* NMEA Latitude = 17 23.63 N
* NMEA Longitude = 024 30.16 W
* NMEA UTC (Time) = Sep 08 2008 20:13:39

* Store Lat/Lon Data = Append to Every Scan
# nquan = 28
# nvalues = 1410
# units = specified
# name 0 = timeS: Time, Elapsed [seconds]
# name 1 = prDM: Pressure, Digiquartz [db]
# name 2 = depSM: Depth [salt water, m]
# name 3 = t090C: Temperature [ITS-90, deg C]
# name 4 = t190C: Temperature, 2 [ITS-90, deg C]
# name 5 = sal00: Salinity [PSU]
# name 6 = sal11: Salinity, 2 [PSU]
# name 7 = c0S/m: Conductivity [S/m]
# name 8 = c1S/m: Conductivity, 2 [S/m]
# name 9 = sbeox0V: Oxygen Voltage, SBE 43
# name 10 = sbeox0ML/L: Oxygen, SBE 43 [ml/l]
# name 11 = xmiss: Beam Transmission, Chelsea/Seatech/Wetlab CStar [%]
# name 12 = density00: Density [density, Kg/m^3]
# name 13 = potemp090C: Potential Temperature [ITS-90, deg C]
# name 14 = flECO-AFL: Fluorescence, Wetlab ECO-AFL/FL [mg/m^3]
# name 15 = upoly0: Upoly 0, WetLabs Turbidity
# name 16 = altM: Altimeter [m]
# name 17 = density00: Density [density, Kg/m^3]
# name 18 = n2satML/L: Nitrogen Saturation [ml/l]
# name 19 = oxsatML/L: Oxygen Saturation [ml/l]
# name 20 = sbeox0ML/L: Oxygen, SBE 43 [ml/l], WS = 2
# name 21 = potemp090C: Potential Temperature [ITS-90, deg C]
# name 22 = pta090C: Potential Temperature Anomaly [ITS-90, deg C], a0 = 0, a1 = 0, salinity
# name 23 = sal00: Salinity [PSU]
# name 24 = specc: Specific Conductance [uS/cm]
# name 25 = sva: Specific Volume Anomaly [10^-8 * m^3/Kg]
# name 26 = tsa: Thermosteric Anomaly [10^-8 * m^3/Kg]
# name 27 = flag: flag
# span 0 = 23.405, 2569.116
# span 1 = 2.000, 707.000
# span 2 = 1.985, 701.589
# span 3 = 7.7612, 27.6712
# span 4 = 7.7608, 27.6938
# span 5 = 34.9570, 36.6071
# span 6 = 34.9590, 36.6155
# span 7 = 3.626457, 5.771784
# span 8 = 3.626659, 5.774208
# span 9 = 1.0208, 3.0432
# span 10 = 1.35904, 5.02562
# span 11 = 95.7500, 98.8836
# span 12 = 1023.4971, 1030.4829
# span 13 = 7.6887, 27.6701
# span 14 = 0.0041, 1.1170
# span 15 = 0.0293903, 0.0768421
# span 16 = 43.04, 101.61
# span 17 = 1023.4971, 1030.4829
# span 18 = 8.37490, 11.93137
# span 19 = 4.48666, 6.64550
# span 20 = 1.36085, 5.00431
# span 21 = 7.6887, 27.6703
# span 22 = 7.6887, 27.6703
# span 23 = 34.9562, 36.6008
# span 24 = 54744.414, 55468.490
# span 25 = 90.827, 439.837
# span 26 = 78.871, 439.874
# span 27 = 0.0000e+00, 0.0000e+00
# interval = decibars: 1
# start_time = Sep 08 2008 20:13:41
# bad_flag = -9.990e-29
# sensor 0 = Frequency 0 temperature, primary, 2265, 2007-10-24
# sensor 1 = Frequency 1 conductivity, primary, 2304, 2007-10-25, cpcor = -9.5700e-08
# sensor 2 = Frequency 2 pressure, 69685, 12/18/2002
# sensor 3 = Frequency 3 temperature, secondary, 2271, 2007-10-24

sensor 4 = Frequency 4 conductivity, secondary, 2645, 2007-10-25, cpcor = -9.5700e-08
sensor 5 = Extrnl Volt 0 WET Labs, ECO_AFL
sensor 6 = Extrnl Volt 1 userpoly 0, FLNTURTD-1012, 2008-04-18
sensor 7 = Extrnl Volt 3 transmissometer, primary, CST-1117DR, 2008-04-30
sensor 8 = Extrnl Volt 4 altimeter
sensor 9 = Extrnl Volt 5 Oxygen, SBE, primary, 794, 2008-09-01
sensor 10 = Extrnl Volt 9 surface irradiance (SPAR), degrees = 0.0
datcnv_date = Sep 08 2008 22:58:19, 7.15
datcnv_in = c:ctd_processingoc449-03_001.hex c:ctd_processingoc449-03_001.con
datcnv_skipover = 0
wildedit_date = Sep 08 2008 22:58:26, 7.15
wildedit_in = c:ctd_processingoc449-03_001.cnv
wildedit_pass1_nstd = 2.0
wildedit_pass2_nstd = 20.0
wildedit_pass2_mindelta = 1.000e+000
wildedit_npoint = 100
wildedit_vars = prDM depSM t090C t190C sal00 sal11 c0S/m c1S/m sbeox0V sbeox0ML/L xmiss density00 potemp090C flECO-AFL upoly0 altM
wildedit_excl_bad_scans = yes
filter_date = Sep 08 2008 22:58:34, 7.15
filter_in = c:ctd_processingoc449-03_001.cnv
filter_low_pass_tc_A = 0.030
filter_low_pass_tc_B = 0.100
filter_low_pass_A_vars = depSM sal00 sal11 c0S/m c1S/m sbeox0V sbeox0ML/L xmiss density00 potemp090C flECO-AFL upoly0
filter_low_pass_B_vars = prDM
alignctd_date = Sep 08 2008 22:58:51, 7.15
alignctd_in = c:ctd_processingoc449-03_001.cnv
alignctd_adv = sbeox0V 4.000, sbeox0ML/L
4.000
celltm_date = Sep 08 2008 22:59:00, 7.15
celltm_in = c:ctd_processingoc449-03_001.cnv
celltm_alpha = 0.0300, 0.0300
celltm_tau = 7.0000, 7.0000
celltm_temp_sensor_use_for_cond = primary, secondary
loopedit_date = Sep 08 2008 22:59:08, 7.15
loopedit_in = c:ctd_processingoc449-03_001.cnv
loopedit_minVelocity = 0.100
loopedit_surfaceSoak: do not remove
loopedit_excl_bad_scans = yes
Derive_date = Sep 08 2008 22:59:20, 7.15
Derive_in = c:ctd_processingoc449-03_001.cnv c:ctd_processingoc449-03_001.con
derive_time_window_docdt = seconds: 2
binavg_date = Sep 08 2008 22:59:32, 7.15
binavg_in = c:ctd_processingoc449-03_001.cnv
binavg_bintype = decibars
binavg_binsize = 1
binavg_excl_bad_scans = yes
binavg_skipover = 0
binavg_surface_bin = no, min = 0.000, max = 0.000, value = 0.000
file_type = ascii
END

Data Processing Description

BCO-DMO Processing Notes
- Awk written to reformat original .cnv files contributed by Phoebe Lam
- AWK: OC449-03_CTDcnv_2_BCODMO.awk

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Data Files

File
CTDprf_OC449_03.csv(Comma Separated Values (.csv), 7.94 MB) MD5:9e010a0fe5eb69d389e96e9663c65357
Primary data file for dataset ID 3469

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Parameters

Parameter	Description	Units
CTD_DataSet_Id	CTD Dataset Id	text
date	Station date	YYYYMMDD
time	Station time	HHMMSS
lat	Station latitude (South is negative)	decimal degrees
lon	Station longitude (West is negative)	decimal degrees
timeS	Time Elapsed	seconds
prDM	Pressure Digiquartz	decibars
depSM	Depth salt water	meters
t090C	Temperature ITS-90	deg C
t190C	Temperature 2 ITS-90	deg C
sal00	Salinity	PSU
sal11	Salinity 2	PSU
c0S_m	Conductivity	S/m
c1S_m	Conductivity 2	S/m
sbeox0V	Oxygen Voltage SBE 43	volts
sbeox0ML_L	Oxygen SBE 43	ml/l
xmiss	Beam Transmission Chelsea/Seatech/Wetlab CStar	percentage
density00	Density	Kg/m^3
potemp090C	Potential Temperature ITS-90	deg C
flECO_AFL	Fluorescence Wetlab ECO-AFL/FL	mg/m^3
upoly0	Upoly 0 WetLabs Turbidity	tbd
altM	Altimeter	meters
density01	Density	Kg/m^3
n2satML_L	Nitrogen Saturation	ml/l
oxsatML_L	Oxygen Saturation	ml/l
sbeox1ML_L	Oxygen SBE 43 WS 2	ml/l
potemp190C	Potential Temperature ITS-90	deg C
pta090C	Potential Temperature Anomaly ITS-90; a0_0; a1_0; salinity	deg C
sal00_0	Salinity	PSU
specc	Specific Conductance	uS/cm
sva	Specific Volume Anomaly	10^-8 * m^3/Kg
tsa	Thermosteric Anomaly	10^-8 * m^3/Kg
flag	flag	nd
cast	cast id/number	integer
station	station id/number	integer

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Instruments

Dataset-specific Instrument Name	CTD Sea-Bird SBE 911plus
Generic Instrument Name	CTD Sea-Bird SBE 911plus
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

OC449-03

Website	https://www.bco-dmo.org/deployment/58663
Platform	R/V Oceanus
Start Date	2008-09-08
End Date	2008-09-18
Description	R/V Oceanus Voyage #449, Leg III was a Coastal transect between Cape Verde and the Mauritanian coast (17N/24.5W to 20N/17.3W). The main scientific objective was to test the hypothesis that the continental margin of northwest Africa provides a significant subsurface supply of iron to the open eastern tropical Atlantic. The planned scientific activities include CTD casts, In Situ Water Pump casts for large volume water collection, Gravity Coring, and Aerosol sampling. Scientific personnel: Dr. Phoebe Lam, Chief Scientist, Woods Hole Oceanographic Institution Dr. Henrieta Dulaiova, Woods Hole Oceanographic Institution Mr. Steven Pike, Woods Hole Oceanographic Institution Mr. James Saenz, Woods Hole Oceanographic Institution Dr. Aron Stubbins, Old Dominion University Ms. Hongmei Chen, Old Dominion University Dr. Edward Michael Perdue, Georgia Institute of Technology Mr. Nelson Green, Georgia Institute of Technology Mr. Péricles Silva, Instituto Nacional de Desenvolvimento das Pescas (INDP) Dr. Anibal Medina, Instituto Nacional de Desenvolvimento das Pescas (INDP) Mr. Alexander Dorsk, Woods Hole Oceanographic Institution WHOI cruise planning synopsis> Cruise information and original data are available from the NSF R2R data catalog.

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Project Information

Sources of Iron to the EasterN tropical Atlantic (SIRENA)

Website: http://www.whoi.edu/sbl/liteSite.do?litesiteid=24492

Coverage: Tropical North Atlantic, focusing on a Cape Verde to Mauritanian Coast transect

We will test the hypothesis that the continental margin of northwest Africa provides a significant subsurface supply of iron to the open eastern tropical Atlantic that supplements dust.

We will test our continental margin hypothesis with a wintertime visit to the new Tropical Eastern North Atlantic Time-Series Observatory (TENATSO) near Cape Verde, located in the eastern tropical Atlantic about 850 km downstream of Mauritanian coastal upwelling, and a summertime cross-shelf transect from the Mauritanian coast to TENATSO with Ed Boyle, who is already funded to study iron in the tropical Atlantic. Our cross-shelf transect will closely examine the potential lateral source of Fe, and evaluate it against an atmospheric source of Fe. Our proposal takes advantage of a novel combination of measurements to uniquely determine the importance of lateral transport vs. dust inputs and subsurface remineralization as Fe sources to the surface ocean. These measurements include:

1) synchrotron x-ray analysis of particulate iron "hotspots": micron-size particles of iron detected with a synchrotron x-ray fluorescence microprobe have been previously shown to exhibit maxima at depths of continental margin input in two ocean basins. Further, the Ti:Fe ratios and the mineralogy of these particles of iron can distinguish dust-derived vs. continental margin iron. This is a qualitative tracer for a dust vs continental margin source of Fe.

2) radium isotopes: the major source of 228Ra into the study area is by diffusion from 232Th-bearing near shore and continental shelf sediments. An open-ocean to coastal transect of 228Ra activities will allow us to determine horizontal mass transfer. 228Ra will be used to quantify the lateral flux of iron from the shelf.

3) 234Th profiles: high vertical resolution 234Th profiles can be used to determine the depth of particle remineralization. This will be used to determine whether or not putative subsurface Fe maxima are from remineralization of Fe-bearing particles.

TENATSO (Tropical Eastern North Atlantic Time-Series Observatory) time series station
16°N, 24°W, North-east of Mindelo, Sao Vicente, Cape Verde

TENATSO Home

TENATSO/SIRENA at Cafe Thorium/WHOI

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Program Information

Ocean Carbon and Biogeochemistry (OCB)

Website: http://us-ocb.org/

Coverage: Global

The Ocean Carbon and Biogeochemistry (OCB) program focuses on the ocean's role as a component of the global Earth system, bringing together research in geochemistry, ocean physics, and ecology that inform on and advance our understanding of ocean biogeochemistry. The overall program goals are to promote, plan, and coordinate collaborative, multidisciplinary research opportunities within the U.S. research community and with international partners. Important OCB-related activities currently include: the Ocean Carbon and Climate Change (OCCC) and the North American Carbon Program (NACP); U.S. contributions to IMBER, SOLAS, CARBOOCEAN; and numerous U.S. single-investigator and medium-size research projects funded by U.S. federal agencies including NASA, NOAA, and NSF.

The scientific mission of OCB is to study the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change through studies of marine biogeochemical cycles and associated ecosystems.

The overarching OCB science themes include improved understanding and prediction of: 1) oceanic uptake and release of atmospheric CO2 and other greenhouse gases and 2) environmental sensitivities of biogeochemical cycles, marine ecosystems, and interactions between the two.

The OCB Research Priorities (updated January 2012) include: ocean acidification; terrestrial/coastal carbon fluxes and exchanges; climate sensitivities of and change in ecosystem structure and associated impacts on biogeochemical cycles; mesopelagic ecological and biogeochemical interactions; benthic-pelagic feedbacks on biogeochemical cycles; ocean carbon uptake and storage; and expanding low-oxygen conditions in the coastal and open oceans.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0726367

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