Averaged bottle measurements from CTD casts on R/V Oceanus cruise OC449-03 in the Coastal transect between Cape Verde and Mauritanian coast in 2008 (SIRENA project)

Website: https://www.bco-dmo.org/dataset/3491
Version: 13 October 2011
Version Date: 2011-10-13

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 Bottle Data - avg, stdev,min and max values at bottle firings for various parameters

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_016.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 13 2008 23:43:34
* NMEA Latitude = 19 50.80 N
* NMEA Longitude = 017 41.17 W
* NMEA UTC (Time) = Sep 13 2008 23:43:32
* Store Lat/Lon Data = Append to Every Scan
** station_006
# interval = seconds: 0.0416667
# start_time = Sep 13 2008 23:43:34
# 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 16 2008 14:23:13, 7.15
# datcnv_in = c:ctd_processingoc449-03_016.hex c:ctd_processingoc449-03_016.con
# datcnv_bottle_scan_range_source = scans marked with bottle confirm bit, 0, 2
# bottlesum_date = Sep 16 2008 14:24:56, 7.15
# bottlesum_in = c:ctd_processingoc449-03_016.ros c:ctd_processingoc449-03_016.con c:ctd_processingoc449-03_016.BL

Data Processing Description

BCO-DMO Processing Notes
- Awk written to reformat original .btl files contributed by Phoebe Lam
- AWK: OC449-03_CTDbtl_2_BCODMO.awk

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Data Files

File
CTDbtl_OC449_03.csv (Comma Separated Values (.csv), 302.96 KB) MD5:90f22101afd22e1f13190542e106fd95 Primary data file for dataset ID 3491

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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 from header record (South is negative)	decimal degrees
lon	Station longitude from header record (West is negative)	decimal degrees
bottle_position	Bottle position	integer

date_bottle	Date of bottle firing	YYYYMMDD
time_bottle	Time of bottle firing	HHMMSS
Density00	Density	Kg/m^3
N2satML_L	Nitrogen Saturation	ml/l
OxsatML_L	Oxygen Saturation	ml/l
Sbeox0ML_L	Oxygen SBE 43	ml/l
Potemp090C	Potential Temperature ITS-90	degrees Celsius
Sal00	Salinity	PSU
Sva	Specific Volume Anomaly	10^-8 * m^3/Kg
TimeS_avg	Elapsed time average	seconds
TimeS_sdev	Elapsed time standard of deviation	seconds
TimeS_min	Elapsed time minimum	seconds
TimeS_max	Elapsed time maximum	seconds
PrDM_avg	Pressure Digiquartz average	decibars
PrDM_sdev	Pressure Digiquartz standard of deviation	decibars
PrDM_min	Pressure Digiquartz minimum	decibars
PrDM_max	Pressure Digiquartz maximum	decibars
DepSM_avg	Depth salt water average	meters
DepSM_sdev	Depth salt water standard of deviation	meters
DepSM_min	Depth salt water minimum	meters
DepSM_max	Depth salt water maximum	meters
T090C_avg	Temperature ITS-90 average	degrees Celsius
T090C_sdev	Temperature ITS-90 standard of deviation	degrees Celsius
T090C_min	Temperature ITS-90 minimum	degrees Celsius
T090C_max	Temperature ITS-90 maximum	degrees Celsius
T190C_avg	Temperature 2 ITS-90 average	degrees Celsius
T190C_sdev	Temperature 2 ITS-90 standard of deviation	degrees Celsius
T190C_min	Temperature 2 ITS-90 minimum	degrees Celsius
T190C_max	Temperature 2 ITS-90 maximum	degrees Celsius
Sal00_avg	Salinity average	PSU
Sal00_sdev	Salinity standard of deviation	PSU
Sal00_min	Salinity minimum	PSU
Sal00_max	Salinity maximum	PSU
Sal11_avg	Salinity 2 average	PSU
Sal11_sdev	Salinity 2 standard of deviation	PSU
Sal11_min	Salinity 2 minimum	PSU
Sal11_max	Salinity 2 maximum	PSU
C0S_m_avg	Conductivity average	S/m
C0S_m_sdev	Conductivity standard of deviation	S/m
C0S_m_min	Conductivity minimum	S/m

C0S_m_max	Conductivity maximum	S/m
C1S_m_avg	Conductivity 2 average	S/m
C1S_m_sdev	Conductivity 2 standard of deviation	S/m
C1S_m_min	Conductivity 2 minimum	S/m
C1S_m_max	Conductivity 2 maximum	S/m
Sbeox0V_avg	Oxygen Voltage SBE 43 average	volts
Sbeox0V_sdev	Oxygen Voltage SBE 43 standard of deviation	volts
Sbeox0V_min	Oxygen Voltage SBE 43 minimum	volts
Sbeox0V_max	Oxygen Voltage SBE 43 maximum	volts
Sbeox0ML_L_avg	Oxygen SBE 43 average	ml/l
Sbeox0ML_L_sdev	Oxygen SBE 43 standard of deviation	ml/l
Sbeox0ML_L_min	Oxygen SBE 43 minimum	ml/l
Sbeox0ML_L_max	Oxygen SBE 43 maximum	ml/l
Xmiss_avg	Beam Transmission Chelsea/Seatech/Wetlab CStar average	percentage
Xmiss_sdev	Beam Transmission Chelsea/Seatech/Wetlab CStar standard of deviation	percentage
Xmiss_min	Beam Transmission Chelsea/Seatech/Wetlab CStar minimum	percentage
Xmiss_max	Beam Transmission Chelsea/Seatech/Wetlab CStar maximum	percentage
Density00_avg	Density average	Kg/m^3
Density00_sdev	Density standard of deviation	Kg/m^3
Density00_min	Density minimum	Kg/m^3
Density00_max	Density maximum	Kg/m^3
Potemp090C_avg	Potential Temperature ITS-90 average	degrees Celsius
Potemp090C_sdev	Potential Temperature ITS-90 standard of deviation	degrees Celsius
Potemp090C_min	Potential Temperature ITS-90 minimum	degrees Celsius
Potemp090C_max	Potential Temperature ITS-90 maximum	degrees Celsius
FlECO_minus_AFL_avg	Fluorescence Wetlab ECO-AFL/FL average	mg/m^3
FlECO_minus_AFL_sdev	Fluorescence Wetlab ECO-AFL/FL standard of deviation	mg/m^3
FlECO_minus_AFL_min	Fluorescence Wetlab ECO-AFL/FL minimum	mg/m^3
FlECO_minus_AFL_max	Fluorescence Wetlab ECO-AFL/FL maximum	mg/m^3
Upoly0_avg	Upoly 0 WetLabs Turbidity average	tbd
Upoly0_sdev	Upoly 0 WetLabs Turbidity standard of deviation	tbd
Upoly0_min	Upoly 0 WetLabs Turbidity minimum	tbd
Upoly0_max	Upoly 0 WetLabs Turbidity maximum	tbd
AltM_avg	Altimeter average	meters
AltM_sdev	Altimeter standard of deviation	meters
AltM_min	Altimeter minimum	meters
AltM_max	Altimeter maximum	meters
Scan_avg	Scan average	integer
Scan_sdev	Scan standard of deviation	integer
Scan_min	Scan minimum	integer

Scan_max	Scan maximum	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

Dataset-specific Instrument Name	Niskin bottle
Generic Instrument Name	Niskin bottle
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

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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 CO_2 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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