Hydrographic data collected during casts with a CTD-rosette system on R/V Endeavor cruise EN614 from May to June 2018

Website: https://www.bco-dmo.org/dataset/757784
Data Type: Cruise Results
Version: 1
Version Date: 2019-03-06

Project
» Collaborative Research: Impact of the Amazon River Plume on Nitrogen Availability and Planktonic Food Web Dynamics in the Western Tropical North Atlantic (Amazon River Plume Nitrogen)

Contributors	Affiliation	Role
Montoya, Joseph	Georgia Institute of Technology (GA Tech)	Principal Investigator
Peterson, Richard N.	Coastal Carolina University	Co-Principal Investigator
Subramaniam, Ajit	Lamont-Doherty Earth Observatory (LDEO)	Co-Principal Investigator
Rauch, Shannon	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Hydrographic data collected during casts with a CTD-rosette system on R/V Endeavor cruise EN614 from May to June 2018.

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Coverage

Spatial Extent: **N**:16.31844 **E**:-50.88036 **S**:4.88196 **W**:-57.26432
Temporal Extent: 2018-05-07 - 2018-05-29

Methods & Sampling

Hydrographic data collected during casts with a CTD-rosette system (SBE11plus equipped with a fluorometer, transmissometer, oxygen sensor, and a PAR sensor. Individual sensor details and calibration info provided in the "en614-ProfileNotes" supplemental document.

Data Processing Description

Data were processed using SeaSave v 7.26.7.107.

BCO-DMO Processing:
- modified parameter names (replaced ".", "-", and "/" with underscores; removed parentheses);
- renamed the second "DepSM" column to "DepSM2";

- replaced blank/empty cells with "nd" (no data);
- removed the blank rows interspersed throughout the file;
- in site names, replaced spaces with underscores and removed commas;
- saved the "en614-ProfileNotes" Excel sheet as a PDF to attach to metadata as a supplemental doc.

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Data Files

File
EN614_CTD.csv (Comma Separated Values (.csv), 6.67 MB) MD5:2fef61fb8c46241bc337325656536904 Primary data file for dataset ID 757784

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Supplemental Files

File
EN614 Profile Processing Notes filename: en614-ProfileNotes.pdf (Portable Document Format (.pdf), 455.30 KB) MD5:5b65ec1581c30900108649ed2094e400 CTD file header and processing notes for EN614 CTD data from J. Montoya.

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Parameters

Parameter	Description	Units
Cruise	Cruise identifier	unitless
Site	Site name	unitless
Station	Station number	unitless
Stn_Event	Station event number	unitless
Filename	CTD file name	unitless
Scan	Scan count	Unitless
TimeJ	Julian days	unitless
TimeS	Time, Elapsed	seconds
Date_ODV	Date and time. Format: yyyy-mm-dd HH:MM	unitless
PrDM	Pressure, Digiquartz	decibars (db)
DepSM	Depth [salt water, m], lat = 8.34783	meters (m)
T090C	Temperature [ITS-90]	degrees Celsius
T190C	Temperature, 2 [ITS-90]	degrees Celsius
T2_T190C	Temperature Difference, 2 - 1 [ITS-90]	degrees Celsius
C0S_m	Conductivity	Siemens per meter (S/m)
C1S_m	Conductivity 2	Siemens per meter (S/m)

C2_C1S_m	Conductivity Difference, 2 - 1	Siemens per meter (S/m)
V0	Voltage 0	volts
CStarAt0	Beam Attenuation, WET Labs C-Star	reciprocal meters (1/m)
CStarTr0	Beam Transmission, WET Labs C-Star [%]	unitless (percent)
V1	Voltage 1	volts
FlECO_AFL	Fluorescence, WET Labs ECO-AFL/FL	milligrams per cubic meter (mg/m^3)
V2	Voltage 2	volts
AltM	Altimeter	meters (m)
V3	Voltage 3	volts
Par	PAR/Irradiance, Biospherical/Licor	micromoles photons per square meter per second (umol photons/m^2/sec)
V4	Voltage 4	volts
Sbeox0V	Oxygen raw, SBE 43 [V]	volts
V5	Voltage 5	volts
Sbeox1V	Oxygen raw, SBE 43, 2 [V]	volts
V6	Voltage 6	volts
V7	Voltage 7	volts
Spar	SPAR, Biospherical/Licor	micromoles photons per square meter per second (umol photons/m^2/sec)
Pumps	Pump Status	unitless
Latitude	Latitude	decimal degrees
Longitude	Longitude	decimal degrees
Sal00	Salinity, Practical	PSU
Sal11	Salinity, Practical, 2	PSU
Sigma_00	Density [sigma-theta]	kilograms per cubic meter (kg/m^3)
Sigma_11	Density, 2 [sigma-theta]	kilograms per cubic meter (kg/m^3)
Sbeox0Mm_L	Oxygen, SBE 43, WS = 2	micromoles per liter (umol/L)
Sbeox1Mm_L	Oxygen, SBE 43, 2, WS = 2	micromoles per liter (umol/L)
Potemp090C	Potential Temperature [ITS-90]	degrees Celsius
Potemp190C	Potential Temperature, 2 [ITS-90]	degrees Celsius
SvCM	Sound Velocity [Chen-Millero]	meters per second (m/s)
SvCM1	Sound Velocity, 2 [Chen-Millero]	meters per second (m/s)
Dz_dtM	Descent Rate, WS = 2	meters per second (m/s)
Gpa	Geopotential Anomaly	joules per kilogram (J/kg)
Nbin	Number of scans per bin	unitless
Flag	Flag	unitless
DepSM2	Depth [salt water, m], lat = 8.34783	meters

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Instruments

Dataset-specific Instrument Name	Sea-Bird SBE 9, 11plus V 5.2
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

EN614

Website	https://www.bco-dmo.org/deployment/751104
Platform	R/V Endeavor
Start Date	2018-05-06
End Date	2018-06-01
Description	See additional cruise information from the Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/EN614

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Project Information

Collaborative Research: Impact of the Amazon River Plume on Nitrogen Availability and Planktonic Food Web Dynamics in the Western Tropical North Atlantic (Amazon River Plume Nitrogen)

Coverage: Amazon River plume

NSF Award Abstract:
This is a focused program of field research in waters of the Western Tropical North Atlantic influenced by the Amazon River Plume during the high river flow season. The Amazon Plume region supports diverse plankton communities in a dynamic system driven by nutrients supplied by transport from the river proper as well as nutrients entrained from offshore waters by physical mixing and upwelling. This creates strong interactions among physical, chemical, and biological processes across a range of spatial and temporal scales. The field program will link direct measurements of environmental properties with focused experimental studies of nutrient supply and nutrient limitation of phytoplankton, as well as the transfer of phytoplankton nitrogen to the zooplankton food web. The Amazon Plume exhibits a close juxtaposition of distinct communities during the high-flow season, making it an ideal site for evaluating how nutrient availability, nutrient supply, and habitat longevity interact to drive offshore ecosystem dynamics and function. This project will include German collaborators and will seamlessly integrate education and research efforts. The investigators and their institutions have a strong commitment to undergraduate and graduate education and to increasing the diversity of the ocean science community through active recruiting and training efforts. The team has a strong

track record of involving both undergraduate and graduate students in their field and lab research. The two research cruises planned will provide opportunities for students and technicians to interact with an interdisciplinary and international research team.

The ultimate objectives of this project are to understand the processes and interactions that promote distinct communities of nitrogen-fixing organisms (diazotrophs) and other phytoplankton around the Amazon Plume and to explore the impacts of these diazotroph-rich communities on zooplankton biomass and production. The research team includes scientists with expertise in nutrient and stable isotope biogeochemistry, remote sensing as well as specialists in characterizing water mass origin and history using naturally occurring radium isotopes. This combination of approaches will provide a unique opportunity to address fundamental questions related to plankton community structure, primary production, and links to secondary production in pelagic ecosystems. The project will address the following key questions focused on fundamental issues in plankton ecology resulting from previous research in this region:

A. What mechanisms promote the preferential delivery of bioavailable phosphorus and the resulting strong nitrogen limitation associated with the northern reaches of the Amazon Plume during the high flow season?

B. What factors lead to the clear niche separation between diazotrophs within and around the Amazon Plume and how are the distinct diazotroph communities influenced by hydrographic and biogeochemical controls associated with the Amazon River Plume and offshore upwelling processes?

C. How does the nitrogen fixed by the different types of diazotrophs contribute to secondary production, and how efficiently does diazotroph nitrogen move through the food web?

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1737078

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