

CTD data from R/V Atlantic Explorer cruise AE1409 in the Western Tropical North Atlantic in 2014 (P Processing by Tricho project)

Website: <https://www.bco-dmo.org/dataset/616342>

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Project

» [Dissolved Phosphorus Processing by Trichodesmium Consortia: Quantitative Partitioning, Role of Microbial Coordination, and Impact on Nitrogen Fixation](#) (P Processing by Tricho)

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Data Files

File
CTD.csv (Comma Separated Values (.csv), 7.87 MB) MD5:1700128a417c22542d0ea856b104b759 Primary data file for dataset ID 616342

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Parameters

Parameter	Description	Units
cast	CTD cast number.	integer
station	Station number.	integer
lat	Latitude. Positive values = North.	decimal degrees
lon	Longitude. Negative values = West.	decimal degrees
date	Year, month, and day of CTD cast (UTC).	YYYYmmdd
time	Time, in hours, minutes, and seconds, of CTD cast (UTC).	HHMMSS
ISO_DateTime_UTC	Date and time (UTC) formatted to ISO 8601 standard.	YYYY-mm-ddTHH:MM:SS.xx
press	Pressure, Digiquartz.	decibars (db)
depth	Sample depth.	meters (m)
cond	Conductivity.	Siemens per meter (S/m)
cond2	Secondary conductivity.	Siemens per meter (S/m)
temp	Temperature.	degrees Celsius
temp2	Secondary temperature.	degrees Celsius
sal	Salinity, Practical.	practical salinity units (PSU)
sal2	Secondary salinity, practical.	practical salinity units (PSU)
sal3	Salinity, Practical.	practical salinity units (PSU)
density	Density.	kilograms per cubic meter (kg/m ³)
N2_sat	Nitrogen saturation.	milliliters per liter (mL/L)
potemp	Potential temperature.	degrees Celsius
O2	Oxygen, SBE 43.	milliliters per liter (mL/L)
O2_sat_mLL_GG	Oxygen Saturation, Garcia & Gordon.	milliliters per liter (mL/L)
O2_sat_mLL_W	Oxygen Saturation, Weiss.	milliliters per liter (mL/L)
O2_sat_umolkg_W	Oxygen Saturation, Weiss.	micromoles per kilogram (umol/kg)
PAR	PAR/Irradiance, Biospherical/Licor	?
time_elapsed	Time elapsed.	seconds
altimeter	Altimeter.	meters (m)
voltage0	Voltage 0.	volts
voltage1	Voltage 1.	volts
flag	Flag	dimensionless

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Deployments

AE1409

Website	https://www.bco-dmo.org/deployment/565190
Platform	R/V Atlantic Explorer
Start Date	2014-05-08
End Date	2014-05-26
Description	May 2014 cruise conducted as part of the "Dissolved Phosphorus Processing by Trichodesmium Consortia: Quantitative Partitioning, Role of Microbial Coordination, and Impact on Nitrogen Fixation" project.

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Project Information

Dissolved Phosphorus Processing by Trichodesmium Consortia: Quantitative Partitioning, Role of Microbial Coordination, and Impact on Nitrogen Fixation (P Processing by Tricho)

Coverage: Western Tropical North Atlantic

Description from NSF award abstract:

Colonies of the cyanobacterium *Trichodesmium* are responsible for a large fraction of N₂ fixation in nutrient-poor, open-ocean ecosystems, ultimately fueling primary production in both *Trichodesmium* and in the broader planktonic community. However, in some parts of the ocean, the scarcity of dissolved phosphorus limits rates of *Trichodesmium* N₂ fixation. *Trichodesmium* colonies employ an arsenal of strategies to mitigate the effects of phosphorus limitation, and the consortia of epibiotic bacteria in the colonies may play a significant role in phosphorus acquisition.

In this study, researchers from Woods Hole Oceanographic Institution and Columbia University will use metagenomic and metatranscriptomic sequencing to investigate how phosphorus metabolism is coordinated in *Trichodesmium* consortia, and to discern the role of quorum sensing in phosphorus acquisition and partitioning. Results from this study are expected to expand understanding of *Trichodesmium* from a monospecific colony whose primary function is fixing CO₂ and N₂ toward a unique planktonic consortium with a diverse, complex, and highly coordinated overall metabolism that exerts profound control over the cycling of inorganic and organic nutrients in the oligotrophic upper ocean.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1332898

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