CTD profiles from the R/V Kilo Moana KM0701 cruise in the South Pacific during 2007 (WP2 project)

Website: https://www.bco-dmo.org/dataset/3404
Version: 03 January 2011
Version Date: 2011-01-03

Project
» Ecotypic Diversity and Adaptation of Prochlorococcus in the Stratified, High Temperature Waters of the Western Pacific Warm Pool (WP2)

Contributors	Affiliation	Role
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Dataset Description

Processed CTD data including pressure, temperature, and salinity profiles

Methods & Sampling

* Sea-Bird SBE 9 Data File:
* FileName = D:CTD Datakm0701ctd88_jd035_st26_c08.dat
* Software Version Seasave Win32 V 5.25b
* Temperature SN = 1489
* Conductivity SN = 1178
* Number of Bytes Per Scan = 30
* Number of Voltage Words = 4
* Number of Scans Averaged by the Deck Unit = 1
* System UpLoad Time = Feb 04 2007 05:31:56
** km0701 wp2 CTD 88 Station 26 cast#8 jd35
** R/V Kilo Moana
** Lat: 32 25.298 S
** Long: 159 5.338 E
# nquan = 13
# nvalues = 598
# units = specified
# name 0 = scan: Scan Count
# name 1 = prDM: Pressure, Digiquartz [db]
# name 2 = t068C: Temperature [ITS-68, deg C]

name 3 = c0S/m: Conductivity [S/m]
name 4 = sbeox0Mm/Kg: Oxygen, SBE 43 [umol/Kg]
name 5 = flSP: Fluorescence, Seapoint
name 6 = par: PAR/Irradiance, Biospherical/Licor
name 7 = nbf: Bottles Fired
name 8 = sal00: Salinity [PSU]
name 9 = sigma-é00: Density [sigma-theta, Kg/m^3]
name 10 = potemp090C: Potential Temperature [ITS-90, deg C]
name 11 = nbin: number of scans per bin
name 12 = flag: flag
span 0 = 3156, 23055
span 1 = 4.000, 601.000
span 2 = 10.6318, 24.7521
span 3 = 3.881517, 5.352337
span 4 = 180.339, 219.161
span 5 = 3.3318e-02, 9.0876e-01
span 6 = 2.7100e-05, 2.8926e-02
span 7 = 0, 0
span 8 = 34.8603, 35.7128
span 9 = 23.8216, 26.7463
span 10 = 10.5555, 24.7448
span 11 = 6, 45
span 12 = 0.0000e+00, 0.0000e+00
interval = decibars: 1
start_time = Feb 04 2007 05:31:56
bad_flag = -9.990e-29
sensor 0 = Frequency 0 temperature, 1489, 01 Dec 2005
sensor 1 = Frequency 1 conductivity, 1178, 01 Dec 2005, cpcor = -9.5700e-08
sensor 2 = Frequency 2 pressure, 75662, 07 JUN 1999
sensor 3 = Extrnl Volt 0 Oxygen, SBE, primary, 0019, 15 Dec 05p
sensor 4 = Extrnl Volt 2 Fluorometer, Seapoint, primary
sensor 5 = Extrnl Volt 4 irradiance (PAR), primary, 5248, 4 Jan 05
datcnv_date = Feb 26 2007 21:50:23, 5.37e
datcnv_in = F:wp2datascratchdatactdctd88_jd035_st26_c08.dat
F:wp2datascratchdatactdctd88_jd035_st26_c08.CON
datcnv_skipover = 0
wildedit_date = Feb 27 2007 08:48:30, 5.37e
wildedit_in = F:wp2datascratchdatactdctd88_jd035_st26_c08.cnv
wildedit_pass1_nstd = 2.0
wildedit_pass2_nstd = 20.0
wildedit_pass2_mindelta = 0.000e+000
wildedit_npoint = 100
wildedit_vars = prDM t068C c0S/m sbeox0Mm/Kg flSP par sal00 sigma-é00 potemp090C
wildedit_excl_bad_scans = yes
wfilter_date = Feb 27 2007 08:56:25, 5.37e
wfilter_in = F:wp2datascratchdatactdctd88_jd035_st26_c08.cnv
wfilter_excl_bad_scans = yes
wfilter_action prDM = gaussian, 5, 1, 0
wfilter_action t068C = median, 21
wfilter_action c0S/m = median, 21
wfilter_action sbeox0Mm/Kg = gaussian, 5, 1, 0
wfilter_action flSP = gaussian, 5, 1, 0
wfilter_action par = gaussian, 5, 1, 0
wfilter_action sal00 = gaussian, 5, 1, 0
wfilter_action sigma-é00 = gaussian, 5, 1, 0
wfilter_action potemp090C = median, 21
loopedit_date = Feb 27 2007 09:16:52, 5.37e
loopedit_in = F:wp2datascratchdatactdctd88_jd035_st26_c08.cnv
loopedit_minVelocity = 0.250
loopedit_surfaceSoak: minDepth = 0.0, maxDepth = 20, useDeckPress = 1
loopedit_excl_bad_scans = yes
binavg_date = Feb 27 2007 10:37:39, 5.37e
binavg_in = F:wp2datascratchdatactdctd88_jd035_st26_c08.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

Data Processing Description

Raw CTD data (downcast only) processed using Sea-Bird SBE Data Processing Version 7.18 using filters and windows as described in the data files.

BCO-DMO Processing Notes
- Awk written to reformat original .cnv files contributed by Zackary Johnson
- AWK: WP2_CTDcnv_2_bcodmo.awk
- Header data for CTD data generated from .cnv file header
- space delimited reformatted to tab delimited
- all records with "#" or "*" ignored
- blank lines ignored
- BCO-DMO header o/p from routine

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Data Files

File
CTD_Profiles.csv (Comma Separated Values (.csv), 6.88 MB) MD5:f94fc22c036d1e673cba6ca0063029c7 Primary data file for dataset ID 3404

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Parameters

Parameter	Description	Units
CTD_Dataset	CTD profile data dataset id (19708001)	text
CTD	CTD number	integer
Station	Station number	integer
date	Station date (GMT)	YYYYMMDD
time	Station time (GMT)	HHMMSS
lon	Station longitude (West is negative)	decimal degrees
lat	Station latitude (South is negative)	decimal degrees
Scan	Scan count	integer
Press	Pressure	decibars
Temp	Temperature (ITS-68)	degrees Celsius
Cond	Conductivity from sensor 2	Siemens/meter
O2	Oxygen (SBE-43)	umol/Kg
Fluor	Fluorescence (Seapoint)	(tbd)
PAR	photosynthetically active radiation (PAR) (Biospherical/Licor)	(tbd)
Nbf	Bottle fired	integer
Salinity	Salinity	practical salinity units (PSU)
Density	Density (Sigma_Theta)	Kg/m^3
Pot_Temp	Potential Temperature (ITS-90)	degrees Celsius
Nbin	number of scans per bin	integer
Flag	Data Flag (always 0 in these data)	integer

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Instruments

Dataset-specific Instrument Name	CTD Sea-Bird 9
Generic Instrument Name	CTD Sea-Bird 9
Dataset-specific Description	href="http://bcodata.whoi.edu/WP2/Formats_of_data_2007.pdf">See: Formats_of_data_2007.pdf href="http://bcodata.whoi.edu/WP2/thsl_cal.pdf">See: thsl_cal.pdf Parameters from .cnv file: # name 0 = scan: Scan Count # name 1 = prDM: Pressure, Digiquartz [db] # name 2 = t068C: Temperature [ITS-68, deg C] # name 3 = c0S/m: Conductivity [S/m] # name 4 = sbeox0Mm/Kg: Oxygen, SBE 43 [umol/Kg] # name 5 = flSP: Fluorescence, Seapoint # name 6 = par: PAR/Irradiance, Biospherical/Licor # name 7 = nbf: Bottles Fired # name 8 = sal00: Salinity [PSU] # name 9 = sigma-é00: Density [sigma-theta, Kg/m^3] # name 10 = potemp090C: Potential Temperature [ITS-90, deg C] # name 11 = nbin: number of scans per bin
Generic Instrument Description	The Sea-Bird SBE 9 is a type of CTD instrument package. The SBE 9 is the Underwater Unit and is most often combined with the SBE 11 Deck Unit (for real-time readout using conductive wire) when deployed from a research vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorometer, altimeter, etc.). Note that in most cases, it is more accurate to specify SBE 911 than SBE 9 since it is likely a SBE 11 deck unit was used. more information from Sea-Bird Electronics

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Deployments

KM0701

Website	https://www.bco-dmo.org/deployment/58165
Platform	R/V Kilo Moana
Report	http://bcodata.whoi.edu/WP2/wp2_cruise_report.pdf
Start Date	2007-01-03
End Date	2007-02-12
Description	A cruise aboard the R/V Kilo-Moana from Hawaii to Brisbane, Australia through the stratified WPWP during January – February 2007. For additional information on KILO MOANA data/data formats see: Formats_of_data_2007.pdf Cruise information and original data are available from the NSF R2R data catalog.

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Project Information

Ecotypic Diversity and Adaptation of Prochlorococcus in the Stratified, High Temperature Waters of the Western Pacific Warm Pool (WP2)

Website: http://www.soest.hawaii.edu/oceanography/zij/wp2/

Coverage: Western Pacific

In most tropical and subtropical ecosystems, the prokaryotic cyanobacteria Prochlorococcus plays a critical

role in ecosystem structure and biogeochemistry because it is the numerically dominant photoautotrophic picoplankter. Although the worldwide distributions of Prochlorococcus are generally understood, the precise reasons for its overwhelming ecological success have remained elusive. This picture has recently become complicated by the discovery that Prochlorococcus is not monophyletic and that different genetic clades of Prochlorococcus have remarkably different distributions with depth and over oceanic basins. Thus, our understanding of factors that structure Prochlorococcus populations in the natural environment, and our ability to predict how this structure might respond to environmental changes, are limited. The PIs will address this by focusing on naturally occurring populations in the Western Pacific Warm Pool, an area where Prochlorococcus is known to dominate, but where there are no data on clade abundances. In addition to being a large region of the Pacific Ocean with significance to the global carbon cycle, the Western Pacific Warm Pool (WPWP) is of particular interest because it is typically highly stratified, with surface waters having extreme temperatures and light levels compared to those at depth. Populations of Prochlorococcus at the surface and at depth experience different environmental pressures, and may belong to different clades and have different adaptive physiologies. The PIs will test this hypothesis on a cruise from Hawaii to Brisbane, Australia through the stratified WPWP. Samples from this transect will be used to quantify (using quantitative PCR) the six known clades of Prochlorococcus and to search for new clades (using clone libraries and isolates) and their abundances. The ultimate goal is to relate clade abundances to temperature, light, nutrient concentrations and other measured biological, chemical and physical variables.

This project will encompass multiple layers of outreach to scientists and the scientific community at large. Data and strains will be deposited at national repositories and results will be disseminated through publications, professional meeting presentations, and a project web site. Undergraduates and graduate students will be trained, and students will be an integral part of the data collection, analysis, and dissemination phases and will be encouraged to present at national meetings. Cross-institutional training will enhance graduate student education. The PIs will integrate results from this project into undergraduate and graduate curricula at their home institutions and will be attending the NSF sponsored 'Scientific Inquiry in the K-16 Classroom' seminar to develop methods to link results to primary education. The PIs will use presentations and activities with local outreach groups, such as the Hawaii Academy of Sciences, to encourage scientific understanding through mentoring, science symposia and science competitions for primary and secondary school students.

WP2/KM0701 Cruise Report

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0526462
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