Hydrographic data from the CTD mounted on the trace metal rosette (TMR) aboard R/V Falkor cruise (160115) during the ProteOMZ expedition in the Central Pacific in 2016.

Website: https://www.bco-dmo.org/dataset/734608
Data Type: Cruise Results
Version: 1
Version Date: 2018-05-01

Project
» The ProteOMZ Expedition: Investigating Life Without Oxygen in the Pacific Ocean (ProteOMZ (Proteomics in an Oxygen Minimum Zone))

Contributors	Affiliation	Role
Saito, Mak A.	Woods Hole Oceanographic Institution (WHOI)	Principal Investigator, Contact
Santoro, Alyson E.	University of California-Santa Barbara (UCSB-LifeSci)	Co-Principal Investigator
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Coverage

Spatial Extent: **N**:10.544984 **E**:-158.320979 **S**:-26.364655 **W**:-179.289931
Temporal Extent: 2016-01-16 - 2016-02-11

Dataset Description

Hydrographic data files from the SeaBird SBE19 CTD mounted on the trace metal rosette (TMR).

Methods & Sampling

Data were collected using the Trace Metal Rosette (TMR, Sea-Bird SEACAT 19+), equipped standard conductivity, temperature and pressure sensors, as well as an added optional SBE 43 dissolved oxygen sensor. All four sensors were factory refurbished/calibrated immediately prior to the expedition in November of 2015 by Sea-Bird Electronics (Bellevue WA).

Notes on CTD/O2 data acquisition and processing using Sea-Bird hardware and software. The GO-SHIP Repeat Hydrography Manual: A Collection of Expert Reports and Guidelines. IOCCP Perort No. 14, ICPO Publication Series No. 134, v. 1. 2010.

Location: Tropical/equatorial Pacific along 150º W; Honolulu, Hawai'i to Pape'ete, French Polynesia

Data Processing Description

Data from the SBE19Plus were processed using Sea-Bird's SBE Data Processing software, v. 7.23.2.

SBE processing modules were applied in the following order: *Data Conversion*, *Filter*, *Align CTD*, *Cell Thermal Mass*, and *Loop Edit* were applied to the input variables using the parameters identified in the .cnv file header shown below. Oxygen data were first processed using the raw sensor voltage, then converted to units of umol/kg using the *Derive* module. Finally, *Wild Edit* was used to remove extraneous values and data were binned by depth into 1 m bins using *Bin Average* and converted to ASCII format using *ASCII Out*.

Sea state during the cruise and issues with the block used to deploy the TMR did not allow full in-water equilibration of the CTD sensors and pumping system prior to each cast. As a result, we recommend using data from the upcasts (designated with the prefix 'u' in the filename).

datcnv_date = May 19 2016 15:57:33, 7.23.2 [datcnv_vars = 5]
datcnv_in = C:\Users\Santoro\Desktop\Falkor_2016\TMR\160131TMR21CTDdata.hex
C:\Users\Santoro\Desktop\Falkor_2016\TMR\SBE19plusV2_6801.xmlcon
datcnv_skipover = 0
datcnv_ox_hysteresis_correction = yes
filter_date = May 19 2016 15:58:16, 7.23.2
filter_in = C:\Users\Santoro\Desktop\Falkor_2016\tmr_process\160131TMR21CTDdata.cnv
filter_low_pass_tc_A = 0.500
filter_low_pass_tc_B = 0.150
filter_low_pass_A_vars = depSM tv290C c0mS/cm sbeox0V
filter_low_pass_B_vars = prdM
alignctd_date = May 19 2016 15:58:49, 7.23.2
alignctd_in = C:\Users\Santoro\Desktop\Falkor_2016\tmr_process\160131TMR21CTDdata.cnv
alignctd_adv = c0mS/cm 0.073 # celltm_date = May 19 2016 15:59:14, 7.23.2
celltm_in = C:\Users\Santoro\Desktop\Falkor_2016\tmr_process\160131TMR21CTDdata.cnv
celltm_alpha = 0.0300, 0.0000
celltm_tau = 7.0000, 0.0000
celltm_temp_sensor_use_for_cond = primary,
loopedit_date = May 19 2016 16:00:13, 7.23.2
loopedit_in = C:\Users\Santoro\Desktop\Falkor_2016\tmr_process\160131TMR21CTDdata.cnv
loopedit_minVelocity = 0.250
loopedit_surfaceSoak: minDepth = 5.0, maxDepth = 20, useDeckPress = 1
loopedit_excl_bad_scans = yes
Derive_date = May 19 2016 16:03:09, 7.23.2 [derive_vars = 5]
Derive_in = C:\Users\Santoro\Desktop\Falkor_2016\tmr_process\160131TMR21CTDdata.cnv
C:\Users\Santoro\Desktop\Falkor_2016\TMR\SBE19plusV2_6801.xmlcon
derive_time_window_docdt = seconds: 2
derive_ox_tau_correction = yes
wildedit_date = May 19 2016 16:03:51, 7.23.2
wildedit_in = C:\Users\Santoro\Desktop\Falkor_2016\tmr_process\160131TMR21CTDdata.cnv
wildedit_pass1_nstd = 2.0
wildedit_pass2_nstd = 20.0
wildedit_pass2_mindelta = 0.000e+000
wildedit_npoint = 100
wildedit_vars = prdM depSM tv290C c0mS/cm sbeox0V sal00 potemp090C density00 sigma-È00
sbeox0Mm/Kg
wildedit_excl_bad_scans = yes
file_type = ascii

BCO-DMO Data Processing Notes:

- Files were originally grouped in separate zip files, but were compressed into one to serve.

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Data Files

File	
FK160115_TMRCTD_asc_bin_hdr.zip	(ZIP Archive (ZIP), 1.76 MB) MD5:665ad68578e47895128bfd8f08a74c05

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Related Datasets

IsRelatedTo

Saito, M. A., Saunders, J. (2022) **Relative protein abundance from scaled and corrected exclusive peptide spectral counts from the ProteOMZ R/V Falkor expedition cruise FK160115 in the Pelagic central Pacific Ocean in 2016.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2022-01-13 doi:10.26008/1912/bco-dmo.868030.1 [view at BCO-DMO]
Relationship Description: This dataset was collected asynchronously using another instrument at the same stations during the expedition.

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Parameters

Parameter	Description	Units
PrdM	Pressure, Strain Gauge	db
DepSM	Depth of salt water	meters
Tv290C	Temperature [ITS-90]	Celsius
C0mS/cm	Conductivity	mS per cm
Sal00	Salinity	Practical Salinity Units
Potemp090C	Potential Temperature [ITS-90]	Celsius
Density00	Density	kilogram per meter cubed
Sigma-E00	Density [sigma-theta]	kilogram per meter cubed
Sbeox0Mm/Kg	Oxygen, SBE 43	umol per kilogram
Flag	Flag	unitless

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Instruments

Dataset-specific Instrument Name	Trace metal rosette
Generic Instrument Name	Trace Metal Bottle
Dataset-specific Description	Used to collect samples
Generic Instrument Description	Trace metal (TM) clean rosette bottle used for collecting trace metal clean seawater samples.

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Deployments

FK160115

Website	https://www.bco-dmo.org/deployment/708387
Platform	R/V Falkor
Report	https://service.rvdata.us/data/cruise/FK160115/doc/FK160115_OfficialCruiseReport_Saito_v3.pdf
Start Date	2016-01-16
End Date	2016-02-11
Description	Project: Using Proteomics to Understand Oxygen Minimum Zones (ProteOMZ) More information is available from the ship operator at https://schmidtocean.org/cruise/investigating-life-without-oxygen-in-the... Additional cruise information is available from the Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/FK160115

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Project Information

The ProteOMZ Expedition: Investigating Life Without Oxygen in the Pacific Ocean (ProteOMZ (Proteomics in an Oxygen Minimum Zone))

Website: https://schmidtocean.org/cruise/investigating-life-without-oxygen-in-the-tropical-pacific/#team

Coverage: Central Pacific Ocean (Hawaii to Tahiti)

From Schmidt Ocean Institute's ProteOMZ Project page:

Rising temperatures, ocean acidification, and overfishing have now gained widespread notoriety as human-caused phenomena that are changing our seas. In recent years, scientists have increasingly recognized that there is yet another ingredient in that deleterious mix: a process called deoxygenation that results in less oxygen available in our seas.

Large-scale ocean circulation naturally results in low-oxygen areas of the ocean called oxygen deficient zones (ODZs). The cycling of carbon and nutrients – the foundation of marine life, called biogeochemistry – is fundamentally different in ODZs than in oxygen-rich areas. Because researchers think deoxygenation will greatly expand the total area of ODZs over the next 100 years, studying how these areas function now is important in predicting and understanding the oceans of the future. This first expedition of 2016 led by Dr. Mak Saito from the Woods Hole Oceanographic Institution (WHOI) along with scientists from University of Maryland Center for Environmental Science, University of California Santa Cruz, and University of Washington aimed to do just that, investigate ODZs.

During the 28 day voyage named “ProteOMZ,” researchers aboard R/V *Falkor* traveled from Honolulu, Hawaii

to Tahiti to describe the biogeochemical processes that occur within this particular swath of the ocean's ODZs. By doing so, they contributed to our greater understanding of ODZs, gathered a database of baseline measurements to which future measurements can be compared, and established a new methodology that could be used in future research on these expanding ODZs.

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Funding

Funding Source	Award
Gordon and Betty Moore Foundation: Marine Microbiology Initiative (MMI)	GBMF3782
Alfred P. Sloan Foundation (Sloan)	Unknown ProteOMZ Sloan Foundation
Schmidt Ocean Institute (SOI)	R/V Falkor 160115 SOI ProteOMZ Expedition

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