B12-vehicle dive sample log: dive samples (rock, fluid, biology) from R/V Thomas G. Thompson TN253 in the NE Pacific Ocean, Juan de Fuca Ridge, Axial Seamount from August to September 2010 (AXIAL project)

Website: https://www.bco-dmo.org/dataset/3377
Version: 25 October 2010
Version Date: 2010-10-25

Project
» Function, activity, and adaptation of microbial communities in geochemically diverse subseafloor habitats (AXIAL)

Contributors	Affiliation	Role
Butterfield, David A.	University of Washington (UW)	Principal Investigator
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Dataset Description

B12: Log: DIVE SAMPLES (Rock, Fluid, Biology) collected by the JASON ROV system
Including samples from Recovered Long-Term Sampling Devices

Methods & Sampling

Original form completed by: James Holden
Original form completion date: 2010-09-06

Data Processing Description

BCO-DMO Processing Notes
Generated from original spreadsheet "TN253 B12-vehicle dive sample log.xls" contributed by David Butterfield

BCO-DMO Edits
- Parameter names edited to conform to BCO-DMO naming convention found at Choosing Parameter Name
- dates reformatted to YYYYMMDD
- times reformatted to HHMM
- Positive Longitude minutes signed negative for West
- Latitude degs,mins/Longitude degs,mins converted from degs, decimal minutes to decimal degrees
- Latitude degs,minutes and Longitude degs, minutes retained
- "nd" (BCO_DMO flag for no data) added to blank cells

- Commas in fields converted to semi-colons
- Sample error descriptions in Sample_ID field moved to Comments field

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Data Files

File
Dive_Sample_Log.csv (Comma Separated Values (.csv), 33.30 KB) MD5:fe2f26b3572e60852a4d3153f48992e3 Primary data file for dataset ID 3377

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Parameters

Parameter	Description	Units
Sample_ID	Unique Sample Id	text
Physical_Sample_Type	Physical Sample Type	text
Physical_Sample_Description	Physical Sample Description	text
Sampling_Device_Type	Sampling Device Type	text
Instrument_Device_Id_No	Instrument Device Id Number	text
Cruise_Id	Cruise Id	text
Start_Sample_Collection_DiveNo	Start Sample Collection JASON ROV Dive Number	text
Start_Sample_Collection_Date	Start Sample Collection Date (GMT)	YYYYMMDD
Start_Sample_Collection_Time	Start Sample Collection Time (GMT)	HHMM
End_Sample_Collection_DiveNo	End Sample Collection JASON ROV Dive Number	text
End_Sample_Collection_Date	End Sample Collection Date (GMT)	YYYYMMDD
End_Sample_Collection_Time	End Sample Collection Time (GMT)	HHMM
Sampling_Device_Recovered	Was Sampling Device Recovered (yes/no)	text

lat	Sample latitude (South is negative)	decimal degrees
Lat_Degrees	Sample latitude whole degrees (South is negative)	degrees
Lat_Minutes	Sample latitude minutes (South is negative)	decimal minutes
lon	Sample longitude degrees (West is negative)	decimal degrees
Lon_Degrees	Sample longitude whole degrees (West is negative)	degrees
Lon_Minutes	Sample longitude minutes (West is negative)	decimal minutes
Local_XY_Origin	lat/lon of origin of local coordinate system	decimal degrees
Local_X	Sample Local X position	meters
Local_Y	Sample Local Y position	meters
Depth	Sample Depth	meters
Positioning_Method	Sample positioning method (USBL; ALBL; DVL; etc)	text
Position_Src	Source of sample position (ReNav; Real Time; etc)	text
Site_Description	Site Description	text
Vehicle_Heading	Vehicle Heading	degrees
Vehicle_Altitude	Vehicle Altitude	meters
Vent_Environment_Temp	Vent Environment Temp	degrees Celsius
Vent_Environment_Salinity	Vent Environment Salinity	ppm
Vent_Environment_Chlorinity	Vent Environment Chlorinity	mmol/kg
Contact_Person	Contact Person	text

Comments	Comments	text

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Deployments

TN253

Website	https://www.bco-dmo.org/deployment/58138
Platform	R/V Thomas G. Thompson
Report	http://data.bco-dmo.org/AXIAL/nemo10-cruise-report.pdf
Start Date	2010-08-26
End Date	2010-09-07
Description	This expedition to Axial Seamount (Axial 2010 or TN"253) on R/V Thompson with ROV Jason (August 26 to September 7, 2010, Newport to Astoria) included two different but complimentary projects funded by the National Science Foundation. One project is continuing a decade"long time"series of pressure measurements at an array of seafloor benchmarks to measure volcanic inflation at Axial (Bill Chadwick and Scott Nooner, co"PIs). The other project is focused on coordinated fluid chemistry and microbiological sampling at hydrothermal vent sites utilizing new methods of sample collection and analysis (Julie Huber and Dave Butterfield, co"PIs). The cruise accomplished six Jason ROV dives, the first two for fluid sampling, followed by one long dive for the pressure measurements, and ending with three additional fluid"sampling dives. In between ROV dives, we deployed and recovered six instrumental moorings (4 ocean"bottom hydrophones (OBHs), 1 bottom pressure recorder (BPR), and 1 remote access fluid sampler (RAS)), deployed six new cement benchmarks to improve the repeatability of the pressure measurements, conducted three CTDs, and collected EM300 multibeam sonar bathymetric data. The expedition was very successful and all our goals were achieved, thanks to the combined efforts of the science party, the Jason team, and the ship's crew. Cruise information and original data are available from the NSF R2R data catalog.

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Project Information

Function, activity, and adaptation of microbial communities in geochemically diverse subseafloor habitats (AXIAL)

Website: http://www.pmel.noaa.gov/vents/index.html

Coverage: NE Pacific Ocean, Juan de Fuca Ridge, Axial Seamount

Collaborative Research: Function, activity, and adaptation of microbial communities in geochemically diverse subseafloor habitats

The integration of both laboratory and field-based chemical and microbiological measurements into a quantitative predictive framework is crucial to understanding the microbial ecology of marine systems. This project work will provide a quantitative assessment of the functional diversity, activity, and physiological adaptation of microbial communities in geochemically diverse subseafloor habitats. Results will guide development of models for linking biogeochemical processes with particular microbial communities at deep-sea hydrothermal vents, with implications for other marine habitats as well. The focus of the effort is at Axial Seamount, a well-studied, active, deep-sea hydrothermal seamount in the NE Pacific Ocean. Samples already collected from Axial, along with a field program in Year 2, will serve as the foundation for the three objectives, which are to:

1. Determine and quantify the functional diversity and activity (expression) of key subseafloor microbial lineages at Axial Seamount.

2. Determine physiological adaptations to the subseafloor habitat by quantifying the growth response of Axial Seamount isolates to in-situ geochemical parameters.

3. Develop a quantitative predictive framework for linking particular types of geochemical vent conditions with specific microbial functional groups and activities at Axial Seamount.

Specific outcomes of this project include the creation of a comprehensive quantitative microbiological and chemical dataset on diffuse and adjacent high-temperature vents within Axial Seamount. This database will include chemical measurements (gases, nutrients, metals, isotopes, and calculated Gibbs free energies) relevant to microbial metabolic processes that can be compared to microbiological data (abundance and activity of microbial lineages and functional genes, growth rates of subseafloor isolates at relevant environmental conditions) using statistical analysis to identify how specific microbial activity is linked to the geochemical environment. This project builds on previous studies of microbial population structure and geochemical measurements at Axial Seamount and addresses critical gaps in current knowledge and understanding that are impeding progress of modeling hydrothermal systems. Results will increase understanding of deep-sea hydrothermal ecosystems as well as provide new insights into controls on the distribution and activity of marine microbial communities throughout the world's oceans.

NeMO10 TN253 Cruise Report

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0926199
NSF Division of Ocean Sciences (NSF OCE)	OCE-0929167

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