Results from inhibition experiments conducted using sediment samples from push cores obtained using HOV Alvin dive 4869 during the R/V Atlantis cruise AT37-06 in Guaymas Basin, Gulf of California in December 2016

Website: https://www.bco-dmo.org/dataset/814415
Data Type: Cruise Results, experimental
Version: 1
Version Date: 2020-06-04

Project
» Collaborative Research: Microbial Carbon cycling and its interactions with Sulfur and Nitrogen transformations in Guaymas Basin hydrothermal sediments (Guaymas Basin Interactions)

Contributors	Affiliation	Role
Joye, Samantha B.	University of Georgia (UGA)	Principal Investigator
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Abstract
Results from inhibition experiments conducted using sediment samples from push cores obtained using the human-occupied deep-diving vehicle (HOV) Alvin dive 4869 during the R/V Atlantis cruise AT37-06 in Guaymas Basin, Gulf of California (27 00.00 N, -111 20.00 W) in December 2016. These data were published in (Zhuang et al., 2018).

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Coverage

Spatial Extent: **Lat**:27.00733 **Lon**:-111.40883
Temporal Extent: 2016-12-21

Data Processing Description

BCO-DMO Data Manager Processing Notes:
* Data submitted in Excel file "Data submission OCE.xlsx" sheet "Inhibition experiment" extracted to csv
* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions (spaces, +, and - changed to underscores). Units in parentheses removed and added to Parameter Description metadata section.
* removed metadata notes at the bottom of the file and moved to parameter descriptions. E.g. "B.D.: Below detection limit."
* Date formats converted to ISO 8601 yyyy-mm-dd
* Lat/lon converted to decimal degrees from degrees decimal minutes

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Data Files

File
inhibition.csv (Comma Separated Values (.csv), 406 bytes) MD5:fc504ee35f4c24be0551c0db33489071 Primary data file for dataset ID 814415

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Related Datasets

IsRelatedTo

Joye, S. B., Teske, A. P. (2020) **Acetate and methanol turnover rates from sediment push cores collected during HOV Alvin dives during the R/V Atlantis cruise AT37-06 in Guaymas Basin, Gulf of California in December 2016.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2020-06-04 doi:10.26008/1912/bco-dmo.814406.1 [view at BCO-DMO]
Relationship Description: Related Datasets which used the same sediment core samples.

Joye, S. B., Teske, A. P. (2020) **Sediment geochemistry from push cores collected during HOV Alvin dives during the R/V Atlantis cruise AT37-06 in Guaymas Basin, Gulf of California in December 2016.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2020-07-21 doi:10.26008/1912/bco-dmo.814391.1 [view at BCO-DMO]
Relationship Description: Related Datasets which used the same sediment core samples.

Joye, S. B., Teske, A. P. (2020) **Sediment geochemistry summary from push cores collected during HOV Alvin dives during the R/V Atlantis cruise AT37-06 in the Guaymas Basin from December 2016.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2020-07-21 doi:10.26008/1912/bco-dmo.819127.1 [view at BCO-DMO]
Relationship Description: Related Datasets which used the same sediment core samples.

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Parameters

Parameter	Description	Units
Dive_No	Dive number	unitless
Site	Site name	unitless
Sampling_date	Sample date (UTC) in ISO 8601 format yyyy-mm-dd	unitless
Latitude	Latitude	decimal degrees
Longitude	Longitude	decimal degrees
Treatment	Treatment description. BES = "2-bromoethanesulfonate"	unitless
Acetate_methanogenesis_rate	Rate of Methanogenesis from Acetate.	picomoles per cubic centimeter per day (pmol cm-3 d-1)
Aceate_Oxidation_rate	Aceate Oxidation rate	picomoles per cubic centimeter per day (pmol cm-3 d-1)
Methanol_methanogenesis_rate	Rate of Methanogenesis from Methanol.	picomoles per cubic centimeter per day (pmol cm-3 d-1)
Methanol_Oxidation_rate	Methanol oxidation rate	picomoles per cubic centimeter per day (pmol cm-3 d-1)

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Deployments

AT37-06

Website	https://www.bco-dmo.org/deployment/720354
Platform	R/V Atlantis
Report	https://datadocs.bco-dmo.org/d3/data_docs/GuaymasBasin_Interactions/AT37-06_CruiseReport.pdf
Start Date	2016-12-09
End Date	2016-12-27

AT37-06_Alvin_Dives

Website	https://www.bco-dmo.org/deployment/782870
Platform	Alvin
Report	https://datadocs.bco-dmo.org/d3/data_docs/GuaymasBasin_Interactions/AT37-06_CruiseReport.pdf
Start Date	2016-12-09
End Date	2016-12-27
Description	Alvin dives conducted at Guyamas Basin on R/V Atlantis cruise AT37-06.

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Project Information

Collaborative Research: Microbial Carbon cycling and its interactions with Sulfur and Nitrogen transformations in Guaymas Basin hydrothermal sediments (Guaymas Basin Interactions)

Coverage: Guaymas Basin, Gulf of California, 27.00 N, 111.00W

Description from NSF award abstract:
Hydrothermally active sediments in the Guaymas Basin are dominated by novel microbial communities that catalyze important biogeochemical processes in these seafloor ecosystems. This project will investigate genomic potential, physiological capabilities and biogeochemical roles of key uncultured organisms from Guaymas sediments, especially the high-temperature anaerobic methane oxidizers that occur specifically in hydrothermally active sediments (ANME-1Guaymas). The study will focus on their role in carbon transformations, but also explore their potential involvement in sulfur and nitrogen transformations. First-order research topics include quantifying anaerobic methane oxidation under high temperature,in situ concentrations of phosphorus and methane , and with alternate electron acceptors; sulfate and sulfur-dependent microbial pathways and isotopic signatures under these conditions; and nitrogen transformations in methane-oxidizing microbial communities, hydrothermal mats and sediments.

This integrated biogeochemical and microbiological research will explore the pathways of and environmental controls on the consumption and production of methane, other alkanes, inorganic carbon, organic acids and organic matter that fuel the Guaymas sedimentary microbial ecosystem. The hydrothermal sediments of Guaymas Basin provide a spatially compact, high-activity location for investigating novel modes of methane cycling and carbon assimilation into microbial biomass. In the case of anaerobic methane oxidation, the high temperature and pressure tolerance of Guaymas Basin methane-oxidizing microbial communities, and their potential to uncouple from the dominant electron acceptor sulfate, vastly increase the predicted subsurface habitat space and biogeochemical role for anaerobic microbial methanotrophy in global deep subsurface diagenesis. Further, microbial methane production and oxidation interlocks with syulfur and nitrogen transformations, which will be explored at the organism and process level in hydrothermal sediment microbial communities and mats of Guaymas Basin. In general, first-order research tasks (rate measurements, radiotracer incorporation studies, genomes, in situ microgradients) define the key microbial capabilities, pathways and processes that mediate chemical exchange between the subsurface hydrothermal/seeps and deep ocean waters.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1357360

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