

# Sample log for hydrocarbon pushcore samples from Guaymas Basin hydrothermal vents, RV/Atlantis cruise AT42-05, Nov. 2018

**Website:** <https://www.bco-dmo.org/dataset/773279>

**Data Type:** Cruise Results

**Version:** 1

**Version Date:** 2019-07-15

## Project

» [Collaborative Research: Hydrothermal Fungi in the Guaymas Basin Hydrocarbon Ecosystem](#) (HOTFUN)

| Contributors                         | Affiliation                                                   | Role                      |
|--------------------------------------|---------------------------------------------------------------|---------------------------|
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| <a href="#">Teske, Andreas</a>       | University of North Carolina at Chapel Hill (UNC-Chapel Hill) | Co-Principal Investigator |
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## Abstract

Sample log for hydrocarbon pushcore samples from Guaymas Basin hydrothermal vents, RV/Atlantis cruise AT42-05, Nov. 2018.

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## Coverage

**Spatial Extent:** N:27.0116 E:-111.4044 S:27.0078 W:-111.4071

**Temporal Extent:** 2018-11-17 - 2018-11-25

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## Dataset Description

This dataset includes a listing of the pushcore samples collected for hydrocarbon analysis at two locations in the Guaymas Basin hydrothermal vents region during Alvin dives on RV/Atlantis cruise AT42-05, Nov. 2018.

## Data Processing Description

### BCO-DMO Processing Notes:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- transcribed columns to rows
- re-formatted date from d/m/yyyy to yyyy-mm-dd

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## Data Files

| File                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------|
| <b>hydrocarbon_sample_log.csv</b> (Comma Separated Values (.csv), 2.22 KB)<br>MD5:911e0e0add87208756085d0e70165dde |
| Primary data file for dataset ID 773279                                                                            |

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## Parameters

| Parameter                | Description                            | Units           |
|--------------------------|----------------------------------------|-----------------|
| Sample_ID                | sample identifier and description      | unitless        |
| Date_time_local_sampling | sampling date - local time (UTC-07:00) | unitless        |
| LAB_SAMPLE_ID            | sample identifier assigned in lab      | unitless        |
| Site                     | sampling site name                     | unitless        |
| Dive                     | Alvin dive number                      | unitless        |
| lat                      | latitude; north is positive            | decimal degrees |
| lon                      | longitude; east is positive            | decimal degrees |

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## Instruments

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dataset-specific Instrument Name</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Generic Instrument Name</b>          | Push Corer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Dataset-specific Description</b>     | Used to collect sediment samples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Generic Instrument Description</b>   | Capable of being performed in numerous environments, push coring is just as it sounds. Push coring is simply pushing the core barrel (often an aluminum or polycarbonate tube) into the sediment by hand. A push core is useful in that it causes very little disturbance to the more delicate upper layers of a sub-aqueous sediment. Description obtained from: <a href="http://web.whoi.edu/coastal-group/about/how-we-work/field-methods/coring/">http://web.whoi.edu/coastal-group/about/how-we-work/field-methods/coring/</a> |

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## Deployments

AT42-05

|                    |                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/773347">https://www.bco-dmo.org/deployment/773347</a> |
| <b>Platform</b>    | R/V Atlantis                                                                                      |
| <b>Start Date</b>  | 2018-11-15                                                                                        |
| <b>End Date</b>    | 2018-11-29                                                                                        |
| <b>Description</b> | Alvin dives to hydrothermal vent area.                                                            |

#### AT42-05 Alvin Dives

|                    |                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/773374">https://www.bco-dmo.org/deployment/773374</a> |
| <b>Platform</b>    | Alvin                                                                                             |
| <b>Start Date</b>  | 2018-11-17                                                                                        |
| <b>End Date</b>    | 2018-11-25                                                                                        |
| <b>Description</b> | Alvin dives 4991-5001at Guaymas Basin                                                             |

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## Project Information

### Collaborative Research: Hydrothermal Fungi in the Guaymas Basin Hydrocarbon Ecosystem (HOTFUN)

**Coverage:** Guaymas Basin, Gulf of CA, Mexico

#### NSF Award Abstract:

Fungi that can derive energy from chemicals, yet consume other organisms or organic material to obtain carbon have been reported from diverse marine subsurface samples, including from hundreds of meters below the seafloor. Evidence exists that Fungi are active in subsurface marine sediments globally, yet there is a dearth of knowledge on their role in the marine subsurface, and specifically on their role(s) in hydrocarbon degradation within deep-sea sediments. This team is isolating a broad collection of environmentally relevant filamentous Fungi and yeasts from hydrothermally-influenced and hydrocarbon-rich seep sediments of Guaymas Basin using high-throughput culture-based approaches. They aim to reveal the diversity of Fungi and Bacteria in these hydrothermal sediments, how temperature and hydrocarbon composition shape their distribution, and how Fungi cooperate to enhance the degradation of hydrocarbons by Bacteria. By hosting six undergraduates through the WHOI Summer Student Fellows program and the Woods Hole Partnership Education Program, the project contributes to increasing diversity in marine science by offering opportunities for promising undergraduates from disadvantaged populations. High school students are involved in summer projects and in intensive summer workshops. One postdoc, a graduate student, and two Research Associates are supported, and international collaborations are strengthened. The postdoc and graduate student are gaining valuable cruise-based experience. An e-lecture on Fungi and their role(s) in biodegradation of hydrocarbons will be made publicly available by the end of the project. Fungal isolates with accompanying information will be secured in a reference culture collection for long-term storage and are available to any interested researcher throughout the project.

The PIs are isolating a broad collection of environmentally relevant filamentous Fungi and yeasts from hydrothermally-influenced and hydrocarbon-rich seep sediments of Guaymas Basin using high-throughput culture-based approaches, with the aim to reveal their ability to degrade individual hydrocarbons under in situ pressures and temperatures. Culture independent methods marker gene analyses are used to characterize in situ fungal and bacterial diversity and to examine how temperature and hydrocarbon composition shape fungal community composition and distribution. Traditional and comprehensive two-dimensional gas chromatographic analyses are used to examine the complexities and subtle changes in inventories of hydrocarbons within sediment cores, and provide evidence for in situ microbial alteration of individual hydrocarbons. Incubation experiments are used to test the ability of fungal isolates to utilize different hydrocarbons as a sole or auxiliary carbon source under in situ pressures and temperatures and their ability to stimulate biodegradation of

hydrocarbons by hydrocarbon-degrading bacteria. Expressed genes within these incubation studies tell us how Fungi and Bacteria couple metabolisms to increase overall specificity and extent of biodegradation of hydrocarbons.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

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## Funding

| Funding Source                                           | Award                       |
|----------------------------------------------------------|-----------------------------|
| <a href="#">NSF Division of Ocean Sciences (NSF OCE)</a> | <a href="#">OCE-1829903</a> |

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