

Discrete temperature and DO measured with the HOV Alvin during R/V Atlantis cruise AT26-24 at Dorado Outcrop in December of 2014

Website: <https://www.bco-dmo.org/dataset/664335>

Data Type: Cruise Results

Version:

Version Date: 2016-11-10

Project

» [Discovery, sampling, and quantification of flows from cool yet massive ridge-flank hydrothermal springs on Dorado Outcrop, eastern Pacific Ocean](#) (Dorado Outcrop)

Program

» [Center for Dark Energy Biosphere Investigations](#) (C-DEBI)

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Dataset Description

This dataset contains discrete measurements of temperature and dissolved oxygen at Dorado Outcrop during R/V Atlantis cruise AT26-24. It also includes the time, latitude, and longitude of the Alvin dives that collected the measurements.

Methods & Sampling

Temperature measurements were made with the thermal couple on board the HOV Alvin. The dissolved oxygen concentrations were measured with an Aanderra optode.

The Alvin dives were conducted off the west coast of Costa Rica in the Pacific Ocean at Dorado Outcrop during the R/V Atlantis cruise AT26-24. For more information about operations of this cruise see the cruise pages which contain links to cruise reports ([AT26-24](#))

Data Processing Description

The data have not been processed further.

BCO-DMO Processing Notes:

- * added a conventional header with dataset name, PI name, version date
- * modified parameter names to conform with BCO-DMO naming conventions
- * added lat/lon of Alvin dives as listed in the [Alvin Dive Log](#)

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Data Files

File
Alvin_O2.csv (Comma Separated Values (.csv), 1.66 KB) MD5:997a958fcde3c0707a5824d18af68d53
Primary data file for dataset ID 664335

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Parameters

Parameter	Description	Units
dive_id	Dive identifier for Alvin dive	unitless
dive_date	Date (UTC) in format yyyy-mm-dd	unitless
dive_lat	Latitude of Alvin dive where measurement was taken	decimal degrees
dive_lon	Longitude of Alvin dive where measurement was taken; west is negative.	decimal degrees
temp	Temperature	Degrees Celsius
oxygen	Dissolved oxygen	micromoles per liter (uM)
location	Location measurement was taken	unitless

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Aanderaa Oxygen Optodes
Generic Instrument Description	Aanderaa Oxygen Optodes are instrument for monitoring oxygen in the environment. For instrument information see the Aanderaa Oxygen Optodes Product Brochure.

Dataset-specific Instrument Name	Alvin thermal couple
Generic Instrument Name	Temperature Logger
Dataset-specific Description	Discrete measurements of temperature were made with the thermal couple on board the HOV Alvin.
Generic Instrument Description	Records temperature data over a period of time.

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Deployments

AT26-24

Website	https://www.bco-dmo.org/deployment/627856
Platform	R/V Atlantis
Report	http://dmoserv3.whoi.edu/data_docs/C-DEBI/cruise_reports/AT26-24_Dorado_Outcrop_2014_Cruise_Report_reduced.pdf
Start Date	2014-11-30
End Date	2014-12-12
Description	Research was conducted on this cruise as part of the C-DEBI project titled "Discovery, sampling, and quantification of flows from cool yet massive ridge-flank hydrothermal springs on Dorado Outcrop, eastern Pacific Ocean" (see: http://www.bco-dmo.org/project/627844).

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Project Information

Discovery, sampling, and quantification of flows from cool yet massive ridge-flank hydrothermal springs on Dorado Outcrop, eastern Pacific Ocean (Dorado Outcrop)

Website: <http://www.darkenergybiosphere.org/research/dorado.html>

Coverage: Dorado Outcrop near Cocos Ridge (9N, 87W)

Description from NSF award abstract:

Pristine fluids from a typical ridge-flank hydrothermal system have never been sampled, mainly because it has not been possible to locate a site of focused discharge where representative samples could be collected. The PIs have located a small basement feature, Dorado outcrop, on 23 m.y.-old seafloor on the eastern flank of the East Pacific Rise that they plan to sample to determine the fluid composition, and to assess the rate of discharge from the outcrop, so that they can quantify the chemical impact of this hydrothermal system. They plan an 18-day expedition that combines the surveying capabilities of the AUV Sentry (bathymetric, sub-bottom sonar, photo mosaics, water column anomalies) and an ocean-class vessel capable of collecting high-quality multi-beam data and CTD samples, and supporting the survey and sampling capabilities of the ROV Jason II for collection of spring and plume fluids, heat flow data, sediment push cores, and still and video photography. These data and samples will be combined hopefully to generate the first well-constrained estimates of hydrothermal flows from Dorado outcrop. This expedition will result in the collection of samples and data from a "fire hose" of ridge-flank, hydrothermal system, challenging the commonly held view that discharge from ridge flank hydrothermal systems occurs primarily from diffuse seeps.

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Program Information

Center for Dark Energy Biosphere Investigations (C-DEBI)

Website: <http://www.darkenergybiosphere.org>

Coverage: Global

The mission of the Center for Dark Energy Biosphere Investigations (C-DEBI) is to explore life beneath the seafloor and make transformative discoveries that advance science, benefit society, and inspire people of all ages and origins.

C-DEBI provides a framework for a large, multi-disciplinary group of scientists to pursue fundamental questions about life deep in the sub-surface environment of Earth. The fundamental science questions of C-DEBI involve exploration and discovery, uncovering the processes that constrain the sub-surface biosphere below the oceans, and implications to the Earth system. What type of life exists in this deep biosphere, how much, and how is it distributed and dispersed? What are the physical-chemical conditions that promote or limit life? What are the important oxidation-reduction processes and are they unique or important to humankind? How does this biosphere influence global energy and material cycles, particularly the carbon cycle? Finally, can we discern how such life evolved in geological settings beneath the ocean floor, and how this might relate to ideas about the origin of life on our planet?

C-DEBI's scientific goals are pursued with a combination of approaches:

- (1) coordinate, integrate, support, and extend the research associated with four major programs—Juan de Fuca Ridge flank (JdF), South Pacific Gyre (SPG), North Pond (NP), and Dorado Outcrop (DO)—and other field sites;
- (2) make substantial investments of resources to support field, laboratory, analytical, and modeling studies of the deep subseafloor ecosystems;
- (3) facilitate and encourage synthesis and thematic understanding of submarine microbiological processes, through funding of scientific and technical activities, coordination and hosting of meetings and workshops, and support of (mostly junior) researchers and graduate students; and
- (4) entrain, educate, inspire, and mentor an interdisciplinary community of researchers and educators, with an emphasis on undergraduate and graduate students and early-career scientists.

Note: Katrina Edwards was a former PI of C-DEBI; James Cowen is a former co-PI.

Data Management:

C-DEBI is committed to ensuring all the data generated are publically available and deposited in a data repository for long-term storage as stated in their [Data Management Plan \(PDF\)](#) and in compliance with the [NSF Ocean Sciences Sample and Data Policy](#). The data types and products resulting from C-DEBI-supported research include a wide variety of geophysical, geological, geochemical, and biological information, in addition to education and outreach materials, technical documents, and samples. All data and information generated by C-DEBI-supported research projects are required to be made publically available either following publication of research results or within two (2) years of data generation.

To ensure preservation and dissemination of the diverse data-types generated, C-DEBI researchers are working with BCO-DMO Data Managers make data publicly available online. The partnership with BCO-DMO helps ensure that the C-DEBI data are discoverable and available for reuse. Some C-DEBI data is better served by specialized repositories (NCBI's GenBank for sequence data, for example) and, in those cases, BCO-DMO provides dataset documentation (metadata) that includes links to those external repositories.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1130146
NSF Division of Ocean Sciences (NSF OCE)	OCE-1131210

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