

CTD data collected during Alvin dives from R/V Atlantis AT15-59 in the Pacific Ocean off Costa Rica from January 2010 (Seep Carbonate Ecology CROCKS II project)

Website: <https://www.bco-dmo.org/dataset/3605>

Version:

Version Date: 2012-01-23

Project

» [Short-term colonization processes at Costa Rica methane seeps](#) (Seep Carbonate Ecology CROCKS II)

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Dataset Description

Atlantis/Alvin cruise off Costa Rica

The primary goal of the cruise was to recover biological experiments deployed at active and inactive seep areas during Feb./March 2009. We successfully recovered 23/24 experimental units deployed on Mound 12, Costa Rica. One was simply missing on the sea floor. By using a gear elevator each day to maximize sample collection (and reserve ALVIN basket space for experiments) we were able to recover our experiments rapidly. This left us time for exploration of unusual biological communities at Jaco Scar.

Methods & Sampling

Equipment used: standard Alvin tubecores; Ocean Instruments multicorer; Seabird CTD with O2 sensor.

Where indicated, sediment samples from tube cores were sectioned vertically and preserved in buffered formaldehyde (standard procedures) or frozen at -80°C.

Colonization substrates had macrofauna (>0.3 mm) and meiofauna (>0.42 microns) removed and preserved. Representative individuals were frozen for subsequent stable isotope analyses.

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Data Files

File
dive_ctd.csv (Comma Separated Values (.csv), 1.74 KB) MD5:4c918a057483b1cc47a7c002cf949b68
Primary data file for dataset ID 3605

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Parameters

Parameter	Description	Units
O2_bottom	bottom dissolved oxygen	milliliters per liter
depths_sample	water depths sampled	integers
cast	ctd cast number	integer
station	location of sample	text
time	GMT time	hhmm
lat	latitude; North is positive	decimal degrees
lon	longitude; East is positive	decimal degrees
depth_w	bottom depth	meters
number	number of bottles fired	integer
year	year of sampling	yyyy
month	month of sampling, GMT	1 to 12
day	day of sampling, GMT	1 to 31
yrday_gmt	GMT day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon). In the case of drifter data, year day may be continuous over a multi year period.	1 to 365
O2_surface	surface dissolved oxygen	milliliters per liter

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Instruments

Dataset-specific Instrument Name	SBE 43 Dissolved Oxygen Sensor
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

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Deployments

AT15-59

Website	https://www.bco-dmo.org/deployment/58765
Platform	R/V Atlantis
Start Date	2010-01-06
End Date	2010-01-13
Description	Costa Rica seafloor methane seeps 8 deg 55 N 84 depth 990m. Included Alvin dives 4586-4591. The primary goal of the cruise was to recover biological experiments deployed at active and inactive seep areas during Feb./March 2009. We successfully recovered 23/24 experimental units deployed on Mound 12, Costa Rica. One was simply missing on the sea floor. By using a gear elevator each day to maximize sample collection (and reserve ALVIN basket space for experiments) we were able to recover our experiments rapidly. This left us time for exploration of unusual biological communities at Jaco Scar. Cruise information and original data are available from the NSF R2R data catalog. Cruise dates changed Feb 2015 to match WHOI ship schedule and R2R.

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Project Information

Short-term colonization processes at Costa Rica methane seeps (Seep Carbonate Ecology CROCKS II)

Coverage: Costa Rica seafloor methane seeps 8 deg 55 N 84 deg 18 W depth 990m

This RAPID project will conduct 5 submersible or ROV dives to collect a series of colonization experiments deployed in March 2009 on Mound 12 off Costa Rica (997 m). These experiments were deployed opportunistically, and to optimize the information that could be obtained, the PIs needed to recover them within a 12 month time frame. Early colonization of rock, wood, shell and tube substrates will be studied. The microbes, foraminiferans and metazoans present after 6-12 mo will be compared to those colonizing similar experiments to be deployed at Hydrate Ridge, where seeps occur within an oxygen minimum zone. The overall project goal is to integrate physical, geological, chemical and biological data to develop a holistic view of the influence of seep-generated carbonate hard-ground ecosystems on margins.

The objectives of the research are to (a) Compare colonizers at seeps off Costa Rica and Hydrate Ridge to assess the importance of different oxygen regimes in the development of anaerobic methane oxidation, sulfide oxidizers and other microbial metabolisms on hard substrates, and to evaluate their roles in driving protozoan and metazoan succession at methane seeps. (b) Deploy a suite of biotic and abiotic substrates to distinguish the specific roles of carbonate substrate from those of other hard substrates (wood, clam and mussel shells, worm tubes) available. (c) Explore the similarity of vent and seep colonization processes by comparing colonization at the Costa Rica seeps, where vent species are common, to the Hydrate Ridge seeps, where they are not. (d) Determine whether there are diagnosable biogeographic isotope or other biomarker signatures from newly recruited Costa Rica microbial, foraminiferal and animal populations at active vs. inactive seeps, and whether these differ from those at Hydrate Ridge.

This research will involve international participation from Costa Rican scientists at the Univ. of Costa Rica.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0825791
NSF Division of Ocean Sciences (NSF OCE)	OCE-0826254
NSF Division of Ocean Sciences (NSF OCE)	OCE-0939559
NSF Division of Ocean Sciences (NSF OCE)	OCE-0825436
NSF Division of Ocean Sciences (NSF OCE)	OCE-0939232
NSF Division of Ocean Sciences (NSF OCE)	OCE-0939557

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