Species counts on wood, rock and biotic colonization substrates from R/V Atlantis AT15-59 in the Pacific Ocean on the Costa Rica margin from 2010-2010 (Seep Carbonate Ecology CROCKS II project)

Website: https://www.bco-dmo.org/dataset/3772
Data Type: Other Field Results
Version:
Version Date: 2012-11-07

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

Contributors	Affiliation	Role
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Dataset Description

Related References:

Case, D. H., Pasulka, A.L., Marlow J.J., Grupe, B. , Levin, L.A., Orphan, V.J. Methane seep carbonates host distinct, diverse, and dynamic microbial assemblages. Environmental Microbiology and Environmental Microbiology Reports. e01348-15 (2015).

Levin, L.A., Mendoza, G. Grupe B., Gonzalez, J. Jellison, B. Rouse, G. Thurber A. Waren A. Biodiversity on the rocks: macrofauna inhabiting authigenic carbonate at Costa Rica methane seeps. PLOS ONE 10(7): e0131080. doi:10.1371/journal.pone.0131080 (2015)

Levin, L.A., G.F. Mendoza and B.M. Grupe, Methane seepage effects on biodiversity and biological traits of macrofauna inhabiting authigenic carbonates. Deep-sea Res. II (2016) http://dx.doi.org/10.1016/j.dsr2.2015.05.021 (2016)

Marlow, J.J., Steele, J.A., Ziebis, W., Thurger A.R., Levin, L.A. and Orphan, V.J. Carbonate hosted methanotrophy: an unrecognized methane sink in the deep sea. Nature Communications 5: 5094 (2014) DOI: 10.1038/ncomms6094

Marlow, J.J., Steele, J.A., Case, D.H. Connon, S.A., Levin, L.A. and V.J. Orphan. Microbial abundance and diversity patterns associated with sediments and carbonates from the methane seep environments of Hydrate Ridge, OR. Frontiers in Marine Science, Aquatic Microbiology. Vol. 1 Article 44 doi: 10.3389/fmars.2014.00044 (2014)

Data Processing Description

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
seep_colonization.csv (Comma Separated Values (.csv), 44.46 KB) MD5:5299e5052fd8bba1f0d5296ca32516cc Primary data file for dataset ID 3772

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Parameters

Parameter	Description	Units
cruise_id	cruise identification; Atlantis	alphanumeric
region	broad area of study	text
station	station name	alphanumeric
lat	latitude; West is negative	decimal degrees
lon	longitude; North is positive	decimal degrees
taxon	taxonomic name	text
sample_size	sample size	integer
abundance_200sqcm	taxon abundance	per 200 cm^2
abund_stderr	standard error of abundance value	dimensionless
abund_pcent	percent taxon abundance of total sample	percent
activity	methane seep activity at station	

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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 oxiders 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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