Log for dives by ROV Global Explorer (Wood Fall project)

Website: https://www.bco-dmo.org/dataset/714212
Data Type: Cruise Results
Version: 1
Version Date: 2017-08-31

Project
» The energetic assembly of biological communities: a test with deep-sea woodfalls (Wood Fall)

Contributors	Affiliation	Role
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Abstract
Log for dives by ROV Global Explorer (Wood Fall project)

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Coverage

Spatial Extent: **N**:28.8133 **E**:-87.8099 **S**:27.1345 **W**:-89.927
Temporal Extent: 2017-05-26 - 2017-06-02

Dataset Description

Provides information for all dives with the remotely operated vehicle.

Data Processing Description

Changed spaces in parameter names to underscores.
Changed to ISO date YYYY-MM-DD.
Changed times to hh:mm.
Formatted decimal degrees to 5 decimal places.

All missing data denoted with nd. NA refers to a data field that is not applicable.

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Data Files

File
rov_dive_log.csv (Comma Separated Values (.csv), 2.26 KB) MD5:61a5a090b26e6767176042f848d8c2c0 Primary data file for dataset ID 714212

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Parameters

Parameter	Description	Units
rov_dive	Number and letter designation of ROV and dive number for deployment. GE refers to Oceaneering's Global Explorer.	unitless
date	Date of ROV dive in the format YYYY-MM-DD.	unitless
site	Given name for each deployment site. WF stands for wood fall. DWH refers to the Deep-Water Horizon Site with the number indicating 500m North or 2000m South.	unitless
cruise_dive_day	Number day of the cruise of the ROV dive	unitless
start_latitude	Starting bottom latitude of the ROV dive	decimal degrees
start_longitude	Starting bottom longitude of the ROV dive	decimal degrees
start_depth	Starting bottom depth of the ROV dive in meters	meters
start_dive_time	Time ROV was off the vessel’s deck	hh:mm
start_bottom_time	Time ROV landed on bottom	hh:mm
end_latitude	Ending bottom latitude of the ROV dive	decimal degrees
end_longitude	Ending bottom longitude of the ROV dive	decimal degrees
end_depth	Ending bottom depth of the ROV dive in meters	meters
end_bottom_time	Time ROV left the bottom	hh_mm

cores	Refers to sediment cores taken during dive. Groupings refers to the number of clusters the cores were taken, e.g. 2 groupings refers to cores being taken in two different clusters with several meters or more between them	unitless
core_no	Number designations of core tubes separated by commas. "|" separator denotes separate groupings.	unitless
video_transects	Video transects taken with ROV during dive	unitless
megafauna_collections	Megafauna collections made by the ROV with the suctions sampler, manipulator arm, etc.	unitless
elevator	Indicates whether a benthic elevator was used during the ROV dive	yes/no
notes	Field for indicating extra information about the ROV dive	unitless
transponder_deployed	Whether a transponder is deployed at site	yes/no
transponder_latitude	Latitude of the deployed transponder	decimal degrees
transponder_longitude	Longitude of the deployed transponder	decimal degrees
transponder_address	unique tracking link for transponders deployed at individual sites	unitless

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	ROV Global Explorer

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Deployments

PE17-22

Website	https://www.bco-dmo.org/deployment/716661
Platform	R/V Pelican
Start Date	2017-05-23
End Date	2017-06-04

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Project Information

The energetic assembly of biological communities: a test with deep-sea woodfalls (Wood Fall)

Coverage: Northern Gulf of Mexico Continental Slope

Changes in both terrestrial and marine carbon production under climate change necessitate an understanding of how ecological communities are structured by carbon availability, which has long been recognized as a predictor of biodiversity. Recent research indicates global marine phytoplankton production may have declined at a rate of ~1% of the global median per year. Regional-scale changes have been more heterogeneous; with the equatorial Pacific Ocean experiencing overall declines of over 50% the last decade and Polar Regions experiencing increases of comparable magnitude. Clearly, there is a strong need for a more complete understanding of the relationship between biodiversity and carbon availability to better predict the consequences of current and forthcoming climate change on marine ecosystems. One challenge is that determinants of available carbon in natural systems are diverse and often unidentifiable. Wood-fall communities in the deep sea are an ideal experimental system for testing many theories about carbon availability and biodiversity. First, the amount of carbon available to the community can be precisely manipulated in the form of wood mass. Second, flows of carbon from wood through the community can be easily tracked because animals supported by wood have distinct chemical signatures that can be traced with stable isotope analysis. Finally, the entire community associated with a wood fall can be sampled, allowing for accurate estimates of biodiversity, biomass, and energy flow. For these reasons, study of deep-sea wood falls provides accurate and simultaneous quantification of standing stock, diversity, and trophic structure as a function of energy availability. Through the use of ROV/submersible-deployed wood falls, the project will test how changes in carbon availability impact marine biodiversity. The results of this project will be beneficial to science in several ways. First, the project contributes significantly to climate change and biodiversity research and specifically to knowledge of the underexplored deep oceans. The project also creates abundant opportunities for public outreach. The multifaceted approach includes: employing web podcasts and blogs; sharing results through photographic exhibitions; and actively recruiting from minority-serving institutions while also providing visiting lectureships. Further, the project will recruit and train young scientists in underrepresented groups, and impact multiple audiences from primary education students, science instructors, and the general public.

The goal of this project is to identify the interactions in energetic processes that regulate community structure, using ROV/submersible-deployed wood falls. Wood will be deployed in varying sizes to control the amount of chemical energy added to the community, and of different wood densities to examine assembly rules while examining total quantity and concentration of resources. This approach will allow the investigators to examining energetic tradeoffs is that multiple impacts, hypotheses, and theories of varying carbon availability on biodiversity can be evaluated simultaneously. The amount of carbon in the community can be precisely manipulated, an improvement over prior studies. The impact of the rate of carbon uptake on ecological processes will also be examined here, but has been rarely evaluated. This research will also reveal much about wood-fall biomes in the deep sea, one of the least studied systems in the ocean. For example, the project will reveal the relative importance different carbon pathways in exporting wood energy and controlling biodiversity.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1634586

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