

Sediment cores (Wood Fall project)

Website: <https://www.bco-dmo.org/dataset/714506>

Data Type: Cruise Results

Version: 1

Version Date: 2017-09-08

Project

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

Contributors	Affiliation	Role
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Abstract

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Coverage

Spatial Extent: N:28.8133 E:-87.8099 S:27.1245 W:-89.927

Temporal Extent: 2017-05-26 - 2017-06-02

Dataset Description

Dataset provides information for macrofaunal cores taken with a remotely operated vehicle on the Northern Gulf of Mexico Continental Slope.

Methods & Sampling

See description of ROV coring method in the related publications.

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
sediment_cores.csv (Comma Separated Values (.csv), 7.61 KB) MD5:295a3fa5555ac318475466833ac784a6 Primary data file for dataset ID 714506

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Related Publications

McClain, C. R., & Barry, J. P. (2010). Habitat heterogeneity, disturbance, and productivity work in concert to regulate biodiversity in deep submarine canyons. *Ecology*, 91(4), 964–976. doi:[10.1890/09-0087.1](https://doi.org/10.1890/09-0087.1)
Related Research

McClain, C., Nekola, J., Kuhnz, L., & Barry, J. (2011). Local-scale faunal turnover on the deep Pacific seafloor. *Marine Ecology Progress Series*, 422, 193–200. doi:[10.3354/meps08924](https://doi.org/10.3354/meps08924)
Related Research

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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. NA designates no ROV used.	dimensionless
site	Number and letter designation of ROV and dive number for deployment. GE refers to Oceaneering's Global Explorer. NA designates no ROV used.	dimensionless
depth	Depth of coring site in meters	meters
core_no	Number designation of core tube	dimensionless
date	Date of core collection in the format YYYY-MM-DD	unitless
sorter	Sorter is the person who sorted macrofaunal from core sample. Gholson is Sara Gholson an undergraduate REU student in the summer of 2017. Landry is Chase Landry undergraduate researcher from Nicholls/Fletcher.	dimensionless
date_sorted	Date when macrofaunal sorting was finished from the core. in the format YYYY-MM-DD.	unitless
core_type	Core type used from the ROV. Okeanos cores were rented from Okeanos Science and Technology in Houma, LA and were 9.575 cm in diameter.	dimensionless
core_id	Combination identifier of rov dive and core number. Used to link to other sheets.	dimensionless
group_number	Designates which clusters the cores were taken in	dimensionless
experiment	Type of experiment the cores were taken for. wf background is for wood-fall deployment background macrofaunal analysis. patch mosaic is for analyzing fine-scale turnover in composition. DWH impacts refers to cores taken around the Deep-Water Horizon well head and rig site.	dimensionless

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Instruments

Dataset-specific Instrument Name	McClain benthic elevator
Generic Instrument Name	Benthic elevator
Dataset-specific Description	Elevator used was a aluminum work basket suspended from the vessel's winch. The elevator was special build for PI McClain by Theriot Machine Works (Chauvin, LA). The basket is rectangular in shape with an A-frame frame pick point and 2 independent doors on either side of A-frame. Total length is 1.96 meters, width of basket is 1.33 meters and height of basket enclosure is 0.96 meters. Maximum height at pick point is 1.85 meters. The basket lids on either side of the a-frame swivel on dual hinges and open fully to touch the a-frame where they are held in place by attached magnetic strips. Each lid has a width of 1.25 meters and a depth of 0.765 meters.
Generic Instrument Description	A platform used to carry equipment and samples from the surface to the seafloor and back up again.

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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