

# Woodfalls (Wood Fall project)

**Website:** <https://www.bco-dmo.org/dataset/714880>

**Data Type:** Cruise Results

**Version:** 1

**Version Date:** 2017-09-15

## Project

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

Contributors	Affiliation	Role
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## Abstract

Information for individual wood falls including size and deployment information.

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## Coverage

**Spatial Extent:** N:28.8133 E:-87.8099 S:27.1345 W:-89.927

**Temporal Extent:** 2017-05-27 - 2017-07-13

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## Dataset Description

Datasheet provides information for individual wood falls including size and deployment information.

## Acquisition Description

See general descriptions of wood fall tagging, wrapping, and methodology in the related publications:

## 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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## Related Publications

McClain, C. R., Barry, J. P., Eernisse, D., Horton, T., Judge, J., Kakui, K., ... Warén, A. (2015). Multiple Processes Generate Productivity-Diversity Relationships in Experimental Wood-Fall Communities. *Ecology*. doi:[10.1890/15-1669.1](https://doi.org/10.1890/15-1669.1)

McClain, C., & Barry, J. (2014). Beta-diversity on deep-sea wood falls reflects gradients in energy availability. *Biology Letters*, 10(4), 20140129–20140129. doi:[10.1098/rsbl.2014.0129](https://doi.org/10.1098/rsbl.2014.0129)

Webb, T. J., Barry, J. P., & McClain, C. R. (2017). Abundance-occupancy relationships in deep sea wood fall communities. *Ecography*, 40(11), 1339–1347. doi:[10.1111/ecog.02618](https://doi.org/10.1111/ecog.02618)

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## Parameters

Parameter	Description	Units
tag_number	Number identifier on the plastic tag on each wood fall	value
tag_color	Color of plastic tag on each wood fall	green, white, orange, yellow, blue

experiment	Type of experiment the wood fall was deployed for. Site 1-Site 4 refer to the experiments testing 12 woodfalls each of Pinus elliotti and Celtis laevigata varying from small to large total weights.aor refers to experiments testing abundance occupancy relationships (two deployments of 12 small and 12 large wood falls).wood_type refers to an experiment testing 11 species of wood species on community composition with each species represented by four wood fall sizes.net_nonet refers to an experiment testing the effects of the mesh wrap and lack of mesh wrap on the wood falls.surf_area deploys woodfalls with wood-fall weight controlled but of varying surface area.shallow is used to designate any wood fall deployed 50m and shallower.	unitless
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.	unitless
site	Given name for each deployment site. WF stands for wood fall.	unitless
deployment_date	Deployment date	YYYY-MM-DD
latitude	Deployment site	decimal degrees
longitude	Deployment site	decimal degrees
depth	Deployment site in meters.	meters
deployment_row	Arrangement of wood fall deployments at site. Individual wood falls are deployed 3-4 meters apart.	value
deployment_column	Arrangement of wood fall deployments at site. Individual wood falls are deployed 3-4 meters apart.	value
wood_type	Wood species of each wood fall.	species
length	Length of wood fall in centimeters.	centimeters
max_diameter	Of the two cut ends, the diameter measurement of the largest in centimeters.	centimeters

min_diameter	Of the two cut ends, the diameter measurement of the smallest in centimeters.	centimeters
wood_mass_final	Final deployed weight of the wood fall. Does not include mesh, zip ties, tags, or rope handles. In kilograms.	kilograms
notes	Denotes either wood fall categorical size for wood type experiment or aor. Indicates absence or presence of mesh for net_nonet. Indicates 2x12 inch plank or 6x6 inch post for surf_area.	unitless
weight_wood_zip	Weight of wood fall with zip tie bands. In kilograms. Precision to 0.01 kg.	kilograms
weight_packet_total_1	Weight of wood fall with zip tie bands plus mesh covering, additional zip ties, rope handle, and tags. In kilograms. Precision to 0.01 kg.	kilograms
weight_wood_only	Weight of wood fall only with subtracted bands, mesh, zip ties, rope handle, and tags. In kilograms. Precision to 0.01 kg.	kilograms
weight_wrap_only	Weight of bands, mesh, zip ties, rope handle, and tags without wood. In kilograms. Precision to 0.01 kg.	kilograms
weight_zip	Total weight of zip ties only calculated from standard set of weighed zip ties of zip tie length. In kilograms. Precision to 0.001 kg.	kilograms
zip_tie_length	Length category of zip tie bands used on wood falls. Two zip tie bands per wood fall. A list of two numbers for a wood fall designates to different sized zip tie bands. Zip Tie Code Length (inches) Mass (kg) 1 60 0.0255 2 48 0.0214 3 41 0.0192 4 18 0.0077 5 15.5 0.0059 9 29.5 0.0100	unitless
weight_packet_total_2	Weight of wood fall with zip tie bands plus mesh covering, additional zip ties, rope handle, and tags. In kilograms. Weight taken on 5/14/17. Precision to 0.01 kg.	kilograms

## Instruments

<b>Dataset-specific Instrument Name</b>	ROV Global Explorer
<b>Generic Instrument Name</b>	ROV Global Explorer
<b>Dataset-specific Description</b>	<p>"Global Explorer offers a complete suite of scientific tools for midwater and benthic sampling, including: detritus sampler, rotary suction sampler, jet pump, push cores/quivers, and an insulated bio box. The Schilling ORION sevenfunction spatially correspondent manipulator arm extracts fragile coral and artifacts with delicate precision." "Global Explorer delivers unmatched live video imagery and stunning digital stills through a Gigabit Ethernet connection. Optional live satellite broadcast is available for collaboration and remarkable outreach." "Global Explorer's nimble platform allows for fast, cost-effective transport and mobilization for asset recovery. Mobilization times have been trimmed to two days for mobilization and one day for demobilization. The vehicle deployable from economical vessels as small as 100 ft."</p> <p><a href="http://www.oceaneering.com/datasheets/ROV-Global-Explorer-ROV.pdf">http://www.oceaneering.com/datasheets/ROV-Global-Explorer-ROV.pdf</a></p>

<b>Dataset-specific Instrument Name</b>	McClain benthic elevator
<b>Generic Instrument Name</b>	Benthic elevator
<b>Dataset-specific Description</b>	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.
<b>Generic Instrument Description</b>	A platform used to carry equipment and sampled from the surface to the seafloor and back up again.

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## Deployments

### PE17\_22

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/716661">https://www.bco-dmo.org/deployment/716661</a>
<b>Platform</b>	R/V Pelican
<b>Start Date</b>	2017-05-23
<b>End Date</b>	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
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1634586</a>

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