Mussel bed vertical change information from laser scans conducted from 2010 to 2012 in Back Sound, North Carolina (EstuarineMetaDyn project)

Website: https://www.bco-dmo.org/dataset/688088
Data Type: Other Field Results
Version:
Version Date: 2016-10-20

Project

» Interacting Effects of Local Demography and Larval Connectivity on Estuarine Metapopulation Dynamics (EstuarineMetaDyn)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:34.69365 **E**:-76.61209 **S**:34.68847 **W**:-76.62112

Dataset Description

This dataset contains elevation, exposure percentage, average vertical change (m), and average vertical change rate from laser scans conducted from 2010 to 2012 in Back Sound, North Carolina.

Other Back Sound datasets in this project:
Oyster density and length
Water level
Reef elevation, exposure, and vertical change
Laser scan, density, and GPS grid sampling information

These data are published in:

Ridge, J. T., Rodriguez, A. B., Fodrie, F. J., Lindquist, N. L., Brodeur, M. C., Coleman, S. E., ... & Theuerkauf, E. J. (2015). Maximizing oyster-reef growth supports green infrastructure with accelerating sea-level rise. Scientific reports, 5. doi: 10.1038/srep14785

Methods & Sampling

A terrestrial laser scanner was used to measure variation in vertical growth across entire reefs constructed in 1997 and 2000, over a two-year time step (measured between 2010 and 2012).

More information available in:

Ridge, J. T., Rodriguez, A. B., Fodrie, F. J., Lindquist, N. L., Brodeur, M. C., Coleman, S. E., ... & Theuerkauf, E. J. (2015). Maximizing oyster-reef growth supports green infrastructure with accelerating sea-level rise. Scientific reports, 5. doi: 10.1038/srep14785

Data Processing Description

BCO-DMO Data Manager Processing Notes:
* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions
* blank values replaced with no data value 'nd'
* Lat/Lon for Back Sound, NJ added to dataset

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Data Files

File
laser_scans.csv(Comma Separated Values (.csv), 12.69 KB) MD5:313da868a9397c69ed51cc20c7c6681e Primary data file for dataset ID 688088

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Parameters

Parameter	Description	Units
location	Sampling location name	unitless
location_lat	Approximate sampling location latitude	decimal degrees
location_lon	Approximate sampling location	decimal degrees
elevation	Elevations for initial scans for each reef broken into 2-cm bins and labeled by midpoint; all in reference to NAVD88	centimeters
exposure	Exposure percentage; The cumulative percent of time that each elevation bin is exposed to air	percent
MF1_1997_avg_change	Average vertical change in meters for each elevation 2 cm bin at site MF1-1997	meters
MF1_1997_avg_change_sd	Standard deviation of the average vertical change in meters for each elevation bin at site MF1-1997	meters
MF1_1997_avg_rate	Average vertical change rate at each elevation bin in millimeters divided by the timestep (years) at site MF1-1997	millimeters per year
MF1_1997_avg_rate_sd	Standard deviation of the average vertical change rate at site MF1-1997	millimeters per year
MF1_2000_avg_change	Average vertical change in meters for each elevation 2 cm bin at site MF1-2000	meters

MF1_2000_avg_change_sd	Standard deviation of the average vertical change in meters for each elevation bin at site MF1-2000	meters
MF1_2000_avg_rate	Average vertical change rate at each elevation bin in millimeters divided by the timestep (years) at site MF1-2000	millimeters per year
MF1_2000_avg_rate_sd	Standard deviation of the average vertical change rate at site MF1-2000	millimeters per year
MF2_1997_avg_change	Average vertical change in meters for each elevation 2 cm bin at site MF2-1997	meters
MF2_1997_avg_change_sd	Standard deviation of the average vertical change in meters for each elevation bin at site MF2-1997	meters
MF2_1997_avg_rate	Average vertical change rate at each elevation bin in millimeters divided by the timestep (years) at site MF2-1997	millimeters per year
MF2_1997_avg_rate_sd	Standard deviation of the average vertical change rate at site MF2-1997	millimeters per year
MF2_2000_avg_change	Average vertical change in meters for each elevation 2 cm bin at site MF2-2000	meters
MF2_2000_avg_change_sd	Standard deviation of the average vertical change in meters for each elevation bin at site MF2-2000	meters
MF2_2000_avg_rate	Average vertical change rate at each elevation bin in millimeters divided by the timestep (years) at site MF2-2000	millimeters per year
MF2_2000_avg_rate_sd	Standard deviation of the average vertical change rate at site MF2-2000	millimeters per year
MF3_1997_avg_change	Average vertical change in meters for each elevation 2 cm bin at site MF3-1997	meters
MF3_1997_avg_change_sd	Standard deviation of the average vertical change in meters for each elevation bin at site MF3-1997	meters
MF3_1997_avg_rate	Average vertical change rate at each elevation bin in millimeters divided by the timestep (years) at site MF3-1997	millimeters per year
MF3_1997_avg_rate_sd	Standard deviation of the average vertical change rate at site MF3-1997	millimeters per year
MF4_2000_avg_change	Average vertical change in meters for each elevation 2 cm bin at site MF4-2000	meters
MF4_2000_avg_change_sd	Standard deviation of the average vertical change in meters for each elevation bin at site MF4-2000	meters
MF4_2000_avg_rate	Average vertical change rate at each elevation bin in millimeters divided by the timestep (years) at site MF4-2000	millimeters per year
MF4_2000_avg_rate_sd	Standard deviation of the average vertical change rate at site MF4-2000	millimeters per year
mean_rate	The overall mean rate of vertical change for each elevation bins across all reefs laser scanned	millimeters per year
mean_avg_change_sd	The overall standard deviation of vertical change rate across all reefs laser scanned	meters

Instruments

Dataset-specific Instrument Name	A terrestrial laser scanner
Generic Instrument Name	terrestrial laser scanner
Generic Instrument Description	Terrestrial laser scanner

Deployments

Fodrie_EstuarineMetaDyn

Website	https://www.bco-dmo.org/deployment/688049
Platform	Back_Sound_NC
Description	Sampling between 2010 and 2015.

Project Information

Interacting Effects of Local Demography and Larval Connectivity on Estuarine Metapopulation Dynamics (EstuarineMetaDyn)

Coverage: North Carolina Estuaries

Description from NSF award abstract:
The PIs will use the eastern oyster (*Crassostrea virginica*) in Pamlico Sound, North Carolina, as a model system and will attempt to optimize the design of networks of no-take reserves as a strategy for maintaining metapopulations of this commercially harvested species. The project specifically recognizes that network persistence depends on (1) the potential for growth, survival, and reproduction within reserves, and (2) the potential to distribute offspring among reserves. Thus, demographic processes within reserves and settling areas play important roles, along with variability of physical transport. The PIs plan to:
(1) test and refine 3D bio-physical models of connectivity due to oyster larval transport in a shallow, wind-dominated system;
(2) test, refine, and apply technology to detect natal origins of larvae using geochemical tags in larval shell; and
(3) integrate regional connectivity and demographic rates to model metapopulation dynamics.

This study will produce new tools and test and refine others used for studying larval connectivity, a fundamentally important process in the maintenance of natural populations, and thus in biological conservation and resource management. The tools include a hydrodynamic modeling tool coupled with an open-source particle tracking model that will be available on-line with computer code and user guide. The project will use integrated modeling approaches to evaluate the design of reserve networks: results will be directly useful to improving oyster and ecosystem-based management in Pamlico Sound, and the methods will inform approaches to network design in other locations.

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1155628