

# Reef elevation, exposure, and vertical change from GPS grids of Back Sound, North Carolina from 2011 to 2014 (EstuarineMetaDyn project)

**Website:** <https://www.bco-dmo.org/dataset/688080>

**Data Type:** Other Field Results

**Version:**

**Version Date:** 2017-04-20

## Project

» [Interacting Effects of Local Demography and Larval Connectivity on Estuarine Metapopulation Dynamics](#)

(EstuarineMetaDyn)

Contributors	Affiliation	Role
<a href="#">Fodrie, F. Joel</a>	University of North Carolina at Chapel Hill (UNC-Chapel Hill-IMS)	Principal Investigator, Contact
<a href="#">York, Amber D.</a>	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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## Coverage

**Spatial Extent:** N:34.69881 E:-76.61168 S:34.68238 W:-76.62192

## Dataset Description

This dataset includes reef elevation, exposure percentage and average vertical change for reef sites in Back Sound, North Carolina between 2011 to 2014.

Other Back Sound datasets in this project:

[Oyster density and length](#)

[Laser scans](#)

[Water level](#)

[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](https://doi.org/10.1038/srep14785)

## Methods & Sampling

Average vertical reef growth was measured using a Trimble 5800 GPS receiver (+-1.5 cm vertical).

## 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'

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## Data Files

File
<b>GPS_Grids.csv</b> (Comma Separated Values (.csv), 825 bytes) MD5:d936e76453a2d124a7a66b74fa39caaa Primary data file for dataset ID 688080

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## Parameters

Parameter	Description	Units
reef	Site name; the name of the reef	unitless
elevation	Elevation above which 10% of the reef resides at the initial time step; site sea surface elevation in reference to NAVD88	meters
exposure_percent	Percent aerial exposure at the top 10% of the reef at the initial time step	percent
avg_vertical_change	Average vertical change at each elevation bin in millimeters divided by the timestep (years) for a specific reef	millimeters per year (mm/yr)
lat	Site latitude	decimal degrees
lon	Site longitude	decimal degrees

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## Instruments

<b>Dataset-specific Instrument Name</b>	Trimble 5800 GPS receiver
<b>Generic Instrument Name</b>	GPS receiver
<b>Dataset-specific Description</b>	Trimble 5800 GPS receiver (+-1.5 cm vertical)
<b>Generic Instrument Description</b>	Acquires satellite signals and tracks your location. This term has been deprecated. Use instead: <a href="https://www.bco-dmo.org/instrument/560">https://www.bco-dmo.org/instrument/560</a>

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## Deployments

### Fodrie\_EstuarineMetaDyn

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/688049">https://www.bco-dmo.org/deployment/688049</a>
<b>Platform</b>	Back_Sound_NC
<b>Description</b>	Sampling between 2010 and 2015.

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## 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.

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## Funding

<b>Funding Source</b>	<b>Award</b>
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1155628</a>

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