# Counts of fish and crustaceans collected at living shoreline, natural marsh, and bulkhead sites in North Carolina from 2010 to 2012 (EstuarineMetaDyn project)

**Website**: https://www.bco-dmo.org/dataset/678377
**Data Type**: Other Field Results
**Version**:
**Version Date**: 2016-10-21

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

| Contributors | Affiliation | Role |
|---|---|---|
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## Table of Contents

## Dataset Description

This dataset contains individual counts of fish and crustaceans collected at living shoreline sites (including sills covered in oysters), natural marsh, and bulkhead sites.

These data were published in:

Gittman R.K., Peterson C.H., Currin C.A., Fodrie F.J., Piehler M.F., and Bruno J.F. 2016. Living shorelines can enhance the nursery role of threatened coastal habitats. Ecological Applications 26(1): 249-263. DOI: 10.1890/14-0716

**Methods & Sampling**

The marsh area sampled included the marsh interior, marsh edge, and unvegetated mudflat within 3 m of the marsh edge at paired sill and control marsh sites.  Nekton from the below sampling methods were speciated where possible and counted.  This dataset reports the individual counts for two categories of organisms, fish and crabs.

**Fyke nets:**
Two fyke nets were set simultaneously at each site during a night spring high tide and recovering gear during the subsequent low tide (~6 h sets). Fyke nets were placed at the sill drop-downs or gaps at the sill sites and haphazardly along the edge of control marsh sites. Fyke net openings were set at approximately the same distance from the marsh edge (3–5 m, depending on sill location relative to the marsh edge) at each paired site. The fyke nets consisted of a 0.9 ×  0.9 × 5.1 m compartmentalized, 3.175 mm mesh bag with 0.9 × 5.1 m wings that stretched out from the bag (set for a total mouth width of 8 m).

**Seine nets:**
Two seines at each site were conducted during afternoon spring low tides parallel to the shoreline for 20 m (~5 m from the sill or marsh edge). Seines were 7.3 m wide by 1.8 m tall, made from 3.175 mm mesh, and included a 1.8 × 1.8 × 1.2 m bag.

**Minnow traps:**
Minnow traps (3.175- mm- galvanized mesh) were set at the edge of each shoreline type 2 h before high tide and collecting the traps 2 h after high tide.

For full details of data collection, see reference:

Gittman R.K., Peterson C.H., Currin C.A., Fodrie F.J., Piehler M.F., and Bruno J.F. 2016. Living shorelines can enhance the nursery role of threatened coastal habitats. Ecological Applications 26(1): 249-263. DOI: 10.1890/14-0716

[ table of contents | back to top ]

## Data Files

| File |
| --- |
| **EcoAppsCounts.csv**(Comma Separated Values (.csv), 13.80 KB)<br>MD5:33842145a636196ce7dcddefef129259 |
| Primary data file for dataset ID 678377 |

[ table of contents | back to top ]

## Parameters

| Parameter | Description | Units |
| --- | --- | --- |
| organism | sample organism (fish/crustacean) | unitless |
| lat_approx | Approximate latitude of study site | decimal degrees |
| lon_approx | Approximate longitude of study site | decimal degrees |
| net_type | Type of sampling device used (Fyke/Seine/Trap) | unitless |
| site_type | Site code (CI=control-impact or SBHC=) | unitless |
| site | Site identifier | unitless |
| count | Number of nekton caught | individuals |
| treatment | Treatment (sill/control/bulkhead) | unitless |
| month | Month of sampling | unitless |

## Instruments

| Dataset-specific Instrument Name | |
|---|---|
| Generic Instrument Name | fyke net |
| Generic Instrument Description | shore fishing gear |

| Dataset-specific Instrument Name | |
|---|---|
| Generic Instrument Name | minnow trap |
| Generic Instrument Description | shore fishing gear |

| Dataset-specific Instrument Name | seine net |
|---|---|
| Generic Instrument Name | Purse-seine Fishing Gear |
| Generic Instrument Description | A purse seine is a large wall of netting deployed in a circle around an entire school of fish. The seine has floats along the top line with a lead line of chain along the bottom. Once a school of fish is located, a skiff pulls the seine into the water as the vessel encircles the school with the net. A cable running along the bottom is then pulled in, "pursing" the net closed on the bottom, preventing fish from escaping by swimming downward. The catch is harvested by bringing the net alongside the vessel and brailing the fish aboard. |

## Deployments

**Fodrie_Ecoapps**

| Website | https://www.bco-dmo.org/deployment/679300 |
|---|---|
| Platform | PineKnollShore_NC |
| Description | fish and crustacean sampling |

## 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 |