# Blue mussel (Mytilus edulis) sample station locations in coastal eastern Maine (MuLTI-2 project)

**Website**: https://www.bco-dmo.org/dataset/658755
**Data Type**: Other Field Results
**Version**:
**Version Date**: 2016-09-16

**Project**
» An integrated theoretical and empirical approach to across-shelf mixing and connectivity of mussel populations (MuLTI-2)

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## Coverage

**Spatial Extent**: **N**:44.825311 **E**:-66.986325 **S**:44.4644175 **W**:-68.3045225
**Temporal Extent**: 2014-04-24

## Dataset Description

This dataset contains station coordinates, station codes, and station locations for each mussel survey station.

**Datasets that use these stations:**

- Gonad Index (GI)
- Gonad Index Sampling Information
- Size Frequency
- Size Frequency Sampling Information
- Density
- Settlement
- Settlement Sampling Information

### 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

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## Parameters

| Parameter | Description | Units |
|---|---|---|
| station_code | station identifier | unitless |
| location_major | descriptive name of broad sampling area | unitless |
| location_minor | descriptive name of specific sampling area | unitless |
| lat | latitude | decimal degrees |
| lon | longitude; west is negative | decimal degrees |

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## Deployments

**MuLTI-2_Mussel_Sampling**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/658775 |
| **Platform** | Maine_Coast |
| **Start Date** | 2014-04-24 |
| **Description** | These locations were sampled using The Uglement, an automobile. Mussel Gonad Index (GI), size frequency, settlement, and density were surveyed. |

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## Project Information

**An integrated theoretical and empirical approach to across-shelf mixing and connectivity of mussel populations (MuLTI-2)**

**Coverage**: Gulf of Maine: Frenchmen Bay (44 28.239 N -68 15.927 W) to Machais Bay (44 39.350 N -67 21.320 W)

Acronym "MuLTI-2" (Mussel Larval Transport Initiative-2)

Extracted from the NSF award abstract:

Existing larval transport models focus mainly on along-shelf transport and have done little to explicitly incorporate the effects of cross-shelf mixing and transport processes. Yet cross-shelf transits (both outgoing and incoming legs) are critical components of the dispersal paths of coastal invertebrates. This project will explore the role of cross-shelf mixing in the connectivity of blue mussel populations in eastern Maine. Previous work has shown that the Eastern Maine Coastal Current (EMCC) begins to diverge from shore southwest of the Grand Manan Channel and creates a gradient in cross-shelf mixing and larval transport, with cross-shelf mixing being more common on the northeastern end, episodic in the transitional middle area, and then becoming rare in the southwestern half of the region of the Gulf of Maine. As a result, the investigators predict that northeastern populations of mussels are seeded mostly from up-stream sources, while a significant component of self-seeding (local retention) exists in southwestern populations. Larvae settling in the

intervening bays are expected to be derived from a mixture of local and up-stream sources. Using a combined empirical and theoretical approach hydrographic, current profile, and larval vertical migration data will be collected and used to develop and validate a high-resolution coastal circulation model coupled to a model of larval behavior. The investigators will model simulations in different years using the empirical data from mussel reproductive output and spawning times. Connectivity predicted from this model will be then tested against independent empirical estimates of connectivity based on trace element fingerprinting for larvae which can be connected to specific natal habitats. Regions of agreement and discrepancy in the model will be identified to guide additional data collection and model refinement. This iterative process will ensure an understanding of both larval transport patterns and processes, and provide estimates of inter-annual variability in connectivity for blue mussel populations in the Gulf of Maine.

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## Funding


| Funding Source | Award |
|---|---|
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1333755 |


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