

CTD station locations for 2010 and 2011 R/V Llyr cruises, Downeast Maine (44.1N 68.1W 44.9N. 66.9W), Saco Bay, Maine (43.45N 70.33W, 43.47N 70.28W) (MuLTI project)

Website: <https://www.bco-dmo.org/dataset/3419>

Data Type: Cruise Results

Version: 1

Version Date: 2011-02-08

Project

» [Does larval transport or physiological tolerance set the southern range boundary of a northern blue mussel?](#)
(MuLTI)

Contributors	Affiliation	Role
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Abstract

CTD station locations for 2010 and 2011 R/V Llyr cruises, Downeast Maine (44.1N 68.1W 44.9N. 66.9W), Saco Bay, Maine (43.45N 70.33W, 43.47N 70.28W).

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Coverage

Spatial Extent: N:44.98148 E:-66.92126 S:43.45326 W:-70.33037

Temporal Extent: 2010-06-06 - 2011-08-30

Dataset Description

CTD Station Locations for Multiple Years

Deployment, Dataset Id, Station Id, Date, Time, Lat, Lon and Description of CTD Stations

Methods & Sampling

Generated from dataset metadata forms submitted by Charles Tilburg

Data Processing Description

Generated from dataset metadata forms submitted by Charles Tilburg

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Data Files

File
CTD_STATIONS.csv (Comma Separated Values (.csv), 45.37 KB) MD5:902c9140964a06e855e6b9dd2eca408e Primary data file for dataset ID 3419

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Parameters

Parameter	Description	Units
deployment	Deployment Id	text
dataset_name	Dataset Name	text
sta_id	Station Id	text
location	General Station Location	text
date	date (GMT) in the format yyyyymmdd	unitless
time	time(GMT)	hhmmss
lon	longitude (West is negative)	decimal degrees
lat	latitude (South is negative)	decimal degrees
dataset_description	General Description of Dataset	text
Year	Year of data collection in the format YYYY	unitless

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Instruments

Dataset-specific Instrument Name	CTD Sea-Bird SEACAT 19
Generic Instrument Name	CTD Sea-Bird SEACAT 19
Dataset-specific Description	HardwareData DeviceType='SBE19plus' SerialNumber='01906084' Manufacturer Sea-Bird Electronics, Inc. FirmwareVersion 2.0c FirmwareDate 20 February 2008 14:10 PCBAssembly PCBSerialNum='not assigned' AssemblyNum='41054F' PCBAssembly PCBSerialNum='not assigned' AssemblyNum='41580A' PCBAssembly PCBSerialNum='not assigned' AssemblyNum='41056F' PCBAssembly PCBSerialNum='not assigned' AssemblyNum='41059D' MfgDate 11 JUN 2008
Generic Instrument Description	The Sea-Bird SBE 19 SEACAT Recorder measures conductivity, temperature, and pressure (depth). The SEACAT is self-powered and self-contained and can be deployed in profiling or moored mode. The SBE 19 SEACAT was replaced in 2001 by the 19plus. more information from Sea-Bird Electronics

Deployments

MuLTI_2010

Website	https://www.bco-dmo.org/deployment/58644																																				
Platform	R/V Llyr																																				
Start Date	2010-06-06																																				
End Date	2010-08-26																																				
Description	<p>A series of stations were re-visited on 11 separate occasions during the 2010 sampling season. The stations were generally located in: Downeast Maine, 44.1°N, 68.1°W - 44.9°N. 66.9°W and Saco Bay, Maine, 43.45°N, 70.33°W - 43.47°N. 70.28°W</p> <table border="1"> <thead> <tr> <th>Deployment Location</th> <th>Start Date</th> <th>End Date</th> </tr> </thead> <tbody> <tr> <td>Downeast Maine</td> <td>2010/06/06</td> <td>2010/06/06</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2010/06/15</td> <td>2010/06/15</td> </tr> <tr> <td>Downeast Maine</td> <td>2010/06/22</td> <td>2010/06/23</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2010/06/25</td> <td>2010/06/25</td> </tr> <tr> <td>Downeast Maine</td> <td>2010/07/07</td> <td>2010/07/09</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2010/07/12</td> <td>2010/07/12</td> </tr> <tr> <td>Downeast Maine</td> <td>2010/07/20</td> <td>2010/07/20</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2010/07/27</td> <td>2010/07/27</td> </tr> <tr> <td>Downeast Maine</td> <td>2010/08/03</td> <td>2010/08/06</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2010/08/19</td> <td>2010/08/19</td> </tr> <tr> <td>Downeast Maine</td> <td>2010/08/24</td> <td>2010/08/26</td> </tr> </tbody> </table>	Deployment Location	Start Date	End Date	Downeast Maine	2010/06/06	2010/06/06	Saco Bay Maine	2010/06/15	2010/06/15	Downeast Maine	2010/06/22	2010/06/23	Saco Bay Maine	2010/06/25	2010/06/25	Downeast Maine	2010/07/07	2010/07/09	Saco Bay Maine	2010/07/12	2010/07/12	Downeast Maine	2010/07/20	2010/07/20	Saco Bay Maine	2010/07/27	2010/07/27	Downeast Maine	2010/08/03	2010/08/06	Saco Bay Maine	2010/08/19	2010/08/19	Downeast Maine	2010/08/24	2010/08/26
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MuLTI_2011

Website	https://www.bco-dmo.org/deployment/58749																																																
Platform	R/V Llyr																																																
Start Date	2011-05-17																																																
End Date	2011-08-30																																																
Description	<p>A series of stations were re-visited on 15 separate occasions during the 2011 sampling season. The stations were generally located in: Downeast Maine, 44.1°N, 68.1°W - 44.9°N. 66.9°W and Saco Bay, Maine, 43.45°N, 70.33°W - 43.47°N. 70.28°W</p> <p>The individual deployments were:</p> <table border="1"> <thead> <tr> <th>Deployment Location</th> <th>Start Date</th> <th>End Date</th> </tr> </thead> <tbody> <tr> <td>Downeast Maine</td> <td>2011/05/17</td> <td>2011/05/19</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/06/01</td> <td>2011/06/01</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/06/08</td> <td>2011/06/08</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/06/14</td> <td>2011/06/16</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/06/22</td> <td>2011/06/22</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/06/28</td> <td>2011/06/30</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/07/01</td> <td>2011/07/01</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/07/12</td> <td>2011/07/12</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/07/15</td> <td>2011/07/15</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/07/26</td> <td>2011/07/28</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/08/03</td> <td>2011/08/03</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/08/09</td> <td>2011/08/11</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/08/12</td> <td>2011/08/12</td> </tr> <tr> <td>Downeast Maine</td> <td>2011/08/23</td> <td>2011/08/23</td> </tr> <tr> <td>Saco Bay Maine</td> <td>2011/08/30</td> <td>2011/08/30</td> </tr> </tbody> </table>	Deployment Location	Start Date	End Date	Downeast Maine	2011/05/17	2011/05/19	Downeast Maine	2011/06/01	2011/06/01	Saco Bay Maine	2011/06/08	2011/06/08	Downeast Maine	2011/06/14	2011/06/16	Saco Bay Maine	2011/06/22	2011/06/22	Downeast Maine	2011/06/28	2011/06/30	Saco Bay Maine	2011/07/01	2011/07/01	Downeast Maine	2011/07/12	2011/07/12	Saco Bay Maine	2011/07/15	2011/07/15	Downeast Maine	2011/07/26	2011/07/28	Saco Bay Maine	2011/08/03	2011/08/03	Downeast Maine	2011/08/09	2011/08/11	Saco Bay Maine	2011/08/12	2011/08/12	Downeast Maine	2011/08/23	2011/08/23	Saco Bay Maine	2011/08/30	2011/08/30
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Project Information

Does larval transport or physiological tolerance set the southern range boundary of a northern blue mussel? (MuLTI)

Coverage: Downeast Maine, 44.1°N, 68.1°W - 44.9°N. 66.9°W and Saco Bay, Maine, 43.45°N, 70.33°W - 43.47°N. 70.28°W

Collaborative Research: Does larval transport or physiological tolerance set the southern range boundary of a northern blue mussel?

Acronym "MuLTI" (Mussel Larval Transport Initiative)

This project will test whether the southern range boundary of a northern blue mussel, *Mytilus trossulus*, is determined by limitations on the dispersal of larvae, or the physiological tolerance of larvae and/or juveniles. *Mytilus trossulus* and its sister species, *M. edulis*, co-occur throughout the Canadian maritime provinces and the northern Gulf of Maine. While the abundance of *M. trossulus* decreases abruptly south of the Canadian border, *M. edulis* ranges south to North Carolina. Work to date has demonstrated that:

- 1) Adult *M. trossulus* in northeastern Maine inhabit coastal sites, islands, and man-made structures that are within the colder water of the Eastern Maine Coastal Current (EMCC).
- 2) Drifters released in the EMCC rarely enter nearshore waters to the south, suggesting that across-shelf transport is extremely limited.
- 3) Larvae of the two species may differ slightly in thermal tolerance, and some evidence suggests that tolerance may also be affected by nutritional status.
- 4) *Mytilus trossulus* juveniles transplanted within the northeastern Maine region, but outside of the EMCC, have high survivorship, while transplants further to the southwest suffer high mortality.

In combination, these results suggest that larval transport sets the proximate range boundary within northeastern Maine (on a scale of 10 km), but thermal tolerance would ultimately limit the distribution on a larger spatial scale (200 km).

We will test this pair of hypotheses via a combination of field and lab experiments. Satellite drifters equipped with temperature loggers deployed in and out of the EMCC during the season of *M. trossulus* larval dispersal (mid-June to mid-August) will be used to quantify the physical flow fields and temperature regimes during larval dispersal. Drogues will allow us to assess whether larvae at different depths may experience different flow fields. Data from hydrographic surveys, combined with regular spatial and temporal sampling of mussel larvae and new settlers, will be used to assess possible associations between larval and post-settlement stages and different water masses. The physiological tolerance of new settlers will be assayed via transplants to sites in and out of the EMCC. Finally, laboratory growth and survival experiments will assay larval performance in different thermal and feeding regimes. We will use molecular markers to identify the morphologically indistinguishable larvae and settlers of these sibling species.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0961157
NSF Division of Ocean Sciences (NSF OCE)	OCE-1233868

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