CTD cast log from casts before and after larval vertical distribution sampling from R/V C-Hawk day cruises in the Eastern Gulf of Maine from 2012 to 2014

Website: https://www.bco-dmo.org/dataset/783749
Data Type: Cruise Results
Version: 1
Version Date: 2019-12-16

Project
» Intertidal community assembly and dynamics: Integrating broad-scale regional variation in environmental forcing and benthic-pelagic coupling (GOMEPRO)

Contributors	Affiliation	Role
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Abstract
CTD cast log from casts before and after larval vertical distribution sampling from R/V C-Hawk day cruises in the Eastern Gulf of Maine from 2012 to 2014.

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Coverage

Spatial Extent: **N**:44.6609108 **E**:-67.3390943 **S**:44.4050113 **W**:-67.653471
Temporal Extent: 2012-08-01 - 2014-08-07

Dataset Description

CTD cast log from casts before and after larval vertical distribution sampling from R/V C-Hawk day cruises in the Eastern Gulf of Maine from 2012 to 2014. These data were presented in Weinstock et al., 2018 (see Fig 1 and 2).

Related Datasets: CTD casts were conducted immediately before and after the associated larval vertical distribution sampling (separate dataset description) and on both flood and ebb tides.
* CTD data for mussel study: https://www.bco-dmo.org/dataset/783736
* Mussel Larvae Vertical Distribution: https://www.bco-dmo.org/dataset/783755

Methods & Sampling

Conductivity, temperature, and depth were sampled via an instrument cast from a small boat. Casts were

conducted immediately before and after the associated larval vertical distribution sampling (see) and on both flood and ebb tides. For more information see the open-access publication Weinstock et al., 2018.

Each cast_name includes the date and tidal phase combination with names including "mm_dd_yy tidephase cast". The first cast was conducted immediately before the larval vertical distribution sampling described in the accompanying dataset file, and the second cast was conducted immediately after larval sampling. An additional descriptor stating the site name (e.g. MB1) is included in the cast_name from 8/16/12 onwards when two different sites were sampled on the same date.

CTD sampling information

Device: CC1223007
Sample type: Cast
Default latitude: 32
Default altitude: 0
Pressure calibration date: 2012-05-31
Temperature calibration date: 2012-06-01
Conductivity calibration date: 2012-06-01
Samples per second: 5

C-Hawk cruise date/site combinations

Date Site
8/1/12 MB1
8/16/12 MB1 & MB2
8/22/12 WB1
7/31/13 WB2
7/22/14 WB3
8/5/14 WB3
8/6/14 WB3
8/7/14 WB3

BCO-DMO Processing Description

* 25 csv files for each cast combined into one tabular dataset (see CTD dataset https://www.bco-dmo.org/dataset/783736). The information in the comment lines in each file was extracted and turned into this CTD cast log dataset.
* "cast_name" column added which contains information in the original filenames which included "mm_dd_yy_tidephase_cast.csv"
* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions (spaces, +, and - changed to underscores). Units in parentheses were removed and added to the Parameter Description metadata section.
* blank values in this dataset are displayed as "nd" for "no data." nd is the default missing data identifier in the BCO-DMO system.
* Start and end altitude, GPS horizontal and vertical error rounded to two decimal places
* Data sorted by time
* Electronics calibration date column was removed because it is not a valid date 0001-01-01
* The following column values were added to Methods & Sampling metadata instead of a data column because they are all the same value.

Device: CC1223007
Sample type: Cast
Default latitude: 32
Default altitude: 0
Pressure calibration date: 2012-05-31
Temperature calibration date: 2012-06-01
Conductivity calibration date: 2012-06-01
Samples per second: 5

Data Files

File
ctd_larvae_log.csv (Comma Separated Values (.csv), 6.42 KB)   MD5:d501320a83ae326cdfa74c7d7660a6b1   Primary data file for dataset ID 783749

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Related Publications

Weinstock, J. B., Morello, S. L., Conlon, L. M., Xue, H., & Yund, P. O. (2018). Tidal shifts in the vertical distribution of bivalve larvae: Vertical advection vs. active behavior. Limnology and Oceanography, 63(6), 2681–2694. doi:10.1002/lno.10968
Results

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Parameters

Parameter	Description	Units
cast_name	Cast name. Name includes the date/tidal phase combination, with file names formatted mm_dd_yy_tidephase_cast. Site name is added where multiple sites sampled in one day.	unitless
File_name	File name CTD data originally recorded to.	unitless
Cast_time_UTC	Cast date and time (UTC) in ISO 8601 format yyyy-mm-ddTHH:MM:SSZ	unitless
Cast_time_local	Cast date and time (local,UTC-4) in format yyyy-mm-dd HH:MM:SS	unitless
Cast_data	Cast data (Raw or Down)	unitless
Location_source	GPS location source (GPS or Manual)	unitless
Start_latitude	Cast start latitiude	decimal degrees
Start_longitude	Cast start longitude	decimal degrees
Start_altitude	Cast start altitude	meters
Start_GPS_horizontal_error	Cast start GPS horizontal error	meters

Start_GPS_vertical_error	Cast start GPS vertical error	meters
Start_GPS_number_of_satellites	Number of GPS satellites at start of cast	per satellite
End_latitude	Cast end latitiude	decimal degrees
End_longitude	Cast end longitude	decimal degrees
End_altitude	Cast end altitude	meters
End_GPS_horizontal_error	Cast end GPS horizontal error	meters
End_GPS_vertical_error	Cast end GPS vertical error	meters
End_GPS_number_of_satellites	Number of GPS satellites at end of cast	per satellite
Cast_duration	Cast duration (seconds between start and end of cast)	seconds

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Deployments

Yund_GoME

Website	https://www.bco-dmo.org/deployment/699509
Platform	R/V C-HAWK
Start Date	2012-08-01
End Date	2016-07-29
Description	The C-Hawk is a 22 ft. fiberglass modified V-hull. These were multiple single-day deployments for GOMEPRO project. Eastern Gulf of Maine Sampled with single-day cruises on: 8/1/12 8/16/12 8/22/12 7/31/13 7/22/14 8/5/14 8/6/14 8/7/14 **Methods & Sampling** Date Site 8/1/12 MB1 8/16/12 MB1 & MB2 8/22/12 WB1 7/31/13 WB2 7/22/14 WB3 8/5/14 WB3 8/6/14 WB3 8/7/14 WB3

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Project Information

Intertidal community assembly and dynamics: Integrating broad-scale regional variation in environmental forcing and benthic-pelagic coupling (GOMEPRO)

Coverage: Rocky intertidal shores and nearshore coastal waters throughout the Gulf of Maine

Rocky intertidal habitats in the Gulf of Maine (GoM) provide a model system to examine the structure and dynamics of natural communities. Throughout the Gulf of Maine, the same species are often found in these habitats but community structure, dynamics and productivity differ markedly among 3 distinct regions (southern, central and northern GoM). Past influential work, conducted primarily in the southern and central GoM, focused on the local processes driving intertidal community structure but produced very different conceptual models of how these communities are structured. This project examines whether regional differences in rocky shore community processes are driven by differences in recruitment that are shaped by regional variation in temperature and food availability and nearshore coastal oceanography. This project will improve the understanding of how large-scale environmental forces interact with local processes to control the distribution of species and the structure and dynamics of these communities. Understanding the interaction between processes operating at different scales is fundamentally important to developing more reliable models that can be used to predict community dynamics. In addition, data resulting from this project will have important implications for regional dynamics in commercially important species and for ecosystem and fisheries management within the GoM.

The overarching hypothesis of this project is that regional differences in community-level processes are driven by very different patterns of population connectivity and recruitment in a few key species, and that these differences are ultimately caused by regional variation in temperature and food availability and mediated by physical larval transport processes. Hence, the project will test the following hypotheses with manipulative field experiments, field sampling, connectivity estimates, and integrative modeling:
1) Locally-dispersing species dominate dynamics in regions with a net export of planktonic larvae (Northern GoM), while species with planktonic larvae dominate the dynamics in regions with high settlement and extensive connectivity among populations (Southern GoM).
2) Settlement density of species with planktonic larvae increases from northern to southern regions in accord with regional variation in food availability.
3) Population connectivity varies greatly among regions, with regions differing in the degree to which they are self-seeded or serve as larval sources vs. sinks; self-seeding leads to relatively localized population dynamics in the middle portion of the GoM.
4) Patterns of population connectivity are driven by physical transport processes and can be represented by coupling basic larval behavior models with circulation models.

At 18 different sites in the GoM across ~ 600 km, surveys will evaluate variation in recruitment, food availability and secondary productivity and experiments will assess community processes in wave-exposed and sheltered habitats. We will use hydrographic, current profile, and larval vertical distribution surveys to collect data for coupled larval/circulation models. Population connectivity will be both modeled and empirically evaluated (for one species) using elemental fingerprinting. A spatially explicit metacommunity model will integrate across all project components and test the relative importance of regional and local processes in controlling community organization and dynamics.

Funding