

CTD profiles located along transects oriented either across-shelf or along-shelf, from multiple day trips in the coastal waters, Gulf of Maine from 2015-2016 (GOMEPRO project)

Website: <https://www.bco-dmo.org/dataset/699745>

Data Type: Cruise Results

Version:

Version Date: 2017-09-06

Project

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

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Coverage

Spatial Extent: N:44.8051 E:-66.9634 S:42.3867 W:-70.9252

Dataset Description

CTD (conductivity, depth, temperature) casts taken at discrete stations located along transects in the Gulf of Maine in 2015 and 2016.

Methods & Sampling

Transects were separated by circa 1-1.5 nautical miles and were oriented either across-shelf or along-shelf. Sampling was limited to 2 hrs. in the middle of the tidal cycle, on either flood or ebb tides. CTD was a YSI Castaway. Headers in 2016 data files contain coordinates of the instrument at the start and stop of each cast.

Labeling conventions for "Transect":

Transects ending in "AS" or "A" are oriented along-shelf

Transects ending in "XS" or "X" are oriented across-shelf

Transect QMC contains both across-shelf and along-shelf components

Data Processing Description

All processing was via YSI software. Depths were calculated from pressures and all measured values expressed as depth. Up-cast data were excluded, so only down-cast data are presented. File type is csv.

BCO-DMO Data Manager Processing Notes:

- * added a conventional header with dataset name, PI name, version date
- * added ISO Date (yyyy-mm-dd) added in addition to date in format yymmdd
- * modified parameter names to conform with BCO-DMO naming conventions
- * rounded values to 2 decimal places (were as long as 17 decimal places)
- * added station information from ctd_station dataset (added station lat/lon)
- * added sampling location information from information in filenames and folder names (Site, Orientation, Tide, Station, etc)
- * added "Along and Across" as the value for QuoddyMooseCove based on note "Transect QMC contains both across-shelf and along-shelf components"

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Data Files

File
ctd.csv (Comma Separated Values (.csv), 4.37 MB) MD5:25c31b5eda489ffd4c91ac384214635a Primary data file for dataset ID 699745

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Parameters

Parameter	Description	Units
Year	Year of sampling	unitless
Site	Site name	unitless
Transect	Transect code (see acquisition description for codes)	unitless
Station	Station number (can be negative)	unitless
Station_lat	Station latitude (nominal)	decimal degrees
Station_lon	Station longitude (nominal)	decimal degrees
Date_ISO	Date in format yyyy-mm-dd	unitless

yymmdd	Station sampling information (time and can contain "A" or "B")	unitless
Tide	Tide description (e.g. Ebb or Flood)	unitless
Orientation	Orientation of sampling; Along or across shelf	unitless
Transect_Description	Description of transect including site and date	unitless
Pressure	Pressure	Decibar
Depth	Sample Depth	meters
Temperature	Temperature	Celsius
Conductivity	Conductivity	MicroSiemens per Centimeter
Specific_conductance	Specific_conductance	MicroSiemens per Centimeter
Salinity	Salinity	Practical Salinity Units (PSU)
Sound_velocity	Sound velocity	Meters per Second
Density	Density	Kilograms per Cubic Meter

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Instruments

Dataset-specific Instrument Name	YSI Castaway
Generic Instrument Name	CTD - profiler
Generic Instrument Description	The Conductivity, Temperature, Depth (CTD) unit is an integrated instrument package designed to measure the conductivity, temperature, and pressure (depth) of the water column. The instrument is lowered via cable through the water column. It permits scientists to observe the physical properties in real-time via a conducting cable, which is typically connected to a CTD to a deck unit and computer on a ship. The CTD is often configured with additional optional sensors including fluorometers, transmissometers and/or radiometers. It is often combined with a Rosette of water sampling bottles (e.g. Niskin, GO-FLO) for collecting discrete water samples during the cast. This term applies to profiling CTDs. For fixed CTDs, see https://www.bco-dmo.org/instrument/869934 .

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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

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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.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1458188

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