CTD profiles collected on the NW Atlantic shelf off New England during the R/V Connecticut (CT2015-08) cruise during August 2015 (Ciliate Diversity project)

Website: https://www.bco-dmo.org/dataset/566273
Version: 2015-09-14

Project
» Patterns of diversity in planktonic ciliates: spatio-temporal scales and community assembly in the coastal ocean (Ciliate Diversity)

Contributors	Affiliation	Role
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Data Processing Description

Data were processed in SeaBird Seasave software, version 7.21a. Raw hexadecimal data files were converted to base 10. Temperature and conductivity data were low-pass filtered to match time constants. The loopedit function was implemented to eliminate loops in the data due to ship roll, and the data were bin averaged to one-meter intervals. Processed data were imported into Excel.

BCO-DMO Processing:

- served data via a toplevel file, adding columns for cruise_id, year, month, day, time_start, lat and lon, ISO_DateTime_UTC, and yrday_utc

version: 2015-09-11: same data as 2015-09-14 but no ISO_DateTime_UTC and yrday_utc

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Data Files

File
CTD_iso.csv (Comma Separated Values (.csv), 315.72 KB) MD5:dedb502b3e1ae3b1f13b144a4df0771a Primary data file for dataset ID 566273

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Parameters

Parameter	Description	Units
cruise_id	cruise identification	unitless
year	year	YYYY
month	UTC month	mm
day	UTC day of month	dd
station	station	unitless
lat	latitude; north is postive	decimal degrees
lon	longitude; east is positive	decimal degrees
time_start	cast start time	HH:MM:SS
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted: YYYY-mm-ddTHH:MM:SS[.xx]Z (UTC time)	unitless
yrday_utc	UTC day and decimal time: as 326.5 for the 326th day of the year or November 22 at 1200 hours (noon).	unitless
temp	temperature; ITS-90	degrees Celsius
pressure	pressure	decibars
depth	depth	meters
oxygen	oxygen from SBE43	mg/l
salinity	salinity	PSU
density	density	Kg/m^3
fluor	fluor	mg/m^3
temp2	temperature from secondary sensor; ITS-68	degrees Celsius

flag	quality flag; 0 = good	unitless

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	CTD Sea-Bird 9
Dataset-specific Description	SeaBird CTD equipped with conductivity and twin temperature sensors, SBE 43 oxygen sensor, and WETLabs WETstar fluorometer.
Generic Instrument Description	The Sea-Bird SBE 9 is a type of CTD instrument package. The SBE 9 is the Underwater Unit and is most often combined with the SBE 11 Deck Unit (for real-time readout using conductive wire) when deployed from a research vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorometer, altimeter, etc.). Note that in most cases, it is more accurate to specify SBE 911 than SBE 9 since it is likely a SBE 11 deck unit was used. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	
Generic Instrument Name	WET Labs (Sea-Bird WETLabs) WETStar fluorometer
Generic Instrument Description	Submersible fluorometer designed for through-flow or pumped CTD applications manufactured by WetLabs and which can be configured for various types of fluorescence. The probe has a temperature range of 0-30 degrees C and a depth rating of 600 meters.

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Deployments

CT2015-08

Website	https://www.bco-dmo.org/deployment/565818
Platform	R/V Connecticut
Start Date	2015-08-12
End Date	2015-08-14

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Project Information

Patterns of diversity in planktonic ciliates: spatio-temporal scales and community assembly in the coastal ocean (Ciliate Diversity)

Coverage: Western North Atlantic, continental shelf

The use of DNA-based methods to measure microbial diversity has revealed a common pattern in which a small group of common species is accompanied by a very large group of rare ones. This pattern holds for bacteria, archaea, and microbial eukaryotes, including the ciliates that are the subject of this study. The project work will use denaturant gradient gel electrophoresis (DGGE) to quantify common species and Illumina pyrosequencing to quantify the rare ones. DGGE is rapid and inexpensive and will permit the study of ciliate biodiversity over a wide range of time and space scales. Illumina pyrosequencing, on the other hand, produces so many sequences from a given sample that even extremely rare forms can be quantified. Using these techniques in both experimental and observational approaches, the following objectives will be pursued:

Objective 1. Quantify the members of the ciliate "rare biosphere" over varied temporal scales to evaluate how change from rarity to commonness is related to ecosystem properties.

Objective 2. Determine the spatial and temporal scales over which the abundant ciliate assemblages in coastal waters are coherent.

Objective 3. Extend the breadth of taxonomic coverage to all microbial eukaryotes in some samples to evaluate how the presence of food and/or competitor organisms from other eukaryotic groups help to structures ciliate assemblages.

Objective 4. Elucidate the role of benthic-pelagic coupling in structuring planktonic assemblages by documenting the presence of metabolically active ciliates (i.e. by comparing DNA and RNA samples) from surface and deep plankton, fecal pellets and other large sinking marine aggregates, and sediments.

Objective 5. Perform experiments on the role of grazing, temperature, ocean acidification, and phytoplankton composition in altering the relative abundances of common and rare species in natural ciliate assemblages.

This work will advance our understanding of global biodiversity by focusing on a single, ecologically important clade of microbial eukaryotes, the oligotrich and choreotrich ciliates. These micrograzers are responsible for a major portion of the consumption in planktonic food webs and they are, in turn, important food items for larval fish and invertebrates. They are thus centrally important for issues concerning food webs, productivity, and global environmental change. The new DNA-based techniques that have been developed in recent decades now allow unprecedented levels of information to be gathered on biodiversity. This information will provide important insights into ecosystem function and resilience in the face of change.

Note: This project is a renewal for the previous collaborative project, "Diversity and dynamics of planktonic ciliates - what can next-generation sequencing technologies tell us?", funded by awards OCE-1130033 and OCE-1129734.

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Funding

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