

Dissolved organic carbon (DOC) and salinity data from seasonal collections/incubations, Doboy Sound, Sapelo Island, GA, July and October 2014

Website: <https://www.bco-dmo.org/dataset/735806>

Data Type: Other Field Results

Version: 1

Version Date: 2018-05-10

Project

» [High Resolution Linkages Between DOC Turnover and Bacterioplankton in a Coastal Ocean](#) (SIMCO)

Contributors	Affiliation	Role
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Abstract

DOC from field and incubation collections of estuarine waters near Sapelo Island, GA in July and October 2014 was analyzed for chemical concentrations. Analysis of the dissolved organic carbon pool retrieved by solid-phase extraction (PPL resin) was analyzed to determine organic carbon concentrations (by TOC Analyzer; Shimadzu).

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Coverage

Temporal Extent: 2014-07 - 2014-10

Dataset Description

DOC from field and incubation collections of estuarine waters near Sapelo Island, GA in July and October 2014 was analyzed for chemical concentrations. Analysis of the dissolved organic carbon pool retrieved by solid-phase extraction (PPL resin) was analyzed to determine organic carbon concentrations (by TOC Analyzer; Shimadzu).

Methods & Sampling

DOM was collected in Doboy Sound off the southeastern U.S. in July and October 2014. Six 20 L carboys were filled with water and wrapped in black plastic. Three were processed immediately, while the remaining three were returned to Doboy Sound for a 24 h dark incubation before processing by an identical protocol. This experimental scheme was carried out twice during each sampling event, once at high tide (HT) and once at low

tide (LT). Immediately after collection, samples were filtered (using 0.7 µm Whatman GF/F filters pre-combusted at 450°C for 5 h and pre-washed 0.2 µm Pall Supor membrane filters), and aliquots were stored frozen for DOC analysis. Filtrates were acidified to pH 2, and DOM was isolated using solid phase extraction (SPE) cartridges (Agilent Bond Elut PPL) as in Dittmar et al. (2008).

DOC concentrations from water samples and extracts (i.e., dried and resuspended in ultrapure water) were measured with a Shimadzu TOC-VCPh analyzer. SPE efficiency across all samples was 71±4% of the DOC.

Data Processing Description

BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date
- column names reformatted to comply with BCO-DMO standards
- filled in the blank salinities by repeating the value for each date/tide

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Data Files

File
DOC_sal_2014.csv (Comma Separated Values (.csv), 794 bytes) MD5:644f903d8d49e4707e9797eafe6ea029
Primary data file for dataset ID 735806

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Related Publications

Dittmar, T., Koch, B., Hertkorn, N., & Kattner, G. (2008). A simple and efficient method for the solid-phase extraction of dissolved organic matter (SPE-DOM) from seawater. *Limnology and Oceanography: Methods*, 6(6), 230–235. doi:[10.4319/lom.2008.6.230](https://doi.org/10.4319/lom.2008.6.230)

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Parameters

Parameter	Description	Units
date	sample collection month and year formatted as yyyy-mm	unitless
sample	sample identifier	unitless
DOC_uM	Concentration of dissolved organic carbon	microMol
Salinity_psu	salinity	practical salinity units

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Instruments

Dataset-specific Instrument Name	Shimadzu TOC-VCPH analyzer
Generic Instrument Name	Shimadzu TOC-V Analyzer
Dataset-specific Description	DOC concentrations measured
Generic Instrument Description	A Shimadzu TOC-V Analyzer measures DOC by high temperature combustion method.

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Deployments

Moran_Sapelo_2012-14

Website	https://www.bco-dmo.org/deployment/661864
Platform	Univ_Georgia
Start Date	2012-09-01
End Date	2014-10-31
Description	Microbial 'omics studies

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Project Information

High Resolution Linkages Between DOC Turnover and Bacterioplankton in a Coastal Ocean (SIMCO)

Coverage: Southeastern U.S. coastal ocean, 31.4° N Lat, 81.3° W Lon

Description from NSF award abstract:

Long-standing questions regarding the fate of dissolved organic carbon (DOC) in coastal oceans require a better understanding of the network that links bacterioplankton metabolism with carbon transformation. These questions address uncertainties about the composition of the bioreactive DOC components transformed in ocean margins, and the role of bacterial taxonomic and genetic composition in determining the fate of DOC.

This project will infuse a new type of data into coastal carbon cycle research based on high-resolution chemical analysis coupled with bacterial gene expression measures. It will extend DOC process studies down to the single-compound level and bacterial activity studies down to the single-gene level, and integrate this information into existing bioinformatic resources for biogeochemical and modeling applications.

The specific goals of this project are:

- 1) To reconstruct major components of the network linking DOC composition, DOC turnover, and bacterial heterotrophy in the coastal ocean (the composition of the DOC pool, the major bioreactive components, the bacterioplankton taxa mediating transformations, and the bacterial genes and pathways responsible).
- 2) To test hypothesized network links for selected DOC compounds using a simplified system that queries individual DOC compounds against a complex natural microbial community.
- 3) To test hypothesized network links for marine bacteria using a simplified system that queries a single generalist heterotrophic bacteria against a complex natural DOC pool.
- 4) To verify predicted DOC-gene linkages that are most informative about heterotrophic activities of bacterioplankton.

This research addresses fundamental questions on bacterial mediation of organic carbon fate in the ocean and atmosphere. As such, these investigations linking the chemical changes in dissolved organic carbon with patterns of gene expression in coastal bacterioplankton communities will be of interest to scientists across several disciplines.

Note: The project acronym, SIMCO, means "Sapelo Island Microbial Carbon Observatory".

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1356010

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