Temperature, salinity, oxygen, and pH measured by SeapHOx sensors at two locations (Gulf coast of Florida near St. Teresa and VA Eastern Shore near Oyster, VA) and two heights in the water column (20 cm and 1.1 m)

Website: https://www.bco-dmo.org/dataset/743408
Data Type: Other Field Results
Version: 1
Version Date: 2018-08-08

Project
» Toward an Improved Understanding of Blue Carbon: The Role of Seagrasses in Sequestering CO2 (Seagrass Blue Carbon)

Contributors	Affiliation	Role
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Abstract
Temperature, salinity, oxygen, and pH measured by SeapHOx sensors at two locations (Gulf coast of Florida near St. Teresa and VA Eastern Shore near Oyster, VA) and two heights in the water column (20 cm and 1.1 m).

Table of Contents

Coverage

Spatial Extent: **N**:37.261789 **E**:-75.815357 **S**:29.907912 **W**:-84.504201
Temporal Extent: 2017-05-10 - 2017-07-22

Dataset Description

Temperature, salinity, oxygen, and pH measured by SeapHOx.

Methods & Sampling

Time series data collected by Satlantic SeapHOx. Samples are collected from two locations (Gulf coast of Florida near St. Teresa (29.907912N, -84.504201E); VA Eastern Shore near Oyster, VA, (37.261789N, -75.815357E) and from two heights in the water column: 20 cm = pump 1 and 1.1 m = Pump 2.

Data Processing Description

BCO-DMO Processing:
- modified parameter names to conform with BCO-DMO naming conventions (removed spaces and units);
- combined two data files into one dataset.

[table of contents | back to top]

Data Files

File
timeseries.csv (Comma Separated Values (.csv), 163.90 KB) MD5:d544444bd1edaa190df1fbc8c8fa006b Primary data file for dataset ID 743408

[table of contents | back to top]

Parameters

Parameter	Description	Units
site	Sampling site name. Samples are collected from two locations: Gulf coast of Florida near St. Teresa (29.907912N, -84.504201E) and VA Eastern Shore near Oyster, VA, (37.261789N, -75.815357E)	unitless
Year	4-digit year when data were collected	unitless
Month	Month when data were collected	unitless
Day	Day of month when data were collected	unitless
Hour	Hour portion of the time when data were collected (local time zone)	unitless
Minute	Minute portion of the time when data were collected (local time zone)	unitless
Second	Seconds portion of the time when data were collected (local time zone)	unitless
Temperature	Water temperature measured by Microcat CTDO2 (part of the SeapHOx)	degrees Celsius
Salinity	Salinity	practical salinity units (PSU)
Oxygen	Oxygen	millilter per liter (mL/L)
pH_internal	pH (total; internal reference electrode)	unitless (pH scale)
pH_external	pH (total; external reference electrode)	unitless (pH scale)
Temperature_seafet	Temperature measured by SeaFET	degrees Celsius
Pump	Pump identifier. Samples were collected from two heights in the water column: 20 cm = pump 1 and 1.1 m = Pump 2	unitless

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	Satlantic SeapHOx
Generic Instrument Name	SeapHOx/SeaFET
Generic Instrument Description	The SeapHOx and SeaFET are autonomous sensors originally designed and developed by the Todd Martz Lab at Scripps Institution of Oceanography. The SeaFET was designed to measure pH and temperature. The SeapHOx, designed later, combined the SeaFET with additional integrated sensors for dissolved oxygen and conductivity. Refer to Martz et al. 2010 (doi:10.4319/lom.2010.8.172). The SeapHOx package is now produced by Sea-Bird Scientific and allows for integrated data collection of pH, temperature, salinity, and oxygen. Refer to Sea-Bird for specific model information.

[table of contents | back to top]

Project Information

Toward an Improved Understanding of Blue Carbon: The Role of Seagrasses in Sequestering CO2 (Seagrass Blue Carbon)

Coverage: Chesapeake Bay, Northern Gulf of Mexico, and Bahamas Banks

NSF abstract:

This research will develop a quantitative understanding of the factors controlling carbon cycling in seagrass meadows that will improve our ability to quantify their potential as blue carbon sinks and predict their future response to climate change, including sea level rise, ocean warming and ocean acidification. This project will advance a new generation of bio-optical-geochemical models and tools (ECHOES) that have the potential to be transform our ability to measure and predict carbon dynamics in shallow water systems.

This study will utilize cutting-edge methods for evaluating oxygen and carbon exchange (Eulerian and eddy covariance techniques) combined with biomass, sedimentary, and water column measurements to develop and test numerical models that can be scaled up to quantify the dynamics of carbon cycling and sequestration in seagrass meadows in temperate and tropical environments of the West Atlantic continental margin that encompass both siliciclastic and carbonate sediments. The comparative analysis across latitudinal and geochemical gradients will address the relative contributions of different species and geochemical processes to better constrain the role of seagrass carbon sequestration to global biogeochemical cycles. Specifically the research will quantify: (i) the relationship between C stocks and standing biomass for different species with different life histories and structural complexity, (ii) the influence of above- and below-ground metabolism on carbon exchange, and (iii) the influence of sediment type (siliciclastic vs. carbonate) on Blue Carbon storage. Seagrass biomass, growth rates, carbon content and isotope composition (above- and below-ground), organic carbon deposition and export will be measured. Sedimentation rates and isotopic composition of PIC, POC, and iron sulfide precipitates, as well as porewater concentrations of dissolved sulfide, CO2, alkalinity and salinity will be determined in order to develop a bio-optical-geochemical model that will predict the impact of seagrass metabolism on sediment geochemical processes that control carbon cycling in shallow waters. Model predictions will be validated against direct measurements of DIC and O2 exchange in seagrass meadows, enabling us to scale-up the density-dependent processes to predict the impacts of seagrass distribution and density on carbon cycling and sequestration across the submarine landscape.

Status, as of 09 June 2016: This project has been recommended for funding by NSF's Division of Ocean Sciences.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1635403
NSF Division of Ocean Sciences (NSF OCE)	OCE-1633951

[table of contents | back to top]