Data describing oxygen, temperature, and salinity in Marsh Pond in Massachusetts from 2014.

Website: https://www.bco-dmo.org/dataset/670819
Data Type: Other Field Results
Version: 1
Version Date: 2016-12-19

Project
» Eutrophication Effects on Sediment Metabolism and Benthic Algal-bacterial Coupling: An Application of Novel Techniques in a LTER Estuary (Benthic_PP_at_TIDE)

Contributors	Affiliation	Role
Stanley, Rachel	Wellesley College	Principal Investigator
Spivak, Amanda	Woods Hole Oceanographic Institution (WHOI)	Co-Principal Investigator
Howard, Evan	Woods Hole Oceanographic Institution (WHOI)	Contact
Ake, Hannah	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Table of Contents

Dataset Description

Marsh Pond data describing oxygen, temperature, and salinity.

Methods & Sampling

Temperature, salinity, and oxygen saturation state data were collected using a YSI Exo2 water quality sonde, calibrated before and after each deployment, with no significant change in instrument response to any variable identified by pre and post calibration over the reported time periods, as well as good agreement with discrete subsampling of period using a handheld YSI ProODO temperature and oxygen saturation state sonde and salinity from a handheld refractometer. All temperature, salinity, and O2 saturation state uncertainties reported per manufacturer specifications. However, Environmental variability in temperature at locations around the pond was s.d. 1 degree C, and salinity was s.d. 0.5 on PSS-78. This environmental variability was used to determine the uncertainty in the saturation states for each noble gas in Datasheet 2. O2 saturation state varied locally around the pond, see Howard et al. (submitted, Limnol. Oceanogr. Letters). Ancillary meteorological data collected in close proximity to the sample data reported here is accessible from the LTER database (Giblin and Forbrich 2016; http://dx.doi.org/10.6073/pasta/14eb405f583ae2384b2c6c5714776214), and includes windspeed and atmospheric pressure.

References:

Howard et. al, Using noble gases in a shallow aquatic environment to compare common gas exchange parameterizations and to constrain efflux of oxygen by ebullition, submitted to Limnology and Oceanography Letters.

Data Processing Description

BCO-DMO Data Processing Notes:

-reformatted column names to comply with BCO-DMO standards
-separated DateTime column into two columns (date and time)
-reformatted date to "yyyy-mm-dd"
-filled in blank cells with "nd"
-added ISO_DateTime_UTC column

[table of contents | back to top]

Data Files

File
environmental_data.csv (Comma Separated Values (.csv), 25.05 KB) MD5:7468baa163400aeb176b942a60220153 Primary data file for dataset ID 670819

[table of contents | back to top]

Parameters

Parameters for this dataset have not yet been identified

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	Oxygen saturation sensor
Generic Instrument Name	Oxygen Sensor
Dataset-specific Description	Measured oxygen saturation, not concentration
Generic Instrument Description	An electronic device that measures the proportion of oxygen (O2) in the gas or liquid being analyzed

Dataset-specific Instrument Name	YSI Exo2 water quality sonde
Generic Instrument Name	Water Quality Multiprobe
Dataset-specific Description	Used to take water quality measurements; temperature, salinity, and oxygen
Generic Instrument Description	An instrument which measures multiple water quality parameters based on the sensor configuration.

[table of contents | back to top]

Deployments

Plum_Island

Website	https://www.bco-dmo.org/deployment/669365
Platform	shoreside Massachusetts
Start Date	2012-07-27
End Date	2012-08-15
Description	Plum Island, MA; LTER sites

[table of contents | back to top]

Project Information

Eutrophication Effects on Sediment Metabolism and Benthic Algal-bacterial Coupling: An Application of Novel Techniques in a LTER Estuary (Benthic_PP_at_TIDE)

Coverage: Plum Island Estuary, Rowley Massachusetts

Extracted from the NSF award abstract:
This project will address how rates of benthic microalgal production respond to eutrophication and geomorphological changes in human-impacted tidal creeks. Excess nutrient loading increases benthic algal biomass and likely stimulates production rates but the magnitude of nutrient and geomorphological effects on rates of production is unknown. Will changes in benthic algal productivity affect algal-bacterial coupling? Furthermore, how is algal-bacterial coupling affected by geomorphological changes, which may be exacerbated by excess nutrient loading but can also occur in pristine marshes?

This project will take advantage of the infrastructure of the TIDE project, a long-term saltmarsh eutrophication experiment at the Plum Island Ecosystem - Long Term Ecological Research site in Northeastern Massachusetts. Specifically, the PIs will measure benthic metabolism and examine algal- bacterial coupling in fertilized and ambient nutrient tidal creeks in the first field season. The following field season, they will compare sediment metabolism and carbon dynamics on slumped tidal creek walls (i.e. areas where low marsh has collapsed into the tidal creek) to that on the bottom of tidal creeks. In both years, gross and net production will be determined using an innovative triple oxygen isotope technique and traditional dissolved oxygen and inorganic carbon flux measurements. Comparisons between these methods will be useful in informing studies of sediment metabolism. Lipid biomarkers will be used to characterize the sources of organic matter to creek sediments, and stable isotope analysis of bacterial specific biomarkers to identify the sources of organic carbon utilized by sediment bacteria. The biomarkers will reveal whether sediment bacteria use organic matter substrates, such as benthic microalgal carbon, selectively or in proportion to availability. Overall, results from the proposed study will provide important information about how sediment carbon dynamics in shallow tidal creeks respond to long term eutrophication. Furthermore, findings will enhance understanding of the role of tidal creeks in coastal biogeochemistry.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1233678

[table of contents | back to top]