

# Chlorophyll fluorescence and turbidity backscatter data from Groves Creek salt marsh, Skidaway Island Georgia, USA, 2013-2015

**Website:** <https://www.bco-dmo.org/dataset/682753>

**Data Type:** Other Field Results

**Version:** 1

**Version Date:** 2017-02-21

## Project

» [Tempo and mode of salt marsh exchange](#) (GrovesCreek)

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## Abstract

Chlorophyll fluorescence and turbidity backscatter were measured at two stations in Groves Creek salt marsh, Skidaway Island Georgia, USA from July 2013 to March 2015.

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## Table of Contents

- [Coverage](#)
  - [Dataset Description](#)
    - [Methods & Sampling](#)
    - [Data Processing Description](#)
  - [Data Files](#)
  - [Supplemental Files](#)
  - [Parameters](#)
  - [Instruments](#)
  - [Deployments](#)
  - [Project Information](#)
  - [Funding](#)
- 

## Coverage

**Spatial Extent:** Lat:31.97 Lon:-81.02

**Temporal Extent:** 2013-07-26 - 2015-03-11

## Methods & Sampling

Chlorophyll and turbidity sampling: Chlorophyll fluorescence and turbidity backscatter at S2 and S8 were measured with Wetlabs FLNTUSB shuttered fluorometers. The deployment scheme for the FLNTUSB units was identical to that for the YSI and FLCDs. The YSIs, FLCd and FLNTUSB fluorometers were swapped out on the same schedules. At S2, the fluorometers were also mounted below the “moon pool” of the floating dock and were ~ 1m from the YSIs. At S8, they were collocated on the bottom frame with the other instruments.

## Data Processing Description

## Chlorophyll and turbidity data processing.

Raw turbidity backscatter and chlorophyll fluorescence counts have been converted to NTUs (nephelometric turbidity unit) and chlorophyll concentration (ug chl l-1) units using the manufacturer calibration sheets that were provided with the instruments (Supplemental Files). No other processing has yet been done with the turbidity data. The instrument response was regularly saturated under the turbid conditions found in Groves Creek. Chlorophyll data have been processed analogously to the fDOM data . While the chlorophyll data are likely to be “right” in a relative sense, the absolute value of the sonde readings underestimate in situ chlorophyll obtained from extracted samples by a factor of 2-3. The data provided here are for the factory calibrations. Third-part users can use the data found in the manufacturer calibration sheet to make an empirical correction, while cautioning that most of the water samples were collected for analysis of chlorophyll at high tide. The contributions of turbidity and CDOM interference with the raw sonde signals have been examined. No significant contribution by either variable were revealed using multiple linear regression.

### BCO-DMO Processing notes:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- added station, lat, lon, date, time, ISO\_DateTime columns
- ISO Date format generated from date and time values
- blank values replaced with no data value 'nd'

[ [table of contents](#) | [back to top](#) ]

## Data Files

File
<b>fluor.csv</b> (Comma Separated Values (.csv), 10.47 MB) MD5:49b9a16b07510b4b6aaefa5c994cbbe4 Primary data file for dataset ID 682753

[ [table of contents](#) | [back to top](#) ]

## Supplemental Files

File
<b>Field chlorophyll data (CSV)</b> filename: CHL_cal_data.csv (Comma Separated Values (.csv), 16.78 KB) MD5:fa669e26bab8c498f6909975a1ea5b42 Field data that support the empirical sonde calibrations. Included in this file are the factory calibration values for each sonde deployed across the channel.
<b>Field chlorophyll data (XLSX)</b> filename: CHL_cal_data.xlsx (Microsoft Excel, 48.27 KB) MD5:a563a086af2f03655739b636466e3160 Field data that support the empirical sonde calibrations. Included in this file are the factory calibration values for each sonde deployed across the channel.
<b>Groves Creek station</b> filename: S2_S8_stations.csv (Comma Separated Values (.csv), 843 bytes) MD5:a73d14f479effe359fdadd0115456ae1 Locations and deployment dates for stations S2 and S8
<b>Sonde factory calibration data (CSV)</b> filename: sonde_factory_cals.csv (Comma Separated Values (.csv), 1.41 KB) MD5:9be3173f0b25cc5939504ad15a4dc940 Chlorophyll concentration (ug chl l-1) units using the manufacturer calibration sheets that were provided with the instruments.
<b>Sonde factory calibration data (XLSX)</b> filename: sonde_factory_cals.xlsx (Octet Stream, 15.66 KB) MD5:68156b2b50d7ad05c164c3c74e6ad5fa Chlorophyll concentration (ug chl l-1) units using the manufacturer calibration sheets that were provided with the instruments.

[ [table of contents](#) | [back to top](#) ]

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## **Parameters**

<b>Parameter</b>	<b>Description</b>	<b>Units</b>
station	station identifier	unitless
lat	latitude; north is positive	decimal degrees
lon	longitude; east is positive	decimal degrees
date	UTC date formatted as yyyy-mm-dd	unitless
time	UTC time; formatted as hh:mm	unitless
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted based on ISO 8601:2004(E) with format YYYY-mm-ddTHH:MM:SS[.xx]Z	unitless
deployment	deployment number	unitless
datenum_matlab	MATLAB formatted datenum	unitless
chl_ref	monitor of internal battery output (refer to the appropriate Wetlabs manuals for a full description.)	unitless (volts/volts)
chl_counts	digitized voltages of chlorophyll counts relative to a full scale instrument response of 4000 counts (itself representative of some maximum voltage)	unitless (volts/volts)
NTU_ref	monitor of internal battery output (refer to the appropriate Wetlabs manuals for a full description)	unitless (volts/volts)
NTU_counts	digitized voltages of turbidity counts relative to a full scale instrument response of 4000 counts (itself representative of some maximum voltage)	unitless (volts/volts)
thermistor	voltage output from a temperature sensor: not used in this study	volts
sonde_id	sonde instrument identifier	unitless
chl_a	concentration of chlorophyll a	micrograms/liter (ug/l)
turbidity	turbidity	Nephelometric Turbidity Units (NTU)

## Instruments

<b>Dataset-specific Instrument Name</b>	Wetlabs FLNTUSB shuttered fluorometers
<b>Generic Instrument Name</b>	Fluorometer
<b>Generic Instrument Description</b>	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

## Deployments

### Groves\_Creek\_2013-2015

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/682763">https://www.bco-dmo.org/deployment/682763</a>
<b>Platform</b>	Groves Creek - SkIO
<b>Start Date</b>	2013-07-26
<b>End Date</b>	2015-03-11
<b>Description</b>	Studies of temporal and compositional changes in exported material in a saltmarsh, both the quantity and quality of dissolved organic matter (DOM) and particulate organic matter (POM) exported from Groves Creek.

## Project Information

### Tempo and mode of salt marsh exchange (GrovesCreek)

**Website:** <http://www.skio.uga.edu>

**Coverage:** Salt marsh east of Savannah, Georgia, USA.

#### *Description from NSF award abstract:*

Salt marshes are critical mediators of the flux of material between the terrestrial and marine realms. The balance of material import, export, and transformation affects both the marsh itself and the surrounding estuary. Previous efforts to understand the role of marshes have concentrated either on examining temporal changes (often at low resolution) of bulk exports, or compositional changes in exported material with little regard for its temporal variability. Researchers working at the Skidaway Institute of Oceanography contend that both the quantity and quality of materials exchanged between marsh and estuary in tidally-dominated systems along the southeastern US coast vary significantly in response to semidiurnal, diurnal, tidal, meteorological and seasonal forcing, and that this variability must be included when considering the total contributions of marshes to carbon cycling along the land-ocean boundary. This study will utilize a three-pronged strategy to assess both the quantity and quality of dissolved organic matter (DOM) and particulate organic matter (POM) exported from Groves Creek, a well-characterized meso-tidal salt marsh in coastal

Georgia. In particular, by evaluating how marsh function responds to a full spectrum of present environmental conditions, this project will provide tangible insight into how carbon cycling in these critical regions will respond to anticipated changes in those conditions.

This project is related to the project "Marine priming effect - molecular mechanisms for the biomineralization of terrigenous dissolved organic matter in the ocean" found at <https://www.bco-dmo.org/project/554157>.

[ [table of contents](#) | [back to top](#) ]

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## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1234704</a>

[ [table of contents](#) | [back to top](#) ]