PAR recorded by two Odyssey PAR loggers in the Florida Keys from 11-17 July 2017

Website: https://www.bco-dmo.org/dataset/849979
Data Type: Other Field Results
Version: 1
Version Date: 2021-04-23

Project
» Collaborative Research: Robust optode-based eddy correlation systems for oxygen flux measurements in aquatic environments (Robust optode-based eddy correlation systems)

Contributors	Affiliation	Role
Huettel, Markus	Florida State University (FSU - EOAS)	Principal Investigator, Contact
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Abstract
This dataset presents the PAR light data recorded by the two Odyssey PAR loggers. The loggers were deployed July 11-17, 2017 in a subtropical inner shelf environment (Salinity: 35-36, temperature: 28-31°C) approximately 9 km south of Long Key in the Florida Keys (24° 43.52'N, 80° 49.85'W). The site was located at 9 ± 1 m water depth near the center of a large flat carbonate platform covered with coral sand. The instruments were installed on the 3OEC instrument at ~185 cm above the sediment-water interface.

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Coverage

Spatial Extent: **Lat**:24.7253 **Lon**:-80.83083
Temporal Extent: 2017-07-11 - 2017-07-17

Acquisition Description

Two Odyssey PAR loggers were deployed July 11-17, 2017 in a subtropical inner shelf environment (Salinity: 35-36, temperature: 28-31°C) approximately 9 km south of Long Key in the Florida Keys (24° 43.52'N, 80° 49.85'W). The site was located at 9 ± 1 m water depth near the center of a large flat carbonate platform covered with coral sand. The instruments were installed on the 3OEC instrument at ~185 cm above the sediment-water interface.

The temperature and oxygen data are the data recorded by factory-calibrated loggers:
Sampling rate: 1 / 10 min
Wavelength range: 400 to 700 nm

The method of data analysis is reported in Huettel et al. (2020).

Processing Description

BCO-DMO Processing:
- renamed fields to comply with BCO-DMO naming conventions;
- added ISO8601 date/time field in UTC.

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Related Publications

Huettel, M., Berg, P., & Merikhi, A. (2020). Technical note: Measurements and data analysis of sediment–water oxygen flux using a new dual-optode eddy covariance instrument. Biogeosciences, 17(17), 4459–4476. doi:10.5194/bg-17-4459-2020
Methods

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Parameters

Parameter	Description	Units
ISO_DateTime_EST	Date and time, Eastern Standard Time Zone; format follows ISO8601 standard: YYYY-MM-DDThh:mm:ss	unitless
PAR_1	PAR	micromoles photons per square meter per second (umol photons m-2 s-1)
PAR_2	PAR	micromoles photons per square meter per second (umol photons m-2 s-1)
ISO_DateTime_UTC	Date and time, UTC; format follows ISO8601 standard: YYYY-MM-DDThh:mm:ssZ	unitless

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Instruments

Dataset-specific Instrument Name	Odyssey PAR logger
Generic Instrument Name	Photosynthetically Available Radiation Sensor
Dataset-specific Description	Odyssey PAR logger; Serial numbers 1024, 1025; Calibrations: factory calibrated.
Generic Instrument Description	A PAR sensor measures photosynthetically available (or active) radiation. The sensor measures photon flux density (photons per second per square meter) within the visible wavelength range (typically 400 to 700 nanometers). PAR gives an indication of the total energy available to plants for photosynthesis. This instrument name is used when specific type, make and model are not known.

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Deployments

Diodon_2017-07-11-12

Website	https://www.bco-dmo.org/deployment/849997
Platform	R/V Diodon
Start Date	2017-07-11
End Date	2017-07-12

Diodon_2017-07-13-14

Website	https://www.bco-dmo.org/deployment/850002
Platform	R/V Diodon
Start Date	2017-07-13
End Date	2017-07-14

Diodon_2017-07-15-16

Website	https://www.bco-dmo.org/deployment/850003
Platform	R/V Diodon
Start Date	2017-07-15
End Date	2017-07-16

Diodon_2017-07-16-17

Website	https://www.bco-dmo.org/deployment/850006
Platform	R/V Diodon
Start Date	2017-07-16
End Date	2017-07-17

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Project Information

Collaborative Research: Robust optode-based eddy correlation systems for oxygen flux measurements in aquatic environments (Robust optode-based eddy correlation systems)

Website: http://myweb.fsu.edu/mhuettel/Projects/NSF_Instr.html

Coverage: Sand flat at ~10 m water depth in Florida Keys, 9 km south of Long Key (24° 43.52'N, 80° 49.85'W)

NSF Award Abstract:

The PIs request funding to build and test robust eddy correlation instruments for unidirectional and oscillating flow environments based on sturdy fiber- and planar-optical sensors and novel signal-processing electronics. The new hardware will be supported by software development to correct potential flux underestimations caused by inadequate oxygen sensor response time and spatial offsets between oxygen and flow sensors. The fragility of the thin glass microelectrode used in aquatic eddy correlation instruments severely limits the use of this powerful technique for flux measurements in benthic environments. This problem represents the major bottleneck preventing the widespread use of this approach.

Broader Impacts:

The PIs have very strong records both in spreading the use of EC technology through the community and in graduate and undergraduate education. They outline clearly the ways in which they will continue their ongoing endeavors in both areas. In addition, the application of this technology to the geochemistry and ecology of shallow-water regions has broad implications for carbon cycling and ocean acidification studies, both of which have important societal ramifications. Better quantify oxygen fluxes in the aquatic environment is important for society. It can e.g. help predict when and if the health of an aquatic system is being weakened, and when e.g. hypoxia or anoxia is approaching. Anoxia leads to death of all higher life

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1334117
NSF Division of Ocean Sciences (NSF OCE)	OCE-1334848

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