
Modeling benthic vs. hyporheic uptake in unshaded streams with varying substrates

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Data Guide

Modeling benthic vs. hyporheic nutrient uptake in unshaded streams with varying substrates

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Overview

These files contain data associated with the *JGR-Biogeosciences* article, “Modeling benthic vs. hyporheic nutrient uptake in unshaded streams with varying substrates.” The article can be accessed at <https://doi.org/10.1029/2018JG004684>.

Content overview of this data archive (by file).

Data files

1. **LEEF_Nutrient_Data_publish.mat** – master data file. Contains filenames, some measurements, and pointers to raw and processed data files.
2. **LEEF_N_vf_20181115.csv** – data file used for statistical analysis. See accompanying *RStudio* file.

Codes

1. **LEEF_vf_Script3_rev1.R** – *RStudio* file containing mixed-model analysis calculations used for statistical analysis.

Detailed File information

LEEF_Nutrient_Data_publish.mat

This is a Matlab data file containing one structure-class variable, named 'library'. Because codes refer to row numbers (i.e., indices), blank records that did not contribute to the published dataset are listed as empty rows. Hierarchy of data fields belonging to library is as follows (units in parentheses):

- **sub** – substrate type (alt, pg, mix, cob)
- **dayindex** – index (ordinal) of sampling day; note that day 1 omitted due to experimental errors.

- **BAD** (d) – biofilm accumulation days, i.e., days elapsed since biofilms were physically removed from the streams.
- **tc** (s) – time stamps for conservative samples
- **cc** (mg/L) – conservative samples
- **tr** (s) – time stamps for reactive (NO_3^- -N) samples
- **cr** (mg/L) – reactive samples
- **q** (L/s) – discharge
- **mc** ($\mu\text{S}/\text{cm}$ equivalents) – injection mass of conservative (NaCl) tracer. Divide by 0.534 to convert to mg
- **mr** (mg) – injection mass of reactive (NO_3^- -N) tracer
- **w** (m) – mean stream width
- **FBOM** (g/cm^2) – fine benthic organic matter. Not used in analysis. This field is class 'struct' with subfields containing mean and standard error (se) of 5 replicate measurements.
- **AFDM** (g/cm^2) – ash free dry mass. This field is class 'struct' with subfields:
 - **vals** – data from 5 replicate measurements
 - **mean** – mean of measurements
 - **stdev** – standard deviation of measurements
- **CpA** (mg/m^2) – chlorophyll a. This field is class 'struct' with identical subfields as AFDM.
- **depth** (cm) – mean and standard error for stream depth.
- **transect** – results from transect survey (see main text Section 2.2). Values are the fraction of streambed coverage for each POM class.
- **tr_end** (s) – manually-imposed upper limit to the reactive concentration time series. Values beyond tr_end were not used in the analysis. See supporting information section S3, subsection *Breakthrough Curves*.
- **T** (deg C) – average temperature recorded during the concentration time series, at the BTC location.
- **DREAM** – 'struct' field containing input/output information for the $\text{DREAM}_{(\text{ZS})}$ algorithm. See Vrugt (2016) for more information.

References

- Vrugt, J. A. (2016). Markov chain Monte Carlo simulation using the DREAM software package: Theory, concepts, and MATLAB implementation. *Environmental Modelling & Software*, 75, 273-316. <http://www.sciencedirect.com/science/article/pii/S1364815215300396>