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LBA-ECO ND-11 Stream Carbon and Nutrients, Mato Grosso, Brazil: 2003-2006

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Summary:

Revision date: February 10, 2009

This data set contains streamwater concentrations of pH, specific conductivity, base cations, carbon (dissolved organic carbon (DOC), particulate organic carbon (POC) and bicarbonate alkalinity) and silica for four headwater streams in the seasonally dry Amazon (Johnson et al. (2006a) and Johnson et al. (2006b)). Data are provided in one comma-separated ASCII file.

This hydrologic study of four headwater watersheds was conducted in an undisturbed forest near Juruena, Mato Grosso in the seasonally dry, southern Amazon. The small catchments range in size from 0.85 to 1.9 ha. Stream water samples were collected weekly during rainy seasons and biweekly during the dry seasons. Stream water concentrations of base cations, silica, electrical conductivity, DOC, and alkalinity varied inversely with discharge. While there was variation among the watersheds, the concentration-discharge patterns were consistent for each of the four watersheds. Discharge data are not included in this data set and will be archived separately.

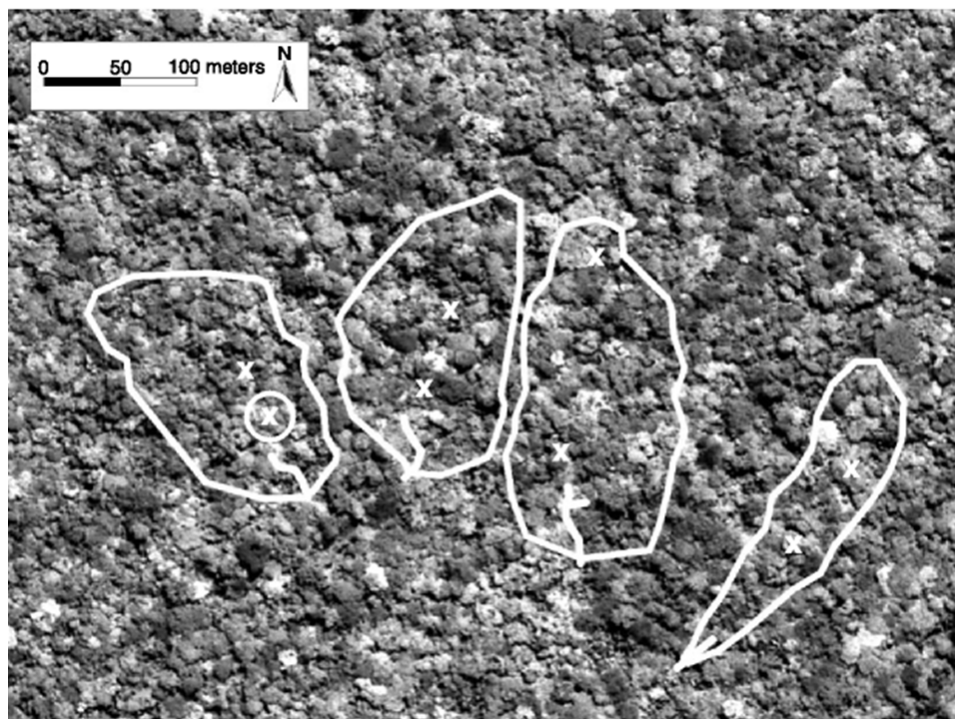


Figure 1. Study location near Juruena, Mato Grosso, Brazil, depicted with watershed delimitation and streams overlain on a 2002 IKONOS panchromatic image of the forested study location (courtesy EOS-Webster). Watersheds are identified as B1, B2, B3, and B4 from right to left.

Data Citation:

Cite this data set as follows:

Johnson, M.S., J. Lehmann, S.J. Riha, J.P. Novaes Filho and E.G. Couto. 2009. LBA-ECO ND-11 Stream Carbon and Nutrients, Mato Grosso, Brazil: 2003-2006. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/921

Implementation of the LBA Data and Publication Policy by Data Users:

The LBA Data and Publication Policy [http://daac.ornl.gov/LBA/lba_data_policy.html] is in effect for a period of five (5) years from the date of archiving and should be followed by data users who have obtained LBA data sets from the ORNL DAAC. Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.

This data set was archived in March 2009. Users who download the data between March 2009 and February 2014 must comply with the LBA Data and Publication Policy.

Data users should use the Investigator contact information in this document to communicate with the data provider. Alternatively, the LBA Web Site [<http://lba.inpa.gov.br/lba/>] in Brazil will have current contact information.

Data users should use the Data Set Citation and other applicable references provided in this document to acknowledge use of the data.

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1. Data Set Overview:

Project: LBA (Large-Scale Biosphere-Atmosphere Experiment in the Amazon)

Activity: LBA-ECO

LBA Science Component: Nutrient Dynamics

Team ID: D-11 (Lehmann / Passos / Couto)

The investigators were Johnson, Mark Stephen; Lehmann, Johannes and Couto, Eduardo Guimaraes . You may contact Johnson, Mark Stephen (msj8@cornell.edu).

LBA Data Set Inventory ID: ND11_Stream_Nutrients

A hydrologic study of four headwater watersheds was conducted in an undisturbed forest near Juruena, Mato Grosso in the seasonally dry, southern Amazon. The small catchments range in size from 0.85 to 1.9 ha. Stream water samples were collected weekly during rainy seasons and biweekly during the dry seasons. Stream water concentrations of base cations, silica, electrical conductivity, dissolved organic carbon (DOC) and alkalinity varied inversely with discharge. While there was variation among the watersheds, the concentration-discharge patterns were consistent for each of the four watersheds.

This data set contains streamwater concentrations of pH, specific conductivity, base cations, carbon (DOC, POC and bicarbonate alkalinity) and silica for four headwater streams in the seasonally dry Amazon.

Related Data Sets :

LBA-ECO ND-11 Coarse Particulate Organic Carbon Watershed Exports, Jurena: 2003-2004

LBA-ECO ND-11 Soil Properties of Forested Headwater Catchments, Mato Grosso, Brazil

2. Data Characteristics:

One comma-delimited ASCII file is provided. Values of -9999 in ASCII file indicate missing values. Headwater stream locations are shown in Figure 1.

Data file: base-flow.csv

| Column | Parameter Description |
|--------------|--|
| ---column 1: | Stream; identifier for headwater stream |
| ---column 2: | Date; sample collection date in yyyy/mm/dd format |
| ---column 3: | pH; stream water pH determined in situ |
| ---column 4: | EC; stream water electrical conductivity (EC) determined in situ (uS/cm) |
| ---column 5: | Na; stream water sodium concentration (mg/L) |
| ---column 6: | K; stream water potassium concentration (mg/L) |

---column 7: Mg; stream water magnesium concentration (mg/L)
 ---column 8: Ca; stream water calcium concentration (mg/L)
 ---column 9: DOC; stream water dissolved organic carbon (DOC, <0.7 um) concentration (mg/L)
 ---column 10: POC; stream water fine particulate organic carbon (POC, 0.7 um - 2 mm) concentration (mg/L)
 ---column 11: SiO₂; stream water silica concentration (mg/L)
 ---column 12: pH_lab; stream water pH determined in lab after filtration and equilibration
 ---column 13: Alk; stream water alkalinity determined in lab after equilibration (mg C/L from HCO₃⁻)

Example Data Records

```

Stream,Date,pH,EC,Na,K,Mg,Ca,DOC,POC,SiO2,pH_lab,Alk
B1,2003/11/18,6.14,54,2.98,1.83,1.22,2.32,4.14,0.47,-9999,-9999,-9999
B1,2003/11/25,5.46,45,3.08,2.46,1.41,2.49,3.13,0.18,-9999,-9999,-9999
B1,2003/12/01,5.43,48,1.44,1.22,0.69,1.10,1.34,-9999,-9999,-9999
..
B4,2006/04/05,6.28,10,-9999,-9999,-9999,-9999,0.52,-9999,3.0,6.10,1.60
B4,2006/04/27,5.44,11,-9999,-9999,-9999,-9999,0.37,-9999,-9999,6.38,1.60
B4,2006/05/18,5.60,15,-9999,-9999,-9999,-9999,0.48,-9999,5.1,6.36,2.00
  
```

Site boundaries: (All latitude and longitude given in degrees and fractions)

| Site (Region) | Westernmost Longitude | Easternmost Longitude | Northernmost Latitude | Southernmost Latitude | Geodetic Datum |
|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------------------|
| Mato Grosso - Juruena (Mato Grosso) | -58.75969 | -58.75969 | -10.42492 | -10.42492 | World Geodetic System, 1984 (WGS-84) |

Time period:

- The data set covers the period 2003/11/18 to 2006/05/18.
- Temporal Resolution: Weekly

Platform/Sensor/Parameters measured include:

- STREAMFLOW STATION / STREAM GAUGE / DISCHARGE/FLOW
- LABORATORY / ION CHROMATOGRAPH / WATER ION CONCENTRATION

3. Data Application and Derivation:

Data sets contain results from field study of stream water nutrient and carbon contents at four headwater watersheds.

4. Quality Assessment:

No known problems with data.

5. Data Acquisition Materials and Methods:

Stream samples were collected as grab samples, filtered using glass fiber filters, and analyzed using ion chromatography (base cations), total carbon analyzer (DOC and POC), and colorimetrically (silica). Alkalinity was determined by titration to fixed endpoint (pH = 4.5) and expressed as HCO₃⁻ (mg C/L). Stream water pH and specific conductivity recorded in field (in situ) using hand-held, combination pH / EC meter.

6. Data Access:

This data is available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

Data Archive Center:

Contact for Data Center Access Information:

E-mail: uso@daac.ornl.gov
 Telephone: +1 (865) 241-3952

7. References:

Johnson, M.S., J. Lehmann, E.G. Couto, J.P. Novaes, and S.J. Riha. (2006a). DOC and DIC in flowpaths of Amazonian headwater catchments with hydrologically contrasting soils. *Biogeochemistry* 81(1):45-57. doi: 10.1007/s10533-006-9029-3.

Johnson, M.S., J. Lehmann, E.C. Selva, M. Abdo, S.J. Riha, and E.G. Couto (2006b). Organic carbon fluxes within and streamwater exports from forested headwater catchments in the southern Amazon. *Hydrological Processes* 20: 2599-2614. doi: 10.1002/hyp.6218.



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