Revision Date: February 27, 2009

LBA-ECO ND-11 Organic Carbon Watershed Exports, Mato Grosso, Brazil: 2003-2004

Summary:

This data set contains stream water exports of coarse particulate organic matter (CPOM) and coarse particulate organic carbon (CPOC) during 2003-2004 from four forested headwater streams near Juruena, Mato Grosso, Brazil (Selva et al. (2007) and Johnson et al. (2006) . Data are reported in a single comma-separated ASCII file as watershed exports in mass units, carbon content, and watershed exports per watershed area over the reported sampling intervals.

Resolving the carbon balance in the Amazonian forest depends on an improved quantification of production and losses of particulate C from forested landscapes via stream export. The export of coarse organic particulate matter (>2 mm) was quantified for one year in four small watersheds (1-2 ha) under native forest in southern Amazonia near Juruena, Mato Grosso, Brazil. Stream-water exports of particulate C were positively correlated with stream flow, increasing in the rainiest months. The export of particulate C in stream flow was found to be a small (less than 1%) percentage of the amount of litterfall produced.

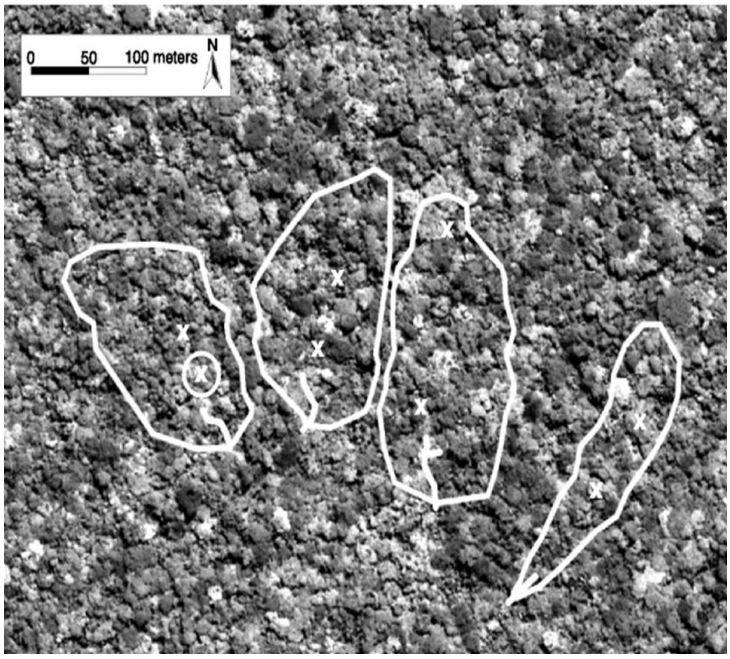

Figure 1. Study location near Juruena, Mato Grosso, Brazil, depicted with watershed delimitation and streams overlain on a 2002 IKONOS panchromatic image of the forested study location (courtesy EOS-Webster). Watersheds are identified as B1, B2, B3, and B4 from right to left.

Data Citation:

Cite this data set as follows:

Selva, E.C., E.G. Couto, M.S. Johnson and J. Lehmann. 2009. LBA-ECO ND-11 Organic Carbon Watershed Exports, Mato Grosso, Brazil: 2003-2004. 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/913

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 Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.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 of 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.

Table of Contents:

1. Data Set Overview:

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

Activity: LBA-ECO

LBA Science Component: Nutrient Dynamics

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

The investigators were Selva, Evandro Carlos; Couto, Eduardo Guimaraes; Johnson, Mark Stephen and Lehmann, Johannes. You may contact Selva, Evandro Carlos (evandroc@cpd.ufmt.br).

LBA Data Set Inventory ID: ND11_Carbon_Export_CPOM

Resolving the carbon balance in the Amazonian forest depends on an improved quantification of production and losses of particulate C from forested landscapes via stream export. The export of coarse organic particulate matter (>2 mm) was quantified for one year in four small watersheds (1-2 ha) under native forest in southern Amazonia near Juruena, Mato Grosso, Brazil. Stream-water exports of particulate C were positively correlated with stream flow, increasing in the rainiest months. The export of particulate C in stream flow was found to be very small (less than 1%) in relation to the amount of litterfall produced.

The data set contains stream water exports of coarse particulate organic matter and coarse particulate organic carbon from four forested headwater streams near Juruena, Mato Gross. Data is presented as watershed exports in mass units, carbon content, and watershed exports per watershed area.

Related Data Sets:

LBA-ECO ND-11 Soil Properties of Forested Headwater Catchments

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

2. Data Characteristics:

One comma-delimited ASCII file is provided. There are no missing values.

CPOM_export.csv

Column	Description
---column 1:	Location; identifier for headwater stream
---column 2:	Date; sample collection date in yyyy/mm/dd format
---column 3:	CPOM_mass; coarse particulate organic matter (CPOM) (g)
---column 4:	CPOC_mass; coarse particulate organic carbon (CPOC) (g)
---column 5:	C-content-of-CPOM; carbon content of CPOM (%)
---column 6:	CPOM_mass-per-WS-area; coarse particulate organic matter (CPOM) export (g/m2 watershed area)
---column 7:	CPOC_mass-per-WS-area; coarse particulate organic carbon (CPOC) export (g/m2 watershed area)

Example Data Records

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Location,Date,CPOM_mass,CPOC_mass,C-content-of-CPOM,CPOM_mass-per-WS-area,CPOC_mass-per-WS-area
B1,2003/09/15,115.80,54.99,47.49,0.0138,0.0065
B1,2003/09/22,22.62,10.27,45.39,0.0027,0.0012
B1,2003/10/04,69.14,29.91,43.26,0.0082,0.0036
...
B4,2004/07/29,36.07,15.97,44.28,0.0031,0.0014
B4,2004/08/20,28.61,12.67,44.28,0.0024,0.0011
B4,2004/09/13,34.68,15.36,44.28,0.0029,0.0013
```

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 2003/09/15 to 2004/09/13.
- Temporal Resolution: Weekly-biweekly (wet-dry seasons)

Platform/Sensor/Parameters measured include:

- LABORATORY / CARBON ANALYZER / ORGANIC CARBON
- FIELD INVESTIGATION / WEIGHING BALANCE / ORGANIC MATTER

3. Data Application and Derivation:

Resolving the carbon balance in the Amazonian forest depends on an improved quantification of production and losses of particulate C from forested landscapes via stream export. The export of coarse organic particulate matter (>2 mm) was quantified for one year in four small watersheds (1-2 ha) under native forest in southern Amazonia near Juruena, Mato Grosso, Brazil. Stream-water exports of particulate C were positively correlated with stream flow, increasing in the rainiest months. The export of particulate C in stream flow was found to be a small (less than 1%) percentage of the litterfall produced.

4. Quality Assessment:

No known problems with data.

5. Data Acquisition Materials and Methods:

Samples were collected using weir traps at the four watershed outlets. A coarse organic matter trap was fixed on the downstream side of the weirs, consisting of a box frame (1 m3) lined with 2-mm mesh on its top, bottom and all sides except on the weir side (i.e. entrance to the trap). The bottom of the box was attached 15 cm below the weir notch so as to not impede free discharge over the weir, and the exit side of the box was fitted with a panel that could be raised to facilitate collection of material retained in the trap.

These weir trap collectors were made from plastic mesh and were installed such that all coarse particulate matter exported from the watersheds was retained in the trap and was removed during routine sample collection.The traps were constructed in the shape of a cube (1m on all sides), with the bottom opening to the trap located below the base of the V-notch so as to not interfere with the free discharge of water over the weir. Samples from the weir traps were collected approximately weekly during the rainy season and biweekly during the dry season. Of these samples, 16 were analyzed for particle size distribution following air drying in the laboratory, and were evenly distributed between the two seasons.

Stream flow CPOM exports were dried to constant mass (70 C) and ground on a Wiley mill. Samples were analyzed in the Limnology Laboratory of the Federal University of Mato Grosso for C concentration on a total carbon analyzer (Multi N/C, Analytik Jena, Jena, Germany) with an inline furnace for analysis of solid samples (Eltra HTF-540, Neuss, Germany). Ground

samples were introduced into the 1300 C furnace where all carbonaceous materials were converted to CO2, which was immediately analyzed by infrared gas analysis (Buurman et al. 1996). Exports were determined from the amount of CPOM retained on the weir traps during the collection interval.

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:

Buurman, P., Van Lagen, B. & Velthorst, E.J. 1996. Manual for soil and water analysis. Backhuys Publishers, Leiden. 314 pp.

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

E.C. Selva, E.G. Couto, M.S. Johnson and J. Lehmann (2007). Litterfall production and fluvial export in headwater catchments of the southern Amazon. Journal of Tropical Ecology 23:329-335. doi:10.1017/S0266467406003956.
