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LBA-ECO CD-08 Leaf Carbon, Nitrogen, LAI, and Isotope Data, Manaus, Brazil: 2001

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Revision Date: September 2, 2014

Summary:

This data set provides measurements for carbon (C), nitrogen (N), leaf area index (LAI), and carbon isotope ratio data (^{13}C and ^{14}C) of leaves sampled at the Manaus ZF2 Jacaranda transect area, Amazonas, Brazil, in 2001. Leaf tips and the petioles from the youngest and oldest leaves from sampled branches for 9 different species were analyzed.

There is one comma-delimited data file (.csv) with this data set.

Data Citation:

Cite this data set as follows:

Trumbore, S.E. 2014. LBA-ECO CD-08 Leaf Carbon, Nitrogen, LAI, and Isotope Data, Manaus, Brazil: 2001. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1245>

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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 Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.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 September 2014. Users who download the data between September 2014 and August 2019 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.

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: Carbon Dynamics

Team ID: CD-08 (Trumbore / Camargo)

The investigators were Trumbore, Susan E.; Camargo, Plinio Barbosa de; Chambers, Jeffrey Q.; Felseburgh, Cristina Aledi; Higuchi, Niro; Ishida, Françoise Yoko; Lara, Luciene L.S.; Martinelli, Luiz Antonio; Melo, Antonio Willian Flores de; Miranda, Erika; Moreira, Marcelo Zacharias; Perez, Tibusay Josefina Acosta; Pinto, Alberto C.M.; Rocha, Rosana; Santos, Guaciara dos; Santos, Joaquim dos; Selhorst, Diogo; Silva, Roseana P. da; Silveira, Vanessa P.; Suemitsu, Chieno; Teixeira, Liliane Martins; Telles, Everaldo de Carvalho Conceicao; Tribuzy, Edgard Siza and Vieira, Simone Aparecida. You may contact Trumbore, Susan E. (setrumbo@uci.edu) and Camargo, Plinio Barbosa de (pcamargo@cena.usp.br).

LBA Data Set Inventory ID: CD08_Leaf_Isotopes_Manus

This data set provides measurements for carbon (C), nitrogen (N), leaf area index (LAI), and carbon isotope ratio data (^{13}C and ^{14}C) of leaves sampled at the Manaus ZF2 Jacaranda transect area, Amazonas, Brazil, in 2001. Leaf tips and the petioles from the youngest and oldest leaves from sampled branches for 9 different species were analyzed.

Related Data Sets (research performed at the same site and during same time period):

[LBA-ECO CD-08 Tropical Forest Ecosystem Respiration, Manaus, Brazil](#)

[LBA-ECO CD-08 Radiocarbon Dating of Tree Ages in Amazonas, Acre, and Para in Brazil](#)

2. Data Characteristics:

Data are provided in one comma-delimited (.csv) file: **leaf_isotopes_manus.csv**

All samples were collected on August 8, 2001. Missing data are represented as -9999.

Column	Column Heading	Units/format	Description
1	Site		Study site. All samples were taken at the Manaus ZF2 site (Manaus ZF2 transect).
3	Common_name		Local name in Portugese
4	Genus		Genus of plant sampled
5	Family		Scientific family of plant sampled
6	Relative_age_leaf		Relative age of leaves based on position on the twig: Young leaves were taken from the tip and old leaves from the position farthest away from the tip
7	Subsample		Sample type: both leaf tip (Tip) and petiole (Stem) were sampled
8	Mean_leaf_area	cm ²	Leaf area was measured by making photo copies of the leaves, cutting them out, weighing the cut-outs, and converting weight of the paper to area in cm ²
9	Std_dev_leaf_area	cm ²	Standard deviation of the leaf area measurements in cm ²
10	Sample_count		Number of individual leaves used in calculating average and standard deviation for leaf area
11	N_concentration	%	Leaf nitrogen concentration measured by dry combustion using a Fisons elemental analyzer according to standard methods
12	C_concentration	%	Leaf carbon concentration measured by dry combustion using a Fisons elemental analyzer according to standard methods
13	CN_ratio		Mass based ratio of carbon to nitrogen concentrations
			delta ¹³ C data are reported as [[¹³ C/ ¹² C ratio

14	delta_13C	per mil	of the sample divided by the 13C/12C of the PeeDee Belemnite standard] -1]*1000
15	Delta_14C	per mil	Measured using accelerator mass spectrometry with an overall accuracy of +/- 5 per mil. DELTA 14C data are reported as 14C/12C ratio of the sample divided by 0.95 times the 14C/12C of the Oxalic Acid standard

Example data records:

```
Site,Common_name,Genus,Family,Relative_age_leaf,Subsample,Mean_leaf_area,
Std_dev_leaf_area,Sample_count,N_concentration,C_concentration,CN_ratio,delta_13C,Delta_14C
Manaus_ZF2_transect,Breu_manga,Protium,Burseraceae,Young,Tip,
-9999,-9999,-9999,2.39,49.57,21,-35.07,77.1
Manaus_ZF2_transect,Breu_manga,Protium,Burseraceae,Young,Stem,
-9999,-9999,-9999,1.1,46.91,43,-35.03,80.6
Manaus_ZF2_transect,Breu_manga,Protium,Burseraceae,Old,Tip,
-9999,-9999,-9999,2.01,45.23,23,-36.26,80.8
...
Manaus_ZF2_transect,Lacre_Branco_da_Mata,Vismia,Clusiaceae,Old,Tip,
43,10,7,1.9,52.29,28,-33.43,91.55
Manaus_ZF2_transect,Lacre_Branco_da_Mata,Vismia,Clusiaceae,Old,Stem,
43,10,7,0.93,48.5,52,-33.12,98.2
Manaus_ZF2_transect,Maçaranduba,Manilkara,Sapotaceae,Young,Tip,
68,17,5,1.16,53.96,47,-31.46,81.7
...
Manaus_ZF2_transect,Matamata,Eschweilera,Lecythidaceae,Young,Stem,
17,7,7,1.16,51.56,44,-34.81,97.7
Manaus_ZF2_transect,Matamata,Eschweilera,Lecythidaceae,Old,Tip,
31,5,7,2.3,52.07,23,-36.02,91.6
Manaus_ZF2_transect,Matamata,Eschweilera,Lecythidaceae,Old,Stem,
31,5,7,1.2,36.16,30,-35.51,88.8
```

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude	Geodetic Datum
Amazonas (Manaus) - ZF2 km 34 (Amazonas (Manaus))	-60.20910	-60.00000	-2.50000	-2.60900	WGS-84

Time period:

- The data set covers the period 2001/08/08 to 2001/08/8.
- Temporal Resolution: All samples were collected on August 8, 2001

Platform/Sensor/Parameters measured include:

- LABORATORY / MASS SPECTROMETER / ISOTOPES
- FIELD INVESTIGATION / WEIGHING BALANCE / LEAF CHARACTERISTICS
- LABORATORY / CHN ANALYZER / NITROGEN
- LABORATORY / CHN ANALYZER / CARBON

3. Data Application and Derivation:

Biophysical parameters are components of the biosphere models used in climate simulation studies.

4. Quality Assessment:

None provided.

5. Data Acquisition Materials and Methods:**Site description**

This study was carried out in the ZF-2 Experimental Station of the National Institute for Research in the Amazon (INPA), approximately 90-km north of Manaus, the capital of Amazonas State, Brazil. The site is a dense terra-firme tropical moist forest, which dominates the Central Amazon landscape (Higuchi et al., 1997).

Sampling

All samples were collected on August 8, 2001 at the Manaus ZF2 site (Manaus_ZF2_transect). Leaf tips and petioles (stem) were sampled. The relative age of leaves based on position on the twig are also reported. Young leaves were taken from the tip of the twig and old leaves from the end of the twig. Leaves were dried and stored until analysis at CENA.

Analysis

Leaf area was measured by making photo copies of the leaves, cutting them out, weighing the cut-outs, and converting weight of the paper to area in cm².

Leaf carbon and nitrogen concentrations (%) were measured by dry combustion using a Fisons elemental analyzer according to standard methods.

Delta (lower case Greek Delta) ¹³C data are reported as $[[^{13}\text{C}/^{12}\text{C} \text{ ratio of the sample divided by the } ^{13}\text{C}/^{12}\text{C} \text{ of the PeeDee Belemnite standard}] - 1] * 1000$.

Delta (upper case Greek Delta) ¹⁴C was measured using accelerator mass spectrometry with an overall accuracy of +/- 5 per mil. Delta (capital greek Delta) ¹⁴C data are reported as $[[^{14}\text{C}/^{12}\text{C} \text{ ratio of the sample divided by 0.95 times the } ^{14}\text{C}/^{12}\text{C} \text{ of the Oxalic Acid I standard, decay corrected to 1950}] - 1] * 1000$.

NOTE: For additional information on ¹³C and ¹⁴C isotope analysis, refer to Telles et al., 2011 and Trumbore 1993.

6. Data Access:

These data are 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:

Higuchi, N., dos Santos, J., Ribeiro, R.J., Freitas, J.V., Vieira, G., Coic, A., Minette, L.J., 1997. Crescimento e Incremento de uma Floresta Amazonica de Terra-Firme Manejada Experimentalmente. In: Biomassa de Nutrientes Florestais. INPA/ DFID, pp. 89-132.

Telles E.D.C., P.B. de Camargo, L.A. Martinelli, S.E. Trumbore, E.S. da Costa, J. Santos, N. Higuchi, R.C. Oliveira and D. Markewitz. 2011. LBA-ECO CD-08 Carbon Isotopes in Belowground Carbon Pools, Amazonas and Para, Brazil. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. <http://dx.doi.org/10.3334/ORNLDAAC/1025>

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