LBA-ECO CD-08 Tree Diameter Measurements, Jacaranda Plots, Manaus, Brazil: 1999-2001

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Revision date: October 16, 2013

Summary:

This data set provides diameter at breast height (DBH) measurements made of trees in a dense terra-firme tropical moist forest at the ZF-2 Experimental Station, 90 km north of Manaus, Brazil. DBH was measured over two transects (East to West and North to South) which were established in 1996 by the Jacaranda Project (agreement between the National Institute for Research in the Amazon (INPA) and the Japan International Cooperation Agency, JICA). For each tree, a metal dendrometer band was fixed to the trunk and growth in circumference was measured monthly with digital calipers.

The transects measured 20-m x 2500-m, and were stratified by plateau, slope, and baixio (lowland areas near small streams). Topography location, distance along the transect, height at which the band was installed, local tree name, and field notes are also provided in the data files. Measurements were taken between June 1999 and December 2001.

There are four data files in comma-delimited format (.csv) with this data set.

Data Citation:

Cite this data set as follows:

Chambers, J.Q., R.P. da Silva, E. Siza Tribuzy, J. dos Santos, and N. Higuchi. 2013. LBA-ECO CD-08 Tree Diameter Measurements, Jacaranda Plots, Manaus, Brazil: 1999-2001. 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/1194

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This data set was archived in October of 2013. Users who download the data between October 2013 and September 2018 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 Chambers, Jeffrey Q.; Trumbore, Susan E.; Santos, Joaquim dos; Higuchi, Niro; Tribuzy, Edgard Siza; Silva, Rose Pereira da and Gomes, Patricia . You may contact Chambers, Jeffrey Q. (JChambers@lbl.gov).

LBA Data Set Inventory ID: CD08_Tree_Growth_Manaus

This data set provides diameter at breast height (DBH) measurements made of trees in a dense terra-firme tropical moist forest at the ZF-2 Experimental Station, 90 km north of Manaus, Brazil. DBH was measured over two transects (East to West and North to South) which were established in 1996 by the Jacaranda Project (agreement between the National Institute for Research in the Amazon (INPA) and the Japan International Cooperation Agency, JICA). For each tree, a metal dendrometer band was fixed to the trunk and growth in circumference was measured monthly with digital calipers.

The transects measured 20-m x 2500-m, and were stratified by plateau, slope, and baixio (lowland areas near small streams). Topography location, distance along the transect, height at which the band was installed, local tree name, and field notes are also provided in the data files. Measurements were carried out between June 1999 and December 2001.

2. Data Characteristics:

Data are presented in 4 comma separated files (.csv):

File #1: CD08_Dendrometers_Jacaranda_Edgard_EW.csv

File #2: CD08_Dendrometers_Jacaranda_Edgard_NS.csv

File #3 CD08_Dendrometers_Jacaranda_Rosa_EW.csv

File #4: CD08_Dendrometers_Jacaranda_Rosa_NS.csv

Files 1 and 2 follow the same organizational scheme:

CD08_Dendrometers_Jacaranda_Edgard_EW.csv and **CD08_Dendrometers_Jacaranda_Edgard_NS.csv**

COLUMN	COLUMN HEADING	Units/format	Description
1	PI		Name of the principal investigator for whom the data were originally collected
2	Tree_ID		Tree identification
3	Local_name		Local name of the tree species where identified
4	Transect		Location of the tree on either the North-South (N-S) or East-West (E-W) transect set up in the Jacaranda plots
5	UA		Sampling unit (unidade de amostra in Portuguese) each 2500-m by 20-m transect was divided into 125 20-m by 20-m units numbered sequentially
6	Distance	m	Distance along the transect reported to the nearest 20-m
7	Topography		Location in terms of topography: plateau, slope or baixio which refers to a lowland position associated with small streams
8	DBH_init	cm	Initial DBH reported in centimeters (cm)
9	Family		Identification of the tree to scientific family
10	Genus		Identification of the tree to genus
11	species		Identification of the tree to species
12 to 28	YYYYMMDD	mm	Columns 12 through 28 are labelled with the sampling date in the format YYYYMMDD and report the dendrometer reading on that date in millimeters (mm)
29	Notes		Notes from field observations on the condition of the tree and the dendrometer

Missing data are represented by -9999

Sample data for Files #1 and 2:

```
PI,Tree_ID,Local_name,Transect,UA,Distance,Topography,DBH_init,Family,Genus,species,
20000712,20000831,20000926,20001103,20001204,20010103,20010201,20010309,20010425,
20010530,20010626,20010724,20010828,20010925,20011031,20011128,20011227,
Notes

Edgard,56,LOURO PRETO,E-W,3,60,plateau,10.5,Lauraceae,Ocotea,minor,
20.3,20.87,20.895, 21.95,22.3,22.41,22.85,23.21,24.32,
25.49,25.87,26.37,26.86,27.65,29.52,29.64,30.39,
-9999
Edgard,70,CAROBA,E-W,3,60,plateau,23.8,Bignoniaceae,Jacaranda,copaia,
11.65,11.35,11.02, 13.29,15.45,17.55,19.07,21.16,23.93,25.43,
26.31,27.23,27.41,27.52,28.1,30.09,32.95,
-9999
...
Edgard,1891,UCHI AMARELO,E-W,81,1620,baixio,18,Humiriaceae,Sacoglottis,ceratocarpa,
16.65,16.605,17.36,18.52,19.46,20.21,21.19,22.3,23.29,23.66,
23.74,23.69,23.79,24.07,25.05,25.83,26.77,
-9999
Edgard,1906,LOURO PIRARUCU,E-W,85,1700,baixio,15.5,Lauraceae,Aniba,williamsii,
28,27.97,28.515,28.76,28.91,28.85,29,29.32,30.28,31.23,
31.78,32.24,32.75,33.39,34.34,35.03,36.09,
-9999
...
Edgard,2798,EMBAUBARANA,E-W,123,2460,plateau,51,Cecropiaceae,Pourouma,villosa,
12.41,13.095,13.685,14.3,14.4,14.17,14.69,14.95,15.48,16.07,
16.25,16.49,16.14,16.38,16.5,16.95,16.56,
-9999
Edgard,2811,ANANI,E-W,123,2460,plateau,33.5,Clusiaceae,Symphonia,globulifera,
6.5,6.475,6.265,6.53,6.98,7.49,7.8,8.44,9.16,9.66,
9.77,9.86,9.81,10.23,11.13,11.44,12.26,
-9999
```

Files 3 and 4 follow the same organizational scheme:

CD08_Dendrometers_Jacaranda_Rosa_EW.csv and **CD08_Dendrometers_Jacaranda_Rosa_NS.csv**

COLUMN	COLUMN HEADING	Units/format	Description
1	PI		Name of the principal investigator for whom the data were originally collected
2	Tree_ID		Tree identification
3	Local_name		Local name of the tree species where identified
4	Transect		Location of the tree on either the North-South (N-S) or East-West (E-W) transect set up in the Jacaranda plots
5	UA		Sampling unit (unidade de amostra in Portuguese): each 2500-m by 20-m transect was divided into 125 20-m by 20-m units numbered sequentially
6	Distance	m	Distance along the transect reported to the nearest 20-m
7	Topography		Location in terms of topography: plateau, slope or baixio which refers to a lowland position associated with small streams
8	DBH_init	cm	Initial DBH reported in centimeters (cm)
9	Band_ht	m	Height at which the dendrometer band was installed reported in meters (m)
10 to 40	YYYYMMDD	mm	Columns 10 through 40 are labelled with the sampling date in the format YYYYMMDD and report the dendrometer reading on that date in millimeters (mm)
41	Notes		Notes from field observations on the condition of the tree and the dendrometer

missing data are represented by -9999

Sample data for Files #3 and 4:

```
PI,Tree_ID,Local_name,Transect,UA,Distance,Topography,DBH_init,Band_ht,
```

19990620,19990723,19990820,19990926,19991026,19991128,19991220,20000127,
20000222,20000323,20000426,20000530,20000629,20000728,20000823,20000926,
20001026,20001128,20001227,20010129,20010220,20010329,20010425,20010529
,20010626,20010725,20010827,20010925,20011031,20011127,20011227,
Notes
Rose,83,CARDEIRO,E-W,4,,plateau,44.8,1.3,
55.35,55.89,55.89,54.09,52.07,51.47,51,48.01,
48.38,47.9,47.9,47.89,47.98,48.06,48.09,48.61,
48.6,48.5,48.38,48.33,47.96,47.83,47.8,47.92,
47.28,46.51,45.87,45.15,43.37,43.03,42.31,
shedding bark
Rose,87,MATAMATA AMARELO,E-W,4,,plateau,22.8,1.2,
53.49,53.79,53.81,54.06,52.71,49.77,48.76,46.57,
45.66,44.69,43.39,42.9,42.45,42.15,41.76,41.88,
41.68,41.69,41.63,41.48,41.58,41.58,41.58,41.68,
41.61,41.56,41.56,41.63,41.61,41.59,41.6,-9999
...
Rose,1311,ABIURANA OLHO DE VEADO,E-W,57,,slope,13.5,1.3,
44.27,43.58,42.7,40.97,39.79,38.03,36.48,37.59,33.89,
32.75,31.68,31.33,30.97,30.75,30.25,30.24,30.2,30.11,
29.23,27.63,26.73,25.12,24.14,22.23,20.87,19.43,18,16.45,
14.39,13.94,13.24,-9999
Rose,1314,PAU RAINHA,E-W,57,,slope,30.8,1.3,
38.08,38.19,38.47,38.37,38.41,38.17,37.95,35.18,36.85,
36.22,35.33,37.62,37.7,37.67,37.24,37.71,37.68,37.63,37.58,
37.34,37.24,36.71,36.27,35.85,35.19,35.2,34.41,33.21,31.24,
31.32,31.42,no canopy/ opening fallen tree/ dendrometer band destroyed
...
Rose,2826,PITOMBA DA MATA,E-W,124,,plateau,12.3,1.3,49.76,
49.74,49.71,49.21,49.74,49.83,49.96,49.96,49.94,
49.92,49.91,49.9,49.87,49.97,49.97,49.97,49.9,49.97,
49.98,49.94,49.97,49.92,49.91,49.89,50.06,50.04,
49.86,49.88,50,49.99,49.98,mosses Rose,2828,CARAPANAUBA,E-W,124,,plateau,60.5,1.3,56.79,
55.99,54.68,52.99,51.22,50.09,47.67,47.14,45.99,44.39,
42.31,41.36,39.98,37.83,36.2,34.1,32.21,29.49,27.67,25.03,
24.03,22,20.32,18.03,16.34,14.48,14.39,13.44,11.34,
9.76,6.91,-9999

Site Boundaries: (All latitude and longitude given in decimal degrees)

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude	Geodetic Datum
Amazonas (Manaus) - ZF2 km 34 (Amazonas (Manaus))	-60.2093	-60.2093	-2.6091	-2.6091	World Geodetic System, 1984 (WGS-84)

Time period:

- The data set covers the period 1999/06/20 to 2001/12/27.
- Temporal Resolution:dendrometers were measured monthly

Platform/Sensor/Parameters measured include:

- FIELD INVESTIGATION / DENDROMETER BANDS / DIAMETER AT BREAST HEIGHT (DBH)
- FIELD INVESTIGATION / CALIPERS / DIAMETER AT BREAST HEIGHT (DBH)

3. Data Application and Derivation:

Annual rates of above-ground biomass productivity can be calculated based on the diameter increments measured using allometric equations.

4. Quality Assessment:

Species identifications were done by local technicians with years of experience but not verified by herbarium experts.

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 Central Amazon landscape (Higuchi et al., 1997). Two transect plots were established in 1996 by the Jacaranda Project. These transects measure 20-m x 2500-m (5 ha) each, oriented in East to West (E-W) and North to South (N-S) directions, and are stratified by plateau, slope and baixio (lowland areas associated with small streams). According to Ferraz et al. (1998), soil classification and textures for plateaus, slopes, and baixios are, respectively, Oxisols very clayey, Ultisols clayey sand and sandy clay, and Entisols very sandy. Within the two transects, soils present low fertility, high acidity, and high negative charges at depressions.

Dendrometer measurements

Initially, 300 individual trees were selected at random from the transect plots (Higuchi et al., 1998), equally distributed among topographical classes (plateau, slope and baixio), the E-W and N-S transects, and the diameter classes (between 10-cm and 30-cm DBH, between 30-cm and 50-cm DBH and greater than 50-cm DBH). Metal dendrometer bands were installed on each selected tree, which measured changes in stem diameter through return spring displacement. Because there is an adjustment period for the metal dendrometers the first readings should be discarded (Keeland and Sharitz, 1993), so only 12 measurements were used from 2000. The total number of tree measurements reported was 272, with the last measurement made December 2001.

Displacement measurements were taken by a digital caliper with precision of 0.01 mm. All metal dendrometers were installed in June 1999 when the first measurement was taken. Measurements were taken monthly between days 25 and 30.

6. Data Access:

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

Data Archive Center:

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

7. References:

da Silva, R.P., J. dos Santos, E.S. Tribuzy, J.Q. Chambers, S. Nakamura, and N. Higuchi. 2002. Diameter increment and growth patterns for individual tree growing in Central Amazon, Brazil. Forest Ecology and Management 166(1-3):295-301.

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Higuchi, N., dos Santos, J., Vieira, G., Ribeiro, R.J., Sakurai, S., Ishizuka, M., Sakai, T., Tanaka, N., Saito, S., 1998. Analise Estrutural da Floresta Primaria da Bacia do Rio Cuieiras, ZF-2, Manaus-AM, Brasil. In: Higuchi, N., Campos, M.A.A., Sampaio, P.T.B., dos Santos, J. (Eds.), Pesquisas Florestais para Conservacao da Floresta e Reabilitacao de Areas Degradadas da Amazonia, pp. 51-81.

Keeland, B.D., Sharitz, R.R., 1993. Accuracy of tree growth measurements using dendrometer bands. Can J. For. Res. 23, 2454–2457.