PLANT PHYSIOLOGY

Data associated with ABRACOS plant physiology measurements are grouped as follows: (a) pasture structure, (b) porometry and (c) In-canopy forest profiles. Some of these data were recorded during the intensive field missions and may be cross-referenced with the coincident micrometeorological data, as well as the continuously monitored climate and soil moisture data. Site and mission details are given in the files AB-AWS.TXT and AB-MMET respectively.

PASTURE STRUCTURE file: ABR-LAI.DAT

This file contains a self explanatory tabulation of pasture physical properties including height, leaf and stem area index, leaf stem and dead material dry biomass, together with the relevant dates and site codes. Quantities are given as means, together with sample standard deviation, maximum, minimum and sample size.

Data were recorded at Fazenda Dimona during the first two missions (M1 and M2) where the grass species were Brachiaria decumbens and B. Humidicola (McWilliam et al 1993). All other data is from Fazenda Nossa Senhora (M3, M4 and M5) where the grass species was Brachiaria Brizantha. Grass was sampled for analysis using a 0.5m x 0.5m quadrat which was randomly placed within the area monitored for water vapour flux data. All vegetative material within the quadrat was removed and analyzed for leaf area and dry biomass within one or two days of removal.

N.B. The M4 leaf and stem area indices were estimated using calculations of specific leaf area obtained from the M3 data.

POROMETRY

files:

M2FDLEAF.DAT M3RJLEAF.DAT

M3NSLEAF.DAT M4RJLEAF.DAT

M4NSLEAF.DAT M5RJLEAF.DAT

M5NSLEAF.DAT

These files contain leaf physiology data from the Ji-Parana and Manaus pasture (NS and FD) and Ji Parana forest (RJ), recorded during or close to the time of the Missions 2 - 5, (see also McWilliam et al. 1995). The file format is the same in all files and is as follows:

HEADER LINE Column headers.

DATE LINE

> This line gives the date on which the data were recorded, followed by an integer giving the number of following data lines for that day.

DATA LINES

> The data lines have twenty two 7-character data elements, space delineated in free format. With the exception of leaf water potential, which was measured using a Scholander pressure chamber, all data where recorded using an ADC Mk3 Infra-red Gas Analiser. Missing data appear as -99. The data columns are as follows:

Column 1

> Vegetation type. The following codes are used to indicated the vegetation species on which the measurement was made.

> Pasture

B.Decum	Pasture grass	Brachiaria Decumbens
B.Humid	Pasture grass	Brachiaria Humidicola
B.Briz	Pasture grass	Brachiaria Brizantha
Mela#1	Shrub	Sp. Melastoma #1
Mela#2	Shrub	Sp. Melastoma #2
Lacre	Shrub	Sp. Lacre
Palm	Palm	Sp. Palmae

Forest: eight trees (T1-8) and three species of lianas (L1-3) as follows (further details are given in McWilliam et al. 1995):

T1	Cedrella odorata (Meliaceae)
T2	Inga sp. (Leguminosae-Mimoseaceae)

T3	Protium polybotrium (Burseraceae)
T4	Leonia glycicarpa (Violaceae)
T5	Guarea cf. da visii (Meliaceae)
T6	Hirtella hispidula (Crysobalanaceae)
T7	Erythroxyllum cf. macrophyllum (Eryth.)
T8	Theobroma microcarpum (Sterculaceae)
T9	Maximiliana maripa (Palmae)
L1	Dioclea (Leguminaceae-Papilloniaceae)
L2	Derris pterocarpa (Legumin.-Papillon.)
L3	Strychnos amazonicus (Loganiaceae)

Column 2
>Additional information relating to the sampled leaves, including 'SUN','SHADE','OLD' (leaves),'NEW' (leaves). '#' indicates no information.

Column 3
>for Pasture Number of plots sampled
>for Forest Number of leaves sampled.

Column 4
>Decimal local time (hours).

Column 5
>Height from the ground (m).

Column 6
>Photosynthetically active radiation (PAR) in micro-mols m-2 s-1.

Column 7
>Air temperature near the leaf (Ta) in degrees C.

Column 8
>Leaf temperature (Tl) in degrees C.

Column 9
>Stomatal conductance (gs) in millimols m-2 s-2.

Column 10
>Net photosynthesis (pn) in micromols m-2 s-1.

Column 11
>Concentration of intercellular carbon dioxide (CO_2) in micromols m-2 s-1.

Column 12
>Leaf evaporation

Column 13-19
>Standard deviations of the mean values appearing in columns 6 - 12.

Column 20
>Decimal local time (hours)for the leaf water potential measurement that was closest in time to the current data line.

Column 21
>Leaf water potential in MPa.

Column 22
>Standard deviation of leaf water potential.

IN-CANOPY FOREST PROFILES

Some of these data were recorded during the intensive field missions and may be cross-referenced with the coincident micrometeorological data, as well as the continuously monitored climate and soil moisture data.

Files: in AB-VEG1
AB-VEG2
AB-VEG3

These files contain 10 minute profiles of PAR (in VEG1) or temperture, humidity and wind speed (TDU in VEG2 and VEG3) at the Manaus and Ji-Parana forest sites. The profiles have six levels from the top of the canopy to about 5m from the ground (see below).
The file name format is as follows.
[code][n][type][#].DAT

where

code	is RD for Manaus or RJ for Ji-Parana
n	is the mission number 1,2,3 or 45
type	is the data type PAR or TDU
#	is the sequence letter

PHOTOSYNTHETICALLY ACTIVE RADIATION (PAR)

The PAR files contains either 20 (RD) or 17 (RJ) 6-character columns in which the ten minute mean PAR is given as an integer in micro-mols m-2 s-1. THE FILES ARE SYSTEMATICALLY DISCONTINUOUS omitting the irrelavent zero (or near zero) night time period of 19.10 - 05.00. The column details are tabulated below. Data were recorded using leveled quantum radiation sensors, model SKP 215 (skye Instruments Ltd, Powys, UK). Sensors were typically 1.5m - 2.5m from the instruments tower and located as follows

File		RD		RJ	
column	Data	height from ground (m)	Direction from tower	height from ground 9(m)	Direction from tower
1	Day	-	-	-	-
2	Time	-	-	-	-
3	PAR	35.0	East	35.0	East
4	PAR	35.0	West	35.0	West
5	PAR	35.0	West	21.3	Eas
6	PAR	25.0	East	21.3	Wes

7	PAR	25.0	East	21.3	West
8	PAR	25.0	West	15.7	East
9	PAR	20.0	East	15.7	East
10	PAR	20.0	West	15.7	West
11	PAR	20.0	West	11.6	East
12	PRA	15.0	East	11.6	Wes
13	PAR	15.0	East	11.6	West
14	PAR	15.0	West	6.1	Eas
15	PAR	10.0	East	6.1	West
16	PAR	10.0	West	2.3	East
17	PAR	10.0	West	2.3	West
18	PAR	5.0	East	-	-
19	PAR	5.0	East	-	-
20	PAR	5.0	West	-	-

TEMPERATURE, HUMIDITY AND WIND SPEED(TDU)

Temperature and humidity deficit were measure using aspirated psychrometers (IH, Wallingford UK) and wind speed using type A100 anemometers (Vector instruments, Rhyl, UK). The data files contain ten minute averages in free format with 7-character columns as follows:

Column	Data
1	Day number
2	Local Time
3 - 8	Temperature (oC)
9 - 14	Specific humidity deficit (g/kg)
15 - 20	Wind speed (m/s)

The six columns for each quantitiy are arranged in order of height with the highest instrument first. The instrument heights were 35m and then every 5m from 25m to 5m.

REFERENCES

McWilliam, A-L.C., Roberts, J.M., Cabral, O.M.R., Leitao, M.V.B.R., de Costa, A.C.L. Maitelli, G.T. and Zamparoni, C.A.G.P., 1993. Leaf area index and above-ground biomass of terra firme rain forest and adjacent clearings in Amazonia. Functional Ecol., 7: 310-317.

McWilliam, A-L.C., Cabral, O.M.R., Gomes, B.M., Esteves, J.L., Roberts, J.M., 1996. Forest and pasture leaf-gas exchange in south-west Amaz"nia. In 'Amazon Deforestation and Climate' (Eds. J.H.C.Gash, C.A.Nobre, J.M.Roberts and R.L.Victoria). John Wiley, Chichester, UK. pp 265-286.