SOIL MOISTURE

GENERAL

The soil moisture file format is

SOIL[site code].DAT

and is compressed into a single file SOIL_PHYSICS.

The first three columns of each file give the year, day number and time (decimal hour) of measurement. Thereafter, the remaining columns contain the mean soil moisture, at various depths, in units of moisture volume fraction (m3/m3). The means are calculated as the linear average of all access tubes at each site, with the exception of Reserva Jaru (see below).

Soil moisture was measured close to the automatic weather station (AWS) using a neutron probe soil moisture meter. The only exception to this was the 'Manaus forest' data which was recorded in primary forest close to the pasture site (FD) rather than at the Manaus forest AWS site (RD), see Hodnett et al. (1995). For this reason an extra code is introduced, FDF, for forest at Fazenda Dimona. Further details of all sites are given in AB-AWS.TXT. The soil moisture at each access tube was read approximately every 7 days and with increased frequency during the intensive data missions (see AB-MMET.TXT).

Measurement access tubes were permanently installed at random positions at each site. Details are as follows:

PASTURE SITES	FD	NS	BS
Tubes	8	6	6
Depth Code	a	c	d
Starting	18/09/90	05/11/91	25/08/91
Ending(*)	02/12/93	20/12/93	29/10/93

SOIL TYPE

Brazilian	Yellow latosol		Red-yellow podsol
FOA	Xanthic ferralsol	Orthic acrisol	Orthic acrisol
US	Haplic acrorthox	Typic paleudult	Typic haplustult

FOREST SITES	FDF	RJ	RV
Tubes	5	8	6
Depth Code	b	c	d
Starting	18/09/90	30/10/91	17/08/91
Ending(*)	02/12/93	29/12/93	27/10/93

SOIL TYPE

Brazilian	Yellow latosol		
FOA	Xanthic ferralsol	Orthic acrisol	Humic cambisol
US	Haplic acrorthox	Typic paleudult	Typic dystrochrept

Where the depth codes, in metres, are as follows

a	0.1, 0.2 then every 0.2 to a depth of 2.0
b	until 17/10/91 as (a) then as (c)
c	0.1, 0.2 then every 0.2 to 3.6 (see also NOTES for RJ below)
d	0.1, 0.2 then every 0.2 to 1.2, and then every 0.3 to 3.6

In each file the depths appear as a header (in the first line) and therefore may be read in as required by any software.

(*) The soil moisture measurement network was not dismantled in December 1993, and measurement continued beyond this date. These subsequent data are managed by CPTEC/INPE

at Cachoeira Paulista, SP, Brazil.

NOTES SPECIFIC TO EACH SITE

FD FAZENDA DIMONA (Pasture)

1. Specific calibration derived and used for 0.1 m depth

FDF FAZENDA DIMONA (Forest)

1. Specific calibration derived and used for 0.1 m measurements.
2. Installation of 3.6 m tubes, 17 October 1991. Two sets of data are shown for this date. The first was made in the original (max depth 2 m) tubes, the second was made in the new tubes. There is a difference in water content due to spatial variability, but the two sets of observations on the same day (effectively at the same time) allow the data sets for the 2 m and 3.6 m tubes to be linked.

NS FAZENDA NOSSA SENHORA

1. A specific calibration for the surface layer was not derived. The absolute water contents will be under-estimated and it is likely that the under-estimation will increase as the water content decreases. Overall this is expected to lead to an under-estimation of the changes of water content at 0.1 m and, to a lesser extent, at 0.2 m.
2. Between 9 February and 1 August 1992 the data are not reliable because of inconsistencies in depth location of the probe. However, they give a good general indication of the soil water behaviour. From 8 August to 1 October 1992 (inclusive), the data are very unreliable and should not be used. On 7 October 1992 the depth location problem was eliminated and the subsequent the data are good (including 7/10/92).
3. In the wet season, the water content in the profile is influenced by the presence of the water table which can reach to within 2.0 m of the soil surface during the wet season.

RJ RESERVA JARU

1. The depth of 6 of the 8 tubes was limited by the depth to bedrock. The maximum depth in the 6 tubes ranged from 2.0 to 3.2m. Therefore the mean moisture content at each depth from the 0.1 to 2.0m uses all 8 tubes: then the mean of 7 tubes at 2.2 m, 6 at 2.4, 5 at 2.6, 4 at 2.8, 3 at 3.0 and 3.2 and the mean of 2 tubes at 3.4 and 3.6.
2. A specific calibration for the surface layer was not derived. The absolute water contents will be under-estimated and it is likely that the under-estimation will increase as the water content decreases. Overall this is expected to lead to an under-estimation of the changes of water content at 0.1 m and, to a lesser extent, at 0.2 m.
3. Between 9 February and 10 October 1992 the data are not reliable because of inconsistencies in depth location of the probe. However, they give a good general indication of the soil water behaviour.

4. In the wet season, the water content in the profile is strongly influenced by the presence of the water table which can reach to within 1.0 m of the soil surface during the wet season.

BS FAZENDA BOA SORTE

1. A specific calibration for the surface layer was not derived. The absolute water contents will be under-estimated and it is likely that the under-estimation will increase as the water content decreases. Overall this is expected to lead to an under-estimation of the changes of water content at 0.1 m and, to a lesser extent, at 0.2 m.

RV RESERVA VALE DO RIO DOCE

1. A specific calibration for the surface layer was not derived. The absolute water contents will be under-estimated and it is likely that the under-estimation will increase as the water content decreases. Overall this is expected to lead to an under-estimation of the changes of water content at 0.1 m and, to a lesser extent, at 0.2 m.

REFERENCES

Hodnett, M.G., da Silva, L.P., da Rocha, H.R. and Cruz Senna, R.C., 1995. Seasonal soil water storage changes beneath central Amazonian rainforest and pasture. J. Hydrol., 170, 233-254.