Geophysical Research Abstracts
Vol. 13, EGU2011-13000, 2011
EGU General Assembly 2011

Characterizing scale-dependent soil mositure series under Eucalyptus globulus using multifractal techniques

Antonio Paz-González (1), Roger Manuel Mestas Valero (1), Rômulo Guimaraes Giácomo (2), and Elza da Silva Militão (2)

(1) University of Coruña, Unit of Soil Sciences, Spain. E-mail: tucho@udc.es, (2) State University of São Paulo (UNESP), campus de Ilha Solteira, SP, Brazil

The objective of this study was to determine if soil moisture data recorded at 60-minute intervals for various soil depth display scale dependent characteristics. Moisture data were measured on a *Eucalyptus globulus* plantation at 10, 20, 40, 60, 90 and 140 cm depth under Atlantic climate during 2010. The water content of the soil profile was above field capacity most of the winter months, whereas in summer the uppermost layers were below wilting point. Moreover, soil water was withdrawal until 140 cm depth in the dry season. These time series of soil water content were analyzed using multifractal formalism. The distribution of the measure could be considered as a fractal, since the moments obeyed power lows. A comparison of the moment scaling function τgq) for each depth and month and the scale function of the simulated monofractal type distribution was carried out. Subsequently, a multifractality index was obtained and the scaling properties observed were characterized as monfractal or multifractal, depending on the period of the year assessed and the depth of measurement. In general the degree of heterogeneity increased from bottom to topsoil and from winter months to summer months.