



Spatial variability of the soil water content in an experimental catchment in Southern Italy

P. Nasta (1), N. Romano (1), G.B. Chirico (1)

(1) Dipartimento di Ingegneria Agraria, Università di Napoli Federico II, Italy
(gchirico@unina.it/Fax: +390812539412)

The accurate description of the spatial and temporal variability of soil water content is a key issue for hydrological applications. In this study we investigated the spatial variability of the soil water content at the hillslope scale within a sub-humid area in Southern Italy. Six hillslope transects have been selected across the main soil-landscape units of a 40 km² catchment. The selected transects have slope gradients ranging from 10% up to 50%. Landuse is dominated by pasture, Mediterranean macchia and orchard. Surface soil properties have been measured from soil samples collected along the hillslope transects with a constant spatial interval of 50 m. In the same locations, soil water contents in the uppermost soil horizons have been monitored by the TDR technique during 10 field campaigns, from September to January 2005. The main terrain attributes of the sample locations have been retrieved from a 5 m DEM. The dependency of the soil water content to the terrain properties and the soil texture has been investigated. Spatial variability of the measured soil water content is largely explained by clay content variability. The role exerted by terrain attributes changes from the dry to the wet seasons. In the dry season, soil water content is mainly influenced by aspect (i.e. slope orientation). In the wet season, instead, soil water content shows a significant correlation with slope and profile curvatures. During the transition period, soil water content shows weak correlation to any of the terrain attributes considered in this study.