Geophysical Research Abstracts, Vol. 9, 01205, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-01205

MOSESS_D, a distributed model for soil erosion prediction

Eduardo E. de Figueiredo, Gustavo de Sousa

(1) Department of Civil Engineering, CTRN/UFCG Brazil (eduardo@dec.ufcg.edu.br, PO Box 505, 58100-970 - Campina Grande, PB – Brazil)

This article presents the distributed version of the model MOSESS, namely MOSESS_D. The former was designed to simulate the processes of runoff and soil erosion based on three assumptions, which are valid for small scales: (a) the basin system is homogeneous; (b) rainfall is space-invariant, and (c) the channel system is negligible. To represent the processes of runoff and soil erosion at catchments of practical size, the heterogeneities (rainfall, soils, channels, etc) of the system have to be considered. For the distributed version of the model, the basin system is modeled through grid elements, with the channel system running at one of the element borders and two alternative procedures for routing the surface runoff put into operation. Also, the space variations in rainfall and soils were taken into account. Alternative methods for calculating the evapotranspiration process were also implemented. In addition, the sediment size distribution for the process of soil erosion was considered to calculate the flow transport capacity with the method of Laursen. These aspects make the model capable of simulating the processes at catchments of practical scales. In order to accomplish such features, a friendly and interactive interface has been designed in DELPHI®, with a reasonable graphic interface (a version in FORTRAN g77® has also been designed). This paper reports the structure of the distributed model MOSESS_D, and also the model workability through simulations realized for some catchments in the semi-arid region of Northeast Brazil. The results showed consistency in the model simulations and demonstrated the effects of the heterogeneities of the system on the results.