



From plot to regional scales: Effect of land use and soil type on soil erosion in the southern Amazon

Marcus Schindewolf (1), Nico Schultze (2), Ricardo S.S. Amorim (3), and Jürgen Schmidt (1)

(1) TU Bergakademie Freiberg, Soil- and Water Conservation Unit, Freiberg, Germany

(marcus.schindewolf@tbt.tu-freiberg.de), (2) Helmholtz Center of Environmental Research, Department of Soil Physics, Halle, Germany, (3) Federal University of Mato Grosso, Department of Tropical Agriculture, Cuiabá, Brazil

The corridor along the Brazilian Highway 163 in the Southern Amazon is affected by radical changes in land use patterns. In order to enable a model based assessment of erosion risks on different land use and soil types a transportable disc type rainfall simulator is applied to identify the most important infiltration and erosion parameters of the EROSION 3D model. Since particle detachment highly depends on experimental plot length, a combined runoff supply is used for the virtually extension of the plot length to more than 20 m. Simulations were conducted on the most common regional land use, soil management and soil types for dry and wet runs.

The experiments are characterized by high final infiltration rates ($0.3 - 2.5 \text{ mm} \cdot \text{min}^{-1}$), low sediment concentrations ($0.2-6.5 \text{ g} \cdot \text{L}^{-1}$) and accordingly low soil loss rates ($0.002-50 \text{ Kg} \cdot \text{m}^{-2}$), strongly related to land use, applied management and soil type. Ploughed pastures and clear cuts reveal highest soil losses whereas croplands are less affected. Due to higher aggregate stabilities Ferrasols are less endangered than Acrisols.

Derived model parameters are plausible, comparable to existing data bases and reproduce the effects of land use and soil management on soil loss. Thus it is possible to apply the EROSION 3D soil loss model in Southern Amazonia for erosion risk assessment and scenario simulation under changing climate and land use conditions.