



Verification and completion of a soil data base for process based erosion model applications in Mato Grosso/Brazil

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The study area of central Mato Grosso is subjected to severe soil erosion. Continuous erosion leads to massive losses of top soil and related organic carbon. Consequently agricultural soil soils suffer a drop in soil fertility which only can be balanced by mineral fertilization. In order to control soil degradation and organic carbon losses of Mato Grosso cropland soils a process based soil loss and deposition model is used.

Applying the model it will be possible to:

- identify the main areas affected by soil erosion or deposition in different scales under present and future climate and socio-economic conditions
- estimate the related nutrient and organic carbon losses/yields
- figure out site-related causes of soil mobilization/deposition
- locate sediment and sediment related nutrient and organic matter pass over points into surface water bodies
- estimate the impacts of climate and land use changes on the losses of top soil, sediment bound nutrients and organic carbon.

Model input parameters include digital elevation data, precipitation characteristics and standard soil properties as particle size distribution, total organic carbon (TOC) and bulk density. The effects of different types of land use and agricultural management practices are accounted for by varying site-specific parameters predominantly related to soil surface properties such as erosional resistance, hydraulic roughness and percentage ground cover. In this context the existing EROSION 3D soil parameter data base deducted from large scale rainfall simulations in Germany is verified for application in the study area, using small scale disc type rainfall simulator with an additional runoff reflux approach. Thus it's possible to enlarge virtual plot length up to at least 10 m. Experimental plots are located in Cuiabá region of central Mato Grosso in order to cover the most relevant land use variants and tillage practices in the region.

Results show that derived model parameters are highly influenced by soil management. This indicates a high importance of tillage impact on resistance to erosion, mulch cover and TOC. The measured parameter ranges can generally be confirmed by the existing data base, which only need to be completed due to changed phenological stages in Mato Grosso compared to German conditions.