



## **Climate Change and Soil Erosion– Results of Comparative Model Simulations with high resolved precipitation data for a catchment in Saxony/Germany**

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### Abstract

Most available climate models produce at best mean hourly or daily precipitation data, whereas erosion is always the result of extreme but short time events, lasting normally not longer than a few hours. The frequency and intensity of these extreme events are expected to increase in some regions in Saxony/Germany which could lead to increased erosion rates. To explore these processes, the impact of expected increase in precipitation intensities as well as expected changes in land use (e.g. fruit rotation, change of phenology) on soil loss are to be considered. The use of a new method for the projection of meteorological time series and their extremes using global climate simulations (ENKE 2003, 2005) permits for the first time an approximation of future soil loss. This research is based on simulated, high resolution data (5min sums) for extreme rainfall events in the period of 2031-2050, which reproduces the mean frequency, intensity and duration of future events with high precipitation intensities relevant to erosion within the investigated seasonal period from June to August. The simulations are performed for one exemplary catchment area in Saxony, based on the EROSION 3D model (SCHMIDT et al., 1997), which is a process-based soil erosion model for simulating soil erosion and deposition by water. Simulated precipitation for the 2031-2050 time period is used to model soil loss, and results are compared to soil loss based on 20 year of measured precipitation from 1981 to 2000.

The simulation results allow the impacts of climate change on erosion rates to be quantified by comparing current climate with predicted, future climate. Expected changes in land use due to influences of shifted harvest are taken into account as exemplary scenarios.