

## Sensitivity analysis of soil erosion on catchment scale

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This study refers to the EROSION 2D/3D computer model which simulates soil erosion by water on single slopes and small catchments (Schmidt 1996) with respect to:

- the detachment of soil particles due to overland flow and raindrop impact
- the hydraulic transport of detached particles by overland flow, and
- the deposition of suspended particles and/or their delivery into the surface water system.

For the simulation runs a small catchment (0,7 km<sup>2</sup>) was chosen located in the East of Germany within the Ore Mountain range. A matrix of temporally and spatially varying model parameters was used to assess the sensitivity of rainfall intensity and duration, wind speed and direction, initial soil moisture, tillage practices, field crops and crop phenology. In contrast to experimental research these parameters could be varied independently of each other by model simulation. The morphology of the catchment as given by the digital elevation model and the distribution of soils and land use categories (arable land, rangeland, forest land, built-up land) were regarded as invariant.

As the results show the polymorphic nature of a catchment is a highly decisive factor for water erosion processes. Most notable is the simulated impact of wind speed and direction. Up to now this interrelationship is widely unregarded so far. Simulation runs show that wind impacts can double the total soil loss of the catchment compared to calm conditions. With respect to field crops and management the computed scenarios confirm existing experimental results.