



## **Assessment of the effects of change in soil properties associated with land use changes by applying three different catchment models for scenario analysis**

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Land use scenarios often are calculated to assess the impact of land use change on the hydrological behaviour of river catchments. Applying process based models soil properties mostly are hold constant while changing land use although it is well known that land use has an influence on soil properties. A couple of studies focusing on soil chemical behaviour and additionally studying a few basic soil physical properties revealed that bulk density differs for similar soils under different land uses. Unfortunately a change of soil hydrological parameters with changing land use has not investigated systematically up to now. But the change in hydrological behaviour can be estimated for example by assuming a change in bulk density and applying pedotransfer functions to derive soil hydrological parameters. Thus the changing soil hydrological behaviour can be reflected by the governing parameters of process based models. This presentation aims on the quantification of the effect taking into account a change of soil hydrological parameters compared to holding parameters constant while calculating land use scenarios. Three process based models are applied: Wasim-ETH, SWAT and TOPLATS. So additionally the model specific soil parameter sensitivity can be analysed. For the case of the Dill catchment (693 km<sup>2</sup>, situated in central Germany) three different land use scenarios are provided by the collaborative research centre 299 of the University of Gießen. For these land use scenarios the effect of different soil representations is analysed by assuming a change in bulk densities and applying pedo-

transfer functions. The study reveals that different models show different sensitivities on these changes. While for example Wasim-ETH does not show any differences for both variants, TOPLATS calculates a different proportion of surface runoff to base flow in the annual water balance. The presentation will systematically analyse the different behaviour of the used models and try to assess the importance to consider soil properties changes while calculating land use scenarios.