



Ensemble model prediction of the effects of land use change on hydrology

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Modelling the effects of land use change on catchment water fluxes is a hot topic in hydrological research. While in some studies simple percentage changes of land use are assumed, more sophisticated approaches use spatially differentiated land use predictions based on ecological and economic site conditions. No matter what approach is chosen, data for model verification does not exist due to the nature of scenarios. To increase the confidence in the scenario analysis, scientists often conduct a Monte Carlo type of uncertainty analysis. However, this type of uncertainty analysis captures only part of the uncertainty, since model structural error is neglected. A more comprehensive way of assessing the uncertainty in the scenario analysis is an ensemble modelling approach, i.e. several models use the same input data to calculate outputs. This technique is commonly used in climatology to assess the credibility of climate change prediction, but it has not yet been applied to hydrological investigations of the impact of land use change.

In the frame of the workshop “Ensemble Model Prediction of the Effects of Land Use Change on Hydrology” 11 different hydrological models (DHSVM, HBV, IHACRES, LASCAM, MIKE SHE, PRSM-MMS, RHESSys, SLURP, TOPLATS,

SWAT, WASIM-ETH) are applied to a common set of land use change scenarios for the regional scale Dill catchment (693 km²) in central Germany. The land use scenarios have been developed by the agro-economic model ProLand and reflect the effects of field size aggregation and allocation on land use distribution. Prior to scenario analysis, all hydrological models are calibrated to the current land use distribution. The general procedure as well as first results of the ensemble modelling approach will be presented.