Effect of increased bioenergy crop production on hydrological response and nutrient emission in central Germany

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Several indications showed that changes in land use/cover can influence the hydrological regimes and in consequence river water quality. Hydrological water quality modelling has proven to be an efficient tool to predict how the changes in land cover can affect the discharge of river catchment and its water quality (such as nitrogen and phosphorus) using different land use scenarios. The aim of this study was to investigate the effect of increased bienergy crop production on the hydrological water quality using a scenario-based appraoch. The HYPE model (HYdrological Predictions for the Environment) was setup in two mesoscale catchments in central Germany. The selected catchments are Selke (463 km2) and Weida (99.5 km2), which are two small tributaries of Elbe river basin and are located in Saxony-Anhalt and Thuringian states, respectively. The predominant land use classes of the Selke catchment are arable land ($\approx$ 50%) located mainly in the lowland area and forest (35%), which is situated in low montain area. Howover, the dominating land use classes of the Weida catchment are agricultural land (40%), forest (29%) and grassland (26%), which are all located in low-montain range (elevation between 357-552m). First, The HYPE model was setup for the Selke catchment. Second, the model was used to predict the measured discharge and nutrient concentration of the Weida catchment using the same corresponding optimized paramter values obtained from calibration in the Selke catchment. Therefore, the feasability of HYPE model-parameter transferability between catchments with different physiographic characteristics and new regionalization schemes were investigated. The HYPE model was then used to predict the impact of different bionergy scanarios on the river discharge and nutrient emission. The preliminary results of this study will be presented and discussed.