



## **Spatiotemporal Changes in Hydrological Response after Partial Deforestation**

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Although the effects of land use change on hydrology have been studied intensively, predicting the effects of land use change on hydrological states and fluxes remains challenging. To improve our hydrological understanding of land use change, high quality data that capture the relevant spatiotemporal dynamics of hydrological states are required to test hydrological models. This study aims to combine key monitoring results from a partial deforestation experiment with modelling results from two distributed hydrological models (MIKE SHE SW-ET and TerrSysMP). For this, we use a dataset obtained from a partial deforestation experiment in the TERENO Wüstebach catchment in Germany, which consists of wireless soil moisture sensor network, eddy covariance, discharge, and precipitation data. Measurements indicate that deforestation decreased actual evapotranspiration, which in turn increased soil moisture and the occurrence of high discharge events. The high resolution dataset further revealed the complex interactions and feedbacks between soil water storage, actual evapotranspiration, and discharge. In the modelling experiment, the land use change was parametrized by simply changing the land surface parametrization for the deforested area. Although both models partly succeeded in predicting the hydrological changes, a comparison between data and simulation results revealed that not all changes in hydrological processes could be predicted by the applied parametrization.