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Evaluating SWAT Predictive Performance Based on Different Spatial Resolution Climatic Data

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Complex Physically based hydrological models require sufficient, detailed, and complex data which represents the overall systems in the respective catchment. Subsequently, the predictive performance of these models is highly influenced by scale of data measurement both in terms of space and time. Soil and Water Assessment Tool (SWAT) was developed to predict the impact of land management practices on water, sediment and agricultural chemical yields in large complex watershed with varying soil, land use and management conditions over long period of times. In this study an attempt has been made to evaluate SWAT predictive performance in two different regions of catchment with different spatial resolution climatic data. Catchments from Ethiopia and Germany have been chosen for the collection of climatic time series data. Data availability at both the catchments is different. German catchments have good data availability at fine resolution; where as counter catchments in Ethiopia have very course and less data. ArcSWAT2.3.4 of the SWAT2005 version for ArcGIS9.3 was used for this study. Calibration and Sensitivity analyses were implemented to parameterize the model for the both the catchments. It has been found that the spatial resolution of climatic data have significant influence on the predictive performance of the SWAT model. The simulation result seems promising and gives a better understanding how the scale can have great impact on the models performance.