



## **Modelling sediment and phosphorus transport in a data scarce catchment in China using SWAT: Model parameterization and first calibration results**

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Modelling studies in China are often hampered by a limited availability of monitoring data, especially when focusing on water quality issues. Nevertheless, it is very important to assess the impact of the fast and dynamic change currently going on in this country on water resources and aquatic ecosystems.

The Three Gorges Region is one of many regions in China currently facing a large scale land use change. Due to the construction of the Three Gorges Dam and the impoundment of the Three Gorges Reservoir, numerous people had to be resettled, new infrastructure was built and the agricultural areas had to be shifted from the valley bottoms to steep, formerly wooded slopes. Presumably this has a strong impact on the water quantity and quality in the affected catchments.

The study presented here is funded by the German Federal Ministry of Education and Research (BMBF). Its central aim is to assess the impact of land use change on the water balance as well as the sediment and phosphorus transport in the Three Gorges Region using the eco-hydrological model SWAT (Soil and Water Assessment Tool; Arnold et al. 1998). The chosen study area is the Xiangxi Catchment, which is located in the western part of Hubei Province and comprises an area of 3099 sq km. Model parameterization poses a challenge due to the limited availability of input data, which is in conflict with the high number of input variables required by SWAT. Therefore, residual and sensitivity analyses are used to identify the most significant processes and sensitive parameters and focus on these during the model parameterization and calibration process.

Discharge in Xiangxi River is calibrated against a measured time series of sufficient length and temporal resolution. Results show a satisfactory agreement between measured and simulated discharge, which is also reflected by the model evaluation statistics. In contrast to discharge, records of sediment and phosphorus are only available for a very short period of time and with a low temporal resolution. Here it is essential to evaluate model structure, input and parameter uncertainties and their connection to predictive uncertainty while trying to get the most out of the available data. Also, two measuring campaigns with a high spatial resolution were conducted in January and July 2010 in order to enhance understanding of the key processes governing sediment and phosphorus transport in the Xiangxi Catchment and therefore support calibration of those parameters.

As an adequate simulation of water quantity is crucial for the simulation of water quality parameters, the results of discharge calibration and validation are presented alongside first, preliminary results of sediment and phosphorus calibration.