Modelling runoff response to land-use change using an integrated approach in Xiangjiang River basin, China

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Abstract Economic development and urbanization have affected both water quantity and quality in many regions of the world. Understanding and quantifying the hydrological response to urbanization and land-use change have become a major focus in studies of the impact of human activities on hydrology. This study employs an integrated approach that combines the land-use change allocation model (CLUE-s) and a physically-based distributed hydrological model (SWAT) for examining the impact of various land-use change scenarios in a region undergoing rapid change in land-use – the Xiangjiang River basin in China. Results indicate that various land-use policies have different levels of impact on the simulation of streamflows. Land-use change can lead to significant changes in the distributions of water resources and hydrological processes. Results of this study will be helpful for land-use planning and watershed management. The integrated modeling approach is shown to be a promising tool for land-use impact studies.

Key words land-use change; distributed hydrologic model; SWAT; CLUE-s; Xiangjiang River basin