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Impact of changes in land use and climate in Beiyunhe Watershed based on SWAT Model and CMADS datasets

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Global climate changes and intensive changes in land use have posted unprecedented impacts on the watershed hydrology and thus the water security at the global scale. To quantitatively analyze the impacts of land use change and climate variability on the stream flow of Beiyunhe Watershed located in Beijing, SWAT model, an extensively used distributed hydrological model, was established. In the SWAT model, climate data came mostly from China Meteorological Assimilation Driving Datasets (CMADS), which for the SWAT model provided high resolution and quality meteorological data. The effects of land use changes and climate variability on the stream of the watershed were then explored by using three scenario analysis approach (integrated scenario simulation, scenario simulation of extreme land use, scenario simulation of climatic variability). Two indices, the p-factor, r-factor as well as efficiency of objective function, were used to assess the calibration /uncertainty performance of the SWAT model. Results showed that SWAT model was capable for simulating runoff responses to changes of land use and climate variability in the watershed.