

Long term variation of water balance controlled by land use change in an urbanization catchment, Yamato River

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Land use change play an important role in catchment hydrology cycle. Studying the impact of land use change on water cycle is of great significance for analyzing the status of water resources at regional scale. By using Geographic Information System technology, and based on the analysis and prediction of the land use change in Yamato River basin. The water balance was simulated using the Soil and Water Assessment Tool (SWAT2012). Model calibration and uncertainty analysis were performed with sequential uncertainty –tting (SUFI-2). The effects of different land use on surface runoff and groundwater in the same climatic environment between 1976 and 2014 were simulated and validated. The correlation coefficient is from 0.75 to 0.84 and the Nash–Sutcliffe coefficient is 0.71 to 0.80 during rate fixing and verification. Between 1976 to 4, farmland was reduced by 39.66% and wasteland by 73.57%. Urban area increased by 67.4%, rail and road area increased by 98.44%. At the same time, the surface runoff increased by 15.68%, and the groundwater decreased to a certain extent. The results indicate that the farmland had negative effect on the runoff depth with the city is a positive influence and the both the effects are non-linear.

Keywords: Yamato River, land use change, Long term variation, SWAT Model, water balance