

Estimation of water budget including deep groundwater discharge in small islands, using hourly resolution SWAT Model analysis

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This study used hourly simulations in the SWAT model to research the water budget in small catchments on the Ikuchijima island. Satisfactory results were obtained for flow simulations in the small catchments using hourly precipitation data. The results show that R^2 and NS both above 0.5 during the calibration and the validation period. And |PBIAS| is below 10 in the both cases. Based on this result, we found that SWAT hourly simulations performed well in rainstorms in small catchment areas and it successfully simulated the flood in this catchment during the simulation period. Therefore, it is considered that SWAT model hourly simulation is reliable in rainstorm and flood forecasting. This study also analyzed water balance components such as surface runoff, lateral flow, base flow and evaporation in this small catchment area, and the results were consistent with the actual conditions of the catchment such as climate, vegetation and geology.

Keywords: SWAT, island, hourly simulation, water budget, runoff