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Hydrologic budget analysis according to the pointwise and PRISM based precipitation data in Jeju island, South Korea

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Since Mt. Halla is located in the center of the Jeju island, South Korea, few points of precipitation measurement was installed in near this mountain. For this reason, the uncertainty of hydrologic budget which is based on the pointwise precipitation data has been pointed out. To tackle this spatial uncertainty of precipitation, PRISM (Parameter-elevation Regressions on Independent Slopes Model) is adopted in this study. PRISM is a unique analytical tool incorporates point data, a digital elevation model, and expert knowledge of complex climatic extremes, including coastal effects, and temperature inversions. Gridded estimates of daily, monthly and annual precipitation were interpolated from 19 monitoring stations to grid points using PRISM. To estimate hydrologic budget properly, SWAT-K(Soil and Water Assessment Tool - Korea) modeling in the catchments in Jeju island was conducted. The runoff simulation results show that the PRISM based modeling produces better accuracy comparing to observed discharge than the pointwise based modeling.