

## Effects of subbasin spatial scale on runoff simulation using SWAT

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**Abstract**

The subbasin spatial scale can affect a hydrological simulation result. The objective of this study was to investigate an appropriate subbasin spatial scale for reproducing the different flow phases with the Soil and Water Assessment Tool (SWAT). Moreover, this study addressed the total hydrologic model uncertainty using the Generalized Likelihood Uncertainty Estimation (GLUE) method. The hydrologic modelling uncertainty analysis revealed that the courser subbasin spatial scale provided a relatively better coverage of most of the observations by the 95PPU. On the other hand, the finer subbasin spatial scale produced the best single simulation output closer to the observation. Moreover, most of the observed high flows were enveloped by the 95PPU while this did not happen for the low flows. The overall average performance improvement through an appropriate subbasin spatial scale for reproducing the different flow phases in the Yongdam and Gilgelabay watersheds were found to be 36% and 53%, respectively. It is, therefore, a worth that to put more effort in reproducing the different flow phases by investigating an appropriate subbasin spatial scale to improve our understanding about the frequency and magnitude of the different flow phases.

Keywords : Subbasin spatial scale, Hydrologic model uncertainty, SWAT, GLUE

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