

Target Topic: Flood and Landslide

A Comparative Study of Model-Driven Soil Moisture Estimates on the Chungju Demonstration Basin

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Abstract:

Asia monsoon is one of the largest water circulation systems in the world and provides substantial water resources that can be used for power generation, food production and transportation facilities. At the same time, it sometimes causes serious water-related problems such as flood and drought. GEOSS/AWCI was launched for solving water-related problems caused by Asia monsoon water cycle and decided to set up a demonstration basin per each country. The Chungju dam basin, which is about 6,648 km² with 56 precipitation stations, 21 discharge stations and 12 meteorological stations, was selected for the Korean demonstration basin.

In this study, we will evaluate the feasibility of model-driven soil moisture data for the integrated data management system over the demonstration basin. Soil moisture is one of the most important factors for water cycle processes. It directly affects to the variations of evapotranspiration and surface runoff processes. However, the measured soil moisture data, especially for those of basin scale rather than point scale, are rarely available. The model-driven soil moisture data or satellite-based soil moisture measurement will be one of the remedies for solving this kind of basin-scale soil moisture data problem. The hydrologic models used in this study are VIC, PRMS, SLURP and SWAT. The measured soil moisture data are used to evaluate the accuracy of model-driven soil moisture data. We will also demonstrate the use of satellite data for surface soil moisture estimation. A basic algorithm for the interactions between atmosphere and surface processes on the demonstration basin is suggested for future study.