Assessment of Flash Flood Forecasting based on SURR model using Predicted Radar Rainfall in the TaeHwa River Basin

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Abstract

A flash flood is one of the most hazardous natural events caused by heavy rainfall in a short period of time in mountainous areas with steep slopes. Early warning of flash flood is vital to minimize damage, but challenges remain in the enhancing accuracy and reliability of flash flood forecasts. The forecasters can easily determine whether flash flood is occurred using the flash flood guidance (FFG) comparing to rainfall volume of the same duration. In terms of this, the hydrological model that can consider the basin characteristics in real time can increase the accuracy of flash flood forecasting. Also, the predicted radar rainfall has a strength for short-lead time can be useful for flash flood forecasting. Therefore, using both hydrological models and radar rainfall forecasts can improve the accuracy of flash flood forecasts. In this study, FFG was applied to simulate some flash flood events in the Taehwa river basin by using of SURR model to consider soil moisture, and applied to the flash flood forecasting using predicted radar rainfall. The hydrometeorological data are gathered from 2011 to 2021. Furthermore, radar rainfall is forecasted up to 6-hours has been used to forecast flash flood during heavy rain in August 2021, Wulsan area. The accuracy of the predicted rainfall is evaluated and the correlation between observed and predicted rainfall is analyzed for quantitative evaluation. The results show that with a short lead time (1-3hr) the result of forecast flash flood events was very close to collected information, but with a larger lead time big difference was observed. The results obtained from this study are expected to use for set up the emergency planning to prevent the damage of flash flood.

Keywords : Flash flood, Soil moisture, SURR model

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