P02

Flood discharge simulation and rainfall-runoff analysis at Kamishiiba catchment for Typhoon 14, 2005

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Kyushu, Southwest area of Japan, was devastated by severe flooding originated in Typhoon 14 from Sep. 4 to Sep. 8, 2005. This study investigates the magnitude of flood discharge caused by Typhoon 14 at Kamishiiba catchment located in Kyushu. The observed discharge data are compared to the simulated results using three different hydrologic model ; a fully physically-based hydrological model and a semi distributed hydrological model, TOPMODEL and a lumped model, Storage function method. Model parameters are calibrated manually through an assessment of goodness-of-fitting to four past observed data. Two types of rainfall data are used for model performance. One is a radar rainfall data considering spatial distribution of rainfall and another is ground rainfall data coupled with radar data to make up missing data in rain gage measurement. Missing ground gauged rainfall data are replaced as average radar rainfall data because some parts of ground gauged rainfall data has been left off the record for approximate 2 days(from Sep. 6, 11:00am to Sep. 8, 12:00am). For clarifying the response of catchment according to change of total amount of rainfall, the relationship of rainfall and discharge calculated using four past flood events is obtained. A quantitative rainfall-runoff analysis of the storm shows that radar rainfall was estimated smaller than the data reported on the ground gage station during typhoon period. Consequently, the simulated peak discharge inputted radar rainfall into rainfall-runoff model is also less estimated than the simulation result came from modified ground rainfall data. Figure 1 shows the study site, Kamishiiba catchment (211 ㎢) and The simulated results are described in Figure 2.

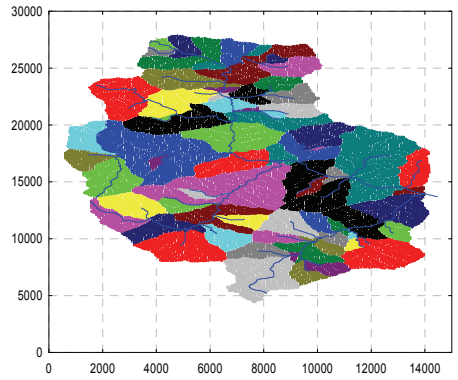

Figure 1. Kamishiiba Catchment. Bold solid line and polygons represent channel network and subcatchments.

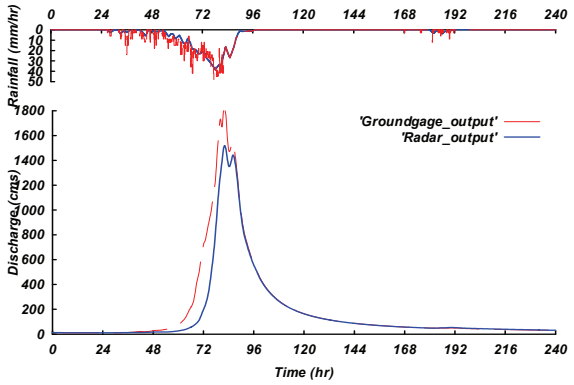

Figure 2. Simulated results for Typhoon 14, 2005

A succeeding research is inevitable to improve radar rainfall reliability and accuracy by using modification of the radar with rain gages. It is also necessary to propose methodology for calibrating reasonable parameters of hydrological models and develop a general guideline index for verification of model applicability with prediction uncertainty assessment.