

Synthetic unit hydrograph using Nash model with geospatially estimated parameters in the mid-sized watershed

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Abstract. The numerous schemes have been developed for synthesizing unit hydrograph or design flood hydrograph. However, most schemes were empirically derived and have been applied very carefully because they show significant biases when applied in local watersheds. There is wide variety of the methods of computing flood discharges from the simplest rational formula to Snyder's formula that were based on the linearity assumption of the small-scale watershed. We were developing revised formula accompanying not only the watershed area but also the watershed characteristic parameter and the runoff coefficient varying upon the return period. The synthetic unit hydrograph were synthesized using the revised peak flood formula and the Nash's model for deriving unit hydrograph using the cascade of linear reservoir. The developed scheme was validated for the 8 sites over the 4 river basins. The 8~13 precipitation events for each station were used for deriving the unit hydrograph. The local minimum method was used for separating baseflow from the total streamflow. The scheme suggested in this study shows improvement over the existing KICT scheme which tends to overestimate the peak flood in Korean watersheds.

Key words: Nash model, unit hydrograph, basin characteristics

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