Estimating Flood Quantiles on the Basis of Multi-Event Rainfall Simulation – Case Study

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A b s t r a c t

This paper presents an approach to estimating the probability distribution of annual discharges Q based on rainfall-runoff modelling using multiple rainfall events. The approach is based on the prior knowledge about the probability distribution of annual maximum daily totals of rainfall P in a natural catchment, random disaggregation of the totals into hourly values, and rainfall-runoff modelling. The presented Multi-Event Simulation of Extreme Flood method (MESEF) combines design event method based on single-rainfall event modelling, and continuous simulation method used for estimating the maximum discharges of a given exceedance probability using rainfall-runoff models. In the paper, the flood quantiles were estimated using the MESEF method, and then compared to the flood quantiles estimated using classical statistical method based on observed data.

Key words: rainfall event, precipitation generating, rainfall-runoff modelling, probability distribution of annual maximum discharges, antecedent runoff conditions, flood quantiles.