# RESPONSE VARIABILITY OF SELECTED HYDROLOGICAL MODELS TO TYPICAL TEMPORAL DISTRIBUTIONS OF SHORT-TERM PRECIPITATION

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The article presents a selection of outcomes of a three-years' project named "Variability of Short-term Precipitation and Runoff in Small Catchments and its Influence on Water Resources Management". Its aim was to provide to the public the newly derived typical temporal distributions of subdaily precipitation, also known as design rainfalls. Next goal of the project was to analyse the impact of short-term precipitation variability on hydrological modelling and design of landscape water structures. This article is focused on selected outcomes of this analysis.

Hydrological models HMS, SMODERP and MikeSHE were included in the sensitivity analysis in order to describe the variability of runoff characteristics induced by the model structure. In general runoff depths from HMS model were found within the range of values produced by the other two physically based models, but its further assessment is hampered by the limitations of the SCS-CN method, which does not reflect the temporal distribution of input rainfall in terms of resulting runoff depths. In most aspects similar models SMODERP and MikeSHE differed in particular scenarios by as much as 100 % only due to the different infiltration routine. The deviations of these two models dissipate when initial soil conditions approach the saturated state or when the soils infiltrability is subnormal. The differences in model structure or methods proved to be more significant than the variability of rainfall temporal distribution.

Last part of presented results is focused on the detailed sensitivity analysis carried out in MikeSHE model only. The variability of modelled runoff proved to depend on the average soil infiltrability. At the same time the strength of the relationship differed for the two considered runoff characteristic. While in the conditions of subnormal soil infiltrability the rainfall temporal distribution did not play a significant role in terms of modelled runoff depths, it was a dominant factor affecting the runoff peak discharges. In contrast, in the conditions of average soil infiltrability the rainfall temporal distribution was equally important factor delimiting both runoff characteristics.