



Characterisation of watersheds by runoff coefficients

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Detailed knowledge of watershed response behaviour is important to establish a regionalisation of flood frequencies for ungauged basins, to customise parameters of hydrologic models and for many other purposes.

For many areas data have been collected only for short time periods. To extend the basis of information, we reuse data from watersheds with similar response behaviour or build homogeneous regions. But which watersheds behave in the same way and which indices indicate similar or different behaviour?

Event runoff coefficients are defined as the ratio of precipitation depth to direct runoff depth during an event, i.e. they are characteristic values for catchment response.

We study the response behaviours of small and medium sized gauged watersheds in the low mountain ranges of Rhineland-Palatinate, Germany by the analysis of runoff coefficients.

The catchment areas between 8 and 1 000 km², representing a wide range of topography, land use, geology, soil types and average annual precipitation.

For each catchment area we identified about 150 rainfall-runoff events of different sizes from hourly runoff and precipitation data covering the period from 1993 to 2008. We listed parameters like season, maximum discharge, event rainfall, antecedent rainfall, and calculated the runoff coefficient for each event. To characterise and compare watersheds we calculated

maximum values, means, coefficients of variation, cumulated distribution function and correlations between listed parameters.

We use correlation analysis and direct comparison of cumulative distribution functions to find most significant parameters and similar behaviour. Seasonal and regional characteristics enable us to combine catchment areas with similar response behaviour.