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Catchment similarity across hydrological indicators - a data based approach

Ralf Merz (1) and Bruno Merz (2)

(1) Helmhotz Centre for Environmental Research UFZ, Department for Catchment Hydrology, Halle (Saale), Germany (ralf.merz@ufz.de), (2) GFZ German Research Centre for Geosciences, Hydrology Section

We say that a flow duration curve, a flood frequency curve, low flow indices, runoff seasonality, measures of runoff generation and dynamics, among many others are all signatures and can be used to describe catchment similarity. Since they are all signatures of the one catchment, to what extent are they linked? Do we get the same grouping of similar catchments, if we cluster in respect to different signatures or combination of signatures? Does knowledge of one signature provide information on other signatures of the same catchment? How do answers to these questions vary with the hydro-climatic setting? We answer these question using a data based approach based on a data set of about 400 Austrian catchments from 10-130000km^2 and a set of about 20 signatures describing the variability and dynamics of catchment runoff, runoff generation and the ratio of rainfall and evaporation.