



Process controls on the statistical flood moments

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In this paper, we analyse the process controls of different flood indicators on the statistical moments (ie. MAF, CV and CS) of 459 Austrian flood records. Two different types of flood indicators are used. The first type, termed static catchment attributes, do not change between events and include catchment area, mean annual precipitation, long term evaporation, base flow index, percentage of catchment area covered by a geological unit, soil type or land use class and statistics of topography and morphology. The second type, termed dynamic catchment attributes is associated with the event scale. Indicators of this type used in the study are event runoff coefficient, time of concentration and antecedent rainfall. The results indicate that MAF and CV are strongly correlated with indicators characterising the hydro-climatic conditions of the catchments, such as mean annual precipitation, long term evaporation and base flow index. Wet catchments tend to have higher specific flood discharges, while the variability of flood peaks between different events is smaller. In dry catchments flood discharges tend to be lower with a higher variability between the events. For the catchments analysed the flood moments are not correlated with static catchment attributes representing runoff generation, such as geology, soil types, land use or the SCS curve number. Indicators of runoff generation which do have predictive power for flood moments are dynamic catchment attributes such as event runoff coefficient and antecedent rainfall. The results of this study are useful in the decision of what information and how this information is transferred across catchment boundaries to estimate flood in ungauged catchments. Also, the results can be used for a more reliable extrapolation to flood discharges of high return periods in gauged catchments.