



## **Exploring the link between meteorological drought and streamflow – effects of climate-catchment interaction**

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In this paper, we perform a detailed regional analysis of the link between meteorological drought indices and streamflow for a comprehensive Austrian dataset of 47 small to medium- size catchments in humid-temperate climate. Four drought indices considering different components of the catchment water balance are tested. We assess the quality of the link using rank correlation analysis, and the probability of detecting low flow events by hit-scores. Overall, correlations range between 0.4 and 0.8 and differ significantly between regions. A stratified analysis shows that the link is much stronger (i) for summer low flows and droughts than for anomalies in general, and (ii) for more humid than more arid conditions. Under more humid conditions streamflow droughts of small to medium-size catchments are to a large extent generated by climate forcing and therefore well represented by a simple meteorological index. Under increasingly dry conditions, the climate signal gets less predictive and storage properties of the underground become more important. A simple soil moisture accounting scheme (such as those of the Palmer index) can considerably improve the correlations. Overall, we conclude there is a significant link between meteorological drought and streamflow drought, except for catchments where groundwater storage and snow processes are important. The results are encouraging and provide a wealth of information which can profitably be used to set up statistical prediction models to estimate low flows from meteorological time series.