

## Detecting seasonal flood changes in the Upper Danube River basin

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Due to a number of large-scale floods observed worldwide in recent years, the analysis of changes in long-term hydrological time series is becoming increasingly important. This study focuses on the Upper Danube region, which was struck by many flood events in the past decade. The flood seasonality of the study region, defined as the area of Germany, the Czech Republic, Switzerland, Austria and Slovakia, is examined to interpret the dominant flood processes. A spatial assessment of the seasonality indices of the annual maximum discharges and the seasonal discharges (derived from daily average discharges) was conducted for 117 gauging stations. Hot spots for potential changes in the mean dates of occurrence of the discharges were identified, and the results were linked with derived spatial characteristics for the catchments.

The first results of the study of the seasonal discharges revealed that the variability of occurrence of summer floods is higher than winter floods in lowlands of the upper Danube catchment. In high Alpine catchments the winter floods variability of occurrence is the same or higher than for the summer floods. The summer season floods tend to appear for all catchment sizes in the same time period. With increased magnitude of floods in the summer season, the variability of occurrence of the floods is higher.