



Long-term regimes of extreme precipitation and floods across the Alpine-Carpathian Range

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The study of the seasonality of extreme precipitation and floods has recently attracted renewed interest, especially in connection with water resources management, flood and low flow regionalization, and land cover and climate change assessment studies. The aim of this contribution is to present the differences in the long-term regimes of extreme precipitation and floods across the Alpine-Carpathian range. This analysis is based on seasonality indices and a catalogue of atmospheric circulation patterns. The main investigation will focus on the understanding of main flood producing processes and on the identification of regions with similar precipitation forcing and catchment response.

The study region covers the South-Eastern part of France, Switzerland, the northern part of Italy, Austria, the southern part of Germany, Slovakia, Romania and a small region along the Ukraine-Hungarian border. The hydrologic dataset was collected within the HYDRATE project and includes the time series of annual maximum runoff and annual maximum daily precipitation at stations with at least 20 years of measurements in the period 1961-2000. The precipitation dataset consists of 1945 stations, the annual maximum flood data of 577 stream gauges with size less than 500km².

As a result, the assessment of regime clustering will be presented. The identification of distinct regions of similar flood generation processes will be discussed within the context of southerly versus westerly circulation patterns, effects of soil moisture seasonality due to evaporation and effects of soil moisture seasonality due to snow melt.