



Spatial Patterns and Temporal Characteristics of Flood Seasonality in Europe

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In Europe, floods are typically analysed within national boundaries and it is yet not well understood how the characteristics of local floods fit into a continental perspective.

To gain a better understanding at the continental-scale, this study analyses the seasonal flood characteristics of a large sample of more than 4000 hydrometric stations from a European flood database for the period of 1960-2010. Spatially the mean timing of floods varies gradually from the west to the east due to increasing continentality, and from the south to the north due to the increasing influence of snow processes.

Six geographically distinct regions with similar flood seasonality are identified based on the monthly relative frequencies of the annual maximum discharges.

The spatial and temporal flood characteristics of each region are examined in detail and European-wide patterns of bimodal and unimodal flood seasonality distributions are presented. Most of the stations (73%) with more than 30 years of data exhibit a unimodal flood seasonality distribution (one or more consecutive months with high flood occurrence). Few stations (3%), mainly located on the foothills of mountainous areas, have a clear bimodal distribution of flood occurrences throughout the year.

Overall, the geographical location of a station in Europe can give an indication of its seasonal flood characteristics, due to the spatial coherence of the dominant flood generating mechanisms.