Detection of flood-rich and flood-poor periods in hydrological time series

David Lun, Alberto Viglione, and Günter Blöschl

Vienna University of Technology, Institute of Hydraulic Engineering and Water Resources Management, Vienna, Austria (lun@hydro.tuwien.ac.at)

The repeated occurrence of severe flood events in central European river basins such as the Danube basin in the most recent past has suggested the hypothesis of clustering of flood events at the decadal scale. Researchers of historical flood series often report decadal fluctuations of flood occurrences, which are also sometimes referred to as flood-rich and flood-poor periods. However, studies on the clustering of flood events at the decadal scale employing systematic data are rare. This works illustrates methods to investigate the clustering of flood events at the decadal scale, which can be used in the context of annual maximum peak discharge series, as well as Peak-over-threshold-series. The methodology is applied to Austrian annual maximum peak discharge series. The results suggest limited inconsistency with the assumption of an i.i.d.-process as the data-generating mechanism. Besides the detection of the clustering of events in single series, the approach can also be generalized to detect anomalous periods in space-time, which will be investigated in future work.