



## **Historical changes in the annual number of large floods in near-natural catchments across North America and Europe, 1931-2010**

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Previous investigations have analyzed historical changes in low magnitude floods, such as the annual peak flow, at regional or national scales. These investigations often use catchments where streamflows have been influenced by human alterations such as reservoir regulation or urbanization. No known studies have analyzed changes in large floods (greater than 25-year return period floods) at a continental scale for near-natural catchments. To fill this research gap, this study analyzed flood flows from reference hydrologic networks (RHNs) or RHN-like gauges in North America (United States and Canada) and Europe (United Kingdom, Ireland, France, Spain, Germany, Switzerland, Iceland, Norway, Denmark, Sweden, and Finland). RHNs are formally defined networks in several countries that comprise gauges with a natural or near-natural flow regime and that provide good quality data. Selected RHN-like gauges were included following a major effort to ensure RHN-like status through consultation with local experts.

Some 1206 study gauges met near-natural and completeness criteria for 1961-2010 and 322 gauges met criteria for 1931-2010. Peak flows with recurrence intervals of 25, 50, and 100 years were estimated using the generalized extreme-value distribution and L-moments, and peak flows at each gauge that exceeded these flood thresholds in each year were compiled. Continental and regional trends over time in the annual number of large floods, including groups differentiated by catchment size and major Köppen-Geiger climate group, are being computed and will be presented at EGU. Plots will also show the decadal variability in the annual number of large floods. The unique dataset used for this study is an example of successful international collaboration on hydro-climatic data exchange, which is potentially a step towards establishing RHN or RHN-like networks and analyzing near-natural streamflows on a global scale.