



Patterns and trends in the longest hydrological series: A Pan-European study

Neil Macdonald and the COST Action ES0901 Team

University of Liverpool, Geography, Liverpool, United Kingdom (neil.macdonald@liverpool.ac.uk)

Hydrological series from each of the countries (24) involved in the EU COST Action 'Floodfreq' (ES0901) are compiled, the longest series were compiled into a centralised dataset, with a maximum of ten stations for any country (96 station series). The data consisted of Annual Maximum (AM) and daily flow data. The longest AM series is from 1799 (Warsaw), with 29 daily data series from the late twentieth century and several series digitised specifically for this analysis (e.g. Turkish sites), with a mean record length is 95 years.

The issue of non-stationarity in hydrological series has emerged over the last decade as a function of climate change, but there has been little evidence to suggest that the effects on hydrological systems are clearly manifested within the magnitude, frequency or seasonality of large to extreme flood events. This paper examines the longest series in Europe to evaluate if there is any evidence of changes over the long periods required to assess whether postulated changes are evidenced. Within this study the AM dataset are considered, with only the stations of ≥ 100 years considered (35) and a subset of ≥ 150 years (13). Previous studies have been severely hampered by their inability to use series of sufficient length to overcome short term fluctuations previously evidenced within series. The results identify that there are a number of different flood-rich and flood-poor phases within the long series, with no clear spatial patterns evident within the results.