



## **Identification of flood-rich and flood-poor periods in flood series**

Luis Mediero, David Santillán, and Luis Garrote

Department of Civil Engineering: Hydraulics, Energy and Environment, Technical University of Madrid, Madrid, Spain

Recently, a general concern about non-stationarity of flood series has arisen, as changes in catchment response can be driven by several factors, such as climatic and land-use changes. Several studies to detect trends in flood series at either national or trans-national scales have been conducted. Trends are usually detected by the Mann-Kendall test. However, the results of this test depend on the starting and ending year of the series, which can lead to different results in terms of the period considered. The results can be conditioned to flood-poor and flood-rich periods located at the beginning or end of the series. A methodology to identify statistically significant flood-rich and flood-poor periods is developed, based on the comparison between the expected sampling variability of floods when stationarity is assumed and the observed variability of floods in a given series. The methodology is applied to a set of long series of annual maximum floods, peaks over threshold and counts of annual occurrences in peaks over threshold series observed in Spain in the period 1942-2009. Mediero et al. (2014) found a general decreasing trend in flood series in some parts of Spain that could be caused by a flood-rich period observed in 1950–1970, placed at the beginning of the flood series. The results of this study support the findings of Mediero et al. (2014), as a flood-rich period in 1950-1970 was identified in most of the selected sites.

### References:

Mediero, L., Santillán, D., Garrote, L., Granados, A. Detection and attribution of trends in magnitude, frequency and timing of floods in Spain, *Journal of Hydrology*, 517, 1072–1088, 2014.