



## Reconstruction of annual flood series in Southern Italy

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In the last few years, several studies have detected changes in the rainfall regime which may have an impact on hydrological extremes and water resources availability. In addition, the lack of continuous observations as well as the significant transformations of river basins limits our ability to fully characterize hydrological response. Therefore, it is urgent to update current methods and tools in order to shed light on the expected hydrological changes.

In the present study, we try to construct a detailed description of extreme flow patterns in Southern Italy in the period 1920-2020. For this reason, the dataset of annual maximum discharges was constructed using all available records and extended using indirect measurements (e.g., daily discharge and water levels). The data before 1980 were collected in the SIMN Special Publication No. 17 and in the SIMN Hydrological Yearbooks, which provide the annual maximum flow rates and the annual rating curves. Hydrological observatory have been transferred to the regional Department of Civil Protection, but only water level observations are available for the most recent period.

Dataset from different sources requires a significant effort to reconstruct reliable timeseries. In order to extend the historical series of floods annual maxima, we tried to transform mean daily maxima into peak flow values by means of a conversion factor proposed by Taguas et al. (2008). Additionally, the database was also integrated with the most recent data converting water level measurements in annual floods by using the annual maxima flow rating curve. Such rating curve turned out to be quite stable over time as demonstrated by Claps et al. (2010) and it was verified using also hydraulic numerical models.

The present study results complement the outcomes of the recent study by Blöschl et al. (2017), who investigated flood trends over the last five decades in Europe. This study provided a clear overview on the recent tendencies in Europe except for southern Italy because of the limited and discontinuous data availability. Therefore, the study allowed to reconstruct a relevant number of timeseries representative of the entire southern Italy. The homogeneity of the reconstructed data have been verified using the Kolmogorov-Smirnov test. Then, the obtained series were analysed in order to detect possible trends by using the Mann-Kendall non-parametric test. Results highlights the dynamics of flood production over the entire southern Italy.

## References

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