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Regional flood frequency analysis in Triveneto (Italy): climate and scale controls

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The growing concern about the possible effects of climate change on flood frequency regime is leading Authorities to review previously proposed procedures for design-flood estimation, such as national regionalization approaches. Our study focuses on the Triveneto region, a broad geographical area in North-eastern Italy consisting of the administrative regions of Trentino-Alto Adige, Veneto and Friuli-Venezia Giulia. A reference procedure for design flood estimation in Triveneto is available from the Italian NCR research project "VA.PI.", which developed a regional model using annual maximum series (AMS) of peak discharges that were collected up to the 80s by the former Italian Hydrometeorological Service. We consider a very detailed AMS database that we recently compiled for ∼80 catchments located in Triveneto. Our dataset includes the historical data mentioned above, together with more recent data obtained from Regional Services and annual maximum peak streamflows extracted from inflow series to artificial reservoirs and provided by dam managers. All ∼80 study catchments are characterized in terms of several geomorphologic and climatic descriptors. The main objectives of our study are: (1) to check whether climatic and scale controls on flood frequency regime in Triveneto are similar to the controls that were recently found in Europe; (2) to verify the possible presence of trends as well as abrupt changes in the intensity and frequency of flood extremes by looking at changes in time of regional L-moments of annual maximum floods; (3) to assess the reliability and representativeness of the reference procedure for design flood estimation relative to flood data that were not included in the VA.PI. dataset (i.e. more recent data collected after the 80s and historical data provided by dam managers); (4) to develop an updated reference procedure for design flood estimation in Triveneto by using a focused-pooling approach (i.e. Region of Influence, RoI).