



## **Local and regional assessment of the possible presence of non-stationarity in extreme rainfall in northern Italy**

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The possible presence of non-stationarity in long rainfall records, along with the related consequences in the estimation of the frequency distribution of the extreme events, was recently pointed out in several scientific studies. However, it is well known that the detection of the presence of non-stationarity may be affected by relevant uncertainties, which are mainly originated by the limited length of the available data samples. The present contribution describes an analysis aimed at detecting the possible presence of non-stationarity in some long rainfall records observed in northern-central Italy. Firstly a regional analysis is performed in order to assess the possible presence of non-stationarity at regional scale. Secondly synthetic rainfall series are analysed in order to assess how much the sample variability of a short stationary series might induce effects which could be attributed to non-stationarity. The result show that it is extremely difficult to distinguish between sample variability and non-stationarity when dealing with the typical sample sizes of hydrometeorological time series.