



Estimating temporal changes in extreme rainfall in Sicily Region (Italy)

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An intensification of extreme rainfall events have characterized several areas of peninsular and insular Italy since the early 2000s, suggesting an upward ongoing trend likely driven by climate change. In the present study temporal changes in 1-, 3-, 6-, 12- and 24-hour annual maxima rainfall series from more than 200 sites in Sicily region (Italy) are examined. A regional study is performed in order to reduce the uncertainty in change detection related to the limited length of the available records of extreme rainfall series. More specifically, annual maxima series are treated according to a regional flood index - type approach to frequency analysis, by assuming stationarity on a decadal time scale. First a cluster analysis using at-site characteristics is used to determine homogeneous rainfall regions. Then, potential changes in regional L-moment ratios are analyzed using a 10-year moving window. Furthermore, the shapes of regional growth curves, derived by splitting the records into separate decades, are compared. In addition, a jackknife procedure is used to assess uncertainty in the fitted growth curves and to identify significant trends in quantile estimates. Results reveal that, despite L-moment ratios show a general decreasing trend and that growth curves corresponding to the last decade (2000-2009) are usually less steep than the ones of the previous periods, rainfall quantile estimates have increased during the 2000s due to a large increase in regional average median, mainly in Western Sicily.