

Trends and variability of precipitation extremes in Sardinia island, 1951-2000: results dependence on the network density.

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An analysis of high resolution network data of daily precipitation on Sardinia island (west Mediterranean) from 1951 to 2000 is presented. A special attention has been dedicated to the network density effects: in a lower resolution network many extreme events of convective type are not intercepted. The mean distance between the stations is about 10 km. The yearly series has been determined by taking the maximum yearly daily precipitation in the whole Sardinia network. The 12 monthly series in a similar way by taking the maximum daily precipitation in Sardinia for each month. Comparison between monthly series by Wilcoxon-Mann-Whitney test shows significantly higher extreme values in October and November. These higher extreme values are associated to very intense convective precipitation. The comparison of 1951-1975 and 1976-2000 periods by Wilcoxon-Mann-Whitney test presents no significant differences except for March series. Decade mobile window Wilcoxon-Mann-Whitney test indicates that the decade 1965-75 has significantly higher values than the rest of yearly series, while the decade 1976-85 has lower values. Trends by Mann-Kendall test present not significant results except March (decreasing) and July (increasing). The dependence of the previous results on the network density has been investigated. A second set of data has been selected by eliminating about 20% of stations in a uniform way, so the station mean distance raises to about 12 km. A third set of data has been obtained by eliminating about 80% of stations, so the station mean distance is 20 km. Comparison between the original data set and the second one by Wilcoxon-Mann-Whitney test shows that they are very similar, on the contrary the third set values are significantly lower. Comparison of 1951-1975 and 1976-2000 periods by Wilcoxon-Mann-Whitney test produces some different results by using the third data set, respect to the original one. Also different results are obtained for the third data set in the trend test.