



A study of rainfall in the Roman area in the years 1951-2000

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The rainfall data collected in the second half of the last century at 31 climatic stations in Lazio, Italy, have been subjected to statistical analysis in order to describe the pluviometric regime of the whole area on a multi-decadal time scale. The stations, for their geographical distribution within the region under study, are apt to represent different climatic zones, namely, a coastal zone, a rural zone, a suburban zone and an urban area. The data have been treated both as time series and as geographical statistical variates with the double aim, first, to verify if in the area under study any changes in the yearly precipitation rate, frequency and its distribution over the different classes of rain intensity, have occurred in the last 50 years; second, to evidence a possible correlation between the intensity of precipitation and any of some environmental variables such as altitude, distance from the coastline and from the urban site.

As for the first issue, it can be concluded that the precipitations in the period 1951-2000 over the Roman area show no significant trend; in particular, no trend is visible in any of the single classes of rain intensity, considering either their frequency or their percent contribution to the total. As for the second issue, significant correlations have been found in the spatial distribution of rainfall with any of the relevant environmental variables mentioned above.

The results of the analysis also show that in the urban area a less amount of rain seem to fall than in the surroundings zones, a result that seems rather anomalous in consideration of the several known factors that favour the intensification of the rainfall in the city with the respect to its surroundings.

Last, a detailed statistical characterization of all the single 31 stations over the whole

period is presented after carrying out a separate study of the durations of droughts and of the statistics of rainy days, using best fits based on the Weibull probability distribution.

Keywords: trend, rainfall, climate change, heat island, urban climate, extreme climatic events.