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Climatology of rain intensity variability and trends over Greece

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Abstract

Rain variability in space and time is one of the most relevant characteristics of Mediterranean climate that is associated with economic, social and ecological implications. Extreme rain events have significant environmental consequences that cause considerable damages in urban as well as in rural areas.

In this study, the spatial and temporal variability of the rain intensity (mm/h) in Greece is examined, during the period 1960-2002. The meteorological data used in this study were acquired from thirty two meteorological stations belonging to the Hellenic National Meteorological Service, while all the time series used in the analysis were tested by the application of the short-cut Bartlett test of homogeneity.

The seasonal spatial distributions of the rain intensity (RI) as well as the trends are studied using the Kriging interpolation method.

Our findings show that in winter, positive trends of RI appear in southern Greece, while negative ones dominate all over the rest of the country. In spring, the pattern remains the same, but the RI trends are higher over the mountainous regions of southern Greece. In summer, the trend patterns differentiate and the positive trends of RI appear over the northern Aegean Sea, while in fall, the positive trends shift from north to the south-eastern sea area of Greece. The study of rain intensity trends is a good tool for policy makers, in order to estimate, among other factors, the erosion and the desertification that appears as a consequence of the climatic changes in the eastern Mediterranean Sea.