

# **Trends in indices of precipitation extremes in Croatia , 1901-2004**

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Trends in indices of precipitation extremes are studied on the basis of daily precipitation measurements from five meteorological stations in Croatia covering different climate regions: Osijek in the very southern part of the Pannonian lowland, Zagreb-Gric in the North-western continental Croatia, Gospic on the Lika plateau in the Dinaric mountains, and at two locations at the eastern Adriatic coast, Crikvenica located in the Kvarner Bay characterised by the maritime climate of the northern Adriatic under the strong influence of the mountains, and Hvar at the middle Adriatic island of Hvar. Indices of precipitation extremes have been calculated according to the WMO report on the activities of the working group on climate change detection. This enables comparison of already obtained results for western and central Europe to the transitional area from the Pannonian lowland to the eastern Adriatic coast in more detail. During the 20th century there was a tendency for precipitation decrease all over Croatia. It is mostly pronounced and statistically significant at northern coast (Crikvenica: 18%/100yrs) as a result of decrease in all seasons. In other parts decreasing annual trends are resulting from precipitation decreases in all seasons especially in spring, except for summer. The annual anomalies show very large variability since 1901 and continue also at the beginning of the 21st century. Trends in precipitation indices point at the increase in annual number of dry days ( $R_d > 1.0$  mm), significant at 5% confidence level along the coast and the city of Zagreb. At the same time it is a very weak negative trend in moderate wet days ( $R_d > R_{75\%}$ ) and no change in very wet days ( $R_d > R_{95\%}$ ). High precipitation amounts that fall on very wet days ( $R_{95\%} T$ ) show practically no change. Highest 1-day and 5-day precipitation amounts have large interannual variability, without significant trend, but with negative sign in 5-day maxima all over Croatia and in 1-day maxima in mountainous and lowland areas. The results show that in drying area, such as Croatia, there is no signal of large changes in extremes that concerns high amounts and frequency of wet and very wet days. The decrease in annual precipitation is the consequence of changes in frequency of rainy days of lower intensity and increased frequency of dry days.