



EMS Annual Meeting Abstracts

Vol. 19, EMS2022-212, 2022

<https://doi.org/10.5194/ems2022-212>

EMS Annual Meeting 2022

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



Trends in temperature and precipitation indices in Croatia, 1961-2020

Ksenija Cindric Kalin¹, Leonardo Patalen¹, Ivana Marinovic¹, and Zoran Pasaric²

¹Croatian Meteorological and Hydrological Service (ksenija.cindric@cirus.dhz.hr), Zagreb, Croatia

²Department of Geophysics, Faculty of Science, University of Zagreb, Zagreb, Croatia

Observed changes in the seasonal and annual air temperature and precipitation amounts, and the corresponding indices of extremes in Croatia are analysed. Daily data from the 1961-2020 period are employed at 37 climatological stations (mean and extreme air temperatures) and 164 rain gauge stations (precipitation amounts) operated by the Croatian Meteorological and Hydrological Service. The trends are estimated using linear regression and the statistical significance of trends is tested by the Mann-Kendall test. The results revealed a consistent warming trend in the whole country. The highest increase in the mean annual air temperature (up to 0.5 °C/10years) is detected in central continental Croatia mostly due to summer and winter positive trends. Observed warming is also evident in positive trends of warm temperature indices (warm days, warm nights and warm spells) and negative trends in cold temperature indices (cold days, cold nights and cold spells). A significant decrease in the summer precipitation amounts is found along the Adriatic coast and in the highlands (5-15 %/10years), in the latter region also in spring. The most prominent feature of precipitation changes is a consistent positive trend in autumn rainfall amounts across the whole country, with the largest increase detected in central parts. The observed trends are associated with an annual increase in dry spell (DS) lengths in the central parts and along the Adriatic coast, and with a significant decrease in DSs in easternmost Croatia. Moreover, in the central, mountainous and northern Adriatic region, a significant increase in precipitation fraction due to very wet days (R95T) and in daily intensity index (SDII) is found. The summer drying is associated with a decrease in the number of moderately wet days along the Adriatic and the highlands but also with an increased number of dry days and DS lengths, and a decrease in the SDII and highest 1-day (Rx1d) and 5- day (Rx5d) precipitation amounts. On the other hand, autumn wetter conditions are mainly associated with an increase in R95T and with shorter DS lengths but also with an increase in SDII and Rx1d and Rx5d. The spring trend pattern is characterised by longer DS lengths in the northern Adriatic and longer wet spells in eastern Croatia.