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Seasonal analysis of warm extreme events in Serbia from 1949 to 2017

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Worldwide studies revealed a general increase in frequency and severity of warm extreme temperature events. In this study, extreme temperature events including Heat waves (HWs) are examined. Extreme indices are calculated based on daily maximum temperature (Tx). The following definitions are employed: SU - number of days with Tx > 25 °C, number of days with Tx > 90th percentile, and WSDI - number of days in intervals of at least six consecutive days for which Tx is higher than the calendar day 90th percentile. Daily values of air temperatures from 11 meteorological stations distributed across Serbia were used for the period 1949–2017.

Trends of extreme temperature events and their frequencies are examined. The period 1949–2017 are characterised by a warming of extreme temperature indices (SU, Tx90, HWs). It is found that maximum air temperatures increased at all stations, but statistically significant at 6 stations in winter, 4 stations in summer and two stations in spring. The average number of SU per station was between 63.1 in Novi Sad to 73.5 in Negotin during the summer season. Significant increase of SU is recorded in summer for 10 out of 11 stations. Positive trends of SU and Tx90 are observed for all stations and seasons, except in Novi Sad. The average number of Tx90 is about 9 for all stations in all seasons. The longest heat waves prevailed in 2012, but the most severe are recorded in 2007. Increasing of warm extreme events in Serbia are in agreement with studies for different regions of the world.