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Changes in maximum air temperatures over the Ukraine territory under modern climate changes

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For nine stations of the Ukraine (Kyiv, Lviv, Odesa, Poltava, Simferopol, Uzhgorod, Uman, Kharkiv, Chernivtsi), the series of average daily maximum temperature for periods of 41 to 112 years are analyzed during the warm season (May, 1 to September, 30).
In the contribution the statistical theory of extreme values changes, so called “block maximum” method, and “peaks-over-threshold” method are used to represent changes in the temporal series of maximum temperature under modern climate change.
For four sites in the Ukraine - Poltava, Simferopol, Uzhgorod, Uman - received a positive trend (changes in temperature are from 1.0 to 3,40C), in Kharkiv, Odesa and Chernivtsi a decrease in temperature with time are observed and for two stations - Kyiv and Lviv – changes are barely noticeable. It should be noted that negative trend corresponds to the regions, where low absolute maximum temperatures are observed, and positive trends fit regions with high values of observed absolute maximum.
The research shows shift in the generalized extreme value distributions of average maximum temperatures for the first and last year of record. The results showed shift of modal values, lower and upper boundary of distributions to higher temperatures for all sites in the Ukraine, Uzhhorod and Kharkiv excepted.
For all nine sites the return levels of highest temperatures are calculated.
Indices for the selection of heat waves (90th percentile, 95th percentile and heat wave criterion proposed by WMO) were calculated for each days of the period under study for all nine sites. For 15th day of each month of the period concerned the maps of extreme indices were created.
These maps can be used to output more suitable and accurate heat wave indices for the territory of Ukraine.
For Odesa heat waves were selected by means of the different extreme criteria. All criteria don’t show increase of heat wave number with time in Odesa. The obtained results show that maximum number of heat waves were observed from 1921 to 1959 and from 1991 to 2005.