



## **Heat wave event dynamics over the territory of Ukraine in the context of the global climate change**

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General circulation models of climate change predict that heatwaves will become more frequent and intense, especially in the higher latitudes, affecting large metropolitan areas. In the study for nine cities 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). The study is based on the Peaks over Threshold Approach, applied to study the frequency of heat waves using three heat indices such as 90th percentile (TX90p), 95th percentile (TX95) and heat wave criterion proposed by WMO (TXA5). For five stations of Chernivtsi, Kharkiv, Kyiv, Odesa and Poltava a linear trend shows the decrease in maximum temperature. For the rest of the stations there is the increase in the year highest temperature. For all stations stepped trend is characterized strong change in the mean value of block maximum temperature. In Kyiv and Lviv the stepped and linear trends don't agree. It shows that in these stations there is different type of variability (for example, cyclical fluctuations). In comparison with the 1961-1990 period for all stations in question number of heat waves is growing. However, most increment of number of heat wave days in the period of 2001-2010 are observed in Kyiv, Simferopol and Uman. For these stations rapid growth in days with maximum temperatures being more than 30 and 35°C, are obtained as well. In Lviv, Poltava and Kharkiv uneven decrease in number of heat wave days occur during XX century for all indices in question. In the other stations periods with small number of heat wave days alternates with ones with large number of heat wave days, which correspond to periods of decrease and increase of maximum temperature. The least length of heat waves takes place in Lviv (doesn't exceed 10 days), Odesa and Chernivtsi (doesn't exceed 15 days) for all indices. The largest length of heat waves is got in Poltava (27 days for TXA5 and TX90p indices). For TX95 index the longest heat wave occur in Simferopol (21 days). In the study frequency distribution of heat wave event in the planes of "cumulative temperature – heat wave length" and "cumulative temperature – heat wave amplitude" are obtained. These frequency distribution shows that the most heat wave events are concentrated in area with cumulative temperature of 5 to 40°C, heat wave amplitude of 2 to 8°C and heat wave length of 6 to 10 days for all stations. The maps of mean monthly indices for the 1961-1990 period over the Ukraine show that there is decrease in indices from east to west in May and June and from southeastern to northwestern in July and August. In September all of indices are reduced from the southern to the northern parts of the Ukraine. The highest values correspond to the TX95p index and the lowest one correspond to TXA5.