



Changes of heat waves characteristics over the territory of Slovakia

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The study is focused on the analysis of long-term changes and trends of heat waves occurrence in selected meteorological stations in Slovakia. Changes of the temperature regime of the hydro-climatic system may have serious consequences on population health. It is expected that climate change could, in the next decades, also lead to a higher frequency and greater spatial extent of extreme heat waves in Central Europe. Heat waves can cause severe thermal environmental stress, health complications, higher hospital admission rates, and increased mortality. A larger number of consecutive warm days and nights can also lead to increased solar overheating of buildings, inhibited ventilation, etc. Detection of possible ongoing changes of the regime of heat waves is therefore of particular interest.

Since heat waves can be quantitatively evaluated through their temperature range (extremity) and also according to their duration, a set of such characteristics using statistical methods were analysed using maximum and average daily air temperature time series from the 1951-2010 period in 8 meteorological stations over the territory of Slovakia. Results indicate an overall consistent (both in time and space) increase of selected heat wave characteristics in Slovakia mostly due to their occurrence in the last two decades (1991 to 2010). This period was characterised by the occurrence of the most extreme heat waves ever recorded in history of meteorological observations in Slovakia (years 1992, 1994, 1998, 2003, 2007, 2010). The absolutely longest and most extreme heat wave occurred in southern Slovakia (station Hurbanovo) in 1992, when one heat wave lasted 47 days, while the cumulative amount of the deviation from 30 °C reached over 106 ° C. Change of the heat waves character in the last two decades was also indicated. Compared with the previous decade (1991-2000), during the decade of 2001-2010, the heat waves had shorter durations, but their total extremity and the quantity increased significantly. Examples of this development in the years 2003, 2007 and 2010 were given.