



Heat wave phenomenon in southern Slovakia: long-term changes and variability of daily maximum air temperature in Hurbanovo within the 1901-2009 period

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Analysis of long-term changes and temporal variability of heat waves incidence in the region of southern Slovakia within the 1901-2009 periods is a goal of the presented contribution. It is expected that climate change in terms of global warming would amplify temporal frequency and spatial extension of extreme heat wave incidence in region of central Europe in the next few decades. The frequency of occurrence and amplitude of heat waves may be impacted by changes in the temperature regime. Heat waves can cause severe thermal environmental stress leading to higher hospital admission rates, health complications, and increased mortality. These effects arise because of one or more meteorology-related factors such as higher effective temperatures, sunshine, more consecutive hot days and nights, stagnation, increased humidity, increased pollutant emissions, and accelerated photochemical smog and particulate formation. Heat waves bring about higher temperatures, increased solar heating of buildings, inhibited ventilation, and a larger number of consecutive warm days and nights. All of these effects increase the thermal loads on buildings, reduce their ability to cool down, and increase indoor temperatures.

The paper is focused to analysis of long-term and inter-decadal temporal variability of heat waves occurrence at meteorological station Hurbanovo (time-series of daily maximum air temperature available from at least 1901). We can characterize the heat waves by its magnitude and duration, hence both of these characteristics need to be investigated together using sophisticated statistical methods developed particularly for the analysis of extreme hydrological events. We investigated particular heat wave periods either from the severity point of view using HWI index. In the paper we also present the results of statistical analysis of daily maximum air temperature within 1901-2009 period. Apart from these investigation efforts we also focused on synoptic causes of heat wave incidence in connection with macro scale circulation patterns in central European region.