

Should the Polish people be afraid of the heat waves in the changing world?

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The high and prolonged period of raised temperature may have a dramatic impact on different fields of human activity, e.g. agriculture, but in particular human health. Studies have shown that a significant rise in heat-related health problems takes place when excessive heat lasts more than two days.

While in the West Europe the year of 2003 remains in memory as a year of many dramatic events connected with heat waves, in Poland the year of 2006 was an extreme one. During the summer months, especially in July, most regions in Poland experienced heat waves. Such events have been unknown for these regions until now. Unfortunately, the climate change projections for Poland foresee the overall growth in temperature in upcoming years. What does it mean for occurrence and characteristics of the heat waves? Will they occur at more frequent intervals and be more severe/extreme in the future?

In this study the heat waves will be described by different thermal characteristics, e.g. the number of hot days/nights and the duration of the hot spell and the hot-nighttime spell (and their combinations) based on daily temperature (first of all maximum temperature but also the minimum for the nighttime), numbers of dangerous days and the duration of dangerous spells based on the heat index, etc. Changes in high temperature extremes were analyzed using statistical tests. Additionally, the different thermal variables of the summer of 2006 will be compared with projections of these variables for the future.

All calculations will be studied based on the results of daily (maximum and minimum) temperature, relative humidity and precipitation for several regional climate models (ENSEMBLES family) in the controlled period of 1961-1990 and for the future of 2071-2100. The characteristics of the heat waves obtained based on different models will be discussed and compared with each other. Simultaneously, the characteristics for the present and for the future will be compared as well.