



Event-adjusted evaluation of temperature extremes

M. Müller (1,2), M. Kaspar (1), A. Valeranova (3), E. Holtanova (3), and L. Crhova (3)

(1) Institute of Atmospheric Physics AS CR, Department of Meteorology, Prague, Czech Republic (muller@ufa.cas.cz), (2) Charles University in Prague, Faculty of Science, Prague, Czech Republic, (3) Czech Hydrometeorological Institute, Department of Climatology, Prague, Czech Republic

Temperature extremes are usually defined using data series from individual gauges. In fact, extreme events not only reach high magnitude at a site but also affect a large area. Moreover, the events are not identical in terms of the affected area and duration. That is why we present the following method of evaluation of weather extremes. At the sites, the extremeness of a value of the representative variable is quantified by its return period. Subsequently, the extremeness is accumulated in space and time using so called Weather Extremity Index (WEI). The method is “event-adjusted” because it optimizes both the considered area and the time window for each event. Besides the value of WEI, each event is also characterized by its spatial extent and duration.

Using daily air temperature minima and maxima from Czech gauges (1961 – 2010), we assemble sets of local cold and heat episodes, respectively. Both sets of extremes are analyzed from various points of view. While heat episodes were more concentrated in two last decades, the temporal distribution of cold extremes was more even and changes with increasing threshold of WEI; the most extreme cold episodes occurred in 1980's. Regarding seasonality, the earliest heat (cold) episodes appeared in the middle of June (December); the latest ones occurred at the end of August (at the beginning of March).