

Kyselý J., 2003: Temporal variability of heat waves in the Czech Republic and the severe 1994 heat wave. *Meteorol. Zpr.*, **56**, 13-19. [in Czech, with summary in English]

The analysis of heat waves at more than fifty stations in the Czech Republic shows the temperature exceptionality of the 1990s when the most severe summer seasons occurred. In 1992 and 1994, long periods with high air temperature and decreased interdiurnal temperature variability were related to persistent circulation patterns over Europe with high pressure systems influencing central Europe. The highest air temperatures ever recorded in the Czech Republic, reaching 40°C in south and central Bohemia, were observed in 1983 but they were confined to relatively short periods and heat waves did not reach a severity comparable with 1992 and 1994. The occurrence of long and severe heat waves in the 1990s may reflect an enhanced persistence of the atmospheric circulation over central Europe in summer season, because all groups of circulation types have considerably increased residence times in the 1990s compared to long-term means. The nature of the long-term temporal heat wave distribution is dominated by a small number of large peaks. The enhanced heat wave occurrence in the 1940s - early 1950s as well as their almost total absence in the first two decades of the 20th century and around 1980 seem to be common features for a larger area of at least central Europe.

The July-August 1994 heat wave was the most severe heat wave from the beginning of uninterrupted temperature measurements at Prague-Klementinum (1775). Using an AR(1) model of maximum daily temperature, an upper limit of the return period of a heat wave lasting at least 34 days (as observed in 1994) was estimated to be 700 years at Strážnice, and the return period of the observed 18-day spell of tropical days is in the order of thousands of years. An increase in the mean summer temperature of 3°C would result in a 100-fold increase in this probability. The extreme 1994 heat wave as well as the preceding June 1994 heat wave were associated with a considerable increase in total mortality and mortality due to cardiovascular diseases in the Czech Republic.