Abstract

The thesis deals with selected heavy snowfall events and evaluation of their extremity in Czechia in the period 2009-2013. Based on a literature search, four methods to assess the extremity of heavy snowfall events are described. In Czechia, the only tool used so far is the highest recorded depth of fresh snow, which represents an indication of point extremities. Another option is to evaluate the size of the area with the depth of fresh snow according to the criteria of the Integrated Warning Service System. The third way is the regional snowfall index (RSI), considering not only the size of the affected area but also the number of population in it. It would also be possible to assess the heavy snowfall events with the help of the weather extremity index (WEI), which would quantify the area distribution of return periods of depth of fresh snow at meteorological stations.

In the second part of the thesis, the extremity of four selected events is evaluated using the first three criteria and the differences resulting from the tools used are pointed out. The results of the extremity assessment of individual heavy snowfall events according to different indices show a difference in the results in the extremity assessment for the same event depending on the evaluation index used. We record the maximum difference in the results when comparing the extremity between the highest daily depth of fresh snow and the extremity according to the adjusted regional snowfall index. Heavy snowfall events, which affect lower positions with higher population density but lower maximum depth of fresh snow, appear to be more extreme than events spatially limited to higher positions, where the maximum depth of fresh snow is significantly higher due to orographic intensification of snowfall.

Keywords: meteorological extreme, heavy snowfall, extremity index, Czechia, depth of fresh snow, warning service system