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Trend of values and culmination time of the seasonal maximum total snow cover depth in Slovakia since the mid-20th century.

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The maximum depth of the total snow cover is one of the significant characteristics of snow cover. Analogous to maximum precipitation totals whose belong to the most analyzed characteristics of precipitation, the maximum depth of the total snow cover has dominant position among other snow characteristics too. High values of the total snow cover depth in relation to the potentially high value of its water equivalent are frequently used in engineering practice.

There are indications that in recent years a number of anomalies in the seasonal regime and in the values of maximum depth of the total snow cover may have occurred. Total snow cover is among one of the meteorological elements that could be most affected by global warming. In such a complex natural conditions of Slovakia, this could mean the occurrence of opposing tendencies even within relatively small regions between lower and higher elevation levels, respectively between valley locations and surrounding slopes.

In the paper maximum values of total snow cover in the winter seasons 1981/1982 - 2011/2012 from 353 meteorological stations within Slovakia were processed, while on 15 stations the analysis was extended to the period 1951/1952 - 2011/2012. Trends in the maximum monthly values of the total snow cover and seasonal tendencies in occurrence of the total snow cover maximum were evaluated in the individual months of the winter season.

The effects of precipitation increase in winter season respectively in the transitional seasons are reflected in the trends of monthly maximum values of the total snow cover as well as the effects of changing temperature conditions. The results point to prevailing upward trends of the maximum monthly values of total snow cover, but not for all months. The regional aspect and altitude effect are also considerable.

In the regime of the seasonal total snow cover maximum at lower altitudes there are tendencies of shifting maxima to months outside of the traditional winter peak period. In high mountain areas there are tendencies of shifting occurrence of the seasonal total snow cover maximum to a later period.