



Synoptic climatological analysis of the high level winds over the Carpathian Basin

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In recent years several „unusual” weather events have been recorded in the Carpathian Basin, e.g. severe snow in March 2013. In this paper we evaluate the hypothesis assuming that these weather events are related to the high level winds, especially, to the characteristics of the polar jet-stream.

For this purpose, first, we performed a general statistical analysis of the high level wind fields of the region for 18 vertical layers above the 500 hPa pressure level, including the detailed analysis of average wind speed and wind directions, trend analysis of daily wind speed values, and extreme wind speed values. In addition, we examined the relationship between the regional climatic conditions and the jet stream, for which we used NAO (North Atlantic Oscillation) and AO (Arctic Oscillation) indices for first estimations since these teleconnection pattern indices are closely related to the jet-stream. We calculated linear correlation coefficients between NAO and AO indices, and local weather conditions for 30 years (1981-2010) on annual, seasonal, and monthly time scales as well as for special cases.

Our final goal is to evaluate the possible effects of climate change on the high level winds, and thereby the weather conditions in the Carpathian Basin.