



Impact of the North Atlantic Oscillation on winter precipitation totals in Slovakia

Livia Leskova (1) and Pavel Stastny (2)

(1) Faculty of Natural Sciences, Comenius University in Bratislava, Slovakia (livia.leskova@gmail.com), (2) Slovak hydrometeorlogical institute, Bratislava, Slovakia (pavel.stastny@shmu.sk)

The North Atlantic Oscillation (NAO) is the most important circulation mode in the Northern Hemisphere, which impacts climate in Europe in various ways. The strongest impacts of oscillation on air temperature and precipitation regime are detected in Scandinavia and Mediterranean region, but impacts have opposite effect. Therefore, assessment of the relation between NAO and precipitation totals seems to be interesting in Slovakia, because of the country location in the centre between above mentioned regions. Our former research detected only the relation between NAO and a winter precipitation totals in Slovakia. More detailed aspects of this relation is analysed in this paper. A correlation method was used at two resolution levels, which detected opposite spatial impact of NAO on above mentioned seasonal precipitation. The first generalised level was based on the precipitation regions, which were distinguished on the base of characteristic precipitation regime of individual regions. The second level was more detailed and the correlation method was applied on data of every individual rain gauge station from the set of 202 rain gauge stations with complete data for period 1901 - 2010 in Slovakia. In the northern part of the country (Orava and Kysuce regions), there was found the positive correlation. Increase in the winter precipitation totals was recorded in the same regions and general precipitation trend in this area was similar to the trend in used Hurrell oscillation index. It means, following the increasing trend in oscillation course, we can also expect the increase in precipitation totals in these regions in the near future. In a southward direction, this correlation changed to the negative values and the most negative correlation coefficients were reached in the lowland regions (Podunajská and Východoslovenská nížina) and in the region of Juhoslovenská kotlina. This last mentioned region is located in multiple precipitation shadow of Carpathians, whereas the precipitation shadow is lower in other regions. Therefore, we suppose, the impact of NAO is strongly influenced by barrier effect of Carpathian Mountains. It can also be expected the important impact of Mediterranean oscillation in the last mentioned regions.

ACKNOWLEDGEMENT

The article was prepared with the support of grant VEGA 1/1155/12.