



How do Southern cyclones appear in the COST 733 catalogue 2.0 domain 05 weather types?

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The small number of cyclones forming over the Mediterranean, Black and Caspian Seas and moving generally northwards, cause large air temperature contrasts, thunderstorms, extreme precipitation events, wind gusts and even tornadoes over the Baltic Sea region.

Aim of the present work is to study how the so called Southern cyclones appear in the COST 733 catalogue 2.0, domain 05 weather types. The following analysis is based on the position of Estonia, being located near the centre of the Baltic Sea region and the domain 05.

We used the cyclones database compiled by Gulev et al. (2001) based on the SLP data with a 6-hour time lag derived from the NCEP/NCAR re-analysis. As Southern cyclones we define those formed South from 47°N and East from the 0° meridian.

A distance of 1000km between cyclone centres and Estonia was used to select the Southern cyclones affecting the weather in Estonia. The point with coordinates 58.75°N and 25.5°E was used as the central point of the 1000km circle.

The Southern cyclones are divided into two classes according to their trajectories: A) passing Estonia from the East; B) passing Estonia from the West. The border between these classes is 25°E.

Next, we selected the cyclones that appeared over the COST 733 period of 1958-2001. Altogether, there were 133 Southern cyclones that passed Estonia from the West, and 257 cyclones that passed from the East.

In Southern cyclones we determined the date when a cyclone was nearest to the central point of Estonia. According to these dates we selected all weather types from the COST 733 catalogue 2.0, domain 05, which appeared on the corresponding dates of classifications that contain 27 or more weather types. Altogether, 159 classifications were analysed. Also, weather types that occurred day before and day after the date when a cyclone was nearest to the Estonian centre were selected and analysed separately. Then, we performed a frequency analysis of such weather types. On the basis of the MSLP maps, we estimated the location of low pressure areas on the given weather type map.

Our analysis shows that there are only few classifications with weather types that occurred on majority of days affected by a Southern cyclone. Still, in the case of Southern cyclone types of most classifications, it was found that most of them represent the synoptic situation when low pressure areas are either located in the West (Western quarters), or East (Eastern quarters) from Estonia.