



The long series of storm days in Northern and Central Europe and their dependence on the synoptic conditions

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Severe weather phenomena, which also include storms, over the last several years have become increasingly common, not only in Europe, but around the world – the number of lightning could rise by as much as 30%. Storms accompanied by lightning, hail, heavy rains, strong winds, landspouts and tornadoes, posing threat to human life and activities.

The aim of the study is to present the synoptic conditions that caused the long series of storm days in selected cities of Northern and Central Europe during the years 2005-2014. These cities are located in the area of moderate cool and warm climate. Trondheim (Norway) and Brest (France) represent maritime climate, Tampere (Finland) and Warsaw (Poland) – temporary, while Syktyvkar and Orenburg (Russia) – continental.

The data used in the work relate to the number of storm days in the years 2005-2014 and analysis of synoptic situation which includes synoptic maps of daily meteorological bulletin (http://www.pogodynka.pl/polska/mapa_synoptyczna/ and <http://www.wetterzentrale.de/topkarten/tkfaxbraar.htm>), visible and infrared satellite images (<http://www.sat24.com/history.aspx>) as well as vertical aerological sounding (<http://weather.uwyo.edu/upperair/sounding.html>). Data on the number of thunderstorm days and daily values of maximum and minimum air temperatures, humidity, pressure, wind speed, visibility are derived from archival database OGIMET and TUTIEMPO and WEATHER UNDERGROUND. Data regarding thunderstorm days and thunderstorms originates from METAR (Meteorological Aerodrome Report) messages from seven airport weather stations.

Days of the storm may occur singly, at intervals of one, few or over a dozen days, but the phenomenon of the storm may also appear daily for a short period of time. At every station there were more single-day storm. The shortest sequence lasted 2 days (performed at all stations), and the longest 5 days in Warsaw.

Ranged (about 5), periods of storm days occur very rarely – just a few times. This means that, synoptic conditions conducive to the formation of this phenomenon does not last long, ending at 1 or 2 storm days. This demonstrates the great dynamics of changes in the atmospheric circulation in moderate cool and warm climate.

Ranged series of storm days can appear from May to September, but most often occur in the July in Tampere, Syktyvkar, Warsaw, and Orenburg. Storms occurred frequently in May and in November in Brest and in June – in Trondheim.

The long series of the storm appear in both frontal storms and thermal storms. Rarely, throughout this period there is one type of storm: only thermal or only frontal.

Keywords: storms, series of storm days, synoptic conditions, Trondheim, Tampere, Syktyvkar, Brest, Warsaw, Orenburg