

Climatological and meteorological aspects of very large hail and tornados in Lithuania in the period 1962-2018

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The impact of climate change to the people life makes meteorologists turn from discussions to deep research and take action to combat this problem. The recurrence of heat waves and powerful summer storms have a significant influence on the weather situation in the Baltic region as well. The main purpose of this presentation is a quantitative analysis along with qualitative study of two hazardous meteorological phenomena in Lithuania – very large hail (hailstone diameter ≥ 20 mm) and tornados (wind gusts ≥ 28 m/s). According to national criteria for severe weather, they are considered as disastrous meteorological phenomenon potentially devastating for aviation, agriculture and constructions. All data (for hail – since 1962, for tornados – since 1967) have been collected from archives of Lithuanian Hydrometeorological Service (LHMS).

During this long period 84 cases of very large hail have been registered in 121 places and 27 tornados cases in 33 places of the country. In fact, about 1 tornado per 2 years and about 2 large hail cases per year registered in the country. Obviously, the real number of occurrences is higher than the observed figure, however due to new technology the information on these phenomena is more and more frequent and exact nowadays.

In most cases, especially intense convection develops in situation when cold front moves from the western or southwestern part of Lithuania to the eastern one which is more frequently occupied by tropical air mass. The convergence at the surface in these mesocyclones associated with divergence at higher levels is the main reason of powerful discharge of the energy of instability.

Over 95 % cases of large hail occur due to the passage of atmospheric fronts. In contrary, there exists a distinction between two basic synoptic situations leading to the development of tornados: the areas of mesoscale convective systems which develop on cold front wave tops (~ 70 % of all tornadoes cases) and the lines of convergence/instability (16 % of cases), and only 3 tornadoes cases were associated with a point of occlusion or warm front in the morning hours.

The poster demonstrates both phenomena using the charts of distribution over Lithuania, diagrams and histograms as well as impact. Additionally, this paper widely illustrates the distinct spread of very large hail and tornados by daytime and by seasons and the prevailing size of hailstones or wind speed of tornados.