



The variability of maximum wind gusts in Poland in the period 1966-2018

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Windstorms are among the most costly type of natural disasters in Europe. Poland is no exception. In August 2017, the strength of winds destroyed huge areas of the forest in Tuchola Forest, three persons died. In December 2013 the mountain wind has brought down many trees in the Polish part of the Tatra Mountains, especially in Kościeliska Valley. The press more and more often reports cases of broken trees, broken roofs or damaged electric traction because of strong winds. The question arises whether episodes with strong winds appear more often lately. To answer it data from 40 synoptic stations of the Institute of Meteorology and Water Management in Poland are examined in the period 1966-2018. There were daily maximum wind gust values. Intraannual variation of daily maximum wind gusts (MWGs) was analysed on all stations as well as their monthly, seasonal and annual maximum values. The spatial correlation between daily and monthly MWGs were analysed in the context to their relation to station distance. Linear trends are also calculated for monthly, seasonal and annual records for all 40 stations. Their statistical significance at the level of $\alpha=0.05$ is tested by t-test. The spatial distribution of trends was also analysed. N-year return periods for different N values for all stations were calculated using two theoretical distributions: GEV (general extreme value) and Gumbel distribution. Several the most spectacular cases of windstorms were analysed more precisely, in terms of maximum gusts of the wind and the area, the maximum gusts exceeding selected thresholds were observed.