



## **Long-term variations and trends in the occurrence of thunderstorms in Finland**

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In many European countries, long time series' exist regarding the occurrence of thunderstorms. In Finland, routine human observations of thunderstorm days were started within the whole country in 1887. In 1960, an automatic flash counter network was established by Finnish Meteorological Institute. Therefore, in 2016, data sets of 130 and 57 years long are available for the annual number of thunderstorm days and the annual number of lightning flashes, respectively.

Both of the parameters show large annual variation, as is the case for basically any meteorological parameter in Finland. However, besides annual variation, also decadal variation is clearly visible especially in the number of thunderstorm days. For example, high-activity seasons occurred 1934–1940 and 1984–1988 while low activity periods took place especially in 1950–1955. The 10-year running mean in the number of lightning flashes, however, is showing a slightly decreasing trend from 1977 onward. As expected, there is a statistically significant correlation between the annual average number of thunderstorm days per year and the annual average cloud-to-ground flash density. The main motivation of this study is to examine the atmospheric factors governing the annual and decadal variations in the occurrence of thunderstorms in Finland.