



Spatiotemporal variability of tornadoes in the Czech Lands, 1801-2017

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Tornadoes are severe, small-scale weather phenomena that may cause loss of human lives and give rise to great material damage on a local (regional) scale. Because of their limited spatial extent, they are usually seldom recorded in the standard network of meteorological stations and corresponding information has therefore to be gathered from various documentary sources (narrative sources, taxation data, newspapers, special reports etc.). Qualitative description of such events over the territory of the Czech Lands (recently, the Czech Republic) has facilitated the creation of a database of tornadoes and the classification of them as "proven" or "probable" for the 1801-2017 period. A total of 367 tornadoes and 299 days with tornado have been detected. The temporal distribution of tornadoes is very non-regular and reflects the availability of documentary sources inspected and general public interest in them. Decades in which their frequency was highest were found in 2001-2010, 1931-1940 and 1921-1930. They occurred mainly in the summer months (70.3%) with a July maximum (28.1%). Moderate tornadoes (F1 on the Fujita scale) were the most frequent (41.7%). Uprooted fruit trees, damage to hop-gardens and vineyards, together with considerable damage to structures or buildings destroyed constituted the most common types of damage. At least 17 people were killed and more than 127 people injured during the 367 documented tornadoes. Seventeen tornadoes with F2-F3 and seven with F3 are listed and briefly characterised. Three F3 events from 11 May 1910, 20 April 1950 and 9 June 2004 are described in more detail. Results related to the spatiotemporal variability of tornadoes in the Czech Lands are further discussed from the viewpoint of data uncertainty and the broader European context. (This work was supported by Czech Science Foundation, project no. 15-11805S "Windstorms in the Czech Lands during the past 500 years" and by the Ministry of Education, Youth and Sports of the Czech Republic, project no. CZ.02.1.01/0.0/0.0/16_019/0000797 "SustES - Adaptation strategies for sustainable ecosystem services and food security under adverse environmental conditions".)