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Windstorms and forest disturbances in the Czech Lands: 1801–2015

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The paper deals with long-term analysis (1801–2015) of relationship between windstorms and forest disturbances in the Czech Lands (recently Czech Republic). Based on documentary evidence, long-term chronologies of windstorms with forest impacts separately for convective storms of the summer half-year (April–September) and windstorms of the winter half-year (October–March) were compiled. Their long-term variability is confronted with three differently created series of forest damage for the periods of 1801–1900, 1900–1980 and 1963–2015. Based on this comparison, 14 most damaging windstorms for forests were selected: 12 events occurred in the winter half-year (October–March) and two in July. They were further analysed from point of view of their meteorological character (temperature, pressure, wind force/speed and direction) and forest damage. Twelve winter windstorms were prevailingly related to large horizontal pressure gradients between pressure lows located northerly/northwesterly and pressure highs south-westerly of Central Europe, warming before windstorm onset with south-west airflow, air pressure decrease and passing of the cold front over the Czech territory. High temperatures and wet ground before windstorms were favourable for extensive windthrows in forests with uprooted and broken trees. Uncertainties in windstorm chronologies and series of damage, as well as consequences for forestry in the Czech Lands and the central European context of this study are further discussed. (This work was supported by Czech Science Foundation, project no. 15-11805S “Windstorms in the Czech Lands during the past 500 years”.)