

Comparison of wind speed trends from homogenized and inhomogeneous time series

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Wind measurement is one of the most problematic meteorological elements in a sense of its reliability. Problems were caused in the past by change in methodology of measurement (Beaufort) and the automation of the meteorological network. Changes of instruments (switching to ultrasound instrument), need of frequent calibration of automated cup anemometers, are a few examples of problems that have to be faced. Added to that, wind speed has weak spatial relationship. The homogenization of the wind speed has been performed in this work for sub-daily and daily data. Our own method of the correction of inhomogeneites have been applied. The method is based on the correction by percentiles. The time series of wind speed were successfully homogenization was repeated in several iterations. After that, all missing values in the period 1961-2015 were filled. It has been found that most of the time series are inhomogeneous. About 85 % of the time series has more than three breaks. Detected breaks were compared with metadata and half of them coincide with metadata information. Most of the breaks were caused by automation after the year 1997. Higher correction was performed in the winter months. Average correction factor for average wind speed was 0.45 m/s.

In the first comparison, the differences between inhomogeneous and homogenized wind speed are significant. For that reason the change of the trend between unadjusted and adjusted time series was analyzed and is presented here. The question is whether the globally observed decrease trend is due to nature phenomenon or human activity (afforestation, increasing of the roughness etc.) or by change of the instruments (automatic, ultrasonic).

Acknowledgements

The authors acknowledge the financial support of the Grant Agency of the Czech Republic for project no. 15-11805S (Windstorms in the Czech Lands during the past 500 years) and by project of the Ministry of Agriculture of the Czech Republic: QJ1610072 (System for monitoring and forecast of impacts of agricultural drought).