



## **Homogenization of Canada's hourly surface wind speeds data**

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In this study, we homogenized hourly near-surface wind speeds recorded at 150 long-term stations in Canada for the period from 1953 to 2015. First, we used metadata and a logarithmic wind profile to adjust hourly wind speeds measured at non-standard anemometer heights to the standard 10-m level. Then, we applied the statistical homogeneity tests in the RHtestsV5 software package to the monthly and daily mean wind speed series derived from hourly wind speeds that have been adjusted to the standard 10-m anemometer height, using homogeneous monthly mean geostrophic wind (geo-wind) speed series as reference series. We used all available metadata to verify the statistically detected changepoints. Finally, we used the quantile-matching (QM) adjustment method to adjust hourly wind speed data for the changepoints found in the monthly and/or daily mean wind speed series, to produce homogenized hourly wind speed data. As shown in our previous study, beside anemometer height change, station relocation is the main cause for discontinuities in the wind speed series, followed by instrumentation problems or changes, and observing environment changes. The effects of artificial mean shifts on the results of trend analysis are shown to be remarkable, with the homogenized wind speed series showing better spatial consistency of trends.