Climate data: homogenized surface wind speed data

Long-term homogenized surface wind speeds (at standard 10 m level) have been specifically developed for climate research in Canada. The data consist of hourly and monthly mean surface wind speeds for more than 100 locations. Series start from 1953 or later and all stations have at least 45 years of continuous observations.

The original data includes hourly surface wind speeds extracted from the National Climate Data Archive of Environment Canada. There are no joined stations.

Surface wind speeds were homogenized in two steps. First, metadata and a logarithmic wind profile were used to adjust hourly wind speeds measured from non-standard to the standard 10 m height. Then, the monthly mean wind speeds were tested for homogeneity using a technique based on regression models (Wang, 2008). Homogeneous monthly mean geostrophic wind speeds, derived from homogenized sea level pressure, were used as reference series.

The homogenization methodology involves the identification of shifts in the wind speed time series due to changes in anemometer height, site exposure, location, instrumentation and anemometer type. Monthly adjustments were derived from the regression models (Wan et al., 2009). Hourly data were adjusted from non-standard to the standard 10 m

height. Whenever possible, the main causes of the identified inhomogeneities were retrieved through historical evidence such as the inspection reports.

- Homogenized surface wind speeds data

References

Wan, H., X. L. Wang, V. R. Swail, 2009: Homogenization and trend analysis of Canadian near-surface wind speeds. J. Clim., 23, 1209-1225.

Wang, Xiaolan, 2008: Accounting for autocorrelation in detecting mean-shifts in climate data series using the penalized maximal t or F test. J. Appl. Meteor. Climatol., 47 (No. 9), 2423-2444.

Date modified:
2013-07-05