



## **Homogenization of near-surface wind speed and gust series across Sweden**

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Twenty-first century surface air temperatures keep rising globally, driving changes in regional weather extremes and other climate variables. Mean and gust winds are not excluded by those shifts. Due to their severe socioeconomic and environmental impacts, the scientific community has started to evaluate the risks associated with changes in extreme wind speed and gust. Across Scandinavia, and particularly in Sweden, windstorms are responsible of a large part of the economic losses associated with natural disasters. Studies which evaluate the impact of wind-related hazards need to have access to reliable and homogeneous measurements. Unfortunately, observed wind series can be affected by several non-climatic artifacts, which may introduce inhomogeneities that mislead the study of climate trends and multi-decadal variability.

This study compares different homogenization approaches to identify the best technique for homogenizing near-surface mean wind speed and daily peak wind gust series across Sweden. In particular, uncertainties associated with different time-scale (daily versus monthly) and used reference series are assessed for the automatic homogenization by the R package *Climatol*. Results show that homogenization carried at daily time-scale is able to identify the major breakpoints detected in monthly homogenization. The homogenization approach that adopts as reference series a combination of nearby stations and ERA-Interim grid-point series performs better compared to other techniques with different reference series, as nearby stations, geostrophic winds or reanalysis datasets.