

Trends of daily peak wind gusts in Australia, 1941-2016

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Daily Peak Wind Gust (DPWG) time series are important for the evaluation of wind-related hazard risks to different socioeconomic and environmental sectors. Yet wind time series analyses can be impacted by several artefacts, such as anemometer changes and site location changes, both temporally and spatially, that may introduce inhomogeneities that mislead the study of their decadal variability and trends. A previous study (EGU2018-14546) presented a strategy in the homogenization of this challenging climate extreme such as the DPWG using 548 time series across Australia for 1941-2016. The automatic homogenization of this DPWG dataset was implemented in the recently developed version 3.1 of the R package Climatol which: (i) represents an advance in homogenization of this extreme climate record; and (ii) produced the first homogenized DPWG dataset to assess and attribute long-term variability of extreme winds across Australia. Given the inconsistencies of wind gust trends under the widespread decline in near-surface wind speed (stilling), the aim of this study is to analyze DPWG trends in Australia for 1941-2016, with particular focus on: (i) the frequency (90th percentile); and (ii) the magnitude (wind speed maxima) of DPWG. Station-based DPWG trends at 548 sites, and regional DPWG trends will be reported at different spatio-temporal scales: i.e. annual, seasonal and monthly. Large-scale atmospheric circulation changes will be analyzed to quantify the role played in the observed DPWG trends and multi-decadal variability.