EGU General Assembly 2025

EGU25-10966, updated on 16 Feb 2026
https://doi.org/10.5194/egusphere-egu25-10966
EGU General Assembly 2025

Winter cyclones drive stronger surface wind extremes in the North Atlantic than in the Southern Ocean

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Hemispheric symmetries, including those in zonal-mean eddy kinetic energy and in hemispheric-mean planetary albedo, are a characteristic feature of Earth's climate. Whether such a symmetry also holds for extreme surface windspeeds driven by midlatitude cyclones is currently unclear. We address this question by focusing on the regions with the peak of storm tracks over the North Atlantic, North Pacific and Southern Ocean. We analyse reanalysis and satellite datasets and employ objectively calculated storm tracks to associate cyclones with surface winds they produce. Additionally, we check for existence of trends in extreme windspeeds of each basin. Results show a statistically distinguishable hemispheric asymmetry in extreme surface windspeeds, with the North Hemisphere having stronger extremes, driven primarily by extreme windspeeds occurring during winter and in proximity to cyclones. This implies that cyclones in the North Hemisphere drive stronger surface windspeed extremes than in the South Hemisphere. The North Hemisphere also has higher extreme windspeeds above the boundary layer (700 hPa), pointing to the role of large-scale processes in driving these differences. Lastly, trends in the extreme surface windspeeds across all basins are positive in the reanalysis dataset, and statistically significant in the North Pacific and Southern Ocean.