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Supplement of

Dynamical precursors to summer temperature extremes on the Antarctic Peninsula

William J. Dow et al.

Correspondence to: William J. Dow (earwd@leeds.ac.uk)

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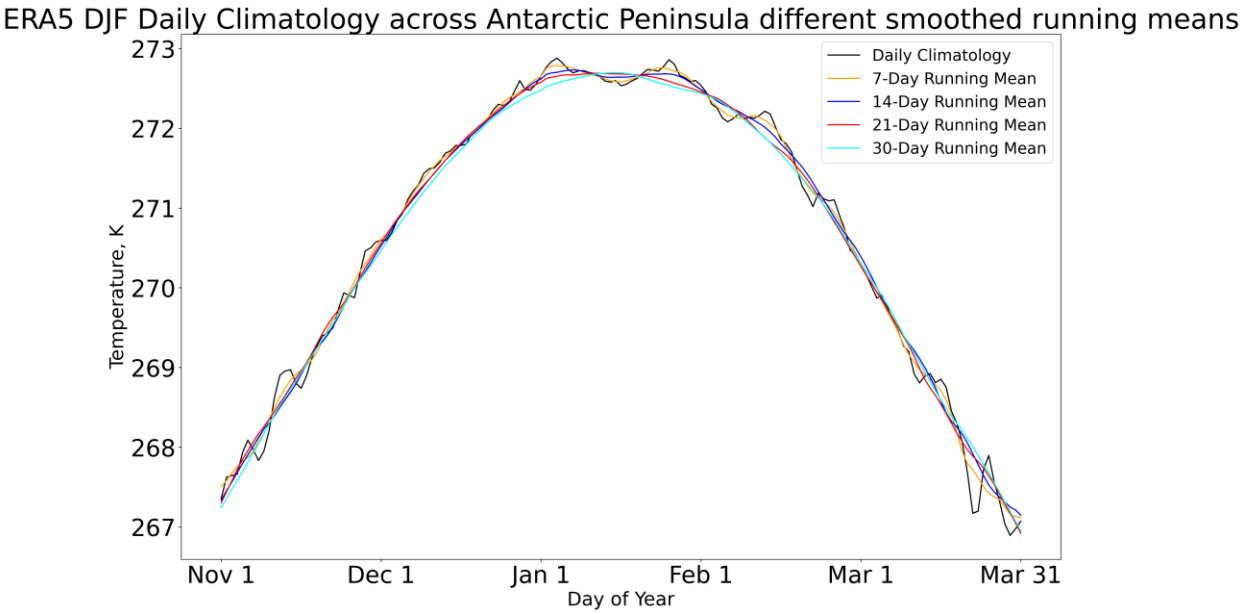


Figure S1: Climatological daily mean 2m temperature during austral summer averaged across the Antarctic Peninsula from ERA5 averaged over 1979-2024 (black). Coloured lines show different low pass filters applied to define a smooth climatological seasonal cycle.

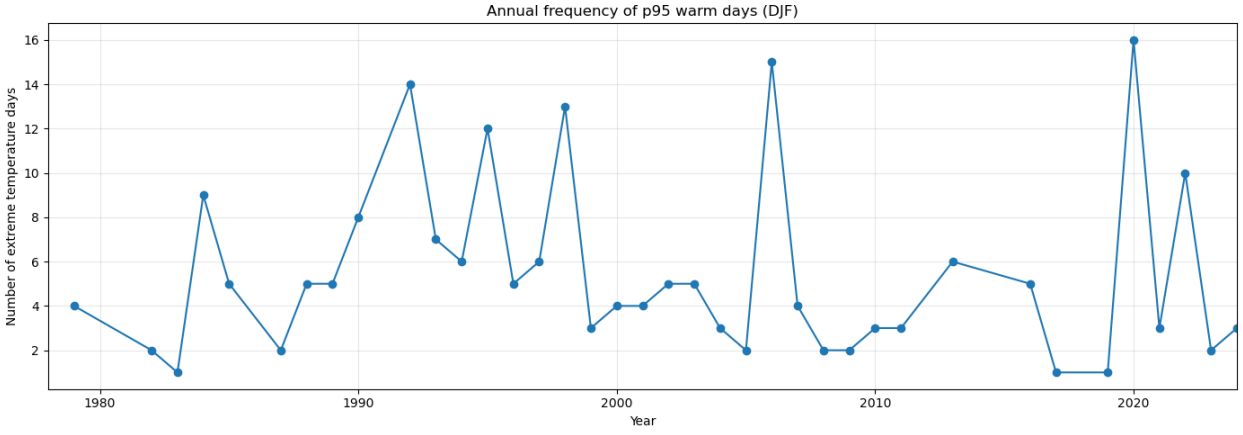


Figure S2: Frequency per summer of days where the daily mean 2m temperature is above the 95th percentile across the Antarctic Peninsula in ERA5. There is large interannual variability but no systematic linear trend in frequency over time.

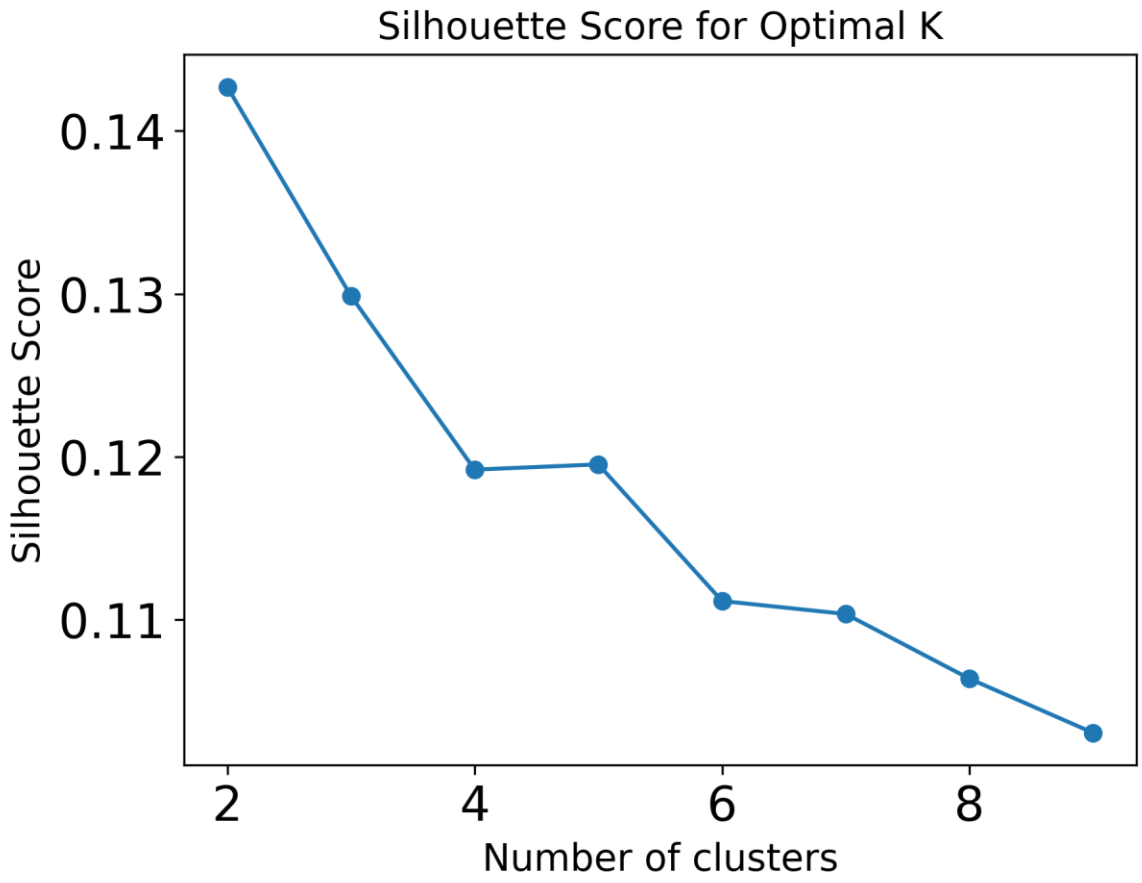


Figure S3: Silhouette score as a function of k for k-means clustering applied to the ERA5 daily mean sea level pressure fields on days when the daily mean 2m temperature across the Antarctic Peninsula exceeds the 95th percentile.

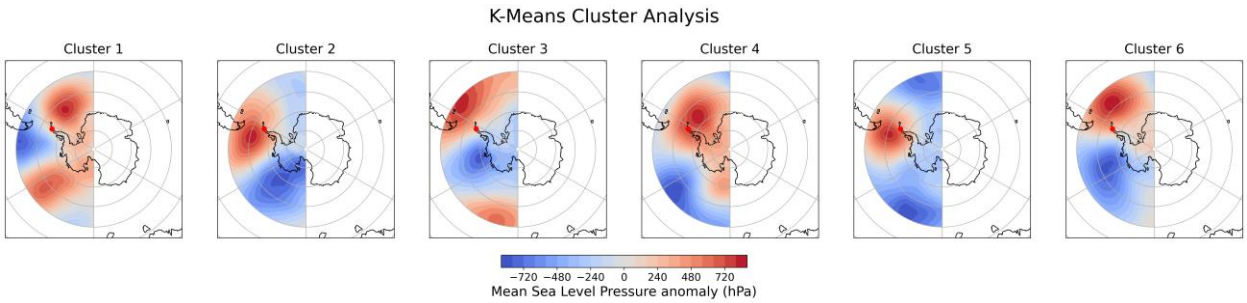


Figure S4: Mean sea level pressure anomalies [hPa] for the cluster centroids when k=6.

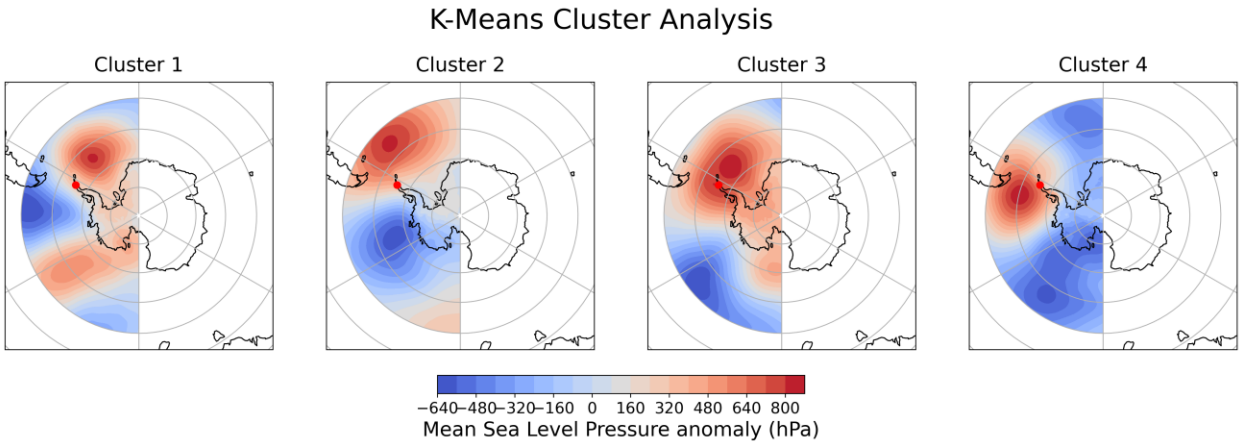


Figure S5: Mean sea level pressure anomalies [hPa] for the cluster centroids when k=4.

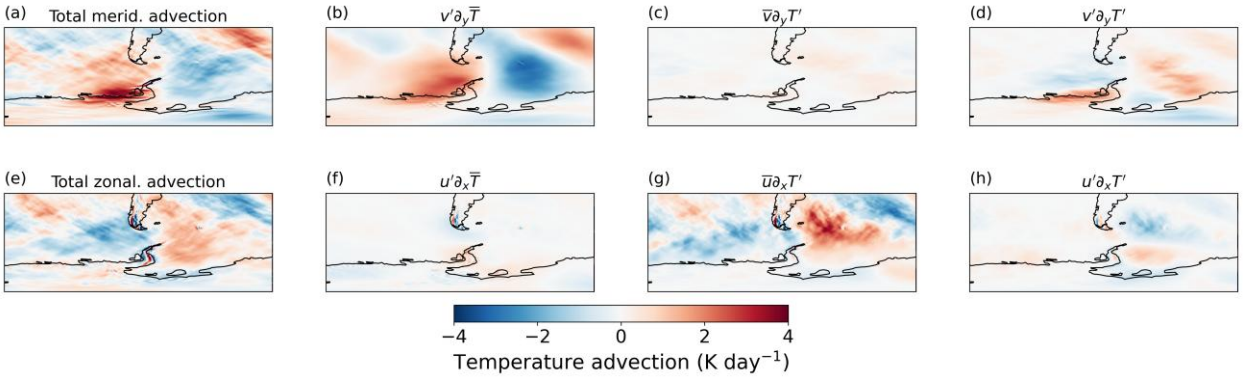


Figure S6: Decomposition of meridional (top row) and zonal (bottom row) temperature advection (K day^{-1}) during p95 events. The left column (a, e) shows the total anomalous advection relative to the DJF climatology. Panels (b, f) show the contribution from anomalous winds acting on the climatological temperature gradient, while (c, g) show the contribution from the climatological winds acting on the anomalous temperature gradient. Panels (d, h) display the nonlinear interaction term. The domain shown is 105°W–45°W and 45°S–80°S.