



Supplement of

Future changes in North Atlantic winter cyclones in CESM-LE – Part 1: Cyclone intensity, potential vorticity anomalies, and horizontal wind speed

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1 Figures



Figure S1. Cyclone temperature composites response for winter in the North Atlantic. a) Non-rotated and b) rotated in the direction of the storm's displacement. Present-day mean is overlaid as black contour lines and future response is shaded. The composites are shown at the time of maximum intensity (time=0). Intense storms (10% strongest) are averaged for the ensemble member number 1 of the CESM-LENS dataset. Present-day: 361 storms and future climate: 312 storms.



Figure S2. Present-day composites of horizontal PV distribution at different levels for extreme cyclones. The separation level at 600 hPa is contoured in red. The composites are shown at the time of maximum intensity (time=0). Extreme cyclones are defined as the 1% strongest systems in terms of maximum RV850.



Figure S3. Present-day composites for extreme cyclones of a) wind speed at 850 hPa and b) wind speed at 250 hPa for winter in the North Atlantic region. The composites are shown at the time of maximum intensity (time=0).



Figure S4. Wind composites obtained from inverting the background PV at 850 hPa in a) present-day climate and their b) future change.



Figure S5. Wind composites at 250 hPa in present-day climate (a) and their future change (b). The wind composite is obtained from inverting the lower-layer PV anomalies.



Figure S6. Internal consistency of the wind flow at 850 hPa. The balanced flow (a,c) and the sum of the individual contributions (b, d) are compared in present-day climate (a, b) and their future change (c, d).



Figure S7. Internal consistency of the wind flow at 250 hPa. The balanced flow (a, c) and the sum of the individual contributions (b, d) are compared in present-day climate (a, b) and their future change (c, d).