Serial clustering of extratropical cyclones and relationship with NAO and jet intensity based on the IMILAST cyclone database

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Cyclone families are a frequent synoptic weather feature in the Euro-Atlantic area, particularly during wintertime. Given appropriate large-scale conditions, such series (clusters) of storms may cause large socio-economic impacts and cumulative losses. Recent studies analyzing reanalysis data using single cyclone tracking methods have shown that serial clustering of cyclones occurs on both flanks and downstream regions of the North Atlantic storm track. Based on winter (DJF) cyclone counts from the IMILAST cyclone database, we explore the representation of serial clustering in the ERA-Interim period and its relationship with the NAO-phase and jet intensity. With this aim, clustering is estimated by the dispersion of winter (DJF) cyclone passages for each grid point over the Euro-Atlantic area. Results indicate that clustering over the Eastern North Atlantic and Western Europe can be identified for all methods, although the exact location and the dispersion magnitude may vary. The relationship between clustering and (i) the NAO-phase and (ii) jet intensity over the North Atlantic is statistically evaluated. Results show that the NAO-index and the jet intensity show a strong contribution to clustering, even though some spread is found between methods. We conclude that the general features of clustering of extratropical cyclones over the North Atlantic and Western Europe are robust to the choice of tracking method. The same is true for the influence of the NAO and jet intensity on cyclone dispersion.