



Characterising mid-latitude storm variability and change: with particular emphasis on the North Atlantic

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The aim of this research is to better understand variability of the winter storm-track in the North Atlantic region, with an eventual focus on extreme storm behaviour. This involves a development and comparison of statistics based on two approaches: using diagnostics of 2-6 day bandpass filtered eddy kinetic energy (TEKE), and ensemble statistics of tracked storms. The TEKE statistics are investigated using empirical orthogonal function (EOF) and teleconnective analyses to identify key patterns of variability, from which extreme behaviour in the storm-track has been analysed. The tracking statistics, based on vorticity fields, are used to develop a range of diagnostics, including mean strength, and track, genesis and lysis densities. Analysis of TEKE has revealed a significant north-south shift pattern in the storm-track in the east North Atlantic. This pattern of storm-track variability is associated strongly with the East Atlantic pattern but weakly with the North Atlantic Oscillation. Composite tracking diagnostics reveal that the north-south storm-track shifts correspond with individual system track changes more than changes to system strengths. In the future this methodology will be applied to recent HadGEM1 global climate model outputs from the Hadley Centre, UK.