Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03431, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03431
EGU General Assembly 2008

Regional Differences in the Prediction of Extratropical Cyclones by the ECMWF Ensemble Prediction System

L. S. R. Froude, K. I. Hodges and L. Bengtsson

Environmental Systems Science Centre (ESSC), University of Reading, UK
(lsrf@mail.nerc-essc.ac.uk)

A storm-tracking approach to forecast verification has been used to explore the prediction of extratropical cyclones by the European Centre for Medium Range Forecasts (ECMWF) Ensemble Prediction System (EPS). An objective feature tracking method has been used to identify and track the cyclones along the forecast trajectories of the ensemble members. Statistics have been produced to determine the rates at which the positions and intensities of the forecasted cyclones diverge from the analysed cyclones with increasing forecast time. The analysis methodology provides an alternative measure of forecast skill to that obtained from conventional RMS and anomaly correlation approaches and gives detailed information about the prediction of extratropical storms. Since these storms are responsible for a vast majority of the weather experienced in the midlatitudes, the method provides a good measure of a forecast system's ability to predict the weather.

In the past the ensemble verification statistics, generated from the storm-tracking analysis, have been for entire hemispheres. A regional analysis of the EPS has now been performed to investigate how these statistics vary from one area of the globe to another (e.g. the Atlantic compared with the Pacific). Results show that in the northern hemisphere there is a larger ensemble mean error in the position of storms over the Atlantic. Further analysis revealed that this is mainly due to errors in the storms propagation speed, with a bias for them to move too slowly. Storm intensity is generally overpredicted over the ocean and underpredicted over the land and there are larger errors in the predicted intensity of storms over the ocean. In the northern hemisphere large errors occur in the prediction of the intensity of storms that originate as tropical

cyclones, but then move into the extratropics. The spatial patterns of the ensemble mean error and ensemble spread, in the intensity of the cyclones, are very different. Spatial distributions of the ensemble mean error suggests that large errors occur during the growth phase of storm development, but this is not reflected in the spatial distributions of the ensemble spread.