UCD Meteorology M.Sc. Research Project 2010

Estimating Predictability of forecasts using ERA Interim data

(Ray McGrath)

The ERA-Interim (1989-present) archive contains sets of daily 10-day forecasts launched from the 00 UTC and 12 UTC analyses. Typically, the predictability of the forecasts, which is seasonally influenced, drops off by about day 7, when the anomaly correlation score falls below about 0.6. However, occasionally, the forecasts beyond day 7 show good skill.

Are these events completely random, or, are they associated with specific atmospheric patterns e.g. strong zonal flow, etc? The study should focus on the European area for forecast skill.

Work Plan:

- Extract the global analysis and day 7-10 forecasts from the 12 UTC daily archive for the period 1989-2009; the MSL pressure and 500hPa geopotential fields will be sufficient.

- Calculate the anomaly correlation score for Europe for the day 7-10 forecasts.

- Analyse the data and focus on high scores (>0.6); these events are to be investigated.

- Confirm that high scores are consistent i.e. a day 10 high score is reflected in high scores for the earlier lead times of the forecast (i.e. not a fluke).

- Look at the starting analyses for these events to see if they have anything in common.

- Ensure that the sample of events is manageable - not too large or small - by picking a suitable threshold for the score or reducing the forecast lead time. Also, investigate whether the frequency of such events has changed over the 21 years.

(The ERA_Interim assimilation/forecast system is fixed but observational data volumes and quality will have changed over the period; changes in the natural variability of the atmosphere may also be relevant.)