# FORECASTS USING DIFFERENT MODELS

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An experiment has recently been carried out at the UK Meteorological Office to complement a recent study by Baumhefner and Downey (1978). This study involved comparing forecasts from six initial data sets using various large models, both those designed for operational forecasting and those designed for general circulation experiments. In the Meteorological Office, forecasts have been carried out using the 10 level operational model and an 11 level general circulation model using both finite differences and spectral methods. A description of these models and full list of references will be found in Cullen (1978). It is hoped to publish these results at a future date.

At the request of ECMWF these forecasts were examined to see if they gave any support to the Monte Carlo forecasting idea of deriving an ensemble of forecasts from different models or from different initial states using the same model, and then using the ensemble mean as the forecast issued, with the variance of the ensemble as an estimate of forecast error. Because of staff limitations it was only possible to construct an ensemble mean forecast by hand, together with an error field for the ensemble mean. The results indicated that the ensemble mean was much smoother than the individual forecasts, and detail that would have been useful guidance to a forecaster was lost. This is to be expected if the ensemble mean is judged against the best of the three forecasts. However, the ensemble mean was also less useful than any one of the three models used on its own. This seemed to be because in each forecast there were serious errors in at least one of the models which contaminated the ensemble mean and destroyed correct information from another model. It was therefore concluded that this sort of approach is not likely to be useful with the present standard of forecast models, though it might reduce the RMS errors through producing smoother fields.

Baumhefner, D., Downey, P. 1978. Forecast Intercomparison from Three Numerical Weather Prediction Models. Monthly Weather Review, 106 pp 1245-1279

Cullen, M.J.P. 1978. Forecast comparisons using various models available to the UK Meteorological Office.

ICSU/GARP Report No. 17. Research activities in atmospheric modelling, p. 59.