Comparison of Met Office and ECMWF Background Fields with Conventional Observations

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Met Office and ECMWF background fields (short range forecasts) of near-surface temperature, humidity and wind have been compared with *in situ* observations, especially land surface reports. The 10 meter forecast wind speeds from both centers are slightly stronger than the reported wind speeds, especially at night. The night-time bias is a known issue in that forecast models have too much mixing under stable conditions [1]. In both models the wind speed biases are particularly large over the Indian sub-continent, this could be due to the roughness lengths used and/or to observational errors. The results for temperature and humidity show less consistency between the models: overall the Met Office forecasts appear slightly too wet and the ECMWF forecasts slightly too dry - probably related to biases in precipitation [2]. The Met Office forecasts show a moist bias in the Northern Hemisphere spring - this moves northwards as spring progresses and appears to be related to snow-melt being a few weeks early in this model. Temperature biases vary by region and season; both models are slightly too warm over the North American Great Plains (and to some extent Siberia) in summer. This may be due to the lack of propagation of convective storms triggered by the Rockies [3], but agricultural irrigation (not represented in the models) may also play a part.

The dependence of biases on the proximity of the coastline has also been examined, in the Met Office model the transition zone for wind seems slightly too wide [4]. Representation of near surface conditions in global forecast models has improved in recent years due to increased resolution and improvements to soil, boundary layer and cloud parameterization. At the Met Office assimilation of most surface temperature, humidity and wind observations has also made some improvements [5]. The remaining biases between background fields and observations often provide valuable insight into model errors, but observation and representativity errors also have to be borne in mind. Met Office analysis increments show humidity biases peaking around the top of the boundary layer [6].

References

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