Grid-Based Forecasting and the Role of the Weather Forecaster

Michael Foley (1), Deryn Griffiths (2), Tennessee Leeuwenburg (1), and Gary Weymouth (1)

(1) Bureau of Meteorology, Melbourne, Australia (m.foley@bom.gov.au), (2) Bureau of Meteorology, Sydney, Australia

This presentation explores forecaster-adjusted gridded weather forecasts, with a focus on probabilistic forecasting and verification in comparison to automated processes.

From 2006 to 2014 the Australian Bureau of Meteorology undertook a modernization of its forecast and warning operations which involved a move from primarily text-based descriptive forecasts to the production of gridded data-based forecasts. This has resulted in a substantial increase in the spatial coverage, temporal extent and accessibility of forecasts provided to the Australian community.

Probabilities have become an integral part of the forecast service for rainfall and tropical cyclone wind speed. Community impact and forecast uncertainty can be significant for both of these phenomena. We have objective guidance for forecasting their probability distributions and forecasters can also edit the grids subjectively. This can account for factors contributing to the level of uncertainty which may not be well captured by the guidance.

Forecasters can favour a forecast story based around a particular conceptual model of the synoptic scale evolution of the atmosphere. However, depicting one synoptic scale story in the grids may not provide the optimum forecast at the 6 km gridcell scale on which many public weather services are defined and derived. Current grid-based services are not tailored to other spatial scales. For instance further work is needed to provide forecast rainfall information on the catchment scale required by hydrologists.

Verification is being implemented to compare the operational gridded forecasts with automated forecasts. The focus will be on achieving better understanding of where the weather forecaster adds most value. An important step is agreeing on appropriate measures of forecast value, so that any changes can be justified to the organization. It is hoped that this work will lead to optimization of the human interaction with the forecasting system and to systematic improvement of the Bureau's forecast and warning services.