EMS Annual Meeting Abstracts
Vol. 12, EMS2015-582, 2015
15th EMS / 12th ECAM

How good is ensemble-based calibrated thunderstorm probability prediction over Australia?

Harald Richter
Research & Development Branch, Bureau of Meteorology, Australia (h.richter@bom.gov.au)

"Calibrated Thunder" is an ensemble-based thunderstorm probability forecast approach first introduced at the Storm Prediction Center in the U.S. about a decade ago. It utilizes two predictors for electrified convection, the Cloud Physics Thunder Parameter (CPTP) and total model precipitation. The system has been run off two separate five member NWP lag ensembles: the experimental ACCESS-RUC (Rapid Update Cycle), a convection allowing model with a 1.5 km grid spacing (RUC) and ACCESS-R12, a currently operational model with a ∼12 km grid spacing (AR12). The RUC-based system ran for a 3-month period (Sep-Nov 2014), the AR12-based system from September 2014 until February 2015. Calibrated Thunder has produced calibrated thunderstorm probabilities in 3-hourly increments across Australia for a range of lead times (out to 21 hours) and model validity times.
The first aim of this work is to (i) appraise the overall performance of Calibrated Thunder forecasts using a range of skill measures such as reliability diagrams and relative operating characteristics and to (ii) gauge the skill gain of Calibrated Thunder over the currently operational Bureau thunderstorm prediction system, the National Thunderstorm Forecast Guidance System (NTFGS).
Preliminary results indicate that both systems (based on the RUC and AR12) are reasonably reliable for the lower probabilities of thunderstorm occurrence. Overforecasting occurs near the higher probabilities for the sample forecasts considered.
Despite the inherent advantage of explicitly modelled convective storms, the Calibrated Thunder system performs better running off AR12 with the current default predictor thresholds for instability and rainfall. It will also be shown that Calibrated Thunder performs better than the current operational NTFGS system.