Evaluating the utility of WRF as a severe weather forecasting tool

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The WRF model shows great promise as a research tool. Furthermore, preliminary results from BAMEX, where it was used to forecast MCSs on a daily basis, are encouraging as well. During this spring's severe convective weather season, the WRF model was utilized to forecast a broader range of convective weather during the annual SPC/NSSL Spring Program. In particular, this year's program was designed to gain a preliminary measure of the value added by high resolution guidance from the WRF model compared to current operational forecast models (i.e., the Eta and RUC models) in forecasting scenarios typically encountered by SPC forecasters.

The program utilized three different WRF modeling systems, each producing forecasts starting at 0000 UTC, extending for 30-36 h, and covering roughly the eastern two-thirds of the CONUS. The first configuration, using the NMM dynamic core, was run at EMC using a "cold start" initial condition from the operational Eta model (40 km grid). The second run used the same initial condition, but the Eulerian mass core; this version was run at NCAR. The third configuration used the same domain, grid-spacing, and dynamic core as the NCAR run, but featured an enhanced initial condition provided by the ARPS data assimilation system, including level II radar data; this version was run by CAPS.

These three model runs were used to issue experimental probabilistic forecasts of severe convection during the Spring Program. The impact of the high-resolution model guidance on human forecasts was measured subjectively by forecasts teams comprised of a mix of operational forecasters and research scientists/numerical modelers. In addition, the individual model forecasts were evaluated and compared by the teams, using separate subjective measures for convective initiation, evolution, and mode. It is anticipated that the results of these assessments will be very useful for identifying systematic strengths and weaknesses of the different configurations and initialization procedures, and for assessing whether the added value of high-resolution forecasts is worth the added cost of their production. Results from the Spring Program will be presented and discussed at the workshop.