EMS7/ECAM8 Abstracts,
Vol. 4, EMS2007-A-00690, 2007
7th EMS Annual Meeting / 8th ECAM

Experiences with realtime explicit convective forecasts with WRF-ARW over the Central US during the 2003-2007 spring and summer seasons

M. Weisman, W. Wang, C. Davis

National Center for Atmospheric Research, Boulder CO., 80301, USA (weisman@ucar.edu)

Over the past several spring and summer seasons, 36 h real time explicit convective forecasts have been produced for the central US with the WRF-ARW model, using a 4 km horizontal grid resolution for 2003-2006 and 3 km in 2007. These forecasts were initialized at 00 UTC using the NCEP/NAM 40 km analysis and forecasts for the initial state and boundary conditions, with no assimilation methods employed to account for ongoing convection. The goal was to assess improvements in the representation of severe convection, such as squall lines and supercells, over the guidance obtained from coarser-resolution operational models, such as the 12 km NCEP/NAM, which employ convective parameterization. The results suggest significant value added for the high resolution forecasts in representing the convective system mode(e.g. for squall lines, bow echoes,mesoscale convective vortices)as well as in representing the climatological characteristics of convection, such as precipitation episodes and the diurnal convective cycle. However, no improvement could be documented in the overall guidance as to the timing and location of significant convective outbreaks. Perhaps the most notable result was the overall strong correspondence between the NAM and WRF-ARW guidance, for both good and bad forecasts, suggesting the overriding influence of larger-scales of forcing on convective development in the 24-36 h timeframe. Sensitivities to PBL, land surface, microphysics, and resolution failed to account for the more significant forecast errors(e.g. completely missing or erroneous convective systems), suggesting that further research is needed to document the source of such errors at these time scales.