



Improved Ceiling and Visibility Forecasts from the US NOAA HRRR/RAP – Hydrometeor Assimilation and Modeling

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Cloud microphysics fields in the US hourly updated weather models, the 13km Rapid Refresh (covering North America) and the 3km High-Resolution Rapid Refresh (covering the lower 48 United States) are used for explicitly derived guidance of ceiling and visibility.

Recent changes to the RAP and HRRR models at NOAA's NCEP with improvements for ceiling/visibility fields occurred in August 2016. This coordinated upgrade (RAP version 3 and HRRR version 2, RAPv3/HRRRv2) includes enhancements to the data assimilation, model, and post-processing formulations. Key assimilation/modeling changes relevant to ceiling/visibility forecasts will be described toward the next NCEP operational implementation (RAPv4/HRRRv3), planned for early 2018. These include further enhancements to the model physics components (aerosol-aware Thompson microphysics, MYNN PBL scheme, Smirnova land-surface model), application of a new vertical coordinate), and possible merger with prognostic smoke/aerosol prediction.