



Do better aerosol forecasts improve weather forecasts? A study with a regional model.

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Impact of aerosols on weather in the boundary layer is examined for short-term forecasts issued over eastern part of North America in summer 2012.

The study employs WRF-Chem and Gridpoint Statistical Interpolation (GSI) for forecasting and 3D-Var simultaneous assimilation of standard meteorological observations and surface measurements of PM_{2.5} and PM₁₀, and MODIS AOD. It is demonstrated that the assimilation of species leads to a significant improvement in prediction of aerosol concentrations. It is also shown that simulated aerosols have visible impact on weather in the boundary layer. While it is intuitively obvious that such impact should occur it is not apparent that quality of physical parameterizations is sufficient to improve weather forecasts. Verification statistics will be presented for a two-month-long period for simulations that do and do not account for aerosol feedback to radiation.