

## **Transitioning to Operational Air Quality Forecasting with WRF**

Jeff McQueen<sup>1</sup>, Pius Lee<sup>2</sup>, Marina Tsidulko<sup>2</sup>, Geoff DiMego<sup>1</sup>,

<sup>1</sup> NOAA/NWS/NCEP, Camp Springs, MD

Jeff.McQueen@noaa.gov

<sup>2</sup> SAIC at NOAA/NWS/NCEP, Camp Springs, MD

During 2003, NOAA and the U.S. EPA signed a Memorandum of Agreement to work together to develop a National air quality forecasting capability. To meet this goal, NOAA's National Weather Service (NWS), the Office of Atmospheric Research (OAR) and the U.S. EPA developed and evaluated a prototype ozone forecast capability for the Eastern U.S. The NWS/ National Centers for Environmental Prediction (NCEP) Eta model at 12 km was used to provide meteorological predictions for the EPA Community Multi-scale Air Quality (CMAQ) model to produce up to 48 h ozone predictions. The CMAQ system simulates various chemical and physical processes that are important for modeling atmospheric trace gas transformations and distributions. CMAQ includes chemical mechanisms to simulate various air quality constituents including tropospheric ozone, fine particles, toxics, acidic deposition, and visibility degradation.

Plans call for WRF to replace Eta by the Fall 2005 in the NWS/NCEP North American forecast cycle run. Therefore, NOAA will begin transitioning the air quality forecast system to a WRF framework. At first, development will emphasize the proper coupling of the WRF land- surface, boundary layer, and wind fields with the CMAQ coordinate system and physical and chemical processes. In addition, WRF model will be coupled with Emissions processes that are meteorologically dependent (e.g.: Biogenic emissions, plume rise from stacks, some aerosol emissions). In the next 5 years, it is expected that NCEP will implement an in-line chemistry version of WRF with coupled cloud and radiation effects (WRF-Chem). This presentation will outline a transition plan for WRF-Chem and present results from the current operational air quality system that will serve as a benchmark for WRF-Chem performance.

*Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.*