

An Operational Evaluation of the Eta-CMAQ Air Quality Forecast Model

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Brief Description:

The National Oceanic and Atmospheric Administration (NOAA), in cooperation with the Environmental Protection Agency (EPA), are developing an Air Quality Forecasting Program that will result in an operational Nationwide Air Quality Forecasting System for the United States. The initial phase of this program, which coupled NOAA's Eta meteorological model with EPA's Community Multiscale Air Quality (CMAQ) model, began operation in July 2003 and provided forecasts of hourly ozone concentrations over the northeastern United States through the end of September. For the 2004 ozone season, the Eta-CAMQ air quality forecast model will be expanded to cover the contiguous U.S. using a 12 km resolution grid and 22 vertical layers (set on a sigma coordinate). This "forecast configuration" of CMAQ couples the CBIV gas-phase chemistry mechanism with emissions (processed offline) that are based on EPA's 1999 National Emissions Inventory. An important component of this Air Quality Forecasting Program will be the development and implementation of an evaluation protocol. Accordingly, a suite of statistical metrics that facilitates evaluation of both discrete-type forecasts (observed versus modeled concentrations of O₃) and categorical-type forecasts (observed versus modeled exceedances of both the maximum 1-hr and 8-hr standards for O₃) will be developed and applied in order to characterize the performance of this model system. The metrics will be applied over various temporal and spatial resolutions, as well as over different concentration ranges. O₃ data from more than 1000 monitors obtained from EPA's AIRNOW monitoring network will be used in the evaluation.