

The 2024 Release of MPAS-CMAQ

Joint WRF/MPAS Users Workshop 2024

Jeff Willison, Jonathan Pleim, David Wong, Robert Gilliam, Russ Bullock, Jerry Herwehe, Christian Hogrefe, George Pouliot, Golam Sarwar, Fahim Sidi, Rohit Mathur, Daiwen Kang and Wyatt Appel

Center for Environmental Measurement & Modeling, Office of Research and Development, United States Environmental Protection Agency, Research Triangle Park, NC, USA

This year the USEPA plans to release a modeling system that allows for coupling between the Community Multiscale Air Quality (CMAQ) model and NCAR's Model for Prediction Across Scales – Atmosphere (MPAS-A). This new framework enables modeling of air quality, from global to regional to local scales, with consistent chemistry and physics. Our poster describes the coupling approach, model performance, configuration options, and features in development.

The upcoming release of CMAQ will include new modules that support coupling of CMAQ with either WRF or MPAS, and a new I/O option for reading and writing CMAQ inputs and outputs. We implement meteorological data assimilation and tailor MPAS' surface and boundary layer physics to improve the forcing for CMAQ. Experiments at various temporal and spatial scales show that the coupled system is skillful at simulating surface concentrations of ozone and particulate matter. Here we showcase results from configurations that will be supported at release, including a uniform 120 km cell spacing mesh and a 92-25 km variable resolution mesh with refinement over North America.

DISCLAIMER

The views expressed in this abstract are those of the authors and do not necessarily represent the views or policies of the U.S. EPA.