SEMINAR

Chemical Data Assimilation and Analog-Based Uncertainty Quantification to Improve Short-term Air Quality Predictions Over the U.S.

Luca Delle Monache
Science Deputy Director, National Security Applications Program (NSAP)
Research Application Laboratory (RAL)

Abstract:

One of the key tools used by decision makers across the U.S. to protect the public from adverse health effects caused by poor air quality (AQ) is the National Oceanic and Atmospheric Administration (NOAA) / National Centers for Environmental Prediction (NCEP) operational AQ forecasting system. To enhance this decision-making activity, this project funded by the National Aeronautics and Space Administration (NASA), aims to improve the accuracy of NOAA/NCEP short-term predictions of ground-level ozone and particulate matter less than 2.5 μm in diameter (PM2.5) and to provide reliable quantification of their uncertainty, by exploiting NASA Earth Science Data with chemical data assimilation and analog-based approaches. The three main project objectives are:

- To improve the initialization of the NOAA/NCEP operational AQ system, which is based on the Community Multiscale AQ (CMAQ) model, through chemical data assimilation of satellite retrieval products with the Community Gridpoint Statistical Interpolation (GSI) system. GSI is being used to assimilate retrievals of aerosol optical depth from the NASA Aqua/Terra Moderate Resolution Imaging Spectroradiometer (MODIS).
- To considerably improve the CMAQ deterministic predictions and reliably quantify their uncertainty with analog-based post-processing methods applied to the CMAQ deterministic predictions.
- To extrapolate deterministic and probabilistic point-based predictions to a two-dimensional grid over the U.S. with a Barnes-type iterative scheme.

Results from the aforementioned objectives will be reported, with a focus on the analog-based techniques, quantifying the developed system performance with a range of metrics for both deterministic and probabilistic predictions of PM2.5 across several hundreds of stations over the U.S.

Date: Monday, August 28, 2017
Time: 3:15 p.m. refreshments, 3:30 p.m. seminar
NCAR Foothills Laboratory, FL2-1022 Main Auditorium

For more information please contact Bonnie Slagel, bonnie@ucar.edu, phone 303-497-8318.

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