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Public Information Statement 21-13
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From: Vijay Tallapragada
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Subject: Soliciting Public Comments on the Proposed
 Upgrade of the CMAQ through April 5, 2021

The Environmental Modeling Center (EMC), the Air Resources Lab (ARL), and Earth Systems Research Laboratory (ESRL) are proposing to upgrade the National Air Quality Forecast Capability (NAQFC) Community Model for Air Quality (CMAQ) model during the summer of 2021. The NWS is seeking comments on this proposed change through April 5, 2021.

On February 1, 2021, EMC began disseminating experimental CMAQ CONUS bias corrected guidance and upgrades to the Alaska and Hawaii CMAQ system to users. Graphical comparisons to operational AQM are located at:
<http://www.emc.ncep.noaa.gov/mmb/aq/cmaq/web/html/max.html>

For CONUS, the CMAQ Kalman Filter Analog (KFAN) bias correction system for fine Particulate Matter (PM2.5) and Ozone will be improved to use a consistent training data set, additional monitor sites and a unified KFAN bias correction system.

Over CONUS, Alaska and Hawaii the CMAQ code will be unified with the CONUS EPA Version 5.3.1 using an updated 2017 National Emissions Inventory (NEI 2017). All domains will be driven by the NWS Global Forecast System (GFS) v16 meteorology with air quality forecasts extended from 48 to 72 hours for the 06 and 12 UTC run cycles.

The ARL Fengsha dust model will be updated with improved threshold velocities by soil type. The Updated Biomass

Emissions Land Database will be updated to v5 for biogenic emissions processing.

Greenness vegetation fraction (GVF) will be updated daily from 7 day average GVF provided by the National Environmental Satellite, Data, and Information Service (NESDIS) satellite products.

Leaf Area Index (LAI) will be updated from a constant value in space and time to a climatological field.

The NESDIS Global Biomass Burning Emissions Product eXtended (GBBEPx) product will be used to initialize fire particulate and gas-phase emissions and its associated Fire Radiative Power used to drive fire smoke plume rise.

Both GVF and LAI are used for biogenic and deposition processes and should result in better land related processes.

The full list of changes are described in presentations and the experimental changelog that are accessible from the EMC NAQFC web page at:

<http://www.emc.ncep.noaa.gov/mmb/aq>

Expected benefits from this upgrade include extension of ozone and PM2.5 forecasts to 72 forecast hours with upgrades to CMAQ model and use of more recent National Emissions Inventory (2017). In addition CMAQ will no longer be driven by NWS NAM meteorology. Instead, CMAQ v5.3.1. will be driven by the 13 km NWS GFS meteorological forecast model with more realistic land surface greenness vegetation fraction and leaf area index. More accurate raw and bias corrected surface ozone and PM2.5 are expected. Ozone predictions around wild fires should be better represented with inclusion of precursor gas emissions from fires.

The current location of experimental CMAQ output in grib2 format is located at:

[ftp://ftp.emc.ncep.noaa.gov/mmb/aq/for NDGD 5x expr/](ftp://ftp.emc.ncep.noaa.gov/mmb/aq/for_NDGD_5x_expr/)

Daily maximum 8 hour average surface ozone and 1 hour daily maximum and 24 hour average surface PM2.5 concentration outputs will be extended from 2 days (48hrs) to 3 days (72 hrs). Hourly averaged ozone and PM2.5 concentration predictions will also be extended from 48 to 72 hours.

The NWS will evaluate all comments to determine whether to proceed with this upgrade. If evaluation is positive, upgraded products will be available operationally on <http://airquality.weather.gov> and <https://digital.mdl.nws.noaa.gov/airquality/>

Send comments on this proposal to:

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National Public Information Statements are online at:
<https://www.weather.gov/notification/>

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