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Service Change Notice 17-55
National Weather Service Headquarters Silver Spring MD
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From: Dave Myrick
 NWS Office of Science and Technology Integration

Subject: Air Quality Prediction Update: Effective June 13, 2017

Effective on or about Tuesday, June 13, 2017, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the Air Quality Model (AQM) capability over CONUS only. The AQM uses the Community Multi-scale Air Quality (CMAQ) modeling system to provide ozone and fine particulate matter air quality predictions.

This upgrade will do the following:

- Update the chemical transport model to CMAQ V5.0.2.
- Update the National Emissions Inventory (NEI) 2011 Point Source Emissions to projections for 2017.
- Update U.S. Forest Service BlueSky smoke emissions system to V3.5.1.
- Add 24-hour "analysis cycle" to include wildfire emissions when they were observed.
- Update the bias correction technique for fine particulate matter (PM2.5) forecast guidance to the Kalman Filter Analog technique (KFAN).
- Update dust-related aerosol species at the CMAQ lateral boundaries to use the NEMS Global Aerosol Capability (NGAC) V2 forecasts.

The expected impact of these changes includes:

- Improved raw and bias corrected fine particulate matter (PM2.5) products especially near wildfires.
- Improved summertime surface ozone predictions especially in coastal areas.

Note: These changes will only be applicable to CONUS results. Alaska and Hawaii will continue using CMAQ v4.

Predictions for the updated AQM over the CONUS region will be made available through a parallel feed at the following location:

<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/aqm/>

Experimental CMAQ ozone and PM2.5 predictions over CONUS will be available on the EMC air quality webpage at:

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

Experimental CMAQ bias corrected PM2.5 predictions over CONUS will be available on the EMC air quality webpage at:

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

Current Output Changes:

Output files can be found on the following sites:

NCEP services:

<ftp://ftpprd.ncep.noaa.gov/pub/data/nccf/com/aqm/prod>

<http://www.ftp.ncep.noaa.gov/data/nccf/com/aqm/prod/>

<http://nomads.ncep.noaa.gov/pub/data/nccf/com/aqm/prod/>

NWS services:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/DF.gr2/DC.ndgd/GT.a/AR.conus/>

<http://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/DF.gr2/DC.ndgd/GT.aq/AR.conus>

Web graphics:

<http://airquality.weather.gov/>

The forecast time range header for the ozone daily maximum files will be corrected.

06 UTC data is available on NWS servers with these names:

ds.mozone01.bin Day 1 will change to "-1-22 forecast hours" from "-2-21 hour".

ds.mozone08.bin Day 2 will change to "29-52 forecast hours" from "30-49 hour".

12 UTC data is available on the NWS servers with these names:

ds.mozone01.bin Day 1 will change to "-7-16 hour" from "-8-15 hour".

ds.mozone08.bin Day 2 will change to "23-46 hour" from "24-47 hour".

06 UTC data is available on the NCEP servers with these names:

aqm.t06z.max_1hr_o3.227.grib2 Day 1 will change to "-1-22 hour" from "-2-21 hour".

aqm.t06z.max_8hr_o3.227.grib2 Day 2 will change to "29-52 hour" from "30-49 hour".

12 UTC data is available on the NCEP servers with these names:

aqm.t12z.max_1hr_o3.227.grib2 Day 1 will change to "-7-16 hour" from "-8-15 hour".

aqm.t12z.max_8hr_o3.227.grib2 Day 2 will change to "23-46 hour" from "24-47 hour".

All output CONUS files will increase in size as land-water bit mask is included, but variables and extent will remain unchanged.

New Products:

CONUS domain raw and bias corrected PM2.5 prediction files will be sent to the NWS website for the National Digital Guidance Database (NDGD):

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/DF.gr2/DC.ndgd/GT.aq/AR.conus>
<http://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/DF.gr2/DC.ndgd/GT.aq/AR.conus>

1-hour average PM2.5 raw and bias corrected (_bc) predictions on Advanced Weather Interactive Processing System (AWIPS) 227 CONUS 5 km grid through 48 forecast hours:

ds.apm25h01.bin
ds.apm25h01_bc.bin

24-hour average daily PM2.5 raw and bias corrected (_bc) predictions on AWIPS 227 CONUS 5 km grid (Day 1 and Day 2 forecasts):

ds.apm25h24.bin
ds.apm25h24_bc.bin

1-hour average daily maximum PM2.5 raw and bias corrected (_bc) predictions on AWIPS 227 CONUS 5 km grid (Day 1 and Day 2 forecasts):

ds.mpm25h01.bin
ds.mpm25h01_bc.bin

The updated PM2.5 products and maps will be made publicly available from the www.airquality.gov website at a later time.

Adding the following raw and bias CONUS 5km corrected fine particulate matter (PM2.5) files to the NCEP services:

1-hour average daily maximum PM2.5 (day 1 and day 2)
aqm.tCCz.max_1hr_pm25.227.grib2
Daily 24-hour average PM2.5 (day 1 and day 2)
aqm.tCCz.ave_24hr_pm25.227.grib2
Bias corrected 1-hour average daily maximum PM2.5 (day 1 and day 2)
aqm.tCCz.max_1hr_pm25_bc.227.grib2
Bias corrected daily 24-hour average PM2.5 (day 1 and day 2)
aqm.tCCz.ave_24hr_pm25_bc.227.grib2

Where CC is cycle (06, 12).

1-hour average PM2.5 for forecast hours 00-48
aqm.tCCz.ave_1hr_pm25.227.grib2
Bias corrected 1-hour average PM2.5 for forecast hours 00-48
aqm.tCCz.ave_1hr_pm25_bc.227.grib2

Where CC is cycle (00, 06, 12, 18).

Product Removals:

The following files will be removed from the NCEP Services sites:

- aqm.tCCz.pm25.fHH.148.grib2

where CC is cycle (00, 06, 12, 18) and HH is hour(00-48).

Users can instead find the hourly data combined in the higher resolution file:

aqm.tCCz.ave_1hr_pm25.227.grib2

- aqm.tCCz.pm25_bc.fHH.148.grib2

where CC is cycle(00, 06, 12, 18) and HH is hour(00-48).

Users can instead find the hourly data combined in the higher resolution file:

aqm.tCCz.ave_1hr_pm25_bc.227.grib2

For questions regarding these updated model forecast guidance, please contact:

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National Service Change Notices are online at:

<https://www.weather.gov/notification/archive>

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