

NOUS41 KWBC 161315
PNSWSH

Service Change Notice 18-104
National Weather Service Headquarters Silver Spring MD
815 AM EST Fri Nov 16 2018

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From: Dave Myrick
 NWS Office of Science and Technology Integration

Subject: Air Quality Prediction Update: Effective December 18, 2018

Effective on or about Tuesday, December 18, 2018, 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 Continental United States (CONUS), Alaska and Hawaii. The AQM uses the Community Multi-scale Air Quality (CMAQ) modeling system to provide ozone and fine particulate matter air quality predictions.

The scope of this upgrade includes:

- For CONUS: the CMAQ Kalman Filter Analog (KFAN) bias correction system for fine Particulate Matter (PM2.5) will be improved to use a consistent training data set, additional monitor sites and a unified KFAN bias correction system. For the first time, the unified KFAN bias correction system will also be employed on CMAQ ozone predictions.
- For CONUS: 4 times/day cycling runs of CMAQ V5.0.2 with updated oil and gas sector emissions for year 2017 (implemented May 1, 2018).
- For CONUS: Updated Environmental Protection Agency (EPA) National Emissions Inventory base emissions to NEI2014V2. Turn off fire smoke emissions from November through April.
- For Alaska and Hawaii (OCONUS): Update the chemical transport model to unified CMAQ V5.0.2 used for all domains.
- All AQM ozone and PM2.5 Advanced Weather Interactive Processing System (AWIPS) grid files (CONUS 227, Alaska 198 and Hawaii 196) will no longer output associated bitmap information to reduce file size. In addition, nearest neighbor option will be used to interpolate from the native CMAQ grid to the Advanced Weather Interactive Processing System (AWIPS) output grids to reduce unrealistic gradients when using the bicubic interpolation approach.

Expected benefits from this upgrade for CONUS include more accurate bias corrected PM2.5 and a new bias corrected ozone product that capture rare ozone events better. The expected impact of these change for the O-CONUS domain runs are minimal.

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

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

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

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

Experimental CONUS bias corrected PM2.5 and ozone prediction graphics over CONUS are also available directly at:

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

I. 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:

for the CONUS domain:

<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/>

for the Alaska domain:

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

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

for the Hawaii domain:

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

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

Web graphics:

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

A. For OCONUS only, the forecast range label for the ozone daily maximum files will be corrected:

0600 UTC data, day 1, 1-hour daily max ozone product time range header will change to "-1 - 22 forecast hours" from "-2 - 21 hour" on NWS servers with these names:

- ds.mozonea01.bin for Alaska domain and ds.mozoneh01.bin for Hawaii domain

On the NCEP servers with this name:

- aqm.t06z.max_1hr_o3.GRD.grib2

0600 UTC data, day 2, 8-hour daily max ozone product time range header will change to "29-48 forecast hours" from "30-49 hour" on NWS servers with these names:

- ds.mozonea08.bin for Alaska domain and ds.mozoneh08.bin for Hawaii domain

On NCEP servers with this name:

- aqm.t06z.max_8hr_o3.GRD.grib2

1200 UTC data, day 1, 1-hour daily max ozone product time range header will change to "-7-16 forecast hours" from "-8-15 hour" on NWS servers with these names:

- ds.mozonea01.bin for Alaska domain and ds.mozoneh01.bin for Hawaii domain

On the NCEP servers with this name:

- aqm.t12z.max_1hr_o3.GRD.grib2

1200 UTC data, day 2, 8-hour daily max ozone product time range header will change to "23-46 forecast hours" from "24-47 hour" on the NWS servers with these names:

- ds.mozonea08.bin for Alaska domain and ds.mozoneh08.bin for Hawaii domain

On the NCEP servers with this name:

- aqm.t12z.max_8hr_o3.GRD.grib2

where GRD=198 for Alaska and 196 for Hawaii.

II. New Products

A. For CONUS, ozone bias corrected files will be added to the NWS Web Services:

- 1-hour average Ozone bias corrected predictions through 48 forecast hours on:

AWIPS 227 CONUS 2.5 km grid: ds.ozone01_bc.bin

- 8-hour average Ozone bias corrected predictions through 48 forecast hours on:

AWIPS 227 CONUS 2.5 km grid: ds.ozone08_bc.bin

- Daily maximum day 1 and day 1-hour average Ozone bias corrected predictions on:

AWIPS 227 CONUS 2.5 km grid: ds.mozone01_bc.bin

- Daily maximum day 1 and day 2 8-hour average Ozone bias corrected predictions on:

AWIPS 227 CONUS 2.5 km grid: ds.mozone08_bc.bin

The display of ozone predictions at airquality.weather.gov to show bias corrected ozone predictions will be updated within two weeks of system upgrade.

B. For OCONUS, domain raw PM2.5 prediction files will be sent to NWS Web Services:

- 1-hour average PM2.5 raw predictions through 48 forecast hours on:
 - AWIPS 198 Alaska 5 km grid: ds.apm25ah01.bin
 - AWIPS 196 Hawaii 5 km grid: ds.apm25hh01.bin
- 24-hour average daily PM2.5 raw predictions (Day 1 and Day 2 forecasts) on:
 - AWIPS 198 Alaska 5 km grid: ds.apm25ah24.bin
 - AWIPS 196 Hawaii 5 km grid: ds.apm25hh24.bin
- 1-hour average daily maximum PM2.5 raw predictions (Day 1 and Day 2 forecasts) on:
 - AWIPS 198 Alaska 5 km grid: ds.mpm25ah01.bin
 - AWIPS 196 Hawaii 5 km grid: ds.mpm25hh01.bin
- The updated PM2.5 products and maps will be made publicly available from the www.airquality.gov website at a later time.

C. For OCONUS, raw 5km fine particulate matter (PM2.5) files will be sent to NCEP Web services.

- 1-hour average daily maximum PM25 (day 1 and day 2)
 - aqm.tCCz.max_1hr_pm25.198.grib2 for Alaska domain
 - aqm.tCCz.max_1hr_pm25.196.grib2 for Hawaii domain
- Daily 24-hour average PM25 (day 1 and day 2)
 - aqm.tCCz.ave_24hr_pm25.198.grib2 for Alaska domain
 - aqm.tCCz.ave_24hr_pm25.196.grib2 for Hawaii domain
- 1-hour average PM25 for forecast hours 00-48
 - aqm.tCCz.ave_1hr_pm25.198.grib2 for Alaska domain
 - aqm.tCCz.ave_1hr_pm25.196.grib2 for Hawaii domain

Where CC = cycle 06 and 12.

III. Product Removals

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

- aqm.tCCz.pm25.fHH.140.grib2 for Alaska domain
- aqm.tCCz.pm25.fHH.139.grib2 for Hawaii domain

where CC is cycle (00, 06, 12, 18) and HH is hour (01-48 for 06 and 12 UTC cycles and 01-06 for 18 and 00 UTC cycles).

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

- aqm.tCCz.ave_1hr_pm25.198.grib2 for Alaska domain
- aqm.tCCz.ave_1hr_pm25.196.grib2 for Hawaii domain

NCEP will evaluate feedback and decide whether to proceed. For questions regarding these updated model forecast guidance, please contact:

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For questions regarding the data flow, please contact:

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National Service Change Notices are online at:

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

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