Technical Implementation Notice 14-47 Amended
National Weather Service Headquarters Washington DC
940 AM EST Mon Nov 17 2014

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From:     Tim McClung
      Science Plans Branch Chief
      Office of Science and Technology

Subject:  Amended: Changes to GFS-based Model Output
      Statistics (MOS) Guidance Effective January 7, 2015

Amended to change the implementation date from Wednesday, December 17, 2014, to Wednesday, January 7, 2015, and to correct the number of sites being added to the MOS text and BUFR products.

On or about Wednesday, January 7, 2015, beginning with the 1200 Coordinated Universal Time (UTC) model run, the NWS Meteorological Development Laboratory (MDL) will implement a refresh of the Global Forecast System (GFS)-based Model Output Statistics (MOS) guidance to coincide with the GFS model upgrade. These changes will also impact the Localized Aviation MOS Program (LAMP) products beginning with the 1600 UTC cycle.

MDL has created a comparison webpage for the short-range and extended-range GFS-based MOS text bulletins. The following link will be active until on or about January 7, 2015:


This update will include the following changes to GFS-based MOS text and BUFR products:

1. Updated cool season equations for the short-range (Days 1-4) MOS text and BUFR messages from the 0000, 0600, 1200, and 1800 UTC model runs. The updates will include the following elements:

Daytime Maximum and Nighttime Minimum Temperature
2-meter Temperature
2-meter Dewpoint Temperature
Wind Speed
Wind Direction
Conditional Probability of Freezing Precipitation
Conditional Probability of Frozen Precipitation
Precipitation Type Best Category
24-h Categorical Snowfall Amount

2. Updated cool season equations for the extended-range (Days 1-7) MOS text and BUFR messages from the 0000 and 1200 UTC model runs. The updates will include the following elements:

- Daytime Maximum and Nighttime Minimum Temperature
- 2-meter Temperature
- 2-meter Dewpoint Temperature
- Wind Speed
- Wind Direction
- Conditional Probability of Freezing Precipitation Occurring (12-h)
- Conditional Probability of Snow Occurring (12-h)
- Conditional Probability of Rain/Snow Mix Occurring (12-h)
- Precipitation Type Best Category (12-h)
- 24-h Categorical Snowfall Amount

3. Updated cool season maximum and minimum temperature equations for all cycles of the short-range and extended-range MOS COOP text message.

4. Updated cool season equations for the probability of precipitation occurrence on the hour (PoPO) and the probability of precipitation occurrence in a 3-h period (PoPO3) for all cycles of the short-range (days 1-4) MOS BUFR message.

5. Due to changes in reporting frequencies at some observing sites, some MOS stations no longer report sufficiently and some stations now have sufficient reports for statistical calibration. As a result, NWS will remove 15 stations and add 339 stations to the short-range and extended-range GFS MOS text bulletins (known by their AWIPS IDs MAV and MEX) and BUFR messages. The NWS will change the identifier used for one station in the GFS MOS text bulletins and BUFR messages: Tazewell City VA will change from K6V3 to KJFZ. This station has been included in the add and remove counts stated above.

6. NWS will remove 38 stations and add one station to the GFS MOS marine text message (known by the AWIPS ID MMG) and BUFR message.

7. NWS will remove 152 stations and add 197 stations to the GFS MOS River Forecast Center SHEF message (known by its AWIPS ID FTP).

8. NWS will remove three stations from the short-range and extended-range GFS MOS Canadian text messages.

9. NWS will remove 1468 stations from the short-range and extended-range GFS MOS COOP messages. These removed stations have closed, stopped reporting, or do not contain sufficient
cases to develop a stable equation. COOP sites influence the Gridded MOS analysis for maximum and minimum temperature. The removal of these COOP sites is not expected to adversely impact the quality of the Gridded MOS maximum and minimum temperature guidance.

10. Stations will be added to existing regional equations for the following elements in the short-range and extended-range MOS text and BUFR products:

Sky Cover
Probability of Precipitation
Quantitative Precipitation
Probability of a Thunderstorm
Conditional Probability of a Severe Thunderstorm
Ceiling Height
Visibility
Obstruction to Vision

These changes will slightly alter the format of the MAV, MEX, MMG, and FTP messages because lines will be added or removed to accommodate the addition/removal of stations. The communication identifiers for the MOS text and BUFR products affected by these changes are shown in the tables below.

Due to a shorter sample of cool season retrospective model data available for the 0600 and 1800 UTC cycles, users are advised that the MOS guidance for these cycles is not tuned as well to the new version of the GFS and may be somewhat degraded. In addition, guidance for Mesonet sites was not updated and as a result may be degraded. Until guidance for Mesonet stations can be redeveloped, steps are being taken to reduce the influence of these sites on the Gridded MOS analysis for temperature and wind. Text-based MOS products are not produced for Mesonet sites.

A web page outlining the station changes and equation updates is available at:


This update will include the following changes to GFS-based LAMP text and BUFR products:

1. NWS will remove 15 stations from the LAMP text bulletin (known by the AWIPS ID LAV) and BUFR messages. In addition, the NWS will change the identifier used for one station in the LAMP text bulletins and BUFR messages: Tazewell City VA will change from K6V3 to KJFZ. As such, K6V3 is included in the list of the 15 stations being removed, and KJFZ is being added to the text bulletin and BUFR messages. No other stations are being added to the LAMP text bulletins at this time.

2. The GFS MOS changes above will slightly alter the format
of the LAV messages because lines will be added in response to additions or removals of GFS MOS guidance for some elements. The communication identifiers for the LAMP text and BUFR products affected by these changes are shown in the tables below.

A web page outlining the LAMP station changes is available at:


Table 1: Communication identifiers for the GFS-based MOS public text products affected by the changes. For Air Force MOS messages with WMO headers FOUS30 and FEUS30, FXX = F01,...,F29.

<table>
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<tr>
<th>WMO HEADING (SHORT RANGE)</th>
<th>AWIPS ID</th>
<th>WMO HEADING (EXTENDED RANGE)</th>
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Table 2. Communication identifiers for the GFS-based Marine MOS text products affected by the changes.

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<td>FQUS26 KWNO</td>
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<td>FOAK37 KWNO</td>
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Table 3. Communication identifiers for the GFS-based River Forecast Center MOS text products affected by the changes.

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For questions regarding the updates to the GFS MOS guidance and station changes please contact:

Phil Shafer
For questions regarding the changes to LAMP guidance please contact:

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Links to the MOS products and descriptions are online at:

http://www.nws.noaa.gov/mdl/synop

NWS national TINs are online at:

http://www.weather.gov/os/notif.htm

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