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From:         Jeffrey Craven  
              NWS Office of Science and Technology Integration  
              Meteorological Development Laboratory

Subject:     Soliciting Comments on the Upgrade of the National Blend of  
              Models and GFS MOS Guidance through April 8, 2022

The Statistical Modeling Division (SMD) of the Meteorological Development Laboratory (MDL) is proposing to update the National Blend of Models (NBM) and GFS Model Output Statistics (MOS) this fall. The NWS is seeking comments on this proposed upgrade through April 8, 2022. If approved, a Service Change Notice (SCN) will be issued at least 30 days prior to the implementation of these upgraded products with more detailed information.

NBM Version 4.1, which is tentatively scheduled to be implemented in January of 2023, will continue to fill existing product gaps requested by the Aviation, Water Resources, Marine, Winter, and Tropical NWS Service Program Offices. Several highlights associated with this upcoming release include: (1) The continued infusion of cutting edge science advancements and usage of high-quality Quantitative Precipitation Estimates (QPE) observational data sets (e.g., the Multi Radar/Multi Sensor System (MRMS)) for calibrating probabilistic quantitative precipitation forecasts (PQPF) in the CONUS, Alaska, HI, and Puerto domains; (2) Improved calibration of probabilistic and deterministic NBM winter weather guidance for snow, ice, freezing rain, and precipitation type through the increase in membership inputs (18 to 100) and leveraging direct model precipitation type guidance; (3) 24h peak wind speed and wind gust guidance in the form of percentiles and exceedance values for particular thresholds for the CONUS domain; (4) Improved the persistent low bias on stronger wind speed and wind gust events in CONUS by inflating speeds based on a cold season regression versus URMA; (5) Added Alaska daytime maximum (MaxT) and nighttime minimum (MinT) temperatures in the form of percentiles and exceedance values for particular thresholds; (6) Improved Alaska deterministic aviation guidance routinely used in daily airport operational planning through 84 hours for Terminal Aerodrome forecasts (TAFs); (7) Added 10th, 50th, and 90th percentile guidance for significant wave heights; (8) Added an innovative tropical cyclone feature matching technique to preserve the National Hurricane Center's Gridded Tropical Cyclone forecast advisory Message (gTCM) wind field while also ensuring a meteorological consistent wind field along the periphery and outside edges

of the gTCM; (9) Added Wet Bulb Globe Temperature (WBGT) for the CONUS, Hawaii, Puerto Rico, and Guam NBM domains; (10) Added NCEP's Aviation Weather Center's 3-layer cloud product along with NCEP's Storm Prediction Center's calibrated Day-1 severe weather probabilistic products of hail, wind, and tornadoes to the CONUS domain; (11) Introduced an upper air quasi-Global blend product (85N to -85S) containing 100 members from the Global Ensemble Forecasting System (GEFS), European Centre for Medium-Range Weather Forecasts, Ensemble (ECMWF), and the Canadian Meteorological Center Ensemble (CMCE) global models; (12) Added new weather elements (some of which are noted above) to the NBM deterministic and probabilistic text products. It is anticipated that these upgrades will benefit the NWS in its mission towards better Impact-based Decision Support Services (IDSS).

GFS MOS maximum temperature, minimum temperature, and 3-hourly temperature, dew point temperature, wind direction, wind speed, and wind gust element equations were all updated in support of NBM station-based bias correction. These updates are intended to bring the GFS MOS more in line with recent operational versions of the underlying model. The dependent data samples for the above elements will now be composed exclusively of data from the GFS FV3 core, with a significant portion coming from the latest version (v16). We have also significantly expanded the number of forecast projections for which the underlying MOS guidance will be available to the NBM, with forecasts now available at 3-hourly intervals through 240h, and 6-hourly from the 246h through 264h projections. Extended-range MOS guidance for these projections (beyond 84h) are also available from the 0600 UTC and 1800 UTC MOS forecast cycles for the first time.

Publicly accessible NBM GRIB2 files will be available for download in NOMADS approximately 30 days prior to implementation. Further details concerning the location of the data will be provided closer to the implementation date with an updated SCN.

All or a portion of the NBM text bulletins can be obtained by visiting an interactive GUI:  
<https://blend.mdl.nws.noaa.gov/nbm-text>

Many of the NBM v4.1 products can be viewed on our Quick Viewer located at:  
<https://blend.mdl.nws.noaa.gov/nbm-images>

Details concerning format changes will be coming soon and will be posted on the MDL NBM home page below:  
<https://vlab.noaa.gov/web/mdl/nbm>

The NWS will evaluate all comments on this NBM upgrade, including the new NBM text bulletins, to determine whether or not to proceed with this upgrade.

For questions regarding the implementation of NBM guidance, please contact:

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