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Public Information Statement 20-24
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From: Vijay Tallapragada
 Chief, Modeling and Data Assimilation Branch
 NCEP/Environmental Modeling Center

Subject: Soliciting Comments about an Upgrade of the High Resolution
Ensemble Forecast (HREF) System through June 24, 2020

The Environmental Modeling Center (EMC) is proposing to upgrade the High Resolution Ensemble Forecast (HREF) in December 2020. The NWS is accepting public comments on this proposed upgrade until June 24, 2020.

This upgrade includes model membership changes with a High Resolution Window (HiresW) - Finite Volume Cubed Sphere (FV3) dynamic core member being added as a first step in a planned unification of all regional weather models around the FV3 dynamical core in the Unified Forecast System (UFS) framework. This new HiresW-FV3 member will replace the HiresW - Nonhydrostatic Multiscale Model on B grid (NMMB) member for all domains. The HiresW-NMMB was selected to be discontinued as it shows the least overall forecast skill of the current HREF membership. The HiresW-FV3 run will be extended to 60 hours to better support a 48-hour HREF forecast with this upgrade. The operational HiresW-NMMB runs to 48 hours.

The High Resolution Rapid Refresh (HRRR) also is being added as a new member for the contiguous U.S. (CONUS) and Alaska HREF domains. With the addition of the High Resolution Rapid Refresh (HRRR), the total number of members (including time-lagged members) increases from 8 to 10 for CONUS and from 6 to 8 for Alaska.

Also included with the proposed upgrade are a number of product additions and refinements:

- Extends the forecast length to 48 hours from the current 36 hours.
- Replaces lower threshold quantitative precipitation forecast (QPF) and snow probabilities currently produced with neighborhood maximum probabilities with Ensemble Agreement Scale (EAS) probabilities.
- Replaces probability-matched mean QPF with a local probability-matched mean QPF.
- Refines how 10 meter above ground level wind speed probabilities are generated, changing from point probabilities of instantaneous wind speed to neighborhood maximum probabilities of hourly maximum wind speed.

- Adds probabilities of QPF exceeding recurrence interval and flash flood guidance values for the CONUS domain only.
- Adds a lightning probability field.
- Adds a mean skin temperature field.
- Modifies the thresholds for maximum updraft helicity probabilities (current production HREF generates for 25 and 100 m²/s²; proposed HREF generates probabilities for 25, 75, and 150 m²/s²).

Graphical comparisons of parallel output are available at these websites through at least June 29, 2020:

- Comparing the real-time HREF parallel and operational HREF:

<https://www.emc.ncep.noaa.gov/mmb/mpyle/hrefv3/>

- Comparing the operational HiresW-NMMB and parallel HiresW-FV3:

https://www.emc.ncep.noaa.gov/mmb/mpyle/hiresw/nmmb_fv3/

Real-time parallel model output data also will be made available:

<https://para.nomads.ncep.noaa.gov/pub/data/nccf/com/hiresw/para/>

The NWS will evaluate all comments to determine whether to proceed with the upgrade.

Please provide comments on this HREF upgrade by June 24, 2020 to:

Matthew Pyle

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Vijay Tallapragada

Email: vijay.tallapragada@noaa.gov

National Public Information Statements are online at:

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

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