

NOUS41 KWBC 201852 AAC
PNSWSH

Technical Implementation Notice 15-32 Amended
National Weather Service Headquarters Washington DC
252 PM EDT Thu Aug 29 2015

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From: Timothy McClung
Chief Operating Officer
NWS Office of Science and Technology Integration

Subject: Amended: Upgrade the Short Range Ensemble Forecast
System Effective September 29, 2015

Amended to:

- Change the implementation date from July 28 to Sep. 29, 2015
- Mention downstream change to the genesis tracker file
- Include reference to TIN 15-30 on BUFR station table changes
- Include a fix to 2m Td field
- Include a fix to mode forecast of cloud ceiling

Effective on or about Tuesday, September 29, 2015, at 1500 Coordinated Universal Time (UTC), the National Centers for Environmental Prediction will upgrade the Short Range Ensemble Forecast System (SREF).

The SREF model upgrades include the following:

- The 7 Weather Research and Forecast (WRF) Nonhydrostatic Mesoscale Model (NMM) members will be eliminated. This includes the following members: ctl, n1, p1, n2, p2, n3, p3.
- The Nonhydrostatic Multiscale Model on B-Grid (NMMB) model members will be increased from 7 to 13 members. The new NMMB members will be: n4, p4, n5, p5, n6, p6.
- The Advanced Research WRF (WRF-ARW) members will also be increased from 7 to 13 members. The new ARW members will be n4, p4, n5, p5, n6, p6.
- Each ensemble member ID will be encoded in the GRIB data for the 26 individual raw SREF members.
- Cloud ceiling height will change from Above Ground Level (AGL) to Above Sea Level (ASL) as requested by the aviation

user community. At the same time, a bug has been fixed in the mode calculation of cloud ceiling.

- Science changes include more diversity in model initial conditions (IC), IC perturbations and physics. The vertical resolution of the model will increase from 35 to 40 vertical levels.

- A few ARW members especially p01, n03, n05 and p06 occasionally produce too high dew-point temperature value at 2m level (2m-Td) such as greater than 90F at local locations where 2m-Td is generally expected to be high (greater than 80F) at 00UTC. Therefore, a cap of 28C or 82.4F has been added. Based on the tests done by both EMC and SPC, this fix is the best one among various approaches being tested at this time. It preserves good domain-averaged performance and spatial structure as well as to take care of these occasional high value spikes. Impact on the ensemble products such as mean and probability is expected to be minimal. No impact is expected on the overall performance of this field. The root cause of this issue will be addressed in next physics upgrade.

- As a uniform measure across all NCEP regional models (see BUFR Station change TIN 15-30, NOUS41 KWBC 091327, PNSWSH,

http://www.nws.noaa.gov/os/notification/tin15-30bufr_stuids.htm

138 new stations have been added in the bufr/sounding output. See the above mentioned TIN for the detail changes.

- All SREF-based downstream jobs, such as cyclone track, will not be impacted in their formats and file names, but are calculated based on new 26 members instead of 21 members, where new members are n4, n5, n6, p4, p5 and p6

Graphical data is viewable here:

<http://www.emc.ncep.noaa.gov/mmb/gplou/emchurr/glblgen/>

The Environmental Modeling Center (EMC) Mesoscale Modeling Branch (MMB) has a publicly available website that can provide users more information concerning the SREF modeling system as well as other NCEP regional modeling systems:

<http://www.emc.ncep.noaa.gov/mmb/mesoscale.html>

AWIPS product changes:

The total number of ensemble members in this upgrade will increase from 21 to 26 due to the discontinuation of the NMM members, and the increase of both the NMMB and ARW members from 7 to 13 members. The increase in ensemble membership will be reflected in the following AWIPS products:

- For 2-meter Temperature and 3-hourly Precipitation products on Grid #221 (32 km North American Lambert Conformal Grid), the GRIB2 Product Definition Template (PDT) will be modified to identify the individual ensemble members.

- For the Mean, Probability, and Spread products on Grids #212 (40 km Contiguous United States (CONUS) Lambert Conformal Grid), #216 (45km Alaska Polar Stereographic Grid), and #243 (Eastern North Pacific Grid), the GRIB2 encoding will reflect the total increase in ensemble members from 21 to 26.

File name changes:

There will be no changes in the file naming convention for the NMMB files, where the model core in file names is represented with the string "nmb". However, the file naming convention for all ARW files will be modified by replacing the previous em string with the arw string.

Also, the file naming convention for the mean, probability and spread cluster files on the NCEP FTP server and NOMADS will change to lead with "sref" and the model cycle:

```
[mean|prob|spread].sref.cluster[1-6].fHH.grib2 ->  
sref.tCCz.[mean|prob|spread]_cluster[1-6].fHH.grib2
```

where CC is the model cycle (03, 09, 15, 21), HH is the 2-digit forecast hour (00, 03, 06, ..., 81, 84, 87)

Data delivery timing/volume/content changes:

With this upgrade, no changes in delivery time are expected. The GRIB2 product definition section (PDS) will be modified to identify the individual SREF members. In combination with the model ID (111=NMMB and 116=ARW), users will be able to identify each of the unique SREF members, as follows: ctl, p1 (+1), n1 (-1), p2 (+2), n2 (-2), ..., p6 (+6), n6 (-6). Due to the increase in SREF members from 21 to 26 and the addition of the member ID to each member's GRIB2 file, users can expect approximately a 10% increase in the data volume for each of the raw individual ensemble member's files.

Output from the SREF is available for North America, the Contiguous United States, Alaska, and Eastern Pacific domains on NOMADS and NOAAPORT.

NOMADS data is available via the following URL:

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

Output from the SREF is available for the CONUS domain on the NWS FTP server at the following location:

ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.sref_CY.CC/RD.YY

YYMMDD

where CC is the cycle (03, 09, 15, 21) and YYYYMMDD is the current date.

A consistent parallel feed of data will be made available on the NCEP HTTP server at the following URL:

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

NCEP encourages all users to ensure their decoders are flexible and are able to adequately handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and also any volume changes which may occur. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes prior to any implementations.

For questions regarding the scientific content of the modeling system, please contact:

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NWS Technical Implementation Notices are online at:

<http://www.nws.noaa.gov/om/notif.htm>

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