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PNSWSH

Service Change Notice 21-50
National Weather Service Headquarters Silver Spring MD
845 AM EDT Fri May 7 2021

To: Subscribers:
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 -Emergency Managers Weather Information Network
 -NOAAPort
 Other NWS Partners, Users and Employees

From: Dr. Michael Farrar, Director
 National Centers for Environmental Prediction

Subject: Initial Implementation of SPC-Post, Including Calibrated
Thunderstorm and Severe Thunderstorm Guidance: Effective May 11, 2021

Effective on or about May 11, 2021, beginning with the 1200 Coordinated
Universal Time (UTC) run, the National Centers for Environmental
Prediction (NCEP) will begin operationally running the Storm Prediction
Center's (SPC's) post-processing suite (SPC-Post). In the event of a
Critical Weather Day (CWD) declaration, the implementation may be delayed.

SPC-Post version 1.0.6 includes two primary probabilistic products:

- High-Resolution Ensemble Forecast (HREF) calibrated thunderstorm
probabilities
- HREF / Short-Range Ensemble Forecast (SREF) calibrated tornado, severe
hail and severe wind probabilities.

These products and associated output files are discussed separately below.

HREF Calibrated Thunderstorm Probabilities:

The HREF calibrated thunderstorm probabilities use three inputs from
HREFv3: 1) -10C reflectivity, 2) accumulated precipitation, and 3) most-
unstable lifted index. Probabilistic thresholds were selected for each
input field and then weighted to optimize performance. Finally, the raw
probabilistic field is calibrated to one or more cloud-to-ground lightning
flashes at each 40-km grid point (i.e., within 20 km or ~12.5 miles).

The HREF calibrated thunderstorm probabilities are available for three
different time windows: 1-hour, 4-hour, and full periods, where "full"
refers to the remainder of the convective day. The output grib2 file name
templates by period (1-hour, 4-hour and full) are as follows:

```
hrefct.tHHz.thunder_1hr.fFFF.grib2  
hrefct.tHHz.thunder_4hr.fFFF.grib2  
hrefct.tHHz.thunder_full.fFFF.grib2
```

Where HH refers to the initialization time of the HREF (00 or 12 UTC) and
FFF is the forecast hour (hourly from f001 to f048).

On NCEP web services (NOAA Operational Model Archive and Distribution System (NOMADS)/FTPFRD), these files will be in:

https://nomads.ncep.noaa.gov/pub/data/nccf/com/spc_post/prod/spc_post.YYYYMMDD/thunder

ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/spc_post/prod/spc_post.YYYYMMDD/thunder

HREF/SREF Calibrated Severe Probabilities:

The HREF/SREF calibrated severe thunderstorm probabilities (i.e., tornado, hail and wind) use two inputs: 1) HREF neighborhood probability of updraft helicity exceeding the 99.85% value, and 2) SPCSREF (SPC's post-processed guidance calculated from the SREF) environmental exceedance probabilities: STP>1 for tornado, MUCAPE>1000 J/kg x Effective Bulk Shear > 20 knots for hail, and MUCAPE > 250 J/kg x Effective Bulk Shear > 20 knots. The historical frequency of a hazard report occurring within 25 miles of a gridpoint for that 4-hour period and forecast pair of probabilities is used as the 4-hour calibrated hazard probability.

The HREF/SREF calibrated severe thunderstorm probabilities are available for two different time windows: 4-hour, and 24-hour. The output grib2 file name templates by period (4-hour and 24-hour):

```
href_cal_wind.tHHz.4hr.fFFF.grib2
href_cal_hail.tHHz.4hr.fFFF.grib2
href_cal_tor.tHHz.4hr.fFFF.grib2
href_cal_wind.tHHz.24hr.fFFF.grib2
href_cal_hail.tHHz.24hr.fFFF.grib2
href_cal_tor.tHHz.24hr.fFFF.grib2
```

Where HH refers to the latest initialization time of the HREF or SREF (00, 03, 12 or 15) and FFF is the forecast hour (see below for details).

The specific inputs and available forecast hours are noted below for each initialization (HH) time:

```
00Z Cycle: 21Z SPCSREF and 00Z HREF
4-hour: Hourly from f016 to f036
24-hour (12Z - 12Z): f036
03Z Cycle: 03Z SPCSREF and 00Z HREF
4-hour: Hourly from f013 to f033
24-hour (12Z - 12Z): f033
12Z Cycle: 09Z SPCSREF and 12Z HREF
4-hour: Hourly from f004 to f024
24-hour (12Z - 12Z): f024
15Z Cycle: 15Z SPCSREF and 12Z HREF
4-hour: Hourly from f005 to f021
24-hour (12Z-12Z): f021
```

On NCEP web services (NOMADS/FTPFRD), these files will be in:

https://nomads.ncep.noaa.gov/pub/data/nccf/com/spcpost/prod/spc_post.YYYYMDD/severe

ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/spcpost/prod/spc_post.YYYMMDD/severe

NCEP urges all users to ensure their decoders can handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and volume changes. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes before implementation.

Any questions, comments or requests regarding this implementation should be directed to the contacts below. We will review any feedback and decide whether to proceed.

If you have questions regarding SPC-Post, please contact:

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If you have questions regarding the data flow aspects, please contact:

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National Service Change Notices are online at:

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

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