

Calibrated Probabilistic Guidance Parameters

Calibrated Probabilistic Guidance parameters are created for tornadoes, severe hail, and severe wind hazards. 4-hour and 24-hour forecasts are generated for each severe hazard.

How are the Calibrated Probabilistic Guidance parameters computed?

Calibrated Probabilistic Guidance parameters utilize the HREF and SREF ensembles. The neighborhood probabilities of atmospheric variables used to generate each severe hazard are:

Hazard	HREF Variable	SREF Variable
Tornado	$UH \geq 75 \text{ m}^2/\text{s}^2$	$STP \geq 1$
Hail	$UH \geq 75 \text{ m}^2/\text{s}^2$	$MUCAPE \geq 1000 \text{ J/kg} \times \text{Eff. Shear} \geq 20 \text{ kt}$
Wind	$UH \geq 75 \text{ m}^2/\text{s}^2$	$MUCAPE \geq 250 \text{ J/kg} \times \text{Eff. Shear} \geq 20 \text{ kt}$

For the 4-hour forecasts, at every valid forecast hour the maximum of each variable over the previous 4 hours are paired at each grid point. The historical frequency of a hazard (i.e., tornado, hail, or wind) report occurring within 25 miles of that grid point and within the 4-h period for that forecast pair of probabilities is substituted as the 4-h calibrated hazard probability.

For the 24-hour forecasts, the output probabilities of the 4-hour forecasts are utilized. Every other valid hour of the 4-hour forecasts are employed. At every grid point, the cumulative sum of the 4-hour probabilities and the maximum 4-hour probability are paired. The historical frequency of a report occurring within 25 miles of that grid point and within the 24-h period for those 4-h calibrated hazard probabilities is substituted as the 24-h calibrated hazard probability.

For more information about the calibration table methodology, please see <http://www.spc.noaa.gov/publications/jirak/calprob.pdf>.

Note: Due to the lack of available archive data for the HREF (forecast files only available back to April 3, 2017), the calibration tables from the SSEO/SREF calibrated guidance have been chosen to be employed, instead. Reliability and ROC diagram verification scores while using these calibration tables score similarly with the HREF/SREF calibration tables. Once a sufficiently long archived HREF dataset has been utilized for calibration, the HREF/SREF calibration tables will be employed, again.

How often are the 4-hour forecasts run?

Generated for 2100 (previous day), 0300, 0900, and 1500 UTC using the 0000 UTC HREF and 2100 UTC SREF (previous day), 0000 UTC HREF and 0300 UTC SREF, 1200 UTC HREF and 0900 UTC SREF, and 1200 UTC HREF and 1500 UTC SREF,

respectively. Forecasts are valid every 2 hours over the previous 4 hours and end at 1200 UTC the next day.

How often are the 24-hour forecasts run?

Generated for 2100 (previous day), 0300, 0900, and 1500 UTC using the 0000 UTC HREF and 2100 UTC SREF (previous day), 0000 UTC HREF and 0300 UTC SREF, 1200 UTC HREF and 0900 UTC SREF, and 1200 UTC HREF and 1500 UTC SREF, respectively. Forecasts have only one time period and are valid from 1200 UTC the current day until 1200 UTC the next day.