Development of Day 2 Calibrated Probabilistic Severe Weather Guidance for Individual Severe Hazards

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Since 2014, the NWS Storm Prediction Center has produced 4-hr and 24-hr calibrated probabilistic guidance for severe convective hazards (i.e., tornado/wind/hail) within the Day 1 convective period (1200 - 1200 UTC). This guidance is produced from a combination of maximum neighborhood probabilities of 1) HREF storm-attribute variables and 2) SREF environmental variables paired with 3) the historical frequency of a hazard report occurring within 25 miles of a grid point. This guidance has been made internally available to SPC forecasters and externally available via the HREF viewer hosted on the SPC website. In May of 2021 this guidance became operational in the NWS, allowing it to be distributed publicly via NCEP web services, serve as a component to SPC prototype severe timing guidance, and has been incorporated into NBMv4.1.

With recent upgrades to the HREF membership and scheduled retirement of the SREF, developmental work has focused on developing new calibrated guidance, that 1) utilizes environmental variables from the GEFS (substituting for the SREF), 2) explores alternative storm-attribute and environmental variables and combinations, 3) explores alternative truth datasets (e.g., MESH), and 4) extends into the Day 2 convective period. These new and existing versions of calibrated guidance were evaluated in the 2022 and 2023 HWT Spring Forecasting Experiment and objectively verified as part of a NOAA Lapenta internship project. This presentation will provide an overview of these developmental efforts, subjective HWT evaluations, and objective verification metrics.