

Product Name: NOAA/CIMSS ProbSevere System v2.0 (ProbSevere) with associated hazard models (ProbSevere, ProbHail, ProbWind, and ProbTor)

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Hazardous Weather Testbed, Experimental Warning Program Relevance:

- Assists forecasters in severe weather situations by highlighting storms that are more or less likely to become severe/tornadic in the near future.
- Products will be evaluated on their ability to increase forecaster confidence and skillfully extend lead-time to severe hazards for NWS warnings during potential severe weather situations.

Product Overview:

- Statistical models provide probabilistic guidance to forecasters on the likelihood of severe weather occurrence for convection in the near term [0-60 min].
- Algorithms incorporate multiple datasets from satellite, radar, total lightning, and NWP into easy-to-interpret products, helping to consolidate/reduce the “fire hose” of data during busy weather situations.
- Model output is CONUS-wide and day/night independent.
- Time series AWIPSII tool
 - Double-clicking a ProbSevere object brings up a time series window of ProbSevere products (ProbHail, ProbWind, ProbTor)

Product Methodology:

- Spatial and temporal features are extracted and computed from satellite and radar storm objects. Satellite trends are shared with overlapping radar objects.
- Trained statistical models compute the probability that a storm will produce severe weather in the near-term, using GOES-derived, NEXRAD-derived, Earth Networks Total Lightning Network™ (ENTLN)-derived, and Rapid Refresh (RAP)-derived data.
- ProbSevere, ProbHail, ProbWind, and ProbTor update every 2 minutes. Forecasters can display each model separately in AWIPSII.

ProbSevere Products

- ProbHail: provides guidance on severe hail.
- ProbWind: provides guidance on severe convective straight-line wind.
- ProbTor: provides guidance on tornado threats.
- ProbSevere: All-in-one display, providing guidance on the above hazards.
- Products are displayed as color contours of severe hail, severe wind, and tornado probabilities around storms on radar.
- Data readout is available by sampling the probability contour. This provides the exact probabilities of hazards and the detailed model predictor values.

Concept for Operational Demonstration:

- GeoJSON files (on the order of kilobytes) will be delivered to the HWT via the LDM and converted on-the-fly into a shapefile using AWIPSII.

Concept for Operations:

- The ProbSevere system (v2.0) became operational at NCEP Central Operations on 14 October 2020. The primary users are radar/warning operators and mesoscale analysts in NWS WFOs. The time series will be incorporated into a future version of AWIPSII, pending forecaster evaluation.