

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

Primary Investigator: Mike Pavolonis (NESDIS)

Purpose:

- ProbSevere assists forecasters in severe weather situations by highlighting storms that are more or less likely to become severe/tornadic in the near future.
- Products are intended to increase forecaster confidence and skillfully extend lead time to severe hazards for NWS warnings during 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 [0-90 min].
- Algorithms incorporate multiple datasets from satellite, radar, total lightning, and NWP into intuitive products, helping to consolidate and reduce the overload of data during busy weather situations.
- Model output is CONUS-wide and day/night independent.

Product Methodology:

- Spatial and temporal features are extracted and computed from satellite and radar tracked 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: probabilistic guidance on severe hail.
- ProbWind: probabilistic guidance on severe convective straight-line wind.
- ProbTor: probabilistic 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.

File format description

- geoJSON files on the order of hundreds of kB, produced every 2 min
- See this document for detailed information: http://cimss.ssec.wisc.edu/severe_conv/training/ProbSevere_v2_FileDescription.pdf

Operations update:

- ProbSevere v2 will be an operational subsystem of MRMS v12, which is scheduled to be deployed at NCEP/NCO in federal FY2020.
- ProbSevere v2 products will only be available to WFOs with AWIPSII v19.2.1 or later (deployment in July 2019).
- See http://cimss.ssec.wisc.edu/severe_conv/ProbSevere_V1vsV2.pdf for differences between ProbSevere v1 and v2.