

# ProbSevere

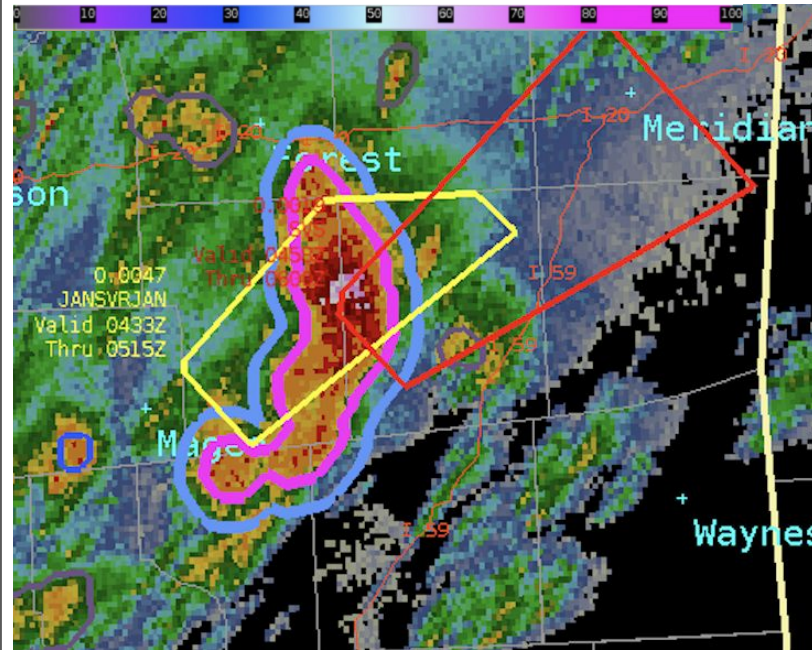
## Quick Guide



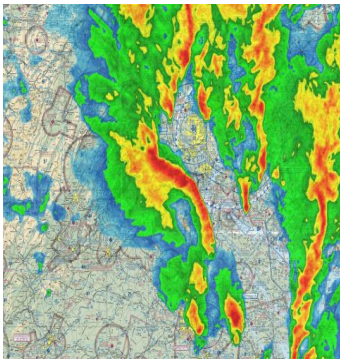
**ProbSevere** tracks storms in radar and satellite imagery across the contiguous U.S. It extracts and computes storm attributes from remotely sensed meteorological observations and environmental data to compute *storm-centric, next-hour probabilities of severe weather*:

1. Probability of hail  $\geq 1$  in diameter
2. Probability of wind gust  $\geq 58$  mph
3. Probability of tornado
4. Probability of any of the above

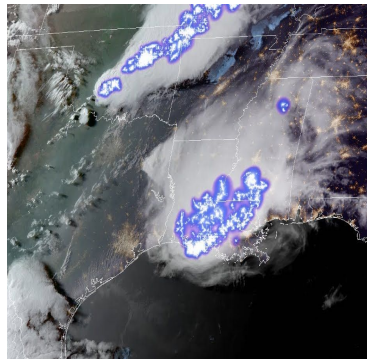
The machine-learning models are gradient-boosted decision trees.



Input sources



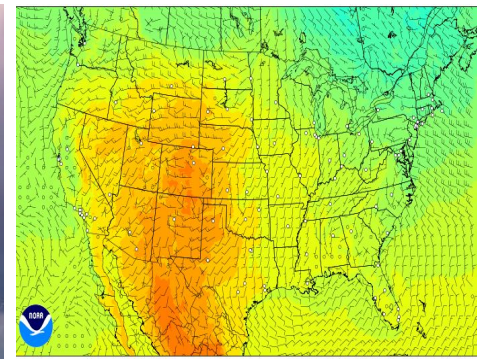
Multi-Radar Multi-Sensor



GOES-R ABI and GLM



ENI Lightning network



High-Resolution Rapid Refresh

### Primary Applications

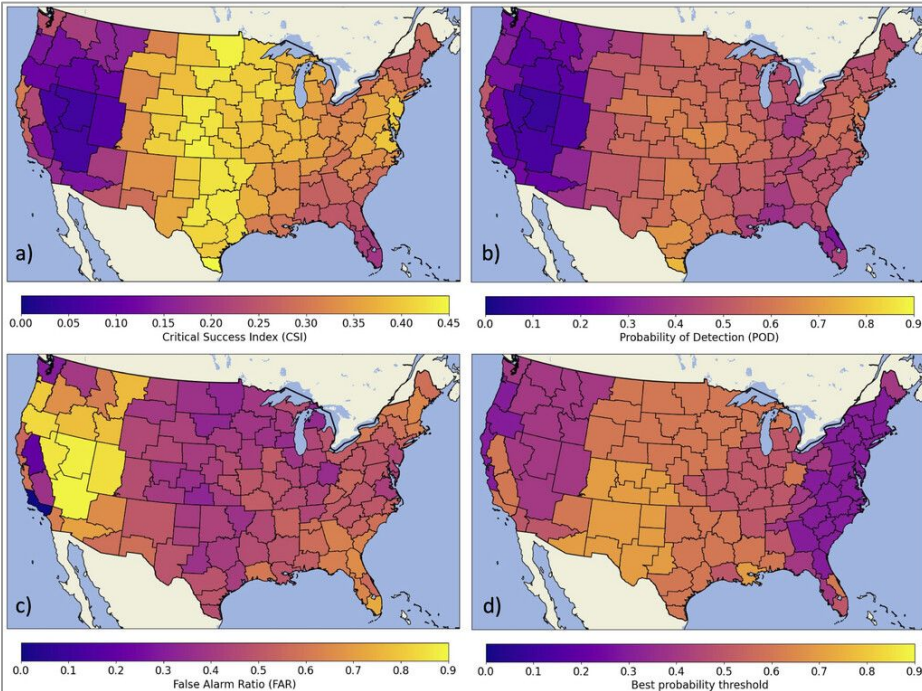
- Provides guidance on storm severity for developing and mature thunderstorms
- Helps triage hazard threats
- Increases forecaster confidence in warning decision making
- Helps increase warning lead time to hazards

### Limitations

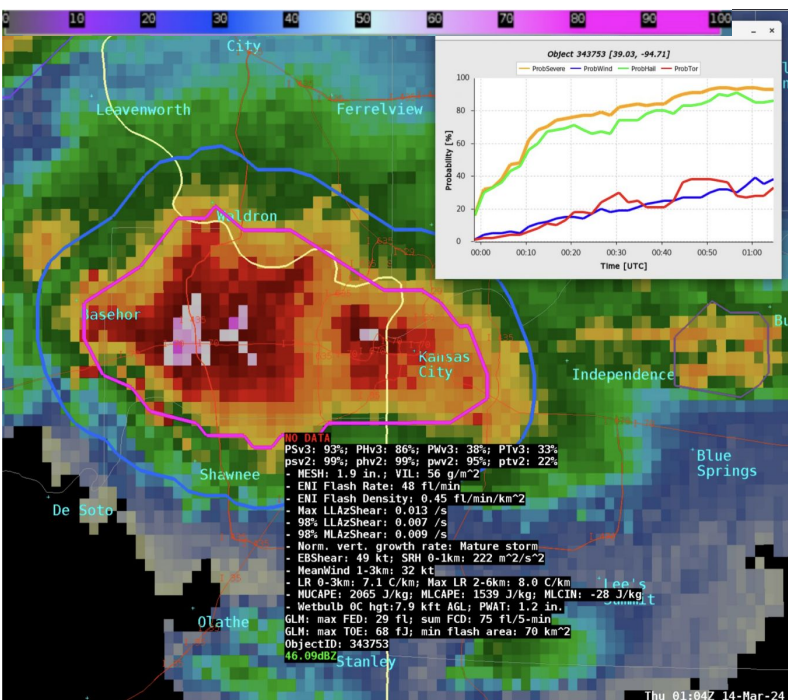
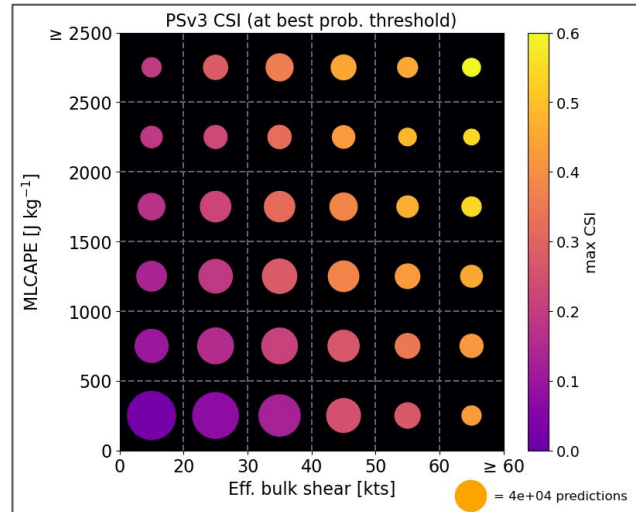
- Requires storm object to be identified
- Shallow and low-lightning storms often have low probabilities
- Poor object-tracking in squall lines can adversely affect probability trends
- Radar inputs coarser than NEXRAD L2

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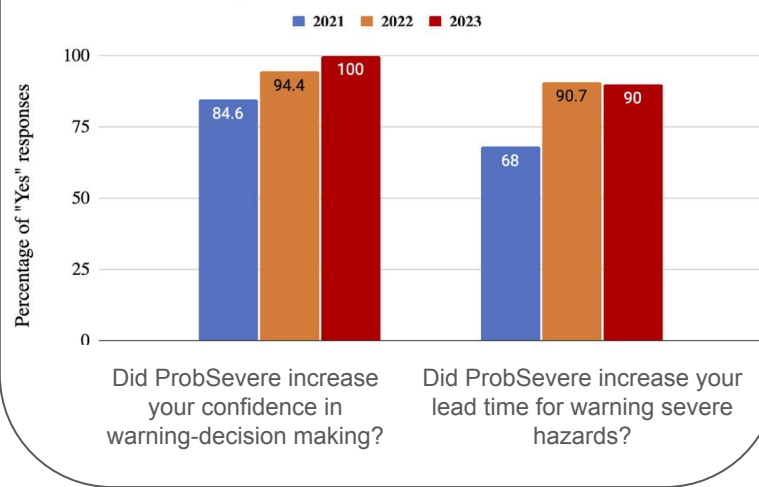
## Quick Guide



ProbSevere validation on thousands of storms in 2023.



### Hazardous Weather Testbed feedback from National Weather Service forecasters



### ProbSevere in AWIPS

- Inner contour colored by probability of any severe
- Outer contour colored by probability of tornado
- Mouse-hover displays probabilities and predictor values



Webpage



Publication