ATS/CIRA Colloquium

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Visiting from Texas Tech University

Developing an Ensemble Sensitivity-Based Subsetting Tool for Improved Forecasts of High-Impact Events

Hosted by Russ Schumacher

3 p.m. Thursday, March 12
ATS room 101

Modern computational resources now allow convection-permitting ensemble forecasts in real time. These forecasts compose massive amounts of data containing information about the predictability of specific atmospheric features, and techniques exploiting such information might provide improved prediction of high-impact events. One such technique is known as ensemble sensitivity, which extracts statistical relationships between weather features later in a forecast and the atmospheric state earlier in time. Uses of ensemble sensitivity include examining the relevant dynamics of high-impact events, determining areas where supplemental observations can be assimilated to improve forecasts, and adjusting forecast probabilities based on ensemble subsetting. The subject of this talk will be the ensemble subsetting technique, which weights ensemble members that have the lowest errors in sensitive regions to beneficially adjust forecast probabilities of severe weather.

Here the development of ensemble subsetting is described from its first tests with synoptic-scale events to more recent work at convection-permitting scales toward developing a tool that can improve probabilistic forecasts of severe convection. Several evaluations at the NOAA Hazerdous Weather Testbed Spring Forecast Experiment (HWT SFE) will be discussed, which provided key feedback from both researchers and operational forecasters to help guide the development of the technique. Finally, the current state of the technique and its operational relevance within the Texas Tech operational ensemble forecast system will be discussed along with future plans to extend its use more broadly for a variety of users and applications.