Short-Range Ensembles and Ensemble Data Assimilation

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Hazardous Weather Forecasts & Warnings
How do we provide model forecast uncertainty information to (severe) weather forecasters?
Typical Forecast Challenge
Goal: Accurate three-dimensional state of the atmosphere
en·sem·ble, n. 1. a group of model forecasts valid over the same time period. Can differ in how atmospheric state perturbations are created, and if model variations are included. Best method available to provide model forecast uncertainty information.
NSSL scientists led initial evaluation and helped design the NCEP Short-Range Ensemble Forecasting (SREF) system.
Convection-resolving ensembles

0300 UTC

member 1

member 2

member 3
HWT’s evaluation of convection-allowing model forecasts influenced NCEP/EMC planning.
Ensemble Forecasts

Ensemble Data Assimilation
Ensemble Data Assimilation

Ensemble Mean Temperature 2m
Challenges remain

4-5 May 2007
3-h Probability of Significant Tornado Parameter > 1
Future

For mesoscale and storm-scale
- Ensemble creation
- Ensemble data assimilation
- Ensemble postprocessing and use in operations
Better, quicker, and more valuable weather and water information to support improved decisions.