



**Earth System Research Laboratory**

*SCIENCE, SERVICE & STEWARDSHIP*

# Probabilistic Storm Forecasting for Traffic Flow Management: Progress and Challenges

*Stephen S. Weygandt*

*NOAA Earth System Research Laboratory*

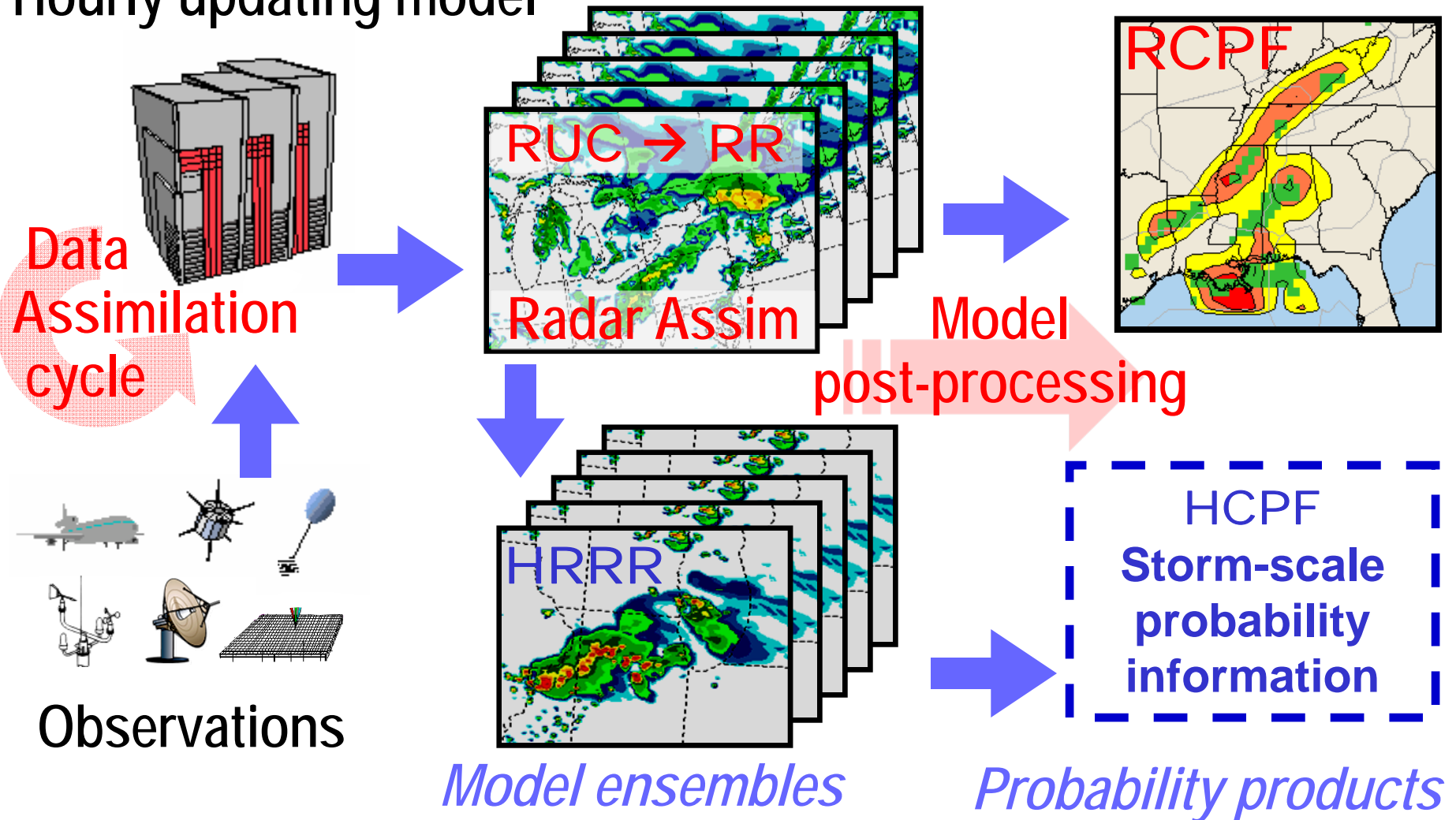
*Friends and Partners of Aviation Weather*

*NBAA Convention, October 9, 2008*



# Model-based storm guidance

Hourly updating model





# Mesoscale model guidance

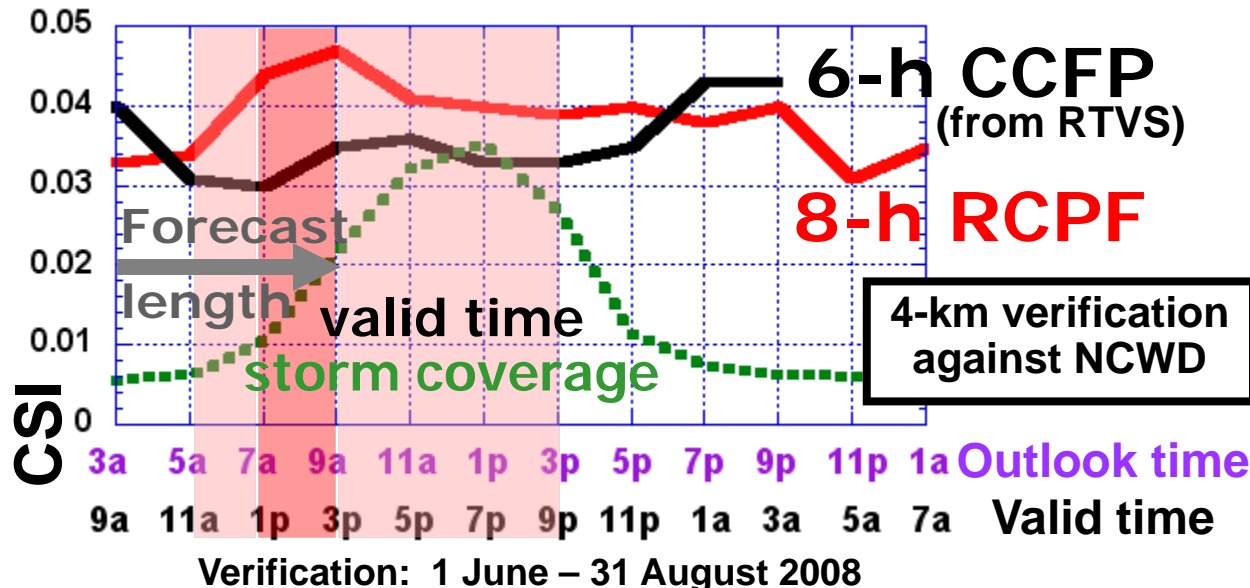
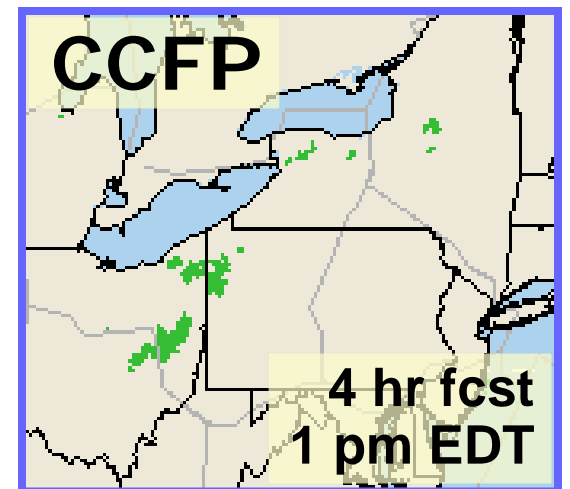
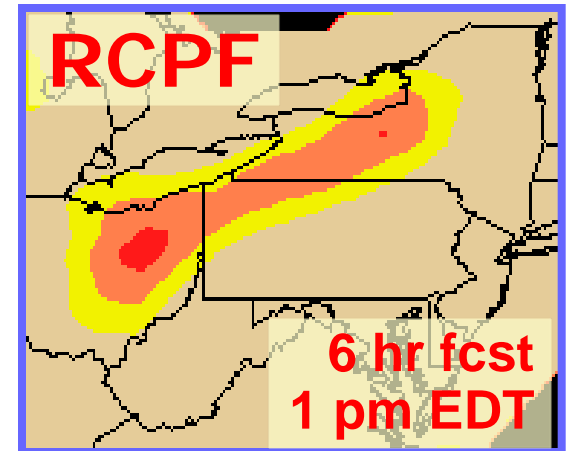
## 13-km RUC & Rapid Refresh

Hourly update cycle gives accurate mesoscale environment, good convective initiation

20 July 2008  
9 am outlook

**RCPF** (hourly 3-10 h outlook ) made from time-lagged ensemble of RUC

RCPF used as guidance for CCFP



# Mesoscale model guidance

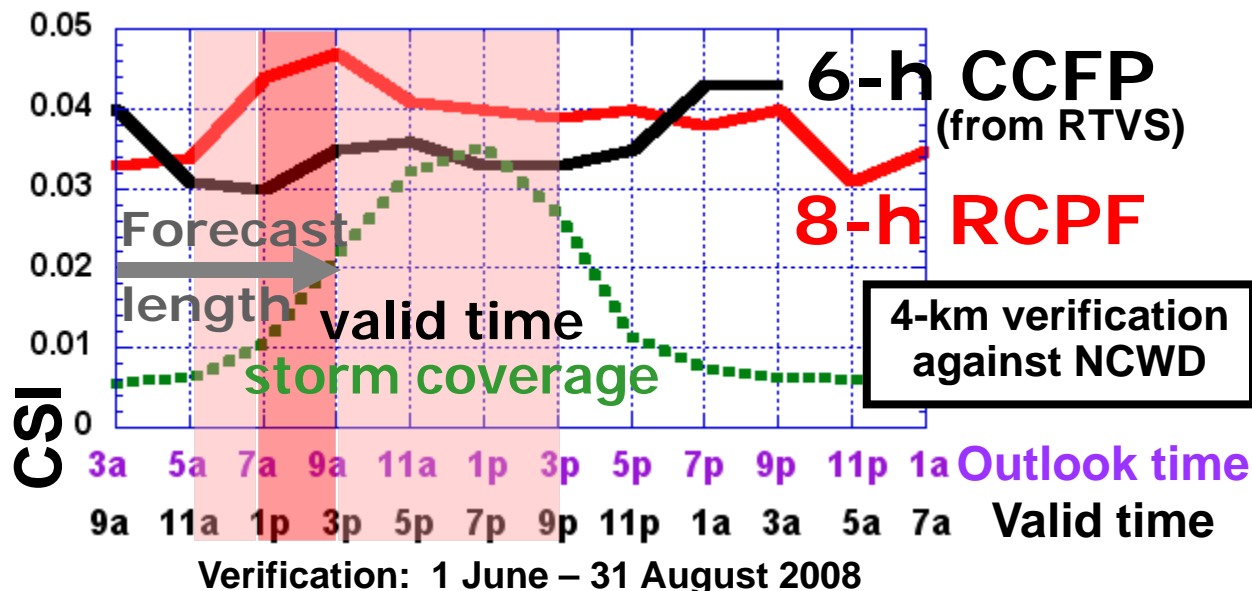
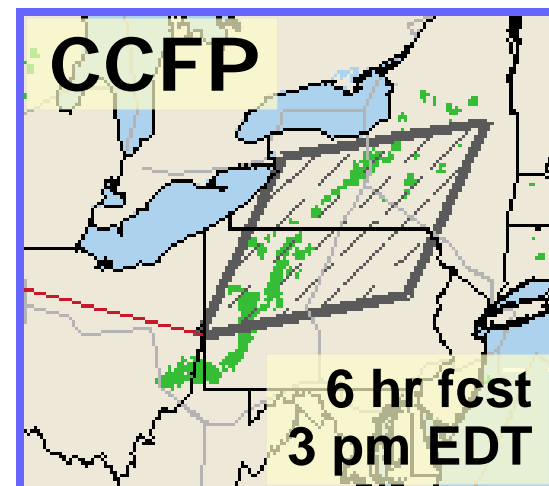
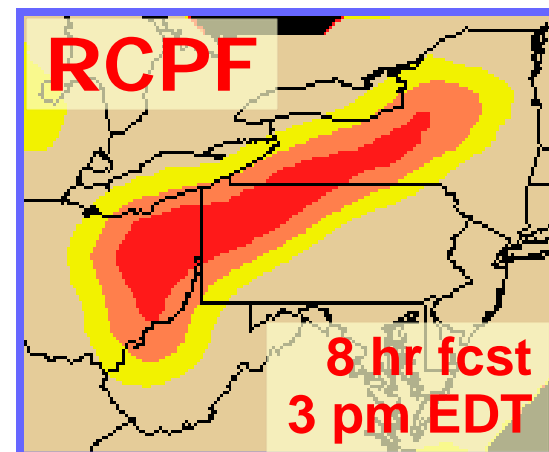
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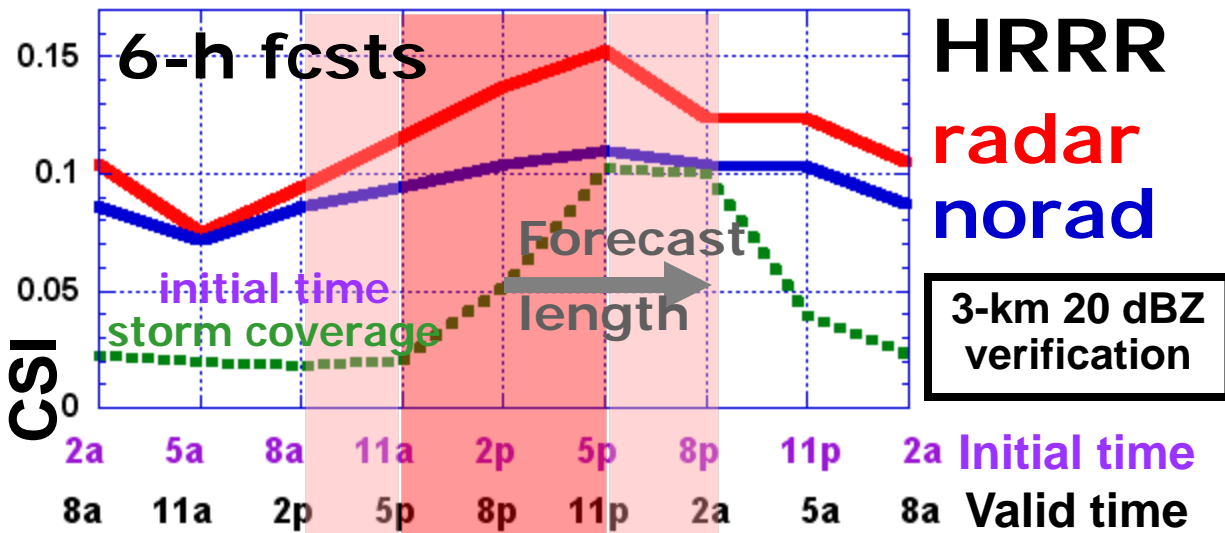
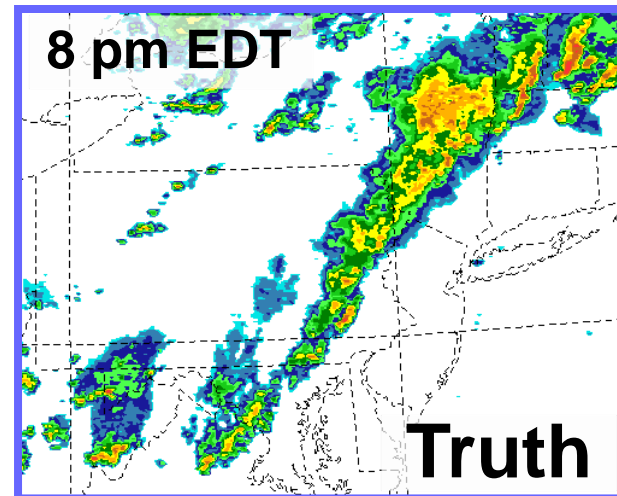
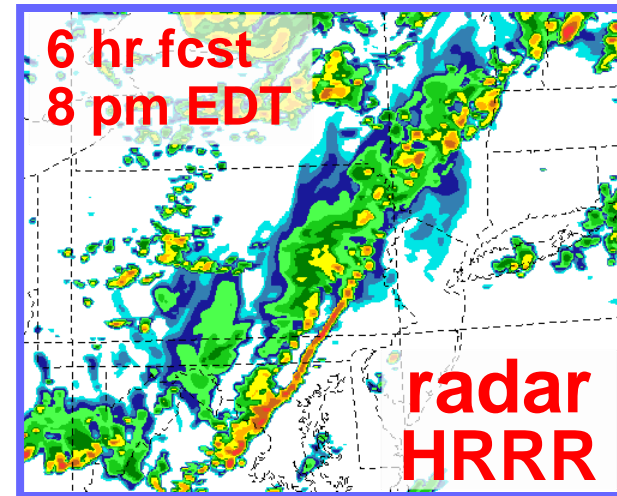
## (3-km Hi-Res Rapid Refresh)

20 July 2008  
2 pm initial time

High resolution needed for realistic storm structure (storm-types, gaps in lines, etc.)

Hourly 12-h forecast, 15-min VIL output

RUC radar assimilation improves HRRR



Verification: 1 June – 31 August 2008

# Storm-scale model guidance

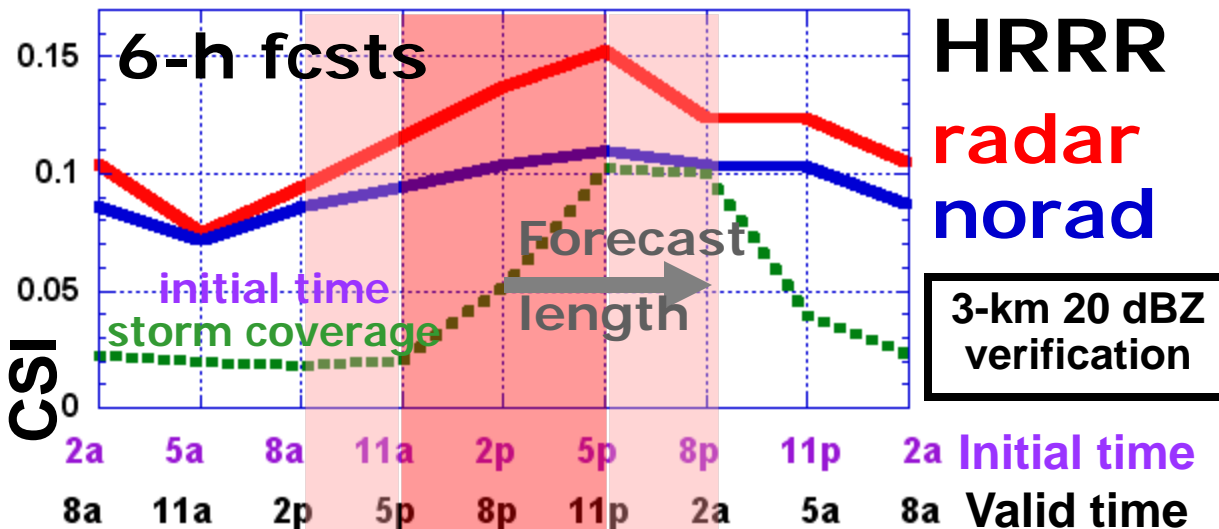
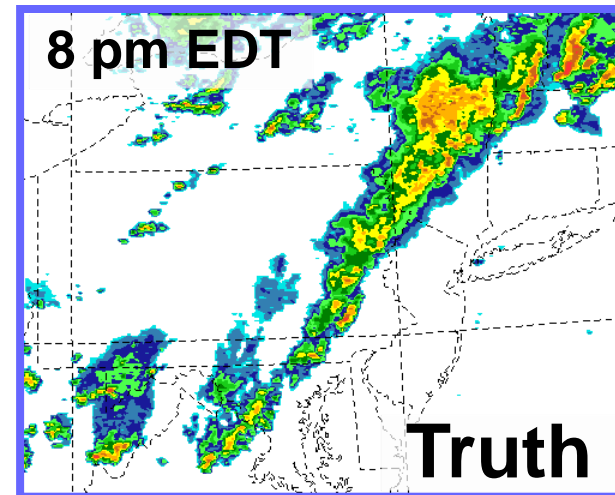
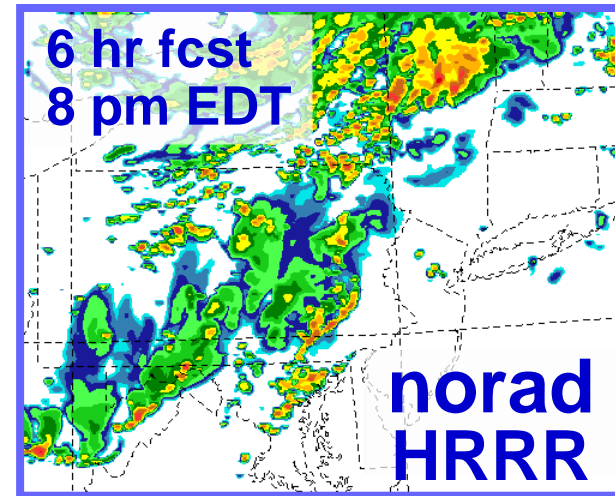
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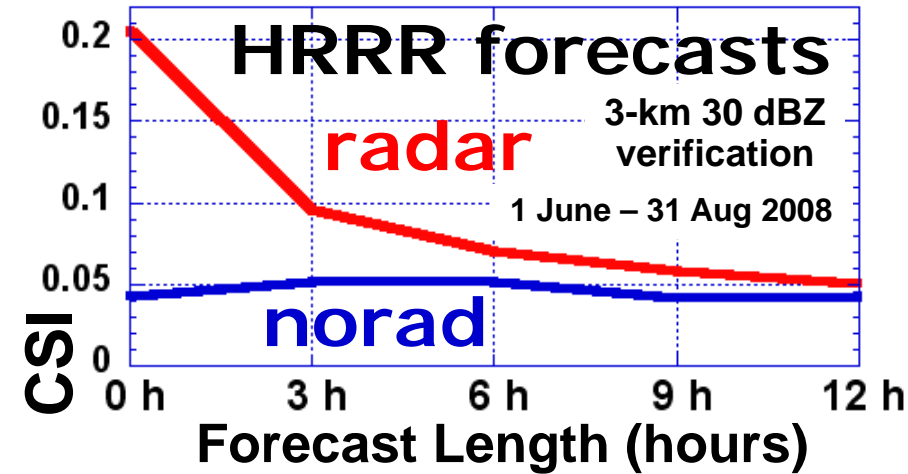
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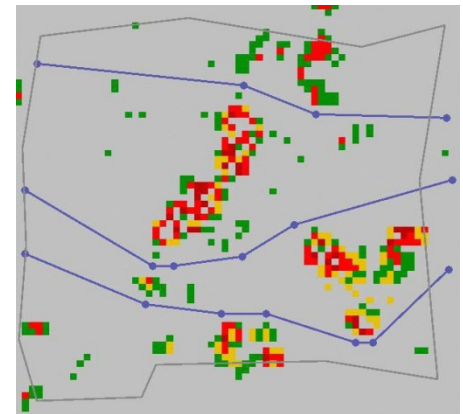
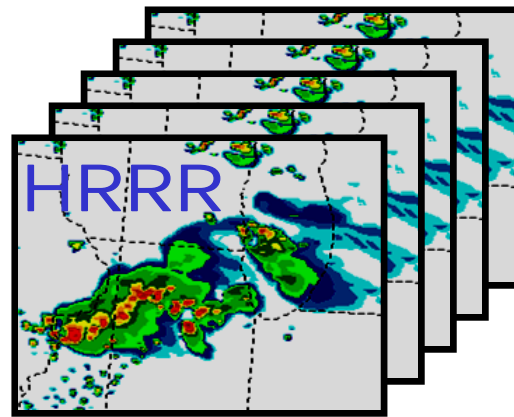
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# Model-based TFM guidance



Radar assimilation improves HRRR forecast through 12-h  
**HRRR key component of CoSPA**  
**HRRR storm structure allows extraction of ATM information**

***HRRR and HRRR-based probabilities Important for automated ATM***



***HRRR ensembles*** → ***ATM probabilities***