

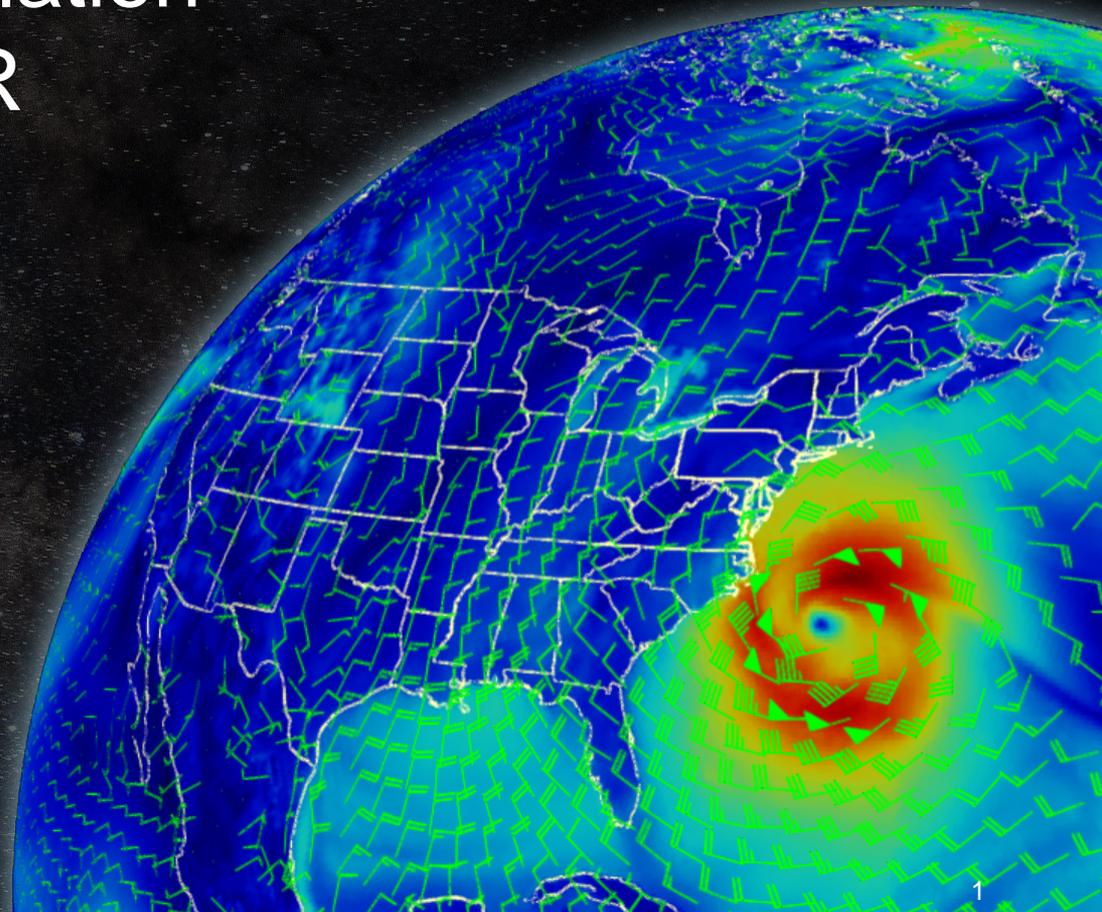
# Radar Data Assimilation for RAP and HRRR

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NOAA/ESRL/GSD



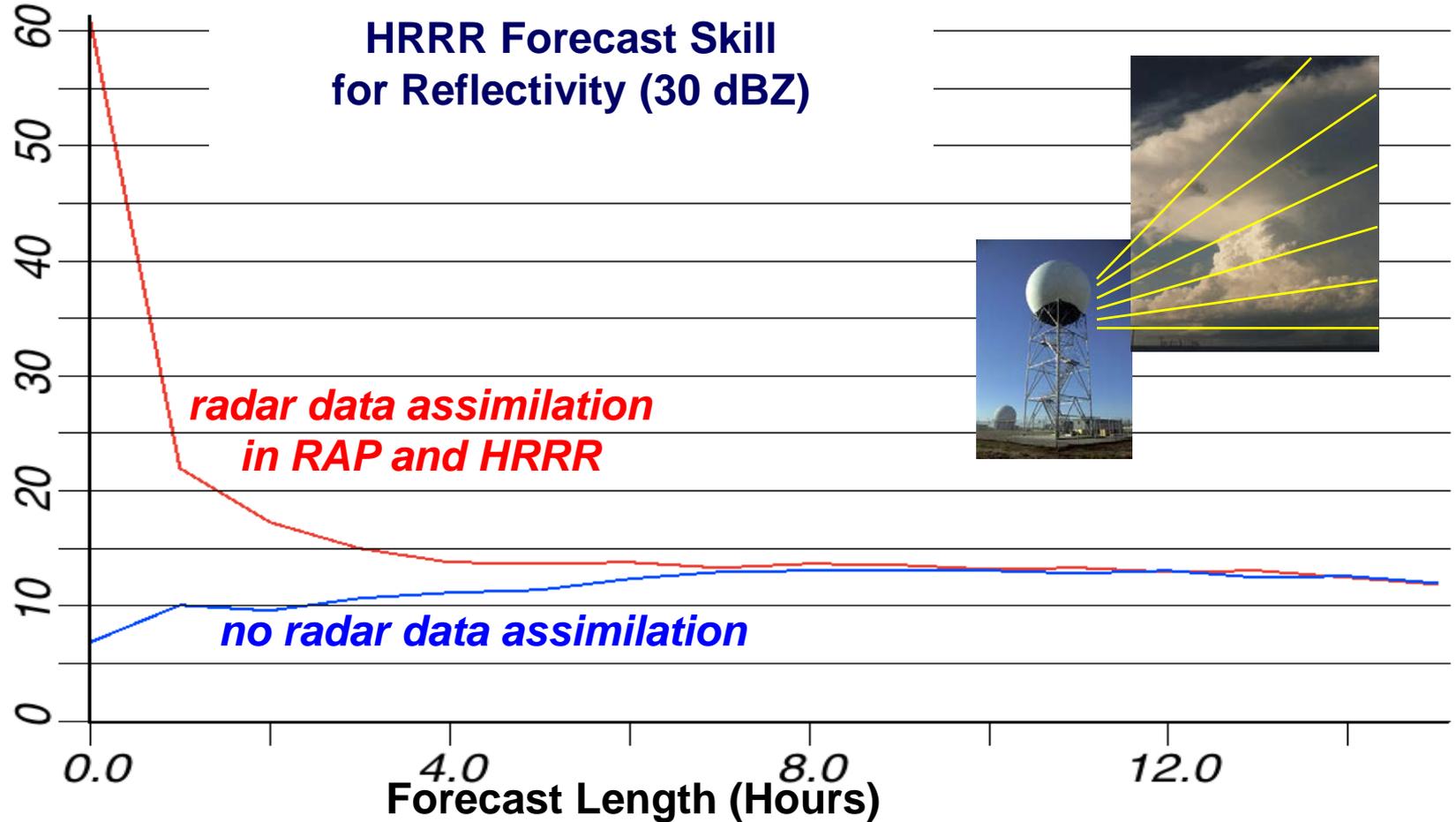
GSD Science Review  
3-5 Nov 2015



# Skill from Reflectivity Data Assimilation

Critical Success Index X 100

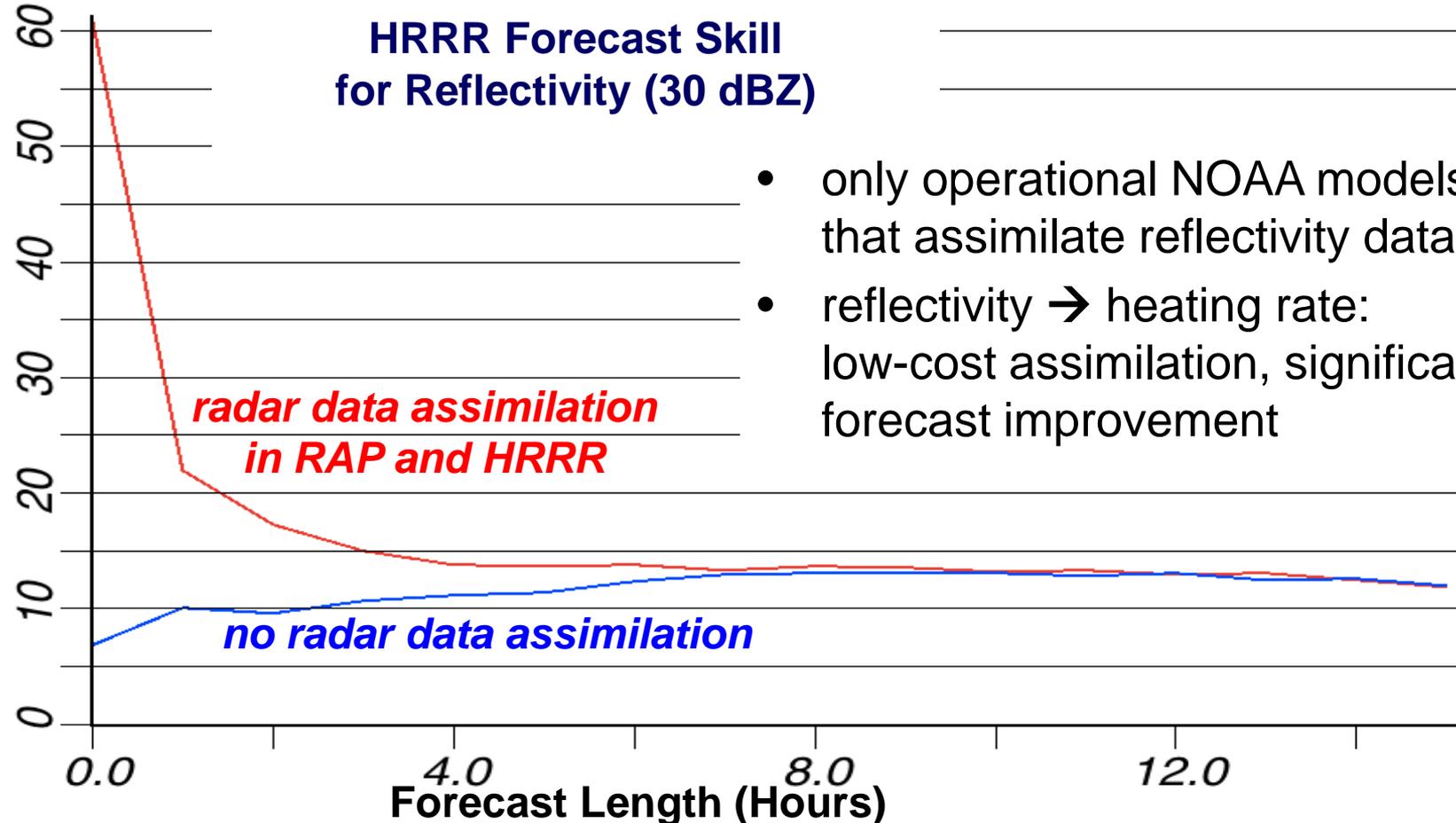
← Less Skill More Skill →



# Skill from Reflectivity Data Assimilation

Critical Success Index X 100

← Less Skill More Skill →

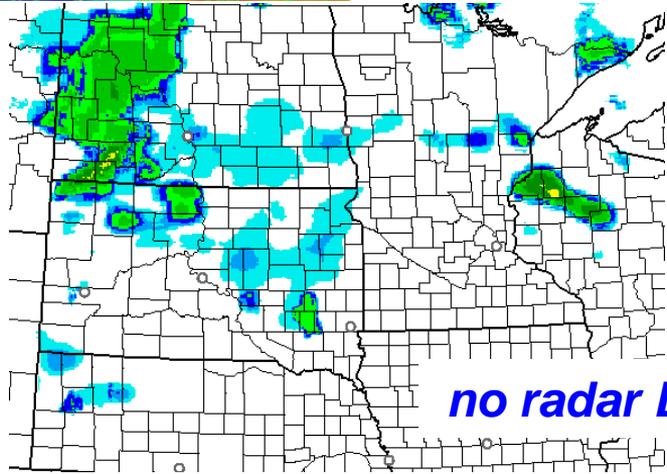


*radar data assimilation in RAP and HRRR*

*no radar data assimilation*

- only operational NOAA models that assimilate reflectivity data
- reflectivity → heating rate: low-cost assimilation, significant forecast improvement

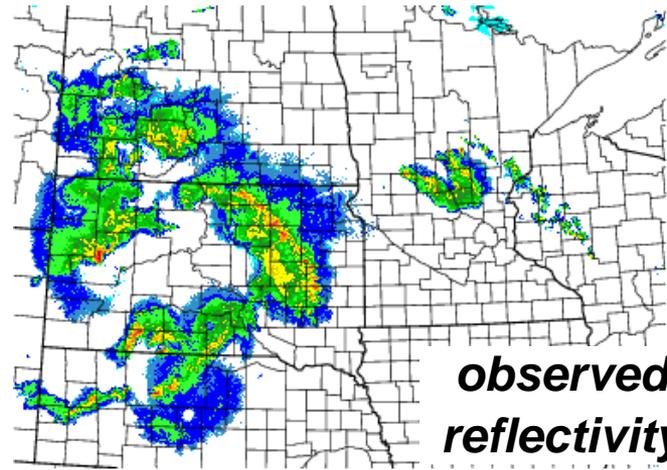
# Example: With and Without Radar Data Assimilation



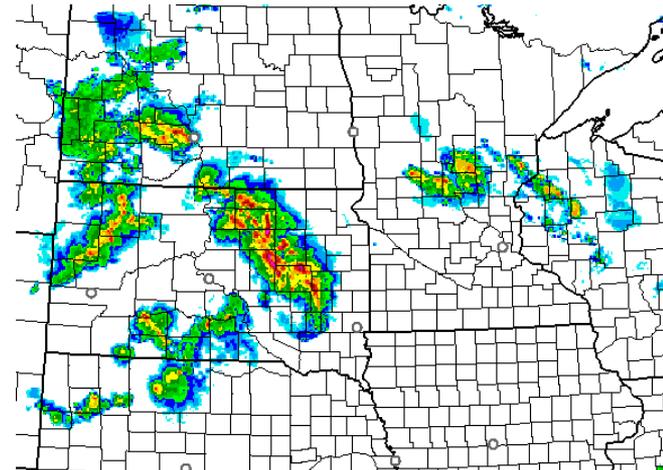
*no radar DA*

**RAP radar DA improves convective forecast in both RAP and HRRR**  
**Additional HRRR radar DA improves fine-scale initialization of HRRR**

*15-minute HRRR forecast*

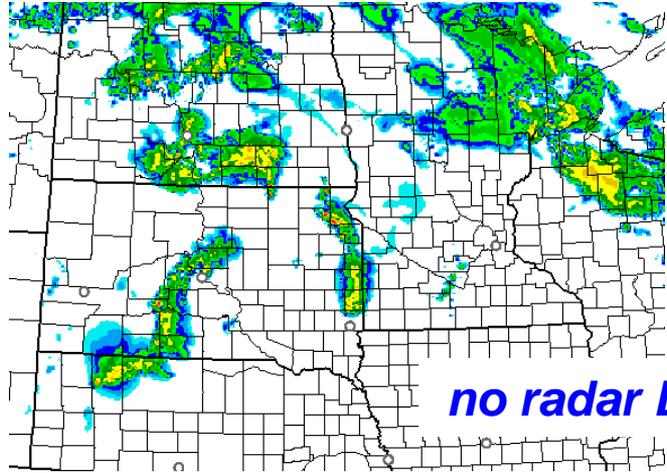


***observed  
reflectivity***



***radar DA in  
RAP  
and HRRR***

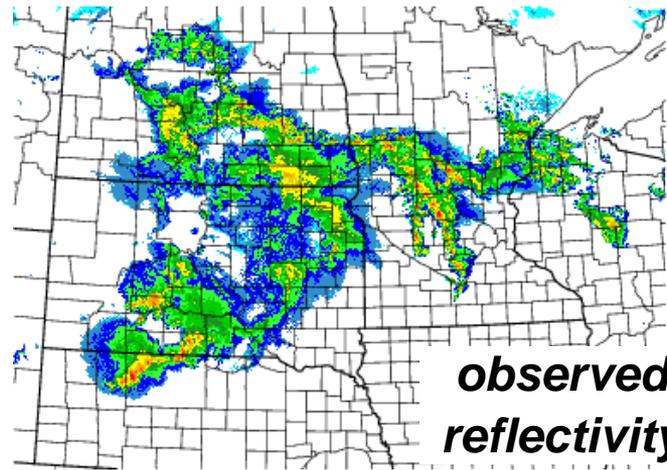
# Example: With and Without Radar Data Assimilation



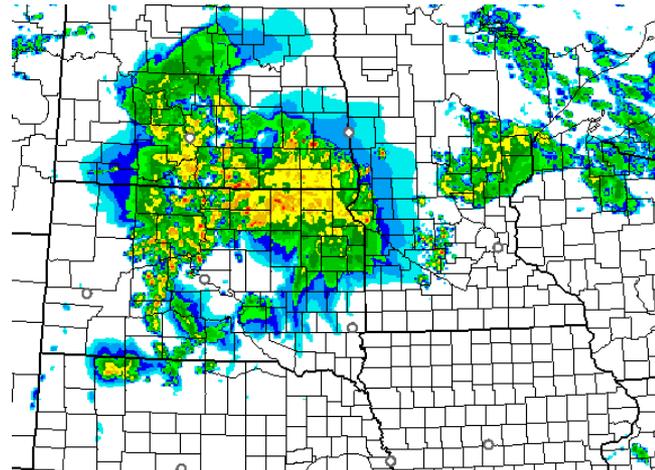
*no radar DA*

**RAP radar DA improves convective forecast in both RAP and HRRR**  
**Additional HRRR radar DA improves fine-scale initialization of HRRR**

*3-hour HRRR forecast*



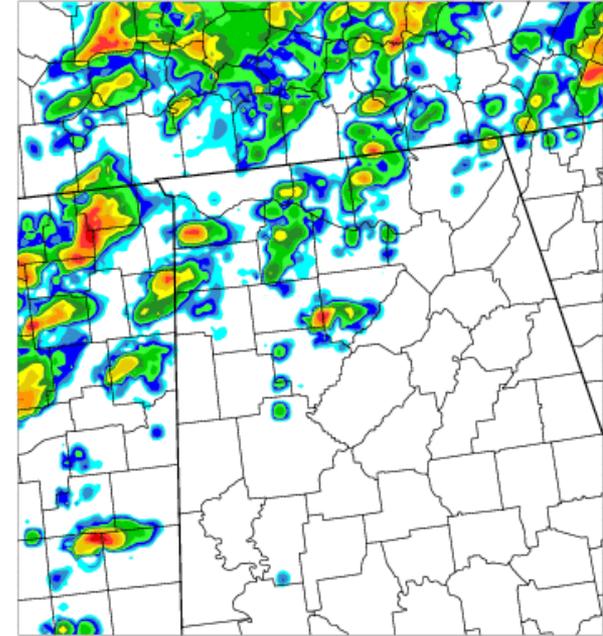
***observed  
reflectivity***



***radar DA in  
RAP  
and HRRR***

# Near Future: HRRR *Ensemble* Data Assimilation

Improved *probabilistic, high-resolution, 0-6 h* forecasts of winds, clouds, and convective storms



Applications: energy, aviation, fire weather, hydrology, Warn on Forecast