High-Resolution Rapid Refresh: From Research to Operations

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Performing work for NOAA/ESRL/GSD

GSD Science Review
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HRRR Path to Operations

High Performance Computers

Larger Domain

Advanced Obs Assimilation

Gridpoint Statistical Interpolation

Advanced Model:

Advanced Research WRF

NCEP Operational 30 Sep 2014

High Density Observations

Frequent Updating

Numerics Physics

Flow Dependent

Community Physics/Chemistry Development
Convection-Allowing Grid Scale

Effective initial conditions from radar data assimilation

More accurate storm structure

Better airline flight planning

13.5 km RAP
Parameterized Convection

3 km HRRR
Explicit Convection

6 hr Reflectivity Fcst

FAA 2010 Savings Estimate: 10,000 delay hours (6% of annual) $26.8 million
Time-lagged ensemble development
Probabilities for hazard likelihood
First-step towards high resolution
ensemble forecast (HREF)

Hourly run-to-run consistency
Increases forecaster confidence

Hourly run-to-run trends
Provides situational awareness
Development and operational implementation of the first convection-allowing (3-km) hourly-updating numerical weather model

- Situational awareness for severe, aviation, energy, hydrological communities
- Community resiliency, reduces hazard impacts towards Weather-Ready Nation

29 June 2012 Obs
HRRR 15 UTC Forecast

Evolve from a deterministic (single-model) to a convection-allowing forecast ensemble to provide forecast uncertainty

Continue development to make forecasts better
...see poster