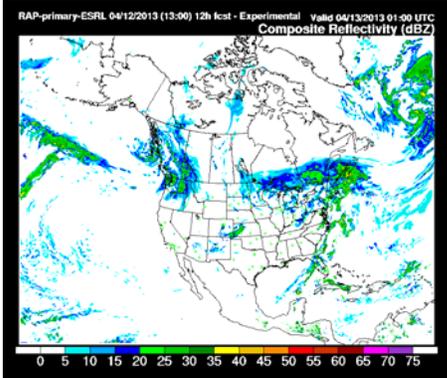
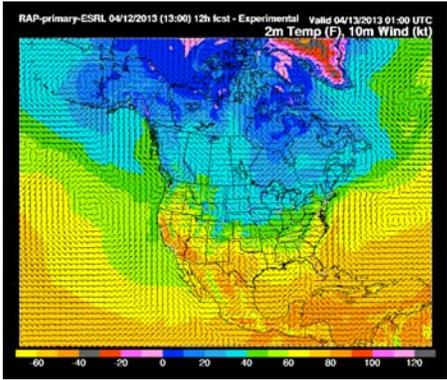




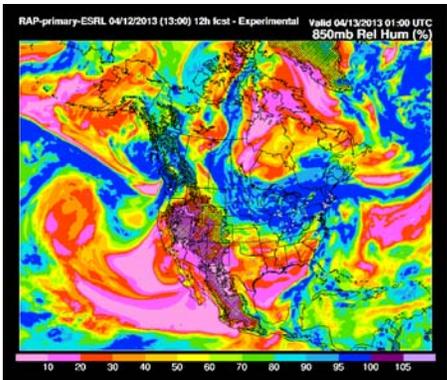
## Data Displays from the RAP



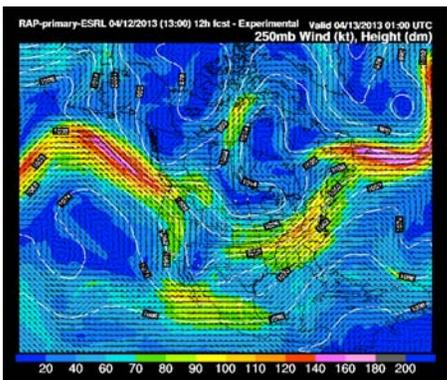
Composite Reflectivity



2m Temperature/10m Winds



850mb Relative Humidity



250mb Winds/Heights

## Rapid Refresh (RAP)

Earth Modeling Branch (EMB) scientists from ESRL's Global Systems Division lead development of the Rapid Refresh (RAP), an hourly updated weather forecast model/assimilation system that replaced the Rapid Updated Cycle (RUC) at NCEP as NOAA's hourly updated model in May 2012. EMB scientists work with colleagues from NCEP, NCAR, and other labs on RAP development. The RAP differs from the RUC in that it uses:

- a RAP-unique version of the Weather Research and Forecast (WRF) model, a community mesoscale forecast model with strong contributions to its development from EMB;
- a RAP-unique version of the Gridpoint Statistical Interpolation (GSI) assimilation system; and
- a larger domain covering all of North America.

## RAP Key Technical and Development Points

The RAP is an operational NOAA/NCEP hourly updating operational weather prediction system covering North America comprised primarily of community numerical forecast model (WRF-ARW) and analysis/assimilation system (GSI) components to initialize that model. EMB has contributed innovations for radar reflectivity, cloud, and surface data assimilation options to GSI, used in RAP and HRRR but also available for other models. EMB has also developed improved parameterizations of boundary-layer mixing, convective clouds, and land-surface (soil, snow, vegetation) processes to the WRF community model to improve RAP and HRRR forecasts but also available to all WRF users.

RAPv2 was implemented at NCEP in Feb 2014, and RAPv3, with further improvements to storm environment, cloud, and winter-storm fields, is planned for NCEP in summer 2015.

The RAP is the parent model for the 3-km High-Resolution Rapid Refresh (HRRR) model.

## RAP Benefits for the Country and Its Citizens

The RAP was developed to serve users needing *frequently updated* short-range weather forecasts, including those in the U.S. *aviation* community and U.S. *severe weather* forecasting community. The RAP is also used prominently for energy-related (especially renewable) forecast guidance.

## For Further Information, Contact:

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