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Technical Implementation Notice 11-36
National Weather Service Headquarters Washington DC
300 PM EDT Wed Jul 27 2011

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From: Tim McClung
Chief, Science Plans Brach
Office of Science and Technology

Subject: Notice of Intent to Replace Rapid Update Cycle (RUC) Model: Effective Fall 2011

Sometime after mid-October 2011, the National Centers for Environmental Prediction plans to replace the current Rapid Update Cycle (RUC) modeling system with the Rapid Refresh (RR) modeling system. More specifics, including an implementation date, will be sent in the next two months.

Brief Description of Changes:

-Change of name of system from Rapid Update Cycle (RUC) to Rapid Refresh (RR)
-Replace RUC prediction model with WRF using ARW dynamic core
-Replace RUC 3-D variational analysis (3DVAR) with the Gridpoint Statistical Interpolation (GSI)
-Expand domain to cover Alaska and Caribbean basin

The transition of the Rapid Update Cycle into use of the WRF model has been planned for more than 6 years. The Rapid Refresh configuration allows the system to take advantage of the community development of the WRF model and GSI data assimilation, used in other NCEP systems including NAM and GFS, while maintaining many of the elements of the RUC crucial to aviation and severe weather forecasting, such as the diabatic digital filter initialization, the assimilation of radar reflectivity data, and the analysis of cloud hydrometeors using METAR and satellite data. The Rapid Refresh domain extends hourly "rapid updating" to all of North America, including Alaska and the Caribbean.

A full description of the changes can be found on the Earth Sciences Research Laboratory’s web page for the Rapid Refresh:

http://rapidrefresh.noaa.gov

Please note that the experimental 3-km High-Resolution Rapid Refresh (HRRR) is not part of this implementation.

Model products:

Most of the output currently available from the RUC will be available for the Rapid Refresh to ensure a smooth transition to the new system. This output includes:

- 13, 20, and 40-km Lambert Conformal grid data covering the CONUS region with output on pressure levels
- 13, 20, and 40-km Lambert Conformal grid data covering the CONUS region with output on native levels
- BUFR model station time series output (with an expanded list of stations to accompany the larger domain)

New data will include:

- Full-domain output on a 32-km Lambert Conformal grid, the only grid on which data covering the entire domain will be generated)
- Alaska data on an 11-km polar-stereographic grid

Data that will no longer be available are 80-km Lambert Conformal grid data covering the CONUS region

A parallel version of the RR is being run at the Environmental Modeling Center each hour with statistics being computed daily. Forecast graphics are available at

http://www.emc.ncep.noaa.gov/mmb/gmanikin/rap/para

Formal evaluation will begin in the fall of 2011, with data files available from NCEP Central Operations, which will be running the system in a real-time dedicated parallel. The location of this parallel test data will be sent in a follow-on notification. Users who wish to get a head start on their evaluation of test files to prepare for the transition can obtain them from the EMC parallel at:

ftp://ftp.emc.ncep.noaa.gov/mmb/mmbpll/rap

NCEP would encourage users to ensure their decoders are flexible and are able to adequately handle changes in content order, parameter fields changing order, changes in the scaling factor component within the Product Definition Section (PDS) of the GRIB files and also any volume changes which may be forthcoming. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes prior to any implementation.

For questions regarding these changes, please contact:

Geoffrey Manikin
NCEP/EMC Global Modeling Branch
Camp Springs, Maryland
301-763-8000 x7263
geoffrey.manikin@noaa.gov
or
Stan Benjamin
NOAA/ESRL
Boulder, CO
303-497-6387
stan.benjamin@noaa.gov

NWS National Technical Implementation Notices are online at:

http://www.nws.noaa.gov/os/notif.htm

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