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Technical Implementation Notice 13-13 Amended
National Weather Service Headquarters Washington DC
719 AM EDT Thu Jul 25 2013

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 -NOAA Weather Wire Service
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From: Timothy McClung, Science Plans Branch Chief
 Office of Science and Technology

Subject: Amended: Hurricane Weather and Research Forecast (HWRF) Model
Changes: Effective July 25, 2013

Amended to reschedule the effective date from July 30, 2013 to Thursday,
July 25, 2013.

Effective on or about Thursday, July 25, 2013, beginning with the 1200
Coordinated Universal Time (UTC) run, the National Centers for
Environmental Prediction (NCEP) will upgrade the HWRF Princeton Ocean
Model (POM) coupled system.

The FY 2013 HWRF model will be implemented on NCEP's new Weather and
Climate Operational Supercomputing System (WCOSS), scheduled to become the
operational machine on or about July 25, 2013. A separate Technical
Implementation Notice (TIN) will be issued announcing the operational
switch to the WCOSS system. In the event that switch date is changed,
this TIN will be modified to reflect that change in implementation date.

Forecasts from the upgraded FY 2013 HWRF model will be made available
through a parallel feed from WCOSS starting June 15, 2013. The HWRF
gridded binary (GRIB) products from WCOSS are disseminated via the NCEP
Parallel file transfer protocol (FTP) server:

<ftp://ftpt.ncep.noaa.gov/com/hur/prod/>

and the products will be displayed through NCEP's parallel Model Analysis
and Guidance (MAG) website:

<http://magpara.ncep.noaa.gov/>

The 2012 version of operational HWRF model will continue providing
forecasts through NCEP Central Computing System (CCS) until the WCOSS
machine goes live on July 25, 2013. The HWRF GRIB products are not
available on NOAAPort or on the Advanced Weather Interactive Processing
System (AWIPS), but they are disseminated via the NCEP production FTP
server:

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/hur/prod/>

The scientific enhancements include the following:

- Implement HWRF GSI V3.7 one-way hybrid EnKF-3DVAR data assimilation with GDAS forecasts as first guess and 80-member Global Forecast System (GFS) EnKF forecasts for ensemble covariances, assimilation of all conventional data and provision to assimilate real-time inner-core TDR/FL/SFMR/Dropsonde recon datasets.

- Improve storm size correction in the vortex initialization, modified filter domain and use GFS vortex when the storm is weaker than 16 m/s.

- Upgrade the nest movement algorithm using 9 parameters based on NCEP tracker.

- Redesign nest-parent interpolations for improved treatment of nest boundaries.

- Increase frequency of physics calls from 180 sec. to 30 sec. and increase size of the third domain from 5-deg x 5.5-deg to 6-deg x 6.5-deg.

- Modify GFS Planetary Boundary Layer (PBL) to include variable critical Richardson number.

- Fix bug for Geophysical Fluid Dynamics Laboratory (GFDL) model radiation.

- Remove flux truncation from HWRF to POM.

- Improve HWRF Unified Post Processor to reduce domain discontinuities in the simulated satellite imagery products.

The model has been extensively tested with a combination of all the upgrades listed above for a 3-year sample of cases. The results showed impressive and remarkable results. For Atlantic basin track, the HWRF is improved by ~5-15% and now appears competitive with the GFS. For intensity, the model reduces errors by ~15%, has demonstrated skill greater than that of the NHC official forecast and greater than that of the statistical models. Similar improvements are noted for the Eastern North Pacific basin as well.

There are no changes to existing products or their contents. There will be an increase of roughly 1 GB in product size due to expanded size of the third domain. The grid is not changing, but additional points will now have non-missing values.

More details about the HWRF-POM are available at:

<http://www.emc.ncep.noaa.gov/HWRF/index.html>

NCEP encourages users to ensure their decoders are flexible and are able to adequately handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and 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 implementations.

For questions regarding these model changes, please contact:

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National Technical Implementation Notices are online at:

<https://www.weather.gov/notification/archive>

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