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PNSWSH

Technical Implementation Notice 13-13, Amended  
National Weather Service Headquarters Washington DC  
700 AM EDT Fri Jul 19 2013

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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 30, 2013

Amended to make the effective date July 30, 2013

Effective on or about Tuesday, July 30, 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 FY2013 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 30, 2013. A separate 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 FY2013 HWRf model were made available through a parallel feed from WCOSS starting June 15, 2013. The HWRf GRIB products from WCOSS are disseminated via the NCEP Parallel 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 or about July 30, 2013. The HWRf GRIB products are not available on NOAAPORT or 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 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 PBL to include variable critical Richardson number
- Fix bug for GFDL 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 1GB 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:

Dr. Vijay Tallapragada  
NOAA/NCEP/Environmental Modeling Center  
Hurricane Forecast Project  
National Centers for Weather and Climate Prediction  
College Park, Maryland, 20740.  
301-683-3672  
vijay.tallapragada@noaa.gov

NWS National Technical Implementation Notices are online at:

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

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