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Technical Implementation Notice 14-20, Amended
National Weather Service Headquarters Washington DC
1030 AM EDT Wed Jun 4 2014

To: Subscribers:
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From: Timothy McClung
Science Plans Branch Chief
Office of Science and Technology

Subject: Amended: GFDL Hurricane Prediction System Changes:
Effective June 12, 2014

This notice amended to change the effective date from June 10 to June 12. If NWS declares a Critical Weather Day, this implementation might occur a day or two before or after the scheduled date.

On or about Thursday, June 12, 2014, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the Geophysical Fluid Dynamics Laboratory (GFDL) Hurricane Prediction System.

The scientific changes to the model include the following:

- Increased horizontal resolution of inner nest from 1/12th to 1/18th degree
- Improved specification of surface exchange coefficients (Ch, Cd)
- Improved specification of surface roughness and wetness over land (climatology replaced by GFS based values)
- Modified PBL with variable Critical Richardson Number
- Improved targeting of initial storm maximum wind and storm structure in initialization
- Advection of individual micro-physics species
- Removed vortex specification for storms of 40 knots and less
- Upgraded ocean model to about 9 km resolution MPI-POM with unified trans-Atlantic basin and 3D ocean for Eastern Pacific basin
- Introduced direct interpolation from GFS hybrid to GFDL sigma coordinates

Extensive testing over multiple hurricane seasons show significant improvements in prediction of storm intensity at all forecast time levels in both the Atlantic and Eastern Pacific. Intensity errors decreased about 15 percent in the 3-5 days lead

times in the Atlantic, with about 6 percent in the critical 1-2 day lead times. Reduced track error averaged 6 percent in the 1-4 day lead times and neutral at Day 5. The excessive over-intensity bias of the GFDL model for weak systems was greatly reduced, increasing the reliability of the model as an intensity guidance tool.

Impact to Output Products:

The GFDL hurricane model GRIB products are disseminated via the NCEP and NWS FTP servers and are not available on NOAAPORT or AWIPS.

There are no changes to existing output content. These changes will result in no change in product dissemination time, or increase in product size.

More details about the GFDL hurricane prediction system are available at:

<http://www.gfdl.noaa.gov/operational-hurricane-forecasting>

NCEP encourages all 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 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 implementations.

For questions regarding these model changes, please contact:

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NWS National Technical Implementation Notices are online at:

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

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