Technical Implementation Notice 14-20 Amended
National Weather Service Headquarters Washington DC
750 AM EDT Tue Jun 3 2014

To: Subscribers:
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-NOAA Weather Wire Service
-Emergency Managers Weather Information Network
-NOAAPort
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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 18, 2014

Amended to change the effective date from June 12, 2014 to June 18, 2014. If NWS declares a Critical Weather Day, this implementation may be completed a day or two before or after the scheduled date.

On or about Wednesday, June 18, 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 Global Forecast System (GFS)-based values)
- Modified Planetary Boundary Layer (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 three-dimensional (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 six percent in the
critical 1-2-day lead times. Reduced track error averaged six
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 gridded binary (GRIB) products are
disseminated via the NCEP and NWS FTP servers and are not
available on NOAAPort or on the Advanced Weather Interactive
Processing System (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
try to alert users to these changes prior to any
implementations.
For questions regarding these model changes, please contact:

Morris Bender  
GFDL/NOAA  
Princeton, NJ  
Phone: 609-452-6559  
morris.bender@noaa.gov

or

Timothy Marchok  
GFDL/NOAA  
Princeton, NJ  
Phone: 609-452-6534  
timothy.marchok@noaa.gov

National Technical Implementation Notices are online at:

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

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