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Technical Implementation Notice 15-26
National Weather Service Headquarters Washington DC
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To: Subscribers:
           -Family of Services
           -NOAA Weather Wire Service
           -Emergency Managers Weather Information Network
           -NOAAPort
           Other NWS Partners, Users and Employees

From: Timothy McClung, Chief Operating Officer
           NWS Office of Science and Technology Integration

Subject: GFDL Hurricane Prediction System Changes: Effective June 9, 2015

Effective on or about Tuesday, June 9, 2015 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:

- Improved initialization of moisture field in the vortex initialization.
- Reintroduction of the vortex initialization for all forecasts except
Nameless systems.
- New specification of storm size in the vortex initialization.
- Correct specification of ocean currents in the surface flux computation.
- Modification of criterion for large-scale condensation in the free
atmosphere.
- Bug Fix in GFDL coupler.

Extensive testing over multiple hurricane seasons shows significant
improvements in the prediction of storm intensity in both the Atlantic and
Eastern Pacific. Intensity errors decreased about 10% in the 1-3 day lead
times in both basins. Reductions in track error averaged 5 percent in the
1-3 day lead times in the Atlantic and about 10 percent in the Eastern
Pacific at days 4-5. The excessive negative intensity bias of the GFDL
model was significantly reduced in both the Atlantic and Eastern Pacific,
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 National Centers for Environmental Prediction (NCEP) and NWS File
Transfer Protocol (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, but there are changes to
all of the GRIB filenames to more clearly identify the domain coverage of
the files. Filename changes are as follows:

- The file ID for the gridded binary (GRIB) file covering the full 75x75 degree domain at 1-degree resolution will change from having the character string ".grib." to having the string ".grib.1p00",

- The file ID for the GRIB file covering the full 75x75 degree domain at 1/6-degree resolution will change from having the character string ".grib6th." to having the string ".grib.0p16",

- The file ID for the GRIB file covering the inner-nest, 5x5 degree domain at 1/18-degree resolution will change from having the character string ".gribn3." to having the string ".grib.0p05".

For example:

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2014 GFDL                    2015 GFDL
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*.YYYYMMDDHH.grib.fhh* --> *.YYYYMMDDHH.grib.1p00.fhh*

*.YYYYMMDDHH.grib6th.fhh* --> *.YYYYMMDDHH.grib.0p16.fhh*
*.YYYYMMDDHH.gribn3.fhh* --> *.YYYYMMDDHH.grib.0p05.fhh* where YYYY is
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year, MM is month, DD is day, and HH is model cycle, and hh is a 2 or 3-digit forecast hour (00, 06, 12, ..., 114, 120, 126), and * at the end of the file name designates availability of .grib2 files.

These changes will result in no change in product dissemination time, or increase in product size.

Please note that data from the GFDL model will continue to be available in both grib1 and grib2 format for the 2015 season. However, the grib1 data will be discontinued for the 2016 hurricane season, so NCEP encourages users to transition to using the grib2 data this season.

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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National Technical Implementation Notices are online at:

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

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