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PNSWSH

Technical Implementation Notice 11-07, Amended
National Weather Service Headquarters Washington DC
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From: Timothy McClung
 Science Plans Branch Chief
 Office of Science and Technology

Subject: Amended: Global Forecast System (GFS) Upgrade:
 Effective May 9, 2011

Amended to change the implementation to as early as Monday, May 9 with the 1200 UTC model cycle. A determination will be made on Monday May 9. There is a high likelihood that Tuesday, May 10, will be declared a Critical Weather, preventing this GFS implementation from proceeding for indeterminate time. The NCEP Senior Duty Meteorologist will issue a NOUS42 administrative message when the implementation has taken place.

Amended to reschedule the implementation from April 26, 2011, to May 10, 2011 to allow for a full evaluation period. Also amended to include details of a new sea level pressure field being added to select products available via the ftp servers.

Effective May 10, 2011, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the GFS. The upgrade includes:

Analysis Changes:

- Improve Ozone Monitoring Instrument (OMI) quality control
- Remove redundant SBUV/2 total ozone
- Retune SBUV/2 ozone observation errors
- Relax AMSU-A Channel 5 quality control
- Update Community Radiative Transfer Model(CRTM) to version 2.0.2
- Include field of view size/shape/power for radiative transfer
- Remove down weighting of collocated radiances
- Limit moisture greater than= 1.e-10 in each outer iteration and at end of analysis
- Include uniform (higher resolution) thinning for satellite radiances
- Improve location of buoys in vertical (move from 20m

- to 10m)
- Improve Gridpoint Statistical Interpolation (GSI) code with optimization and additional options
- Recompute background errors
- Include SBUV from NOAA-19
- Ambiguous vector quality control for ASCAT (type 290) data

Model Changes:

- Set new thermal roughness length
- Set minimum moisture value in Stratosphere to 1.0×10^{-7}
- Reduce background diffusion in the Stratosphere

Product Changes:

- Correct error in the 192 hr, 12-hr precipitation bucket
- Addition of a new membrane sea level pressure (SLP) field to the 0.5, 1.0 and 2.5 degree pressure grib (pgrb) files only. This pressure is generated by first relaxing the underground virtual temperature and then integrating the hydrostatic equation downward. The field will be subject to Spectral Gibbsing near the coast, but this will be addressed in a future implementation.

The three model changes and the 192 hr precipitation change listed above are designed to address shortfalls introduced with the 27 July 2010 GFS resolution increase. The issues being addressed are:

- increased low level warm bias over land
- negative temperature bias in the stratosphere
- negative wind speed bias in the stratosphere
- error in the calculation of the 12 hr accumulated precipitation at 192 hrs only.

Data Availability:

The format and content of all GFS data sets will remain Unchanged, with the exception of the addition of the new SLP field. GFS data is currently available on NOAAAPORT, the NWS FTP server, the NCEP server and in NOMADS. The location of the data will remain unchanged.

Product delivery timing of the GFS products is not expected to change as a result of this implementation. More information regarding the GFS and associated products can be found at:

<http://www.emc.ncep.noaa.gov/GFS/doc.php>

A consistent parallel feed of data will become available on the NCEP server once the model is running in parallel on the NCEP Central Computing System by mid-March. The parallel data will be available via the following URLs:

<http://www.ftp.ncep.noaa.gov/data/nccf/com/gfs/para>

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/gfs/para>

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 changes, please contact:

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NWS National Technical Implementation Notices are online at:

<http://www.weather.gov/os/notif.htm>

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