

NOUS41 KWBC xxxxxx [editorial comments in brackets]
PNSWSH

Technical Implementation Notice 15-xx
National Weather Service Headquarters Washington DC
Xxxx xM EST xxx August 14 2015

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, Science Plans Branch
 Office of Science and Technology

Subject: Global Ensemble Forecast System (GEFS) Changes:
 Effective September 22, 2015

On or about Tuesday, September 22, 2015, beginning with the 1200 Coordinated Universal Time (UTC) run, the NCEP Global Ensemble Forecast System (GEFS) will be updated.

The upgrade in the GEFS production suite includes:

1. Running the latest Global Forecast System (GFS) model with Semi-Lagrangian dynamic scheme and improved physics scheme, GSM v12.1.0, to replace the currently used GFS v9.1.0.
2. Increasing the horizontal resolution from T254 (about 55km) to TL574 (about 33km) for the first 192 hours (8 days) of model integration, and from T190 (about 70km) to TL382 (about 55km) between 192 hours and 384 hours of model integration.
3. Increasing vertical resolution from 42 levels to 64 levels for 0-384 hours (0-16 days) forecasts.
4. Modifying the ensemble initialization method by replacing the Bred Vector with Ensemble Transform and Rescaling (BV-ETR) scheme with Ensemble Kalman Filter (EnKF) scheme. The 6-hour forecasts of the 80 EnKF ensemble members of the Hybrid Data Assimilation system, from the previous cycle, are used to initialize the ensemble perturbations.
5. Improving the stochastic Total Tendency Perturbation (STTP) scheme by (1) turning off perturbations in the surface pressure, (2) increasing the perturbation amplitude of other model state variables around the time of model truncation (192 hours), and (3) adjusting its parameters to match the Semi-Lagrangian scheme, the increased model resolution and improved model physics.

There will be several changes in the 1 degree and 2.5 degree GEFS product data files (affects files with names pgrb2a/pgrb2b and pgrb2alr). The GEFS products disseminated over NOAAPORT will not change in format or content. The GEFS products disseminated via the NWS and NCEP servers will have some changes in content. A significant increase in the GRIB product data volumes is expected due to these changes. These products are available at the following locations:

NCEP server:

<http://www.ftp.ncep.noaa.gov/data/nccf/com/gens/prod/gefs.YYYYMMDD/xx>

or

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/gens/prod/gefs.YYYYMMDD/xx> , where YYYYMMDD is the date and xx is the model cycle

NWS server:

ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.ensq_CY.xx/RD.YYYMMDD

Specific sub-directories and filenames on these servers will be given for each product change below.

New 0.5 degree grid products

In addition to the existing 1 degree and 2.5 degree grib2 product data files, 0.5 degree grib2 files will be added. The new 0.5 degree product files will be written to the new sub-directories pgrb2ap5 and pgrb2bp5. The file names will be ge???.tHHz.pgrb2a.0p50.anl, ge???.tHHz.pgrb2a.0p50.fhhh, ge???.tHHz.pgrb2b.0p50.anl, and ge???.tHHz.pgrb2b.0p50.fhhh. Note that all hhh strings are 3-digit numbers for the 0.5 degree files.

When these two (pgrb2ap5 and pgrb2bp5) sub-directories are combined, these files will have the same content as the 1 and 2.5 degree products but at higher frequency (every 3 hours) for the first 192 hours (8 days) of model integration. However, the division of variables between the two sub-directories is different from that between pgrb2a/pgrb2alr and pgrb2b/pgrb2blr. While most of the variables are in the pgrb2bp5 files, the pgrb2ap5 files include the following 43 variables:

HGT:1000, 925, 850, 700 mb, surface (000h and 20h only)	(5)
TMP:1000, 925, 850 mb and 2m above the surface	(4)
RH:1000, 925, 850 mb and 2m above the surface	(4)
UGRD:1000, 925, 850, 700, 500 400 300 mb and 10m above surface	(8)
VGRD:1000, 925, 850, 700, 500 400 300 mb and 10m above surface	(8)
PRES:surface, mean sea level	(2)
APCP, CSNOW, CICEP, CFRZR, CRAIN	(5)
PWAT, TCDC, CAPE, CIN	(4)

TMAX, TMIN (2)
VVEL, 850 mb (1)

Product Additions

In pgrb2b and pgrb2blr, 163 new variables will be added. A list of these new products is available on line at
(web page URL will be added, a world file is available)

Products removals

The following 3 variables in pgrb2b will be removed:
GPA:500 mb, 1000 mb (anomaly)
5WAVA:500 mb (HGT filtered, anomaly)

Products moved from pgrb2b to pgrb2a

The following 4 variables will be moved from pgrb2b to pgrb2a:
UGRD:300, 400mb
VGRD:300, 400mb

Product name changes

The four products of soil temperature (for 0-0.1, 0.1-0.4, 0.4-1, 1-2 m below ground) will be re-named TSOIL (currently TMP).

Grib2 packing changes

For wind, the two components (UGRD and VGRD) will be packed into two different records instead of one record.

New tropical cyclone track and genesis forecast products

For the first time, tropical cyclone track forecasts and genesis probability forecasts will be disseminated as text files in the sub-directories tctrack and genesis, respectively.

tctrack: (storm position for individual members ap??, control members ac00 and gfsx, and ensemble mean aemn)
ac00.tHHz.cyclone.trackatcfunix
aemn.tHHz.cyclone.trackatcfunix
ap??.tHHz.cyclone.trackatcfunix
gfsx.tHHz.cyclone.trackatcfunix

genesis: (probability for each potential storm XX in each Northern Hemisphere Basin, HC, AL, EP, and WP)
aemn.trkprob.HCXX.65nm.YYYYMMDDHH.indiv.data
aemn.trkprob.ALXX.65nm.YYYYMMDDHH.indiv.data
aemn.trkprob.EPXX.65nm.YYYYMMDDHH.indiv.data
aemn.trkprob.WPXX.65nm.YYYYMMDDHH.indiv.data

Retrospective forecast for the period of May 2013 to present (00Z and 12Z only) was conducted using the GEFS upgrade package. The

data set is available at para.nomads.ncep.noaa.gov. Please note that the directory and file names for the 0.5 degree product files, and the parameters included in the pgrb2a/b/d sub-directories may be different than described here.

The current GEFS production package will continue to run for one year, with a name GEFS-LEGACY. It will run the BV-ETR based ensemble initialization cycling every 6 hours and provide the 00Z cycle forecast. The data will be accessible at (?).

A consistent parallel feed of data from the new GEFS will become available on the NCEP server once the model is running in parallel on the NCEP Weather and Climate Operational Supercomputing System (WCOS) by early **August**. The parallel data will be available via the following URL:
<http://para.nomads.ncep.noaa.gov>

Test data are also available at:
ftp://ftp.emc.ncep.noaa.gov/gc_wmb/

Specific information regarding the scientific implementation can be found at:
http://www.emc.ncep.noaa.gov/gmb/yzhu/html/imp/201412_imp.html

Disclaimer: NCEP would encourage all users to ensure their decoders are flexible and are able to adequately handle changes in content order, parameter fields changing 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 implementation.

For questions regarding these changes, please contact:

Dingchen Hou
NCEP/EMC Global Modeling Branch
College Park, Maryland
Phone: 301-683-3707
dingchen.hou@noaa.gov

For questions regarding the dataflow aspects of this dataset, please contact:

Kelly Kempisty
NCEP/NCO Dataflow Team
College Park, Maryland
301-683-0567
ncep.list.pmb-dataflow@noaa.gov

NWS National Technical Implementation Notices are online at:

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

\$\$