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PNSWSH

Service Change Notice 18-50 Updated  
National Weather Service Headquarters Silver Spring MD  
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To:           Subscribers:  
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From:         Dave Myrick  
              NWS Office of Science and Technology Integration

Subject:      Updated: Upgrade of GEFS/NAEFS Bias-Corrected and  
              Downscaled Products: Effective July 18, 2018

Updated to reflect a new implementation date of July 18, 2018

Effective on or about Wednesday, July 18, 2018, beginning with the 1200 Universal Coordinated Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the Global Ensemble Forecast System (GEFS) and the North American Ensemble Forecast System (NAEFS). The upgrade will include:

- Update the directory structure on NCEP Web Services to better define the NAEFS output
- Replace 1 degree with 0.5 degree output
- Upgrade the temporal resolution to 3 hourly for the first 8 days
- Introduce a 0.5 degree grid raw and bias-corrected forecast from Canadian Meteorological Centre (CMC) global ensemble and use it in NAEFS products as well as tropical storm track/genesis prognosis
- Upgrade the GEFS bias-corrected quantitative precipitation forecast (qpf) and probabilistic quantitative precipitation forecast (pppf) products

1) Changes in GEFS output forecast

The following GEFS changes will apply to products on the NCEP Web and NWS Web Services:

NCEP Web:

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/gens/prod/>  
<http://www.ftp.ncep.noaa.gov/data/nccf/com/gens/prod>  
<http://nomads.ncep.noaa.gov/pub/data/nccf/com/gens/prod>

NWS Web:

[ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.ensg\\_CY.CC/RD.YY  
YYMMDD/](ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.ensg_CY.CC/RD.YYYYMMDD/)  
[http://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.ensg\\_CY.CC/RD.Y  
YYYYMMDD/](http://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.ensg_CY.CC/RD.Y<br/>YYYYMMDD/)

Where CC is cycle and YYYYMMDD is year, month and day

The GEFs model will remain unchanged, but there will be some changes in the output product files.

- Addition of Icing Severity (ICSEV) at 300, 400, 500, 600, 700 and 800mb

NCEP Web: pgrb2b/geMMM.tCCz.pgrb2bffff

NCEP Web: pgrb2blr/geMMM.tCCz.pgrb2bffff.2

NCEP Web: pgrb2bp5/geMMM.tCCz.pgrb2b.0p50.ffff

NWS Web:

PT.grid\_DF.gr2\_RE.low/fh.0FFF\_pa.membrpMMM\_tl.press\_gr.onedeg

NWS Web:

PT.grid\_DF.gr2\_RE.high/fh.0FFF\_pa.membrMMM\_tl.press\_gr.2p5deg

Where CC is cycle, FFF is forecast hour, and MMM is member

- Addition of height (HGT) at 300 mb and Ice Thickness (ICETK) at the surface:

NCEP Web: pgrb2a/geMMM.tCCz.pgrb2afffff

NCEP Web: pgrb2alr/geMMM.tCCz.pgr2afffff.2

NCEP Web: pgrb2ap5/geMMM.tCCz.pgrb2a.0p50.ffff

NWS Web: PT.grid\_DF.gr2\_RE.high/

fh.0FFF\_pa.membrMMM\_tl.press\_gr.onedeg

- Remove Ice Thickness (ICETK) from:

NCEP Web: pgrb2b/geMMM.tCCz.pgrb2bffff

NCEP Web: pgrb2blr/geMMM.tCCz.pgr2bffff.2

NCEP Web: pgrb2bp5/geMMM.tCCz.pgrb2b.0p50.ffff

NWS Web:

PT.grid\_DF.gr2\_RE.low/fh.0FFF\_pa.membrMMM\_tl.press\_gr.onedeg

- The following variables will be added to the pgrb2ap5 files and removed from the pgrb2bp5 files. This will allow the pgrb2ap5/pgrb2bp5 files to have an identical list of variables as the pgrb2a/pgrb2b.

NCEP Web added: pgrb2ap5/geMMM.tCCz.pgrb2a.0p50.ffff

NCEP Web removed: pgrb2bp5/geMMM.tCCz.pgrb2b.0p50.ffff

UGRD/VGRD: 10, 50, 100, 200, 250 mb

TMP: 10, 50, 100, 200, 250, 500, 700 mb

RH: 10, 50, 100, 200, 250, 500, 700 mb

HGT: 10, 50, 100, 200, 250, 500 mb

TSOIL and SOILW: 0-0.1 m below ground

WEASD, SNOD, LHTFL, SHTFL, DSWRF, DLWRF, USWRF, and ULWRF:  
surface

ULWRF: top of atmosphere

2) Changes in output to the GEFs/NAEFS re-processed forecast

- Under NCEP Web Services the NAEFS output will be moved to a new directory structure

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/naefs/prod/>  
<http://www.ftp.ncep.noaa.gov/data/nccf/com/naefs/prod/>

<http://nomads.ncep.noaa.gov/pub/data/nccf/com/naefs/prod>

This includes changes to the following:

A. Forecasts from bias-corrected GEFS

/com/gens/prod/naefs.YYYYMMDD ->

/com/naefs/prod/naefs.YYYYMMDD

B. Forecasts reprocessed, or derived from, GEFS raw or bias-corrected products

/com/gens/prod/gefs.YYYYMMDD/ndgd\_gb2 ->

/com/naefs/prod/gefs.YYYYMMDD/ndgd\_gb2

/com/gens/prod/gefs.YYYYMMDD/prcp\_gb2 ->

/com/naefs/prod/gefs.YYYYMMDD/prcp\_gb2

/com/gens/prod/gefs.YYYYMMDD/pgrb2a\_bc ->

/com/naefs/prod/gefs.YYYYMMDD/pgrb2ap5\_bc

\*\*Note, this final directory is also changing name to reflect that its products are going from 1.0 degree resolution to 0.5 degree.

C. Forecasts from CMC

/com/gens/prod/cmce.YYYYMMDD ->

/com/naefs/prod/cmce.YYYYMMDD

D. Forecasts from Fleet Numerical Meteorological and Oceanography Center (FNMOC)

/com/gens/prod/fens.YYYYMMDD ->

/com/naefs/prod/fens.YYYYMMDD

- Replacing the GEFS/NAEFS 1 degree grid with 0.5 degree grid

A. Directory changes

gefs.YYYYMMDD/CC/pgrb2a\_bc -> gefs.YYYYMMDD/CC/pgrb2ap5\_bc

naefs.YYYYMMDD/CC/pgrb2a\_bc -> naefs.YYYYMMDD/CC/pgrb2ap5\_bc

B. NCEP GEFS bias-corrected file names are changed to indicate 0.5 degree

NCEP Web: pgrb2ap5\_bc/FILE.tCCz.pgrb2a.0p50\_bcfFFF

Where FILE is gepMM, gec00, gegfs, geavg, gespr, gel0pt, ge50pt, ge90pt, or gemode

C. NAEFS forecast derived from ensemble, bias-corrected

NCEP Web: pgrb2ap5\_bc/FILE.tCCz.pgrb2a.0p50\_bcfFFF

Where FILE is naefs\_gel0pt, naefs\_ge50pt, naefs\_ge90pt, naefs\_gemode, naefs\_geavg, or naefs\_gespr

- Replacing the NAEFS 1 degree (pgrb2a\_an) with 0.5 degree (pgrb2ap5\_an) grid

A. Deviation of NAEFS ensemble mean from daily climatology file names are changed to indicate 0.5 degree

NCEP Web: pgrb2ap5\_an/naefs\_geavg.tCCz.pgrb2a.0p50\_anvfFFF

B. Additional variable, Total Speed (WIND: 10m above ground)

C. Addition of new Extreme Forecast Index (efi) are added with selected variables

NCEP Web: pgrb2ap5\_an/naefs\_geefi.tCCz.pgrb2a.0p50.fFFF

- Addition of variable Total Speed (WIND: 10m above ground)

NCEP Web: pgrb2ap5\_bc/\*

- Addition of 3 hourly output to forecast hour 192 for the following

NCEP Web: pgrb2ap5\_an\*  
NCEP Web: pgrb2ap5\_bc/\*

- Adding the GEFS sub-directory with the following files:  
gefs.YYYYMMDD/CC/pgrb2ap5\_an/  
Climate percentile of GEFS member and mean forecast  
gepMM.tCCz.pgrb2a.0p50\_anFFFF (Where MM is 01, 02 - 20)  
gec00.tCCz.pgrb2a.0p50\_anFFFF  
gegfs.tCCz.pgrb2a.0p50\_anFFFF  
geavg.tCCz.pgrb2a.0p50\_anFFFF  
Deviation of GEFS ensemble mean forecast from daily climatology  
geavg.tCCz.pgrb2a.0p50\_anvFFFF  
Extreme Forecast Index (efi) for selected variables  
geefi.tCCz.pgrb2a.0p50.fFFF

- Replacing the existing 1.0 degree grid files with 0.5 degree grid in GEFS, and changing the file name to indicate 0.5 degree  
gefs.YYYYMMDD/CC/prcp\_gb2/gepqpff.tCCz.pgrb2\_24hFFFF ->  
gefs.YYYYMMDD/CC/prcp\_gb2/gepqpff.tCCz.pgrb2a.0p50.24hFFFF

- Adding new bias-corrected GEFS precipitation forecast products, gefs.YYYYMMDD/CC/  
A. Ensemble quantitative precipitation forecast - 24 hour accumulation, bias-corrected, one record for each of the 21 individual members (20 perturbed members and low-res control)  
prcp\_bc\_gb2/geprcp.tCCz.pgrb2a.0p50.bc\_24hFFFF  
B. Ensemble quantitative precipitation forecast - 06 hour accumulation, bias-corrected, one record for each of the 22 individual members (20 perturbed members, low-res control and gfs)  
prcp\_bc\_gb2/geprcp.tCCz.pgrb2a.0p50.bc\_06hFFFF  
C. Ensemble based PQPF forecast, one record for each of the 13 thresholds - 24 hour accumulation, bias-corrected  
prcp\_bc\_gb2/gepqpff.tCCz.pgrb2a.0p50.bc\_24hFFFF  
D. Ensemble based PQPF forecast, one record for each of the 13 thresholds - 06 hour accumulation, bias-corrected  
prcp\_bc\_gb2/gepqpff.tCCz.pgrb2a.0p50.bc\_06hFFFF  
E. Extreme precipitation forecast derived from GEFS ensemble, 24 hour accumulation - Percentile (of the 50-percentile-forecast of all ensemble members) in the climate distribution, 1 record  
prcp\_bc\_gb2/geprcp.tCCz.pgrb2a.0p50.anvFFFF  
F. Extreme forecast index, 1 record  
prcp\_bc\_gb2/geprcp.tCCz.pgrb2a.0p50.efifFFFF

Where FFF for 06 hour accumulation is 006, 012, 018 - 384  
Where FFF for 24 hour accumulation is 024, 030, 036 - 384

- Increasing the temporal resolution to 3-hourly for GEFS/NAEFS downscaled products (CONUS and Alaska NDGD):  
NCEP Web: gefs.YYYYMMDD/CC/ndgd\_gb2/gefs.\*.grib2  
NCEP Web: naefs.YYYYMMDD/CC/ndgd\_gb2/naefs.\*.grib2

- Addition of National Digital Guidance Database (NDGD)  
Precipitation for GEFS ensemble based products, bias-corrected,

and downscaled to ndgd conus 2.5km grid.

NCEP Web: /com/naefs/prod/gefs.YYYYMMDD/CC/ndgd\_prpcp\_gb2

A. Ensemble quantitative precipitation forecast, 21 records, one for each member (20 perturbed plus the low-res control).

24 hour accumulation: geprcp.tCCz.ndgd2p5\_conus.24hfHHH.gb2

06 hour accumulation: geprcp.tCCz.ndgd2p5\_conus.06hfHHH.gb2

B. Probability of Quantitative Precipitation Forecasts (PQPF) forecast derived from ensemble, 13 records, one for each threshold

24 hour accumulation: gepqpf.tCCz.ndgd2p5\_conus.24hfHHH.gb2

06 hour accumulation: gepqpf.tCCz.ndgd2p5\_conus.06hfHHH.gb2

Where HHH=024, 030, 036, -. 384 hours for 24 hour accumulations and HHH=006, 012, 018 -. 384 hours for 06 hour accumulations

### 3) Upgrade of CMC Raw and Bias-Corrected Ensemble

- Migrate the NCEP Web directory under the naefs directory structure

gens/prod/cmce.YYYYMMDD -> naefs/prod/cmce.YYYYMMDD

- Replace the CMC ensemble raw forecast 1 degree with a 0.5 degree grid. The directory and file names will change to reflect the 0.5 degree change.

A. Directory change

gens/prod/cmce.YYYYMMDD/CC/pgrb2a ->

naefs/prod/cmce.YYYYMMDD/CC/pgrb2ap5

B. Modify the file names to include 0.5 degree

NCEP Web: pgrb2ap5/cmc\_geMMM.tCCz.pgrb2a.0p50.fFFF

NCEP Web: pgrb2ap5/cmc\_geavg.tCCz.pgrb2a.0p50.fFFF

NCEP Web: pgrb2ap5/cmc\_gespr.tCCz.pgrb2a.0p50.fFFF

Where MMM is member and FFF is forecast hour 000 - 384

- Addition of the following variables

HGT:300 mb

UGRD:300 mb

VGRD:300 mb

UGRD:400 mb

VGRD:400 mb

ICETK:surface (ice thickness)

- Increase the temporal resolution to 3-hourly between 000h and 192h

- The output of the CMC data will be between 5-40 minutes earlier than current production

- The 1 degree CMC bias-corrected will be replaced with 0.5 degree and change both directory and file names

A. The directory path will change

nonoperational/com/gens/prod/cmce.20180508/12/pgrb2a\_bc/ ->

/com/naefs/prod/cmce.YYYYMMDD/CC/pgrb2ap5\_bc

B. The file pattern will change to include 0.5 degree

YYYYMMDDCC\_CMC\_naefsbcb\_latlon0p5x0p5\_PFFF\_0MM.grib2

Where MM is member and FFF is forecast hour from 000 to 384

#### 4) Changes in Tropical Cyclone track/Genesis Forecast output

- The ensemble tropical cyclone track and genesis files will be moved into a new directory structure on NCEP Web services.

    tctrack and genesis sub-directories of GEFS, CMCE and FENS forecast, will be moved to a new directory named ens\_tracker on the NCEP servers

    A. gens/prod/gefs.YYYYMMDD/CC/DIR ->  
        ens\_tracker/prod/gefs.YYYYMMDD/CC/DIR

    B. gens/prod/cmce.YYYYMMDD/CC/DIR ->  
        ens\_tracker/prod/cmce.YYYYMMDD/CC/DIR

    C. gens/prod/fens.YYYYMMDD/CC/DIR/ ->  
        ens\_tracker/prod/fens.YYYYMMDD/CC/DIR

Where DIR is 'genesis' or 'tctrack'

- Modify the file names for FNMOC Ensemble (FENS) Tropical Cyclone (TC) track files to replace "f" with "n"

    NCEP Web: tctrack/nMMM.tCCz.cyclone.trackatcfunix

    NCEP Web: tctrack/nemn.tCCz.cyclone.trackatcfunix

    NCEP Web: genesis/nemn.trkprob.ID.65nm.YYYYMMDDCC.indiv.gene

Where ID is storm identification number

- Modifying the format of records within the TC mean track files.

ens\_tracker/prod/gefs.YYYYMMDD/CC/tctrack/aemn.tCCz.cyclone.trackatcfunix

ens\_tracker/prod/cmce.YYYYMMDD/CC/tctrack/cemn.tCCz.cyclone.trackatcfunix

ens\_tracker/prod/fens.YYYYMMDD/CC/tctrack/nemn.tCCz.cyclone.trackatcfunix)

The last three elements will be dropped off, e.g.

BB, 02, YYYYMMDDHH, 03, FEMN, 024, 264N, 925E, 10, 1000,

XX, 34, NEQ, 0000, 0000, 0000, 0000, 84, 2, 3

    Will be replaced by

BB, 02, YYYYMMDDHH, 03, FEMN, 024, 264N, 925E, 10, 1000,

XX, 34, NEQ, 0000, 0000, 0000, 0000

- Product delivery timing for the CMC ensemble tracker output is changing with this upgrade.

- Adding output to the Genesis files

    Currently the files list only forecast hour with percent probability of genesis. Now it will contain the following variables:

    BASIN, CY, YYYYMMDDHH, TECHNUM/MIN, TECH, TAU, LatN/S, LonE/W, Genesis Probability reference:

[https://www.nrlmry.navy.mil/atcf\\_web/docs/database/new/abdeck.txt](https://www.nrlmry.navy.mil/atcf_web/docs/database/new/abdeck.txt)

- Addition of tropical cyclone track files for TIGGE data exchange for GFS, GEFS and CMC deterministic and ensemble

    NCEP Web: kwbc\_YYYYMMDDCC0000\_GFS\_glob\_prod\_sttr\_glo.xml

NCEP Web: kwbc\_YYYYMMDDCC0000\_GEFs\_glob\_prod\_esttr\_glo.xml  
NCEP Web: kwbc\_YYYYMMDDCC0000\_CMC\_glob\_prod\_sttr\_glo.xml  
NCEP Web: kwbc\_YYYYMMDDCC0000\_CENS\_glob\_prod\_esttr\_glo.xml

- Addition of genesis forecast files for individual ensemble members of NCEP (GEFS), CMCE and FENS on the NCEP Web services

ens\_tracker/prod/gefs.YYYYMMDD/CC/genesis/storms.axxx.atcf\_gen.a  
ltg.YYYYMMDDCC  
ens\_tracker/prod/cmce.YYYYMMDD/CC/genesis/storms.cxxx.atcf\_gen.a  
ltg.YYYYMMDDCC  
ens\_tracker/prod/fens.YYYYMMDD/CC/genesis/storms.nxxx.atcf\_gen.a  
ltg.YYYYMMDDCC

A consistent parallel feed of NAEFS and Tropical Cyclone data will be available on the NCEP server via the following URLs:  
<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/naefs/para>  
[http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/ens\\_tracker/para](http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/ens_tracker/para)

A static example of the parallel GEFs will be available on the NCEP parallel server at the following location:

\*NOTE: While this static dataset has an underscore before YYYYMMDD, the production will keep the gefs.YYYYMMDD convention.  
[http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/gens/static\\_p  
ara/gefs\\_20180417/00/](http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/gens/static_para/gefs_20180417/00/)

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 file 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.

NCEP will evaluate all comments to determine whether to proceed with this upgrade.

For questions regarding these changes, please contact:

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For questions regarding the dataflow aspects of these data sets, please contact:

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NWS National Service Change Notices are online at:

<https://www.weather.gov/notification/>

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