Service Change Notice 18-50 Updated
National Weather Service Headquarters Silver Spring MD
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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
Coordinated Universal 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 (PQPF) products.

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.YYYYMMDD/
http://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.ensg_CY.CC/RD.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 800 mb:
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.pgrb2afFFF
NCEP Web: pgrb2alr/geMMM.tCCz.pgr2afFFF.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

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:
Forecasts from bias-corrected GEFS
/com/gens/prod/naefs.YYYYMMDD -> /com/naefs/prod/naefs.YYYYMMDD

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.

Forecasts from CMC:
/com/gens/prod/cmce.YYYYMMDD -> /com/naefs/prod/cmce.YYYYMMDD

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:

Directory changes:
gefs.YYYYMMDD/CC/pgrb2a_bc -> gefs.YYYYMMDD/CC/pgrb2ap5_bc
naefs.YYYYMMDD/CC/pgrb2a_bc -> naefs.YYYYMMDD/CC/pgrb2ap5_bc

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, ge10pt, ge50pt, ge90pt or gemode/.

NAEFS forecast derived from ensemble, bias-corrected:
NCEP Web: pgrb2ap5_bc/FILE.tCCz.pgrb2a.0p50_bcfFFF
Where FILE is naefs_ge10pt, 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. 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
Additional variable, Total Speed (WIND: 10m above ground)

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/

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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/gepqpf.tCCz.pgrb2_24hfFFF ->
gefs.YYYYMMDD/CC/prcp_gb2/gepqpf.tCCz.pgrb2a.0p50.24hfFFF

Adding new bias-corrected GEFS precipitation forecast products,
gefs.YYYYMMDD/CC/:
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
Ensemble quantitative precipitation forecast – 6-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
Ensemble based PQPF forecast, one record for each of the 13 thresholds –
24-hour accumulation, bias-corrected:
prcp_bc_gb2/gepqpf.tCCz.pgrb2a.0p50.bc_24hfFFF
Ensemble based PQPF forecast, one record for each of the 13 thresholds –
6-hour accumulation, bias-corrected:
prcp_bc_gb2/gepqpf.tCCz.pgrb2a.0p50.bc_06hfFFF
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
Extreme forecast index, 1 record:
prcp_bc_gb2/geprcp.tCCz.pgrb2a.0p50.efifFFF

Where FFF for 6-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 National Digital Graphical Database (NDGD)):
NCEP Web: gefs.YYYYMMDD/CC/ndgd_gb2/gefs.*.grib2
NCEP Web: naefs.YYYYMMDD/CC/ndgd_gb2/naefs.*.grib2

Addition of 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_prcp_gb2
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
6-hour accumulation: geprcp.tCCz.ndgd2p5_conus.06hfHHH.gb2
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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
6-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 6-hour accumulations.

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.

Directory change: gens/prod/cmce.YYYYMMDD/CC/pgrb2a ->
naefs/prod/cmce.YYYYMMDD/CC/pgrb2ap5

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 000 hours and 192
hours.

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.

The directory path will change:
nonoperational/com/gens/prod/cmce.20180508/12/pgrb2a_bc/ ->
/com/naefs/prod/cmce.YYYYMMDD/CC/pgrb2ap5_bc

The file pattern will change to include 0.5 degree:
YYYYMMDDCC_CMC_naefsbc_latlon0p5x0p5_PFFF_0MM.grib2
Where MM is member and FFF is forecast hour from 000 to 384.

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:
gens/prod/gefs.YYYYMMDD/CC/DIR -> ens_tracker/prod/gefs.YYYYMMDD/CC/DIR
gens/prod/cmce.YYYYMMDD/CC/DIR -> ens_tracker/prod/cmce.YYYYMMDD/CC/DIR
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.trac katcfunix
ens_tracker/prod/cmce.YYYYMMDD/CC/tctrack/cemn.tCCz.cyclone.trac katcfunix
ens_tracker/prod/fens.YYYYMMDD/CC/tctrack/nemn.tCCz.cyclone.trac katcfunix)

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

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

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_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 gridded binary (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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National Service Change Notices are online at:

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

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