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TECHNICAL IMPLEMENTATION NOTICE 09-32...AMENDED
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
300 PM EST TUE DEC 1 2009

TO: SUBSCRIBERS:
-FAMILY OF SERVICES
-NOAA WEATHER WIRE SERVICE
-EMERGENCY MANAGERS WEATHER INFORMATION NETWORK
-NOAAPORT
OTHER NWS PARTNERS...USERS AND EMPLOYEES

FROM: TIM MCCLUNG
SCIENCE PLANS BRANCH CHIEF
OFFICE OF SCIENCE AND TECHNOLOGY

SUBJECT: AMENDED: GLOBAL FORECAST SYSTEM CHANGES:
EFFECTIVE DECEMBER 15 2009

REFER TO: TECHNICAL IMPLEMENTATION NOTICE /TIN/ 09-32
TRANSMITTED SEPTEMBER 23 2009... AND TIN 09-32
TRANSMITTED FRIDAY NOVEMBER 6 2009.

AMENDED TO INDICATE THAT SEVERAL ADDITIONAL PARAMETERS WILL BE
ADDED TO THE SFLUXGRBFXX.GRIB2 AND GEOSSIMPGRIB FILES AVAILABLE
ON THE FTP SERVERS.

EFFECTIVE DECEMBER 15 2009...BEGINNING WITH THE 1200
COORDINATED UNIVERSAL TIME /UTC/ RUN...THE NATIONAL CENTERS
FOR ENVIRONMENTAL PREDICTION /NCEP/ WILL UPGRADE SEVERAL
COMPONENTS OF THE GLOBAL FORECAST SYSTEM /GFS/.

NEW DATA SOURCES AND IMPROVED NUMERICAL TECHNIQUES WILL BE
INCLUDED IN THE GRIDPOINT STATISTICAL INTERPOLATION /GSI/
ANALYSIS.

THE POST PROCESSORS USED FOR THE GLOBAL FORECAST SYSTEM
/GFS/ AND THE GLOBAL DATA ASSIMILATION SYSTEM /GDAS/ WILL BE
UNIFIED AND TWO MINOR CHANGES WILL BE INTRODUCED INTO THE GLOBAL
FORECAST MODEL. UNIFICATION OF THE POST PROCESSING CODES WILL
RESULT IN SLIGHTLY LESS SMOOTH FIELDS IN THE GDAS.

IN ADDITION THE ACCURACY IN THE FORMULATION OF A NUMBER OF
DIAGNOSTIC VARIABLES WILL BE IMPROVED AND ADDITIONAL
PARAMETERS WILL BE ADDED TO THE MODEL OUTPUT FILES.

THE ANALYSIS CHANGES INCLUDE:

-ASSIMILATING TROPICAL STORM PSEUDO SEA-LEVEL PRESSURE
OBSERVATIONS
-ASSIMILATING NOAA-19 HIRS/4 AND AMSU-A BRIGHTNESS

TEMPERATURE OBSERVATIONS

- ASSIMILATING RARS 1B DATA
- ASSIMILATING NOAA-18 SBUV/2 AND AURA OMI OZONE OBSERVATIONS.
- MONITOR NOAA-19 AND METOP-2 GOME OZONE OBSERVATIONS
- ASSIMILATING EUMETSAT-9 ATMOSPHERIC MOTION VECTORS
- USING UNIFORM THINNING MESH FOR BRIGHTNESS TEMPERATURE DATA
- IMPROVING ASSIMILATION OF GPS RADIAL OCCULTATION /RO/ DATA /QC... RE-TUNED OBSERVATION ERRORS/
- ADDING DRY MASS PRESSURE CONSTRAINT
- USING GODDARD MODELING AND ASSIMILATION OFFICE/EMC MERGED CODE INCLUDING HOOKS FOR 4DVAR AND OBSERVATION SENSITIVITY
- UPDATING BACKGROUND ERROR COVARIANCE FILE

CHANGES TO THE GLOBAL FORECAST MODEL INCLUDE:

- UPGRADING EARTH SYSTEM MODELING FRAMEWORK /ESMF/ TO VERSION 3.1.0RP2
- CHANGING OUTPUT CLOUD DEFINITION INCLUDING BOUNDARY LAYER CLOUD AND LOW CLOUD

THE PARAMETERS WITH IMPROVED FORMULATIONS IN THE POST PROCESSOR INCLUDE:

- VORTICITY
- ISENTROPIC POTENTIAL VORTICITY /IPV/
- DYNAMIC TROPOPAUSE FIELDS
- PLANETARY BOUNDARY LAYER /PBL/ MEAN RH
- BEST CAPE/CIN
- BEST LIFTED INDEX
- LFM 0.33-1.00 RH

THE NEW PARAMETERS FOR THE GDAS INCLUDE:

- UNFILTERED SEA LEVEL PRESSURE

THE NEW PARAMETERS FOR THE GFS PRESSURE GRIB FILES INCLUDE:

- RELATIVE HUMIDITY AT 10...30...50 AND 70 MB
- HELICITY
- ICAO HEIGHT AT THE TROPOPAUSE AND MAXIMUM WIND LEVEL
- SUNSHINE DURATION

THE NEW PARAMETERS IN THE GLOBAL FORECAST MODEL SURFACE FILES /SFLUXGRBFXX.GRIB2/ INCLUDE:

- MAXIMUM SPECIFIC HUMIDITY
- MINIMUM SPECIFIC HUMIDITY
- DOWNWARD SOLAR RADIATION FLUX AT TOP OF ATMOSPHERE
- CLEAR SKY /CS/ UPWARD LONG WAVE RADIATION FLUX AT TOP OF ATMOSPHERE
- CS UPWARD SOLAR RADIATION FLUX AT TOP OF ATMOSPHERE

- CS DOWNWARD LONGWAVE RADIATION FLUX AT SURFACE
- CS UPWARD SOLAR RADIATION FLUX AT SURFACE
- CS DOWNWARD SOLAR RADIATION FLUX AT SURFACE
- CS UPWARD LONG WAVE RADIATION FLUX AT SURFACE
- SNOW PHASE-CHANGE HEAT FLUX AT LAND SURFACE
- WILTING POINT AT LAND SURFACE
- FIELD CAPACITY AT LAND SURFACE
- SUNSHINE DURATION

THE FOLLOWING NEW PARAMETERS IN THE GLOBAL FORECAST MODEL SURFACE FILES /SFLUXGRBFXX.GRIB2/ ARE AVAILABLE FOR THE FIRST 60 HOURS OF THE GFS FORECAST:

- TIME-AVERAGE VOL SOIL MOIST CONTENT /FRAC/ LAYER 10 CM TO 0 CM
- TIME-AVERAGE TEMPERATURE AT 2 METER
- TIME-AVERAGE FRICTIONAL VELOCITY
- TIME-AVERAGE BOUNDARY LAYER HEIGHT
- TIME-AVERAGE U WIND AT HEIGHT 10M ABOVE GROUND
- TIME-AVERAGE V WIND AT HEIGHT 10M ABOVE GROUND
- TIME-AVERAGE SURFACE ROUGHNESS
- TIME-AVERAGE LAND-SEA-ICE SURFACE MASK /FRACTION/

THE NEW PARAMETERS ADDED TO THE GLOBAL FORECAST MODEL GOES IMAGERY FILES /GOESSIMPGRIB/ INCLUDE:

- PRESSURE REDUCED TO MSL
- 5-WAVE GEOPOTENTIAL HEIGHT

THESE CONTENT CHANGES WILL IMPACT THE NWS PUBLIC FTP SERVER AND THE NCEP PUBLIC FTP SERVER. DATA DELIVERY TIMING WILL NOT BE IMPACTED BY THIS IMPLEMENTATION. A SMALL INCREASE IN DATA VOLUME IS EXPECTED.

TEST DATA IS ONLINE AT /USE LOWERCASE/ EXCEPT FOR WRF:

[HTTP://WWWT.EMC.NCEP.NOAA.GOV/MB/WRFRETRO/GFS_PARA/](http://wwwt.emc.ncep.noaa.gov/mb/wrfretro/gfs_para/)

A CONSISTENT PARALLEL FEED OF DATA WILL BECOME AVAILABLE ON THE NCEP FTP SERVER ONCE THE MODEL IS RUNNING IN PARALLEL ON THE NCEP CENTRAL COMPUTING SYSTEM ON NOVEMBER 6 2009. THE PARALLEL DATA THEN WILL BECOME AVAILABLE VIA THE FOLLOWING URL /USE LOWERCASE/:

[FTP://FTP.NCEP.NOAA.GOV/PUB/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...PARAMETER FIELDS CHANGING ORDER...CHANGES IN THE SCALING FACTOR COMPONENT WITHIN THE PDS OF THE GRIB FILES AND ANY VOLUME CHANGES WHICH MAY OCCUR. 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 MODEL 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 TECHNICAL IMPLEMENTATION NOTICES ARE ONLINE AT
/USE LOWERCASE/:

[HTTP://WWW.NWS.NOAA.GOV/OS/NOTIF.HTM](http://www.nws.noaa.gov/os/notif.htm)

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