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PNSWSH

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
         CHIEF...SCIENCE PLANS BRANCH
         OFFICE OF SCIENCE AND TECHNOLOGY

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

AMENDED TO INDICATE THAT SEVERAL ADDITIONAL PARAMETERS WILL BE ADDED TO
THE SFLUXGRBFXX.GRIB2 AND GEOSSIMPGRIB FILES AVAILABLE ON THE FILE
TRANSFER PROTOCOL /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 GLOBAL POSITIONING SYSTEM /GPS/ RADIAL
OCCULTATION /RO/ DATA /QC...RE-TUNED OBSERVATION ERRORS/.

- ADDING DRY MASS PRESSURE CONSTRAINT.
- USING GODDARD MODELING AND ASSIMILATION OFFICE/ENVIRONMENAL MODELING
CENTER /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 RELATIVE HUMIDITY /RH/
- BEST CONVENTIVE AVAILABLE POTENTIAL ENERGY /CAPE//CONVECTIVE INHIBITION
/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 GRIDDED BINARY /GRIB/ FILES
INCLUDE:

- RH AT 10...30...50 AND 70 MB
- HELICITY
- INTERNATIONAL CIVIL AVIATION ORGANIZATION /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 METERS
- 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 LOWER CASE EXCEPT FOR WRF/:

HTTP://WWWT.EMC.NCEP.NOAA.GOV/MMB/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 LOWER CASE/:

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 PRODUCT
DEFINITION SECTION /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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NATIONAL TECHNICAL IMPLEMENTATION NOTICES ARE ONLINE AT /USE LOWER CASE/:

HTTPS://WWW.WEATHER.GOV/NOTIFICATION/ARCHIVE

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