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TECHNICAL IMPLEMENTATION NOTICE 07-21
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
1120 AM EDT THU APR 12 2007

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

FROM: PAUL HIRSCHBERG
CHIEF...SCIENCE PLANS BRANCH
OFFICE OF SCIENCE AND TECHNOLOGY

SUBJECT: NCEP GLOBAL FORECAST SYSTEM MODEL UPGRADE: EFFECTIVE MAY 1 2007

EFFECTIVE TUESDAY MAY 1 2007...BEGINNING WITH THE 1200 COORDINATED
UNIVERSAL TIME /UTC/ RUN...THE NATIONAL CENTERS FOR ENVIRONMENTAL
PREDICTION /NCEP/ WILL UPGRADE THE GLOBAL FORECAST SYSTEM /GFS/ TO IMPROVE
ITS ACCURACY AND PRODUCTS.

THIS UPGRADE WILL INVOLVE IMPROVEMENTS TO BOTH THE ANALYSIS AND FORECAST
OF THE GFS. DETAILS OF THESE CHANGES ARE AS FOLLOWS:

ANALYSIS CHANGES:

1. REPLACE SPECTRAL STATISTICAL INTERPOLATION /SSI/ ANALYSIS SYSTEM WITH
GRIDPOINT STATISTICAL INTERPOLATION /GSI/ ANALYSIS SYSTEM.
2. USE OF INCREASED OBSERVATIONS INCLUDING FULL RESOLUTION ATMOSPHERIC
INFRARED SOUNDER /AIRS/ DATA...CONSTELLATION OBSERVING SYSTEM FOR
METEOROLOGY...IONOSPHERE AND CLIMATE /COSMIC/ GLOBAL POSITIONING SYSTEM
RADIO OCCULTATION /GPSRO/ DATA.

MODEL CHANGES:

3. MODIFY SIGMA COORDINATE SYSTEM TO A HYBRID SIGMA-PRESSURE COORDINATE
SYSTEM.
4. UPDATED GFS RADIATION MODULE.

PRODUCT CHANGES:

5. SURFACE FLUX FILES HAVE 30 NEW RECORDS MAINLY FOR HYDROLOGICAL USE.
6. CHANGE OUTPUT OF GLOBAL DIAGNOSTIC ASSIMILATION SYSTEM /GDAS/ FROM 3-
HOURLY TO HOURLY.
7. MODEL TO NATIVE OUTPUT FILE WILL CHANGE FROM A SIGMA SPECTRAL BINARY
FILE TO A HYBRID SPECTRAL BINARY FILE.

PLEASE NOTE THAT THERE WILL BE NO CHANGES TO THE GFS PRODUCTS BEING SENT OVER NOAAPORT WITH THIS UPGRADE.

EXPECTED IMPROVEMENTS/CHANGES:

THE GFS FORECAST SHOULD HOLD THE ASIAN JET EAST OF THE HIMALAYAS BETTER. THE GFS FORECAST SHOULD BE SLIGHTLY IMPROVED OVERALL IN THE STRATOSPHERE. THE OVERALL TROPICAL SKILL OF THE GFS FORECASTS SHOULD IMPROVE. THE EXTRATROPICAL SKILL SHOULD IMPROVE IN THE SHORT LEAD TIMES BUT BE ABOUT THE SAME IN THE MEDIUM RANGE. THE UNIFIED GSI ANALYSIS SYSTEM ENABLES NEW OBSERVATION SYSTEMS AND IS MORE ADAPTABLE FOR FUTURE UPGRADES.

RETROSPECTIVE EVALUATION:

THE GFS SYSTEM HAS BEEN RETROSPECTIVELY EVALUATED FOR THE FOLLOWING PERIODS:

JULY 1 2005 - OCTOBER 31 2005
SEPTEMBER 1 2006 - OCTOBER 31 2006
NOVEMBER 1 2006 - JANUARY 31 2007

RESULTS FROM THESE RETROSPECTIVE RUNS CAN BE VIEWED AT /USE LOWER CASE/:

[HTTP://WWW.EMC.NCEP.NOAA.GOV/GMB/PARA/PARALOG.GSIHYBRID.HTML](http://www.emc.ncep.noaa.gov/gmb/para/paralog.gsihybrid.html)

NCEP CENTRAL OPERATIONS IS CURRENTLY RUNNING A REAL-TIME PARALLEL RUN VERSION OF THE GFS WITH THESE UPGRADES. RESULTS FROM THESE PARALLEL RUNS CAN BE VIEWED AT /USE LOWER CASE/:

[HTTP://WWW.NCO.NCEP.NOAA.GOV/PMB/NWPARA/ANALYSIS](http://www.nco.ncep.noaa.gov/pmb/nwpara/analysis)

THE EFFECTIVE DATE OF THIS CHANGE IS SOONER THAN SPECIFIED BY NWS POLICY. THE SHORTER ADVANCE LEAD TIME WAS CAUSED BY THE NECESSITY TO CONDUCT AN EVALUATION OF THE GFS MODEL OUTPUT STATISTICS /MOS/ GUIDANCE PRODUCTS. RESULTS OF THE EVALUATION CONCLUDED THAT THERE WILL BE LITTLE IF ANY IMPACT ON GFS MOS GUIDANCE PRODUCTS. THE SHORTER LEAD TIME WAS APPROVED BECAUSE IT IS EXPECTED THAT USERS WILL NOT HAVE TO MAKE MAJOR ADJUSTMENTS TO ACCOMMODATE THESE CHANGES.

IF YOU HAVE ANY QUESTIONS ABOUT THESE CHANGES...PLEASE CONTACT:

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

[HTTPS://WWW.WEATHER.GOV/NOTIFICATION/ARCHIVE](https://www.weather.gov/notification/archive)

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