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TECHNICAL IMPLEMENTATION NOTICE 08-79 AMENDED  
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC  
1020 AM EST THU NOV 6 2008

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

FROM: JASON TUELL  
CHIEF...SCIENCE PLANS BRANCH  
OFFICE OF SCIENCE AND TECHNOLOGY

SUBJECT: AMENDED: NORTH AMERICAN MESOSCALE MODEL CHANGES: EFFECTIVE  
DECEMBER 16 2008

AMENDED TO POSTPONE THE EFFECTIVE DATE FROM DECEMBER 2 2008 TO DECEMBER 16  
2008 DUE TO ISSUES RAISED DURING THE EVALUATION PERIOD. THE ORIGINAL  
NOTICE...WITH THE REVISED DATE...IS BELOW:

EFFECTIVE TUESDAY DECEMBER 16 2008...BEGINNING WITH THE 1200 COORDINATED  
UNIVERSAL TIME /UTC/ RUN...SEVERAL CHANGES WILL BE MADE TO THE FOLLOWING:

- WEATHER RESEARCH FORECAST NON-HYDROSTATIC MESOSCALE MODEL /WRF-NMM/  
RUNNING IN THE NORTH AMERICAN MESOSCALE MODEL /NAM/
- NAM DATA ASSIMILATION SYSTEM /NDAS/
- DOWNSCALED GLOBAL FORECAST SYSTEM /GFS/ WITH ETA EXTENSION /DGEX/
- GRIDPOINT STATISTICAL INTERPOLATION /GSI/ ANALYSIS WHICH PROVIDES  
INITIAL CONDITIONS TO THE NDAS AND NAM FORECASTS.

THESE CHANGES ARE BEING MADE TO IMPROVE MODEL PERFORMANCE. THE MODEL  
MODIFICATIONS INCLUDE:

1. A CHANGE TO THE WRF-NMM RADIATION PARAMETERIZATION BY DOUBLING THE  
ABSORPTION COEFFICIENT FOR CLOUD WATER AND CLOUD ICE.
2. TWO COLD-SEASON RELATED CHANGES TO THE WRF-NMM LAND-SURFACE  
PHYSICS...CHANGING THE COMPUTATION OF POTENTIAL EVAPORATION TO DECREASE  
LINEARLY WITH BULK RICHARDSON NUMBER UNDER STABLE CONDITIONS /WEIGHTED BY  
SNOW COVERAGE/...AND ALLOWING THE SLOPE OF THE SATURATED HUMIDITY FUNCTION  
WITH RESPECT TO TEMPERATURE TO DECREASE LINEARLY WITH SNOW COVERAGE.
3. CHANGING THE TURBULENT MIXING AND DIFFUSION SCHEMES SO THAT THEY  
VERTICALLY MIX AND DIFFUSE EACH HYDROMETEOR SPECIES SEPARATELY.

THE ANALYSIS CHANGES INCLUDE:

1. ASSIMILATION OF NEW OBSERVATION TYPES...INCLUDING METOP2 RADIANCE  
DATA...AND TAMDAR/AMDAR AIRCRAFT DATA.

2. USE OF THE LATEST /1Q 2008/ VERSION OF THE GSI ANALYSIS...AND AN IMPROVED VERSION OF THE COMMUNITY RADIATIVE TRANSFER MODEL /CRTM/.

THE CHANGES TO THE NDAS INCLUDE:

1. EACH NDAS CYCLE WILL BE INITIALIZED USING ATMOSPHERIC STATES FROM THE GLOBAL DATA ASSIMILATION SYSTEM /GDAS/ INSTEAD OF THAT FROM THE PREVIOUS NDAS CYCLE /SO-CALLED PARTIAL CYCLING OPTION/...NDAS LAND-SURFACE STATES WILL CONTINUE TO BE FULLY CYCLED FROM THE PREVIOUS NDAS RUN.

2. THE OBSOLETE WRF STANDARD INITIALIZATION /WRF-SI/ SOFTWARE USED TO PROCESS THE GDAS FIRST GUESS FOR THE NDAS IS BEING REPLACED WITH THE NEW WRF PREPROCESSING SYSTEM /WPS/ SOFTWARE.

3. REPLACE THE CURRENT AIR FORCE WEATHER /AFWA/ SNOW DEPTH ANALYSIS WITH A NEW HIGHER RESOLUTION /23-KM/ AFWA ANALYSIS.

ALL WRF-NMM MODEL CHANGES WILL BE SIMULTANEOUSLY IMPLEMENTED INTO THE DGEX...AS WILL THE REPLACEMENT OF WRF-SI SOFTWARE WITH WPS SOFTWARE...WHICH PROCESSES THE 78-HOUR NAM FORECAST INTO INITIAL CONDITIONS TO THE DGEX.

NAM OUTPUT CHANGES INCLUDE:

1. A NEW ENLARGED 32-KM OUTPUT GRID WHICH COVERS THE ENTIRE EXPANDED NAM COMPUTATIONAL DOMAIN THAT WILL HAVE THE SAME FIELDS AS THE EXISTING 32-KM GRID #221 /AWIP32/ FILE.

2. ADD RICHARDSON NUMBER BASED PLANETARY BOUNDARY LAYER HEIGHT...MIXED LAYER DEPTH...AND TRANSPORT WIND COMPONENTS TO GRID #221 /AWIP32...32 KM NORTH AMERICA/...GRID #218/AWIP12...12 KM CONTIGUOUS U.S. /CONUS//...AND GRID #242/AWP242...11.25 KM ALASKA/ STATIONS.

3. CHANGE THE NAM POST-PROCESSOR SOFTWARE TO USE SHELTER TEMPERATURE INSTEAD OF SKIN TEMPERATURE IN THE UNDERGROUND CHECK FOR LOWEST FREEZING LEVEL HEIGHT.

4. ADD SNOW MIXING RATIO ON PRESSURE LEVELS TO THREE OUTPUT GRIDS /GRID #104..GRID #212...GRID #237/ THAT CURRENTLY ONLY OUTPUT CLOUD ICE...SO THAT TOTAL ICE CAN BE COMPUTED.

THE COMBINED IMPACT OF THESE CHANGES LEADS TO:

1. IMPROVED NAM FORECAST PERFORMANCE BASED ON QUANTITATIVE SKILL SCORES FOR HEIGHTS AND TEMPERATURE /RMS ERROR AND BIAS/ OVER BOTH THE CONUS AND ALASKA.

2. NEUTRAL OR BETTER QUANTITATIVE PRECIPITATION FORECAST SCORES /DEPENDING ON SEASON/ WITH LOWER PRECIPITATION BIAS.

3. SLIGHT IMPROVEMENTS TO MOST NEAR-SURFACE FORECASTS...ESPECIALLY IN THE COLD SEASON /DUE TO THE WRF-NMM MODEL RADIATION CHANGE/.

MORE DETAILS ABOUT THESE CHANGES CAN BE SEEN AT /USE LOWER CASE/:

[HTTP://WWW.EMC.NCEP.NOAA.GOV/MB/MBPLL/PARALOG/PARALOG.NAMX OPSPLL FALL2008.HTML](http://www.emc.ncep.noaa.gov/mb/mbpll/paralog/paralog.namx_opspll_fall2008.html)

WHEN IT BECOMES AVAILABLE...A COPY OF THE BRIEFING PACKAGE FOR THE NCEP DIRECTOR CAN BE FOUND AT /USE LOWER CASE/:

[HTTP://WWW.EMC.NCEP.NOAA.GOV/MB/NAMCHANGES\\_FALL2008/NAM\\_UPGRADES.FALL2008.HTML](http://www.emc.ncep.noaa.gov/mb/namchanges_fall2008/nam_upgrades_fall2008.html)

DATA DELIVERY TIMING WILL NOT BE IMPACTED BY THIS IMPLEMENTATION. THE NAM DELIVERY TIME WILL NOT CHANGE.

DATA VOLUMES ARE EXPECTED TO CHANGE FOR SOME NAM OUTPUT GRIDS DUE TO THE CHANGES OUTLINED ABOVE. FOR THOSE GRIDS IMPACTED...THESE CONTENT CHANGES WILL IMPACT ALL DISSEMINATION ROUTES WHICH INCLUDE NOAAPORT...THE NWS PUBLIC FILE TRANSFER PROTOCOL /FTP/ SERVER AND THE NCEP PUBLIC FTP SERVER.

PARALLEL DATA FOR THE NAM...NDAS AND DGEX WILL BECOME AVAILABLE ON THE NCEP FTP SERVER ON OCTOBER 14 2008. IT WILL BE AVAILABLE AT THE LINKS BELOW /USE LOWER CASE/:

[FTP://FTP.NCEP.NOAA.GOV/PUB/DATA/NCCF/COM/NAM/PARA](ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/nam/para)

NCEP ENCOURAGES ALL USERS TO ENSURE THEIR DECODERS ARE FLEXIBLE AND ARE ABLE TO ADEQUATELY HANDLE CHANGES IN CONTENT ORDER...PARAMETER FIELDS CHANGING ORDER...CHANGES IN THE SCALING FACTOR COMPONENT WITHIN THE PRODUCT DEFINITION SECTION /PDS/ OF THE GRIDDED BINARY /GRIB/ FILES AND ALSO ANY 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 BEFORE IMPLEMENTATION.

FOR QUESTIONS CONCERNING THESE CHANGES...PLEASE CONTACT:

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OR

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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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