

NOUS41 KWBC 041430
PNSWSH

TECHNICAL IMPLEMENTATION NOTICE 08-77...AMENDED
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
930 AM EST TUE NOV 4 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: RAPID UPDATE CYCLE UPGRADE EFFECTIVE: NOVEMBER
12 2008

REFER TO: TECHNICAL IMPLEMENTATION NOTICE /TIN/ 08-77 TRANSMITTED
ON OCTOBER 6 2008

AMENDED TO POSTPONE THE EFFECTIVE DATE FROM NOVEMBER 4 2008 TO
NOVEMBER 12 2008 DUE TO TECHNICAL DELAYS TO THE START OF THE
EVALUATION PERIOD. THE ORIGINAL NOTICE...WITH THE REVISED DATE IS
BELOW:

EFFECTIVE NOVEMBER 12 2008...BEGINNING WITH THE 1200 COORDINATED
UNIVERSAL TIME /UTC/ RUN...SEVERAL CHANGES WILL BE MADE TO THE
RAPID UPDATE CYCLE /RUC/ MODELING-ASSIMILATION SYSTEM. THESE
CHANGES ARE MADE TO IMPROVE MODEL PERFORMANCE.

THE MODEL CHANGES INCLUDE:

1. USE OF RRTM LONGWAVE RADIATION SCHEME...REPLACING PREVIOUS
DUDHIA LONGWAVE RADIATION SCHEME.
2. MODIFICATIONS TO GRELL-DEVENYI CONVECTIVE PARAMETERIZATION TO
REDUCE EXCESSIVE AREAL COVERAGE FOR LIGHT PRECIPITATION.
3. MODIFICATIONS TO RUC LAND-SURFACE MODEL-SNOW DENSITY CHANGE
TO PREVENT EXCESSIVE COLD 2-M TEMPERATURES OVER FRESH SNOW
AND SNOW MELTING LIMITATION TO IMPROVE 2-M TEMPERATURES FOR
WARM-AIR ADVECTION OVER SNOW COVER.
4. SPECIFICATION OF LATENT HEATING FROM 3-D RADAR REFLECTIVITY
DURING PRE-FORECAST DIABATIC DIGITAL FILTER INITIALIZATION
/DFI/ ALREADY IN THE RUC MODEL.

THE ANALYSIS CHANGES INCLUDE:

1. ASSIMILATION OF 3-D RADAR REFLECTIVITY...COMBINED WITH
SATELLITE AND METAR CLOUD DATA TO MODIFY WATER VAPOR FIELD...
AND PRODUCING RADAR-BASED 3-D LATENT-HEAT SPECIFICATION TO BE
INCLUDED IN RUC MODEL DFI.

2. ASSIMILATION OF TAMDAR AIRCRAFT OBSERVATIONS INCLUDING MOISTURE OBSERVATIONS.
3. ASSIMILATION OF MESONET WIND DATA USING STATIONS FROM A MESONET STATION WIND USELIST.
4. REVISION TO OBSERVATION ERROR AND BACKGROUND ERROR FOR MOISTURE OBSERVATIONS.
5. IMPROVED QC BASED ON MEAN OBSERVATION-BACKGROUND DIFFERENCES FOR A GIVEN PLATFORM WITHIN A RUC ANALYSIS WINDOW.

OTHER OUTPUT CHANGES INCLUDE:

1. ADD 4 ADDITIONAL 2-D FIELDS TO THE RUC ISOBARIC /PGRB/ FILES:
 - THREE REFLECTIVITY FIELDS /MAXIMUM...1-KM...4-KM SIMILAR TO PRODUCTS ALREADY PRODUCED FOR THE NAM.
 - RELATIVE HUMIDITY RELATIVE TO PRECIPITABLE WATER FOR SATURATED COLUMN.
2. REVISION TO 2-M DEW POINT DIAGNOSTIC TO BETTER ACCOUNT FOR VERTICAL MIXING--THIS IS NOT A CHANGE TO THE MODEL...ONLY IN THE POST-PROCESSING.
3. ERRONEOUS PRECIPITATION FIELDS FOR THE ANALYSIS TIME PERIOD ARE BEING REMOVED /ALL VALUES ARE SET TO MISSING/.
4. REDUNDANT PRECIPITATION FIELDS AT FORECAST HOURS 1...4...7...AND 10 ARE BEING REMOVED.
5. NO OTHER OUTPUT CHANGES.

THE COMBINED IMPACT OF THESE CHANGES HAS LED TO THE FOLLOWING IMPROVEMENTS IN MODEL PERFORMANCE:

1. REDUCES BIAS IN 2-M TEMPERATURE AND 10-M WIND SPEED FOR ALL TIMES OF DAY AND ALL SEASONS.
2. IMPROVED PRECIPITATION AND CLOUD FORECASTS FOR 1-H TO 12-H DURATIONS.
3. IMPROVED CEILING AND VISIBILITY FORECASTS
4. IMPROVED LOWER TO MID-TROPOSPHERIC TEMPERATURE AND RH FORECASTS IN MIDWEST AND EASTERN US.
5. IMPROVED ACCURACY IN TEMPERATURE AND WIND FIELDS FOR CONUS RTMA /WHICH USES DOWNSCALED 1-H RUC FORECASTS AS RTMA BACKGROUND/.

THE RUC CHANGES INCLUDED IN THIS PROJECT WILL INCREMENTALLY IMPROVE THE OVERALL FORECAST SKILL OF THE RUC FORECAST. IN ADDITION TO THE ASSIMILATION OF NEW OBSERVATION TYPES /RADAR REFLECTIVITY...TAMDAR...MESONET WINDS/...THE CHANGES ARE INTENDED TO ADDRESS KNOWN RUC WEAKNESSES AND BIASES AS OBSERVED BY NOAA/ESRL/GSD STAFF...EMC/MMB STAFF...NCEP SERVICE CENTERS AND NWS FORECASTERS.

MORE DETAILS ABOUT THESE CHANGES CAN BE SEEN AT /USE LOWER CASE LETTERS EXCEPT...NCEP-CCB-RUC...BELOW/:

[HTTP://RUC.NOAA.GOV/RUC13_DOCS/NCEP-CCB-RUCUPGRADE-12MAY08.PDF](http://ruc.noaa.gov/ruc13_docs/ncep-ccb-rucupgrade-12may08.pdf)

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

DATA VOLUMES WILL INCREASE ONLY SLIGHTLY FROM THE FEW ADDITIONAL

2-D FIELDS DESCRIBED ABOVE.

SIGNIFICANT DATA CONTENT CHANGES ARE NOT EXPECTED.

THESE MODEL CHANGES WILL IMPACT ALL DISSEMINATION ROUTES WHICH INCLUDE NOAA PORT THE NWS PUBLIC FTP SERVER AND THE NCEP PUBLIC FTP SERVER. 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. THIS IS PLANNED TO OCCUR ABOUT SEPTEMBER 16 2008...AT WHICH TIME THE PARALLEL DATA WILL BECOME AVAILABLE VIA THE FOLLOWING URL /USE LOWER CASE LETTERS/:

[FTP://FTP.NCEP.NOAA.GOV/PUB/DATA/NCCF/COM/RUC/TEST](ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/ruc/test)

DISCLAIMER: NCEP WOULD ENCOURAGE 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 PDS OF THE 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 PRIOR TO ANY IMPLEMENTATIONS.

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

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THIS AND OTHER NWS TECHNICAL IMPLEMENTATION NOTICES ARE AVAILABLE ONLINE AT /USE LOWER CASE LETTERS/:

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

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