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TECHNICAL IMPLEMENTATION NOTICE 08-77
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
402 PM EDT MON OCT 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: RAPID UPDATE CYCLE UPGRADE EFFECTIVE: NOVEMBER 4 2008

EFFECTIVE NOVEMBER 4 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 TO PRODUCE 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. REMOVAL OF ERRONEOUS PRECIPITATION FIELDS FOR THE ANALYSIS
TIME PERIOD. ALL VALUES ARE SET TO MISSING.
4. REMOVAL OF REDUNDANT PRECIPITATION FIELDS AT FORECAST HOURS
1...4...7...AND 10

THE COMBINED IMPACT OF THESE CHANGES HAS LED TO THE FOLLOWING
IMPROVEMENTS IN MODEL PERFORMANCE:
1. REDUCED 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 UNITED STATES
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 LOWERCASE
EXCEPT...NCEP-CCB-RUC...BELOW/:

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.

SIGNFICANT DATA CONTENT CHANGES ARE NOT EXPECTED.

THESE MODEL CHANGES WILL IMPACT ALL DISSEMINATION ROUTES
INCLUDING NOAAPORT... 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... ABOUT SEPTEMBER
16 2008...AT WHICH TIME THE PARALLEL DATA WILL BECOME AVAILABLE

VIA THE FOLLOWING URL /USE LOWERCASE LETTERS/:

FTP://FTP.NCEP.NOAA.GOV/PUB/DATA/NCCF/COM/RUC/TEST

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 PDS OF THE GRIB FILES AND 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.

FOR QUESTIONS CONCERNING THESE CHANGES...PLEASE CONTACT:

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

HTTP://WWW.WEATHER.GOV/OS/NOTIF.HTM

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