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PNSWSH

TECHNICAL IMPLEMENTATION NOTICE 05-40
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
1125 AM EDT MON MAY 23 2005

TO: SUBSCRIBERS:
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OTHER NWS CUSTOMERS...PARTNERS AND EMPLOYEES

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

SUBJECT: UPGRADE OF THE RAPID UPDATE CYCLE /RUC/ FORECAST SYSTEM:
EFFECTIVE JUNE 28 2005

EFFECTIVE JUNE 28 2005...BEGINNING WITH THE 1200 COORDINATED UNIVERSAL
TIME /UTC/ RUN...THE NATIONAL CENTERS FOR ENVIRONMENTAL PREDICTION /NCEP/
WILL UPGRADE THE RAPID UPDATE CYCLE /RUC/ FORECAST SYSTEM TO IMPROVE ITS
ACCURACY AND PRODUCTS. THE UPGRADE IS INTENDED TO PROVIDE IMPROVEMENTS TO
THE FOLLOWING AREAS OF THE FORECAST GUIDANCE:

CLOUD
CEILING
VISIBILITY
ICING FORECASTS
TEMPERATURE AND DEWPOINT FORECASTS AT THE SURFACE AND IN THE LOWER
TROPOSPHERE
PRECIPITATION FORECASTS.

THE FOLLOWING MODIFICATIONS TO THE RUC MODEL WILL BE MADE IN ORDER TO
ACHIEVE THESE IMPROVEMENTS:

- INCREASE THE HORIZONTAL RESOLUTION FROM 20 KM TO 13.3 KM.
- USE NEW HIGHER RESOLUTION /ALSO 13 KM/ FIXED FILES FOR TERRAIN
ELEVATION/ LAND USE /WITH LAND-SEA MASK/ SOIL TYPE/ AND ROUGHNESS LENGTH.
- MODIFY GRELL-DEVENYI CONVECTIVE PARAMETERIZATION TO USE OPTIMIZED
WEIGHTING FOR MULTIPLE CLOSURES FOR IMPROVED FORECASTS OF CONVECTIVE
PRECIPITATION.
- IMPLEMENT UPDATED VERSION OF RUC/NATIONAL CENTERS FOR ATMOSPHERIC
RESEARCH /NCAR/ BULK MIXED-PHASE CLOUD MICROPHYSICS DESIGNED TO PRODUCE
MORE ACCURATE DEPICTION OF SUPERCOOLED LIQUID WATER NEEDED FOR ICING
FORECASTS.

THE INITIALIZATION OF LOW-LEVEL MOISTURE FIELDS IS GREATLY IMPROVED BY:

- MODIFYING THE MOISTURE ANALYSIS VARIABLE FROM LOG OF WATER VAPOR MIXING
RATIO TO PSEUDO-RELATIVE-HUMIDITY.
- MODIFYING RUC MODEL DIGITAL FILTER INITIALIZATION.

- ASSIMILATING NEW OBSERVATIONS FROM GLOBAL POSITIONING SYSTEM /GPS/ PRECIPITABLE WATER AND IMPROVING THE QUALITY CONTROL FOR PRECIPITABLE WATER DATA.
- ADD SOIL TEMPERATURE AND MOISTURE NUDGING IN ANALYSIS...ONLY INCLUDED UNDER CERTAIN CONSERVATIVE CONDITIONS...BASED ON NEAR-SURFACE ANALYSIS INCREMENTS OF TEMPERATURE AND MOISTURE. THIS LEADS TO SIGNIFICANT IMPROVEMENTS IN 2-METER TEMPERATURE AND DEW POINT FIELDS AS WELL AS INSTABILITY FORECASTS AND RESULTANT CONVECTIVE PRECIPITATION.
- ASSIMILATE NEW OBSERVATIONS MESONET SURFACE STATIONS AND BOUNDARY-LAYER WIND PROFILERS TO IMPROVE SURFACE ANALYSIS.
- ASSIMILATE METAR OBSERVATIONS OF CLOUD LEVELS AND VISIBILITY TO IMPROVE INITIAL CONDITIONS FOR RUC 3-D HYDROMETEOR FIELDS.

THE ENVIRONMENTAL MODELING CENTER (EMC) IS CURRENTLY RUNNING A NEAR REAL-TIME PARALLEL OF THIS NEW VERSION OF THE RUC FOR ALL MODEL CYCLES. EMC HAS A WEBPAGE DISPLAYING MODEL OUTPUT OF THESE PARALLEL RUNS VERSUS THE OPERATIONAL RUNS. THIS WEBPAGE CAN BE FOUND ONLINE AT /USE LOWER CASE/:

[HTTP://WWW.EMC.NCEP.NOAA.GOV/MMB/RUC2/PARA/](http://www.emc.ncep.noaa.gov/mb/ruc2/para/)

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

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

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

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