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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:  
-FAMILY OF SERVICES /FOS/  
-NOAA WEATHER WIRE SERVICE /NWWS/  
-EMERGENCY MANAGERS WEATHER INFORMATION NETWORK /EMWIN/  
-NOAAPORT  
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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