

ZCZC WSHPNWSH ALL  
TTAA00 KWSH 282000

PUBLIC INFORMATION STATEMENT...TECHNICAL INFORMATION NOTICE 00-07  
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC  
300 PM EST TUE MAR 28 2000

TO: FAMILY OF SERVICES /FOS/ SUBSCRIBERS  
NOAA WEATHER WIRE SERVICE /NWS/ AND EMWIN SUBSCRIBERS  
NOAAPORT SUBSCRIBERS  
OTHER NWS CUSTOMERS...PARTNERS AND EMPLOYEES

FROM: LEROY SPAYD  
CHIEF...SCIENCE AND TRAINING CORE

SUBJECT: CHANGES TO THE NCEP ETA ANALYSIS/FORECAST SYSTEM...EFFECTIVE  
MARCH 29 2000

SEVERAL CHANGES TO THE NATIONAL CENTERS FOR ENVIRONMENTAL PREDICTION  
/NCEP/ MESOSCALE ETA ANALYSIS/FORECAST SYSTEM WILL BE IMPLEMENTED AT 1200  
COORDINATED UNIVERSAL TIME /UTC/ ON MARCH 29 2000.

SUMMARY OF CHANGES:

1. MODIFICATION OF MODEL CONVECTION SCHEME TO REDUCE PRECIPITATION  
BIASES:
  - DRY OVER HIGHER TERRAIN IN WESTERN U.S.
  - WET OVER COASTAL REGIONS OF SOUTHERN U.S.
2. ETA THREE-DIMENSIONAL VARIATIONAL /3DVAR/ ANALYSIS MODIFIED TO ACCOUNT  
FOR RAWINSONDE AND PIBAL BALLOON DRIFT. ACTUAL BALLOON LOCATION USED IN  
PLACE OF STATION LOCATION.
3. VELOCITY AZIMUTH DISPLAY /VAD/ WINDS REINTRODUCED IN THE ETA 3DVAR  
ANALYSIS WITH NEW COMPLEX QUALITY CONTROL /CQC/ ALGORITHM.
4. FORECAST TIME EXTENSION: 00Z/12Z TO 60 HOURS AND 06Z/18Z TO 48 HOURS.
5. NEW PRODUCTS / CHANGES TO EXISTING PRODUCTS:
  - A. GRIDS 212 AND 215 AVAILABLE FOR 00Z AND 12Z RUNS.
  - B. 3-HOURLY PRECIPITATION BUCKETS FOR THE HIGHER RESOLUTION GRIDS FROM  
THE 00/12Z RUNS.
  - C. FOR ALL ETA OUTPUT GRIDS...OCTET 6 OF THE GRIDDED BINARY /GRIB/  
PRODUCT GENERATION SECTION (PDS)...THE MODEL GENERATING ID...WILL BE  
CHANGED FROM 89 TO 84 FOR THE 00Z AND 12Z RUNS...AND FROM 85 TO 84 FOR  
06/18Z RUNS.
  - D. SEA LEVEL PRESSURE COMPUTED FROM BOTH THE STANDARD NCEP REDUCTION AND  
THE ETA REDUCTION ALGORITHM FOR ALL ETA GRIDS AVAILABLE TO THE ADVANCED  
WEATHER INTERACTIVE PROCESSING SYSTEM /AWIPS/ SATELLITE BROADCAST NETWORK  
/SBN/.
  - E. STORM MOTION VECTOR COMPUTATION CHANGED FROM DAVIES AND JOHNS TO  
BUNKERS METHOD.

DETAILED DESCRIPTION:

MODEL CHANGES:

- THE BETTS-MILLER-JANJIC CONVECTION SCHEME HAS BEEN MODIFIED TO REDUCE TWO WELL-KNOWN BIASES IN THE ETA MODEL: TOO LITTLE PRECIPITATION OVER THE HIGHER TERRAIN IN THE WESTERN UNITED STATES...AND TOO MUCH PRECIPITATION OVER THE COASTAL REGIONS OF THE SOUTHERN UNITED STATES.

- TO ADDRESS THE WESTERN U.S. BIAS...THE MINIMUM CLOUD DEPTH REQUIRED FOR DEEP CONVECTIVE PROCESSES (WHICH GENERATE PRECIPITATION) HAS BEEN CHANGED FROM A FIXED VALUE OF 290 MB TO "200 \* /SURFACE PRESSURE / 1000/" MB. OVER HIGHER TERRAIN...PRECIPITATING CONVECTIVE CLOUDS OFTEN HAVE HIGH BASES AND WOULD NOT SATISFY THE 290 MB CRITERIA. THE PRESSURE DEPTH USED TO SEARCH FOR THE MOST BUOYANT LAYER AT A GRIDPOINT HAS BEEN CHANGED FROM THE LOWEST 130 MB TO THE LOWEST "200 \* /SURFACE PRESSURE / 1000/" MB.

- TO ADDRESS THE COASTAL U.S. BIAS...THE USE OF DRIER RELATIVE HUMIDITY /RH/ REFERENCE PROFILES OVER LAND AND MOISTER RH PROFILES OVER WATER HAS BEEN ELIMINATED AND REPLACED BY SEA PROFILES EVERYWHERE. BY ELIMINATING THIS DISTINCTION...AIR PARCELS WITH A LONG OVER-WATER FETCH WILL NOT REACT TO THE DRIER RH PROFILES OVER LAND BY PRODUCING EXCESSIVE PRECIPITATION ALONG THE COAST.

ANALYSIS/OBSERVATION CHANGES:

- THE ETA 3DVAR ANALYSIS HAS BEEN MODIFIED SO THAT RAWINSONDE AND PIBAL DATA ARE ANALYZED AT THE LOCATION OF THE DRIFTING BALLOON INSTEAD OF THE STATION LOCATION. THE HORIZONTAL DRIFT IS CALCULATED ON EACH VALID WIND AND HEIGHT LEVEL BASED ON THE MEAN VECTOR WIND IN THE LAYER BENEATH...AND THE ESTIMATED TIME OVER WHICH THE BALLOON TRAVERSED THIS LAYER. THE DRIFT TIME IS CALCULATED FROM THE LAYER THICKNESS AND AN ASSUMED ASCENT RATE OF FIVE METERS PER SECOND.

- VAD WINDS...ABSENT FROM THE 3DVAR ANALYSIS SINCE JANUARY 1999 DUE TO NUMEROUS QUALITY CONTROL PROBLEMS...WILL BE REINTRODUCED THROUGH APPLICATION OF A NEW VAD CQC ALGORITHM. THIS ALGORITHM IS DESIGNED TO REMOVE WINDS WITH VERY SMALL MAGNITUDE /ABOUT EIGHT PERCENT OF ALL WINDS/..."ROUGH" ERRORS WITH VERY LARGE MAGNITUDE /SEVEN PERCENT/...AND RADAR SIGNAL "ERRORS" FROM MIGRATING BIRDS /FIVE PERCENT OF DATA DURING MIGRATION SEASONS/.

- EXTENSION OF 00Z/12Z FORECAST TO 60-HOURS AND 06Z/18Z FORECAST TO 48-HOURS. THE ETA ANALYSIS/FORECAST SYSTEM HAS BEEN RUN TO 48-HOURS FOR ALL FOUR CYCLE TIMES /00Z...06Z...12Z...18Z/ SINCE IMPLEMENTATION ON THE IBM-SP IN NOVEMBER 1999. HOWEVER...THE 06Z AND 18Z CYCLES WERE ONLY PROCESSED TO 33-HOURS AND 30-HOURS...RESPECTIVELY FOR DISTRIBUTION TO THE AWIPS SBN...REFLECTING THE FORECAST LENGTH OF THE PRE-IBM OFF-TIME RUNS. WITH THIS IMPLEMENTATION...PROCESSING OF THE 06/18Z FORECASTS WILL BE DONE TO 48-HOURS AND THE FORECASTS WILL BE DISSEMINATED TO AWIPS VIA THE SATELLITE BROADCAST NETWORK /SBN/. ADDITIONALLY...THE 00/12Z FORECASTS WILL BE EXTENDED FROM 48-HOURS TO 60-HOURS.

- NEW PRODUCTS / CHANGES TO EXISTING PRODUCTS. CURRENTLY...THE 06Z AND 18Z ETA OUTPUT SENT TO THE AWIPS SBN IS ON GRID 212 /40-KM RESOLUTION/ AND GRID 215 /20-KM RESOLUTION/. THESE GRIDS WILL NOW BE AVAILABLE FROM THE 00Z AND 12Z ETA RUNS...IN ADDITION TO THE LOWER RESOLUTION OUTPUT /GRIDS 104...207...211/ CURRENTLY AVAILABLE. THE FORECAST PRECIPITATION BUCKETS FOR THE HIGHER RESOLUTION GRIDS FROM THE 00/12Z ETA RUNS WILL BE 3-HOURLY AS THEY ARE FOR THE 06/18Z ETA. THE LOW RESOLUTION GRIDS /207...211...104/ WILL CONTINUE TO HAVE 12-HOUR PRECIPITATION BUCKETS.

- FOR ALL ETA OUTPUT GRIDS...OCTET 6 OF THE GRIB PRODUCT GENERATION SECTION /PDS/...THE MODEL GENERATING ID...WILL BE CHANGED FROM 89 TO 84 FOR THE 00Z AND 12Z RUNS...AND FROM 85 TO 84 FOR 06/18Z ETA RUNS. THE ONE EXCEPTION TO THIS IS THE INTERACTIVE COMPUTER WORDED FORECASTS /ICWF/ GRIDS PRODUCED FROM GRID 212 OUTPUT FOR THE 00/12Z ETA RUNS...THEY WILL CONTINUE TO USE 89 AS THE MODEL GENERATING ID.

- ALL ETA GRIDS AVAILABLE TO THE AWIPS SBN WILL NOW CONTAIN THE SEA LEVEL PRESSURE /SLP/ COMPUTED FROM THE STANDARD NCEP REDUCTION IN ADDITION TO THE SLP FROM THE ETA REDUCTION ALGORITHM.

- THE METHOD TO COMPUTE STORM MOTION VECTORS IN THE ETA MODEL HAS BEEN CHANGED TO USE THE BUNKERS DYNAMIC METHOD. THE PREVIOUSLY USED DAVIES AND JOHNS METHOD WAS BASED ON A CLIMATOLOGY OF CENTRAL AND EASTERN U.S. SUPERCELL THUNDERSTORMS. THE BUNKERS METHOD IS MORE PHYSICALLY-BASED...USING THE INFLUENCE OF THE MEAN WIND ON THE INITIAL CELL MOTION AND THE INTERACTIONS OF THE CONVECTIVE UPDRAFT WITH THE ENVIRONMENT.

THE DRAFT NWS TECHNICAL PROCEDURES BULLETIN /NUMBER 465/ DESCRIBING THESE CHANGES IN MORE DETAIL CAN BE FOUND AT /USE LOWER CASE/:

[FTP://FTP.NCEP.NOAA.GOV/PUB/EMC/WD20ER/ETATPB/ETA60TPB.HTM](ftp://ftp.ncep.noaa.gov/pub/emc/wd20er/etatpb/eta60tpb.htm)

TECHNICAL DETAILS REGARDING IMPLEMENTATION CAN BE FOUND AT REQUEST FOR CHANGE /RC/ NUMBER 2453 ON THE WEBPAGE /USE LOWER CASE/:

[HTTP://WWW.NWS.NOAA.GOV/OSO/OSO1/OSO11/OSO112/DRG/DRGRPTY.HTM](http://www.nws.noaa.gov/os01/os011/os0112/drg/drgerty.htm)

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

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

END  
NNNN