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PNSWSH

Technical Implementation Notice 15-53
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Subject: RTMA and URMA Upgrade: Effective December 15, 2015

Effective on or about December 15, 2015, beginning with the 1300 Universal
Coordinated Time (UTC) cycle, the National Centers for Environmental
Prediction (NCEP) will upgrade the Real-Time Mesoscale Analysis (RTMA) and
the Unrestricted Mesoscale Analysis (URMA) to:

- Change model components
- Add new product fields
- Change product output

Model Component Changes:

- Add a variational quality control for the observations to RTMA-CONUS,
RTMA-Alaska and URMA-CONUS.
- Add an observation buddy-check for temperature to RTMA-Alaska.
- Relax the observation quality control for coastal mass observations in
RTMA-Hawaii.
- Add a 3.0 km resolution URMA-Alaska system.

The analysis runs hourly for 00 UTC, 01 UTC, 02 UTC...to 23 UTC. Compared
with the corresponding RTMA-Alaska, the analysis is initiated with a 6-
hour delay so that late arriving observations can also be assimilated.
For example, the 02 UTC URMA-Alaska analysis is initiated at approximately
0835 UTC.

The new variational quality control helps reduce the intensity of the
bullseyes that might occur in the analysis due the assimilation of bad
observations. Because of its relaxed observation cutoff time, the new
URMA-Alaska uses more observations than the existing RTMA-Alaska, thus
providing users with a superior analysis for verification purposes.

For hourly precipitation RTMA: uses Stage IV hourly as primary source of
precipitation RTMA, supplemented by Stage II hourly when Stage IV is not
available at the time precipitation RTMA is made. At present, only Stage
II hourly is used for the RTMA. NCEP now receives hourly Quantitative
Precipitation Estimates (QPEs) from some River Forecast Centers (RFCs)

before the RTMA cutoff time (33 minutes past the top of the hour) using these QPEs will allow RTMA to benefit from local expertise as well as at least some human oversight at RFCs.

For 6-hourly precipitation URMA: coverage inside of an RFC's domain proper will only come from that RFC (at present, if an RFC's input is late or missing, coverage from neighboring RFCs is used). The West Gulf RFC (WGRFC) domain will be expanded to cover its area of responsibility in Mexico. Areas outside of the RFC domains (except for Gulf of Mexico and the Atlantic) will be set to no data/missing. Coverage for the Great Lakes will come from specific RFCs assigned to each Lake (at present the average of all available coverage from nearby RFCs is used for the Great Lakes). By only using data from specific RFCs responsible for each given grid point in the mosaic, NCEP can ensure data contributing to the mosaic are properly quality- controlled. The only exception is for areas in the Gulf of Mexico and off the Atlantic Coast, which are filled in with data from the neighboring RFCs as before; these data are provided mainly for visual interest (e.g., when there is a tropical cyclone passing through), even though the coverage would not be of the same quality as the areas that are within RFCs' domains of responsibility.

Addition of Variables:

- Files will be available on the NCEP ftp, http and NOAA Operational Model Archive and Distribution System (NOMADS) servers via the following URLs (YYYYMMDD is the year, month, day):

ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/urma/prod/urma2p5.YYYYMMDD
http://www.ftp.ncep.noaa.gov/data/nccf/com/urma/prod/urma2p5.YYYYMMDD
www.nomads.ncep.noaa.gov/pub/data/nccf/com/urma/prod/urma2p5.YYYYMMDD

Daytime maximum temperature (TMAX) analysis, and overnight minimum temperature (TMIN) analysis, along with the corresponding fields of the analysis uncertainty to the URMA-contiguous U.S. (CONUS) gridded bonary version two (GRIB2). The new fields have a nominal spatial resolution of 2.5 km and are produced once a day. The current day 08 UTC analysis creates the TMAX analysis for the previous day, while the current day 20 UTC analysis creates the TMIN analysis for the current day.

Maximum Temperature (TMAX) analysis will be added to:
urma2p5.t08z.2dvaranl_ndfd.grb2 urma2p5.t08z.2dvaranl_nwrfc.grb2

Maximum Temperature (TMAX) analysis uncertainty will be added to:
urma2p5.t08z.2dvarerr_ndfd.grb2 urma2p5.t08z.2dvarerr_nwrfc.grb2

Minimum Temperature (TMIN) analysis will be added to:
urma2p5.t20z.2dvaranl_ndfd.grb2 urma2p5.t20z.2dvaranl_nwrfc.grb2

Minimum Temperature (TMIN) analysis uncertainty will be added to:
urma2p5.t20z.2dvarerr_ndfd.grb2 urma2p5.t20z.2dvarerr_nwrfc.grb2

NCEP is adding the following 3.0 km resolution analysis fields and corresponding analysis uncertainty fields from the new URMA-Alaska system:

2-m temperature
2-m specific humidity
2-m dew point
10-m wind speed
10-m wind direction
10-m wind gust
surface pressure
surface visibility
maximum temperature (TMAX)
minimum temperature (TMIN)

These fields are produced hourly for 00 UTC, 01 UTC, 02 UTC,...and 23 UTC, except for TMAX and TMIN, which are produced once a day each. The current day 08 UTC analysis creates the TMAX analysis for the previous day, while the current day 20 UTC analysis creates the TMIN analysis for the current day.

The URMA-Alaska GRIB2 files containing these fields will be available on the NCEP ftp, http and NOMADS servers as follows:

akurma.tCCz.2dvaranl_ndfd_3p0.grb2 (for analysis)
akurma.tCCz.2dvarerr_ndfd_3p0.grb2 (for analysis uncertainty)

Product output changes:

The radius of the Earth used for the GRIB2 encoding of the RTMA and URMA output files is changing from 6,371,229.0 m to 6.371,200.0 m, which is the value used by the National Digital Forecast Database (NDFD) and the Advanced Weather Interactive Processing System (AWIPS).

Additional airport temperature data:

RTMA temperature data will be interpolated at an additional 141 airports (all in Alaska) to serve as a real-time observation where an observation is unavailable. This action will change the order of text. Use of the RTMA is expected to help mitigate the problem of flight delays, diversions, and cancellations caused by the lack of a temperature report. Interpolated temperature data at airports across CONUS, Hawaii, Puerto Rico and Guam will continue to be available. Users can download the hourly text product, alphabetized by the airport 3- or 4-character code, on the NCEP server at:

http://nomads.ncep.noaa.gov/pub/data/nccf/com/rtma/prod/airport_temps

Sample Parallel Data will be available on the NCEP HTTP server in early-November. The parallel data will be available via the following URLs:

http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/rtma/para/
http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/urma/para/

Information about the precipitation RTMA/URMA, with links to parallel run data directories if available at:

http://www.emc.ncep.noaa.gov/mmb/ylin/pcpanl/

For questions regarding these changes, please contact:

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