V2.8 RTMA/URMA/RTMA-RU
Science Brief

Jacob R. Carley, Manuel Pondeca, Steve Levine, Ying Lin, Yan Luo, Annette Gibbs, Jim Purser, Stylianos Flampouris, Xiaoyan Zhang, Matthew Morris, Edward Colon, Runhua Yang, Gang Zhao, Jeff Whiting, and Daryl Kleist

And many other excellent folks from ESRL/GSD, NWS WFOs and Regions, MDL + the NBM team, and NCEP Centers

1NCEP/EMC/Modeling and Data Assimilation Branch
2IM Systems Group
3Systems Research Group
V2.8 RTMA/URMA/RTMA-RU Timeline

Science Briefings

11/22

Science evaluation ends

12/9-10

12/17

Hand off to NCO

March 2020

NCO begins 30 day IT test

April 2020

Implementation [latest estimate from NCO]

[latest estimate from NCO]
RTMA/URMA/RTMA-RU

- **2D, 2.5km* analysis of sensible wx elements**
  - 2DVar system
  - 2m T and moisture, 10m wind and gust, ceiling, visibility, sky cover, wave height, etc.

- **Real Time Mesoscale Analysis (RTMA)**
  - Hourly
  - Real time system for nowcasting and situational awareness

- **UnRestricted Mesoscale Analysis (URMA)**
  - Runs 6 hours after RTMA to capture late arriving obs
  - Verification, calibration, analysis of record
  - Calibration in National Blend of Models

- **RTMA-Rapid Update**
  - 15-min updates, low-latency
  - Nowcasting, aviation, + situational awareness

*AK domains are currently at 3 km
*PR now at 1.25 km
v2.8 RTMA/URMA Upgrade: Highlights

- Downscaling/background field improvements [All stakeholders]
  - 2.5 km → 1.25 km for PR, consistent with NDFD [NBM, Puerto Rico]
- Improved wind analysis with reduced low bias [All stakeholders]
- Significant wave height for Guam and Great Lakes [NBM, Guam, Great Lakes]
- Moisture/dew point analysis enhancements [NBM, W. Region, WFO Missoula]
- Re-tuned sky cover analysis with enhanced QC [NBM, CONUS, AWC]
- Consistent ceiling and sky analysis [All stakeholders, esp. AWC]
- Precipitation enhancements [CONUS and coastal CONUS, WPC]
- NOHRSC snow analysis [CONUS, WPC]
- Expansion of upgrade for better fit to observations for OCONUS (already in CONUS) [NBM, OCONUS]

Many improvements continue to be motivated via collaboration with highly engaged stakeholder community
Downscaling updates for v2.8

***Background/first guess in RTMA/URMA***

- **HRRR Smartinit (sent to AWIPS)**
  - Winds
    - Where the NDFD terrain > model terrain.
      - Maximum of the 10-m winds (instead of model level 1 winds) and vertically interpolated winds multiplied by 0.7 (to account for surface friction)
    - When NDFD terrain <= model terrain
      - The 10-m winds are used.

- **RAP Smartinit (not sent to AWIPS)**
  - Use land sea mask for coastline adjustment instead of vegetation type

- **NAM Hawaii and Puerto Rico, HiresW Guam and RAP Smartinit (sent to AWIPS)**
  - New temperature downscaling, consistent with HRRR approach
    - If NDFD terrain != model terrain
      - Use the local lapse rate, constrained between dry adiabatic and isothermal, to adjust the temperature

- **Puerto Rico grid change from 2.5 km to 1.25 km to be consistent with NDFD**
**BCRMSE**

**OLD SYSTEM**

**NEW SYSTEM**

**Bias**

**CONUS**

![CONUS chart](chart1)

**Alaska**

![Alaska chart](chart2)

**Hawaii**

![Hawaii chart](chart3)

**Puerto Rico**

![Puerto Rico chart](chart4)

*stats are relative to METARs, buoys, and ships*
Wind Speed Time Series - Background

**BCRMSE**  
**OLD SYSTEM**  
**NEW SYSTEM**  
**Bias**

**CONUS**  
**Alaska**  
**Hawaii**  
**Puerto Rico**

*stats are relative to METARs, buoys, and ships*
Has been assumed that all wind obs are taken at 10 m AGL
  - We know from looking at station photos that this is not true
For mesonets: wind sensor height will now be a function of provider/network
  - Current list of providers/heights
Background wind is adjusted via similarity theory to the same height as the observed wind
Observation is be compared against this adjusted background wind value
Similar adjustments made to gust analysis
Wind Speed Time Series - Analysis

BCRMSE

OLD SYSTEM

NEW SYSTEM

Bias

CONUS

Alaska

Hawaii

Puerto Rico

*stats are relative to METARs, buoys, and ships*
Significant Wave Height Upgrades

- Preprocessing, downscaling and merging the multi-grid output, of the SWH background:
  - Adding the sea land mask → erroneous values from the background have been eliminated
  - Background can now be produced by an infinite number of background grids
    - e.g. for CONUS, waves from 6 grids are merged
- Analysis for the Great Lakes is added, based on the GL forecasting system.
- Sea/ice mask is applied (CONUS and AK), based on the NCEP operational ice coverage retrieval.
- Significant Wave Height analysis is now provided for Guam (RTMA).
Great Lakes

Wave Height v2.8

Guam

*stats are relative to METARs, buoys, and ships*
Puerto Rico Wave Height Stats

- The spatial resolution of PR was doubled (from 2.5km to 1.25km):
  - The system’s parameters were recalibrated
  - PR URMA is now the wave analysis system with the highest spatial resolution globally

*stats are relative to METARs, buoys, and ships*
Dew Point Analysis Updates

- Moist bias causing issues with FireWx
  - First noticed by WFO Missoula, MT
- Operational Dew Point Product:
  - Q and surface press. analysis is used to derive Td
  - Analysis increments between the computed Td fields is smoothed via a “1-2-1” filter and added to the downscaled Td to generate the final analysis
- The “1-2-1” smoothing filter has been switched off**
- Impacts closely tied to steep terrain
  - Coordinated and approved with Western Region and WFO Missoula

**Very early RTMA (>10yrs ago) had serious issues with localized areas of unrealistically low dew points
Ceiling and Sky Cover Updates for v2.8

- Ceiling is cleared (i.e., set to maximum ceiling value) when the analyzed sky cover is < 50%
  - Ensuring product consistency
- Reject GOES Imager sky cover observations when:
  - The observation is < 30% and over water; and
  - Solar zenith angle is > 80° (i.e., late evening, overnight, or early morning)
  - Based upon feedback and consultation with GOES product developer and stakeholders
- Reduced thinning of GOES sky cover observations (by half) and tripled the decorrelation length to address feedback of a “splotchy” sky cover analysis
- Add sky cover analysis to RTMA-RU
  - Updates every 15 minutes
Example: Ceiling clearing

18Z on 15 March 2019
Example: Sky Cover QC

Original Sky Cover

Modified Sky Cover (QC)

VIS

14Z on 24 April 2019
Example: Sky Cover QC

Original Sky Cover
Modified Sky Cover (QC)
VIS

15Z on 24 April 2019
Ceiling and Sky Cover Stats

Ceiling over CONUS - 2019101900000 to 201912052300

Sky Cover over CONUS - 2019101900000 to 201912052300

Stats are relative to METARs, buoys, and ships.
QPE RTMA/URMA Changes for v2.8

- **Precip RTMA**
  - Real time, low-latency QPE → currently from Stage II/IV (+33 min)
  - **v2.8**: Replace with radar-only MRMS; change hourly run schedule from hh:33 to hh:15
    - Improve latency
    - Situational awareness

- **Precip URMA**
  - Backbone is Stage IV and is rerun regularly ~1 week after valid time to refine/enhance as RFCs transmit revised data (what the NBM uses)
  - **v2.8**: Add NOHRSC snowfall analysis
  - **v2.8**: Add a blending for a smoother offshore filling with MRMS and CMORPH QPE
  - **v2.8**: Change hourly run schedule for PCPANL/pcpURMA from hh:33 to hh:55
    - Request by OWP, RFCs for RIDGE II, so more RFC QPEs can be included for current hour
    - More complete coverage, earlier

- **PCPANL v4.0** (upstream job of RTMA/URMA):
  - Discontinue Stage II analysis - prod suite simplification
  - Add another 30h rerun of Stage IV 24h mosaic (for water.weather.gov/precip
    - Supplements the current ~daily rerun schedule and gives chance for updated RFC QPE’s to get out to public (e.g. water.weather.gov/precip)
pcpRTMA using MRMS: validation

Prod vs. v2.8 pcpRTMA: 24 QPE validation vs. daily gauges (1 Aug - 30 Nov 2019)

ETS vs. threshold

Bias vs. threshold
NOHRSC Snowfall Analysis for URMA

- Add NOHRSC 6h/24h snowfall analysis to the precipitation URMA suite
- At the 18Z cycle (run at 18:55Z), process NOHRSC data for current day AND the past 7 days to continually refine snow product
  - Data mapped from NOHRSC’s g184 to the expanded ConUS grid (WEXP) for NBM
  - g184 data sent out to AWIPS
The primary source of ConUS pcpURMA is the NCEP Stage IV
  - mosaicked RFC QPEs → which is limited to RFC domains

V2.7 introduced offshore filling of ConUS PCPURMA with
  - Gauge-corrected MRMS (where RQI ≥ 0.1)
  - CMORPH
  - Sharp discontinuities can exist between these products

Solution → apply Whittaker blending function for a smoother pcpURMA offshore filling
  - Approach already used in RTMA/URMA to fill edges around domain
Evaluation Survey and Feedback

- Evaluation completed via Google Form [survey](#)
- Responses requested from all NWS regions, WPC, AWC and MDL
  - Survey was also sent to the field at large via MEG-maintained [website](#)
  - Website also linked to viewers and stats for the parallel, all previous relevant presentations
  - Much feedback also received via [VLab community website](#) and [forum](#)
- Responses asking for implementation:
  - Eastern Region, Western Region, Southern Region, AK Region, WPC, MDL and 1 WFO
- Response asking for changes
  - AWC detected a bug in the sky cover analysis at the end of the evaluation period
  - This bug has been corrected and AWC now recommends implementation
In this upgrade the snowfall analysis from NOHRSC has been added as a new product for the URMA. Do you find this snowfall analysis product useful?
Evaluation Survey Results

Are there improvements in the ceiling?
- 12.5% Yes, major improvement
- 25% Yes, minor improvement
- 50% No change
- 12.5% Degradation
- 25% N/A

Are there improvements in the sky cover?
- 50% Yes, major improvement
- 25% Yes, minor improvement
- 25% No change
- 12.5% Degradation
- 12.5% N/A

Is the OCONUS selection algorithm an improvement?
- 75% No change
- 25% N/A

Are there improvements in the dew point?
- 37.5% Yes, major improvement
- 37.5% Yes, minor improvement
- 25% No change
- 25% Degradation
- 12.5% N/A
Should RTMA/URMA be implemented into operations?

8 responses

- Implement as proposed: 87.5%
- Reevaluate after changes (see comments): 12.5%
- Do not implement: 0%

AWC detected a bug in the sky cover analysis which is now being addressed (next slide)
Sky Cover QC Additions

- AWC evaluation noted cases during low sun angles where low ceilings were erroneously cleared by the ceiling consistency check owing to low analyzed values of sky cover.

- GOES Imager sky cover QC was expanded to cover land areas beginning with the 14z (20z) URMA (RTMA) cycle on 5 December

*Thanks to AWC’s Jeremiah Pyle for identifying this issue and working with us!
Evaluation Survey Results

Are there improvements in the sky cover?

8 responses

- Yes, major improvement: 37.5%
- Yes, minor improvement: 12.5%
- No change: 25%
- Degradation: 25%
- N/A

Should RTMA/URMA be implemented into operations?

8 responses

- Implement as proposed: 100%
- Reevaluate after changes (see comments)
- Do not implement

Link to all responses
Summary

- Improved wind analysis through improved assimilation algorithm
- Expanded support for waves to Great Lakes and Guam
- Improved sky cover analysis and consistent with ceiling
- A number of improvements/updates for precipitation
  - Offshore blending, NOHRSC snowfall, additional re-runs for better quality URMA QPE, MRMS
- Much more → full evaluation page with complete stats
- Schedule:
  - Code hand off to NCO: Dec. 17th
  - Implementation expected: Mid April, 2020
- Final notes
  - This is the final 2D RTMA/URMA/RTMA-RU upgrade
  - 3D-RTMA is coming in the FY23 timeframe!
- RTMA/URMA/RTMA-RU/Precip benefits tremendously from an active and engaged user community → thank you!
Resources
Up/Downstream Changes

● Upstream dependency changes
  ○ PCPANL v4.0 (upstream job of RTMA/URMA):
    ■ Discontinue Stage II analysis
    ■ Stage IV: change from GRIB1 to GRIB2
  ○ Obsproc upgrade
    ■ Adding GOES Imager for RTMA-RU
  ○ SmartInit Changes for RAP, HRRR, NAM
  ○ HiRes wave background

● Product additions
  ○ NOHRSC snow

● SBN changes for AWIPS
  ○ New PR grids (tentative approval)
  ○ NOHRSC (tentative approval)
Resource Changes

- Minimal node use changes
- Minor (>10%, ~100 GB/day) increase in disc space
  - New variable (sky cover) for RTMA-RU increased from ~180 GB/day to ~220 GB/day
  - New fields needed in smartinit files for enhanced wind assimilation - small increase locally
    - HRRR Smartinit has increased from ~13 GB/day to ~26 GB/day
    - RAP Smartinit has increased from ~7 GB/day to ~10 GB/day
    - HIRESW Guam Smartinit has increased from ~250 MB/day to ~280 MB/day
    - NAM Smartinit has increased from ~8 GB/day to ~14 GB/day (00-12 hours)
    - PR RTMA/URMA increased from ~15GB/day to ~30GB/day
      - Also includes impact of resolution change
  - WW3 background has increased from ~25 GB/day to ~50GB/day (temp space only)
Supplemental Slides
Ceiling and Sky Cover Stats - following QC extension

Ceiling over CONUS - 201912060000 to 201912082300

Sky Cover over CONUS - 201912060000 to 201912082300

*stats are relative to METARs, buoys, and ships*
OCONUS: Updated Observation Selection Algorithm

- Already in place over CONUS and Alaska, being expanded to other domains
- Assimilate only the observation reported closest to the analysis time at each site
- This adjustment allows for a closer fit to observations in each analysis as well as the improved use of special (SPECI) reports (ceiling and visibility).
  - The modified algorithm ensures the SPECIs always get the strongest weight in the analysis.

**Largest impacts:**
- Situations where the element in question may change rapidly
- Frontal passages, valley drainage, etc.
- Closer fit to observations

**Diagram:**
- 12Z Ops OCONUS RTMA/URMA considers all obs in the window and interpolates among them
- 12Z v2.8 OCONUS RTMA/URMA Only considers report closest to analysis time
Analysis is a statistical combination of the observations and background, weighted by their respective errors.

The background 2m T field can struggle in/around complex terrain (i.e. an error in the background).

Incorporate a valley map into the background error to inflate the errors in complex terrain:
  ○ Fit observations more closely where the OCONUS RTMA/URMA background struggles - valley cold pools.

OCONUS: Revised 2m T Background Error Covariance

*Implemented for CONUS in v2.7*
• Our science evaluation does NOT include any data from the RAP/HRRR evaluation
• Timing of evals and lack of CONUS HRRR availability prevented full testing
• RTMA/URMA will likely be implemented before RAP/HRRR
• We will likely run another parallel, at some point, when CONUS RAP/HRRR fields are available
• Largest improvement in new RAP/HRRR: improved inland lake temperatures
  o Water temperature have been too cold before
  o New SST algorithm in HRRR
Wind Adjustment Procedure

- **Inputs**
  - Lowest two sigma levels of background model
  - Background skin temperature
  - Land/sea mask value

- **Similarity Theory Adjustment**
  - 10 m wind factor is calculated based on local stability
  - Background winds are then multiplied by this factor
  - ‘Adjusted’ background is then compared to observation to generate innovation and increment

- **Results in higher wind speeds in the analysis**
  - Closer to METAR observed wind speed
  - Many mesonet wind obs will still not be used at all; more may need to be flagged (info [here](#))
  - If background under forecasts wind speed, analysis winds will still be too light.
The Move to Three Dimensions

- **3D-RTMA/URMA**
  - With sub-hourly updates
  - CONUS + Alaska to start

- Joint development effort between EMC + ESRL/GSD

- Real time, rapid updated analysis of 3D atmospheric fields
  - Severe and aviation weather parameters
  - Analysis of hydrometeor and cloud fields
  - Assimilation of radar observations
  - Heavy rainfall, etc.

*Thanks to ESRL/GSD for this figure*
The 2.8 upgrades had positive or neutral effect on the analysis of SWH.
Supplemental material for precipitation
pcpRTMA using MRMS

- Use radar-only MRMS QPE
  - Lower latency
  - Less affected by data outages than gauge-corrected MRMS QPE
- Radar quality index (RQI) added as companion to each hour’s pcpRTMA array
  - Provide users with info about quality of the QPE
  - RQI arrays will be available on NOMADS (not AWIPS)
Request Changing Precip Run Schedule

- Current production PCPANL/pcpRTMA/pcpURMA run at hh:33
- Request:
  - Advance pcpRTMA by 18 minutes (to hh:15)
  - Postpone PCPANL/pcpURMA by 22 min (to hh:55)

Prod precip suite currently runs at hh:33 due to Stage II/pcpRTMA dependency on METAR gauges, available at ~hh:30
  - Using MRMS as source for pcpRTMA removes this dependency → simpler
  - Running pcpRTMA at hh:15 (instead of even earlier) allows use of MRMS data within a ±10 min window in case of an outage near hh:00 → Reliability

- Postponing PCPANL(Stage IV), pcpURMA to hh:55 → more current-hour’s RFC QPEs included
  - Per request by OWP - plans to use Stage IV hourly mosaic for RIDGE II beginning in Q3 FY2020
Delivering Stage IV from hh:33 to hh:55

- 22:33Z: Some RFCs have not sent their QPEs for that hour yet.
- 22:55Z: All RFCs that produce 1h QPEs have sent them.
  - CNRFC/NWRFC do not have 1h QPEs.
  - Stage IV provide coverage for that area using the RFCs’ 6h QPEs (received at 14:06/14:30 in this case) time-disaggregated using 1h MRMS data as weights.
  - QPE appears next day (3rd panel)

**prod, made at 22:33Z**
**para, made at 22:55Z**
**prod/para at 14:33/14:55Z next day**

Better coverage with small delay
For the 24h ending at 12Z 28 Oct, several hourly OHRFC QPEs were missing. Data received at 14:32Z 29th. There was also a problem with earlier QPEs from WGRFC that was corrected at 17:47Z 30th.

Para has complete coverage from the 30-h rerun. Prod still missing OHRFC area - had to wait until next day (12:33Z 30th) for complete coverage

Corrected WGRFC QPE was used in the 3-day rerun in both prod/para.
Radar-Only vs. Gauge-Corrected MRMS QPE

- Radar-only QPE
  - More timely!
  - A 2-minute lag vs. ~58min for gauge-corrected QPE
- Radar-only QPE is available every 2 minutes
  - In case of a data outage at the top of the hour, QPE valid closest to the top of the hour (within ±10 min of hh:00:00) can be used for pcpRTMA.
- E.g. on 26 Nov, gauge-corrected MRMS QPE was missing for 01/02/04Z. Radar-only QPE also had gaps: no data between 00:58:00 - 02:08:00Z and 03:58:00 - 04:10:00Z. No missing v2.8 pcpRTMA:

<table>
<thead>
<tr>
<th>pcpRTMA valid at</th>
<th>From radar-only MRMS valid at</th>
</tr>
</thead>
<tbody>
<tr>
<td>01Z</td>
<td>00:58:00</td>
</tr>
<tr>
<td>02Z</td>
<td>02:08:00</td>
</tr>
<tr>
<td>03Z</td>
<td>03:00:00</td>
</tr>
<tr>
<td>04Z</td>
<td>03:58:00</td>
</tr>
</tbody>
</table>
Current prod uses first run Stage IV supplemented by first run Stage II.

At the time of the pcpRTMA run (33 min past the top of the hour), the RFC QPEs (basis for Stage IV) generally do not yet have the benefit of human oversight/QC:

02Z 17 Dec 2017 (Saturday evening ET): bad gauge included in the first-run RFC QPE/pcpRTMA. NERFC removed the bad gauge within hours and pcpURMA was updated accordingly in the following hour’s rerun. pcpRTMA was only run once (“Real Time”) and the bull’s eye stayed in the RTMA.
PCPURMA Blending Flow Chart  v2.8.0

Unfilled pcpURMA

Merged pcpURMA

CMORPH (exist?)

MRMS (exist?)

Yes

No

Yes

No

Yes

No

Blending map

Blended pcpURMA

Unfilled pcpURMA (no change)
From Yan Luo:

Examples of Blended Offshore PCPURMA

Warm Season Case (2019051600.06h)

Cold Season Case (2018120912.06h) - East Coast
Offshore pcP尿MA Blending

Recent example: 24h ending at 12Z 27 Nov

Prod

v2.8

https://www.emc.ncep.noaa.gov/users/verification/precip/rtma-urma/v2p8/daily/plots/urma/pcpurma2.20191127.png
Recent example: 24h ending at 12Z 16 Nov
Offshore pcpURMA Blending

Recent example: 24h ending at 12Z 20 Oct
Offshore pcpURMA Blending

Recent example: 24h ending at 12Z 01 Dec

Prod

v2.8

https://www.emc.ncep.noaa.gov/users/verification/precip/rtma-urma/v2p8/daily/plots/urma/pcpurma2.20191201.png
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, ConUS

Time series of RMSE
ETS vs. threshold
Bias vs. threshold
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, ABRFC
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, CBRFC

Time series of RMSE

ETS vs. threshold

Bias vs. threshold
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, CNRFC

Time series of RMSE
ETS vs. threshold
Bias vs. threshold
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, LMRFC

Time series of RMSE
ETS vs. threshold
Bias vs. threshold
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, MARFC

Time series of RMSE

ETS vs. threshold

Bias vs. threshold
**RTMA vs. RTMAv2.8 vs. URMAv2.8**, 16 Sept - 15 Nov, MBRFC

Time series of RMSE

ETS vs. threshold

Bias vs. threshold
**RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, NCRFC**

- **Time series of RMSE**
- **ETS vs. threshold**
- **Bias vs. threshold**
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, NERFC

Time series of RMSE

ETS vs. threshold

Bias vs. threshold
**RTMA vs. RTMAv2.8 vs. URMAv2.8**, 16 Sept - 15 Nov, NWRFC

- **Time series of RMSE**

- **ETS vs. threshold**

- **Bias vs. threshold**
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, OHRFC

Time series of RMSE
ETS vs. threshold
Bias vs. threshold
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, SERFC

Time series of RMSE

ETS vs. threshold

Bias vs. threshold
RTMA vs. RTMAv2.8 vs. URMAv2.8, 16 Sept - 15 Nov, WGRFC

Time series of RMSE

ETS vs. threshold

Bias vs. threshold
Summary of changes for users of PCPANL (Stage II/IV) data planned for March 2020 with RTMA/URMA v2.8 implementation (https://www.emc.ncep.noaa.gov/users/meg/rtma_urma_v2p8/):

- Stage II will be discontinued with the RTMA/URMA v2.8 implementation (scheduled for Mar 2020)
- Stage IV will be in GRIB2 format, instead of GRIB1
- Stage IV mosaicking will be done at hh:55 instead of hh:33 (per request by OWP, RFCs for RIDGE II, so that more RFC QPEs can be included for the current hour)
- There is an additional re-run for 24h ConUS mosaic done at 30h after valid time (at the 18:55Z cycle), to supplement the current 1/2/3/5/7-day rerun schedule, done at 12:55Z, to give RFCs a better chance to have their re-sent or updated QPEs included in AHPS’s water.weather.gov/precip w/o waiting for the 2-day rerun the next day

Add’l info about the upcoming precip change for RTMA/URMA v2.8:
https://docs.google.com/presentation/d/1GUjHKmD56AR1fxzgF-LexBsJTfs0KNEG4O7xonZpJ7g/edit?usp=sharing