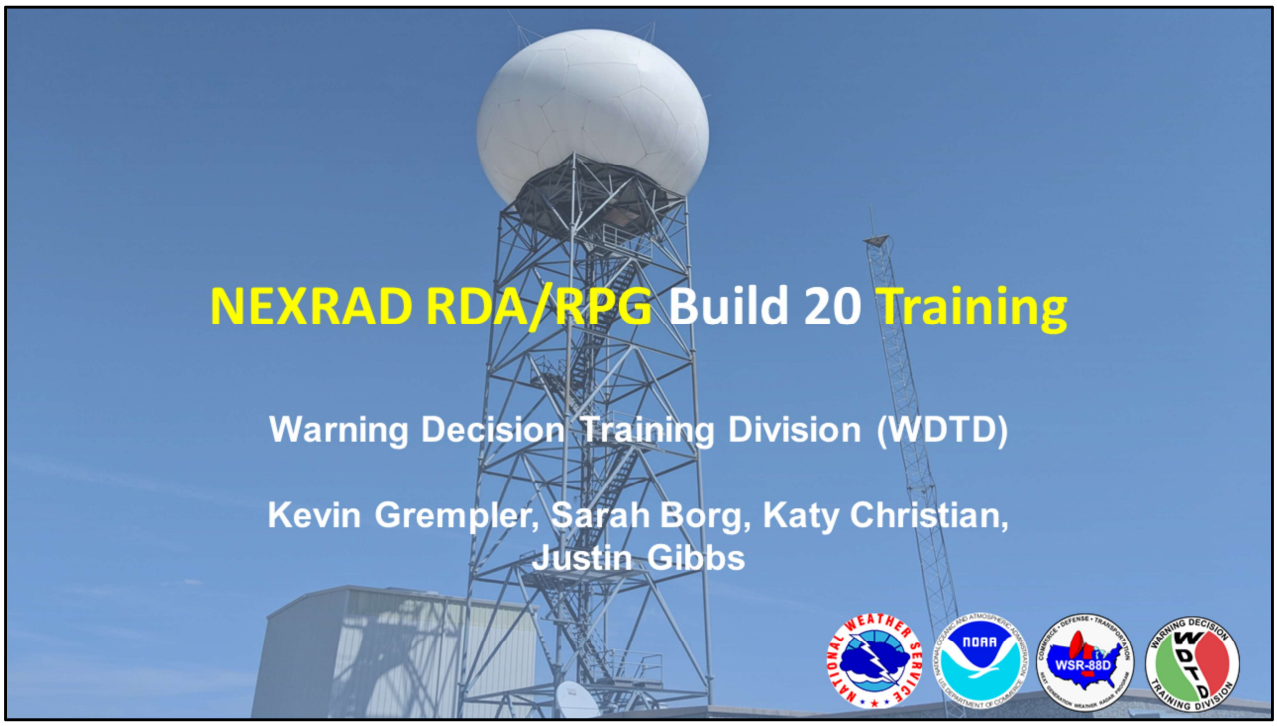
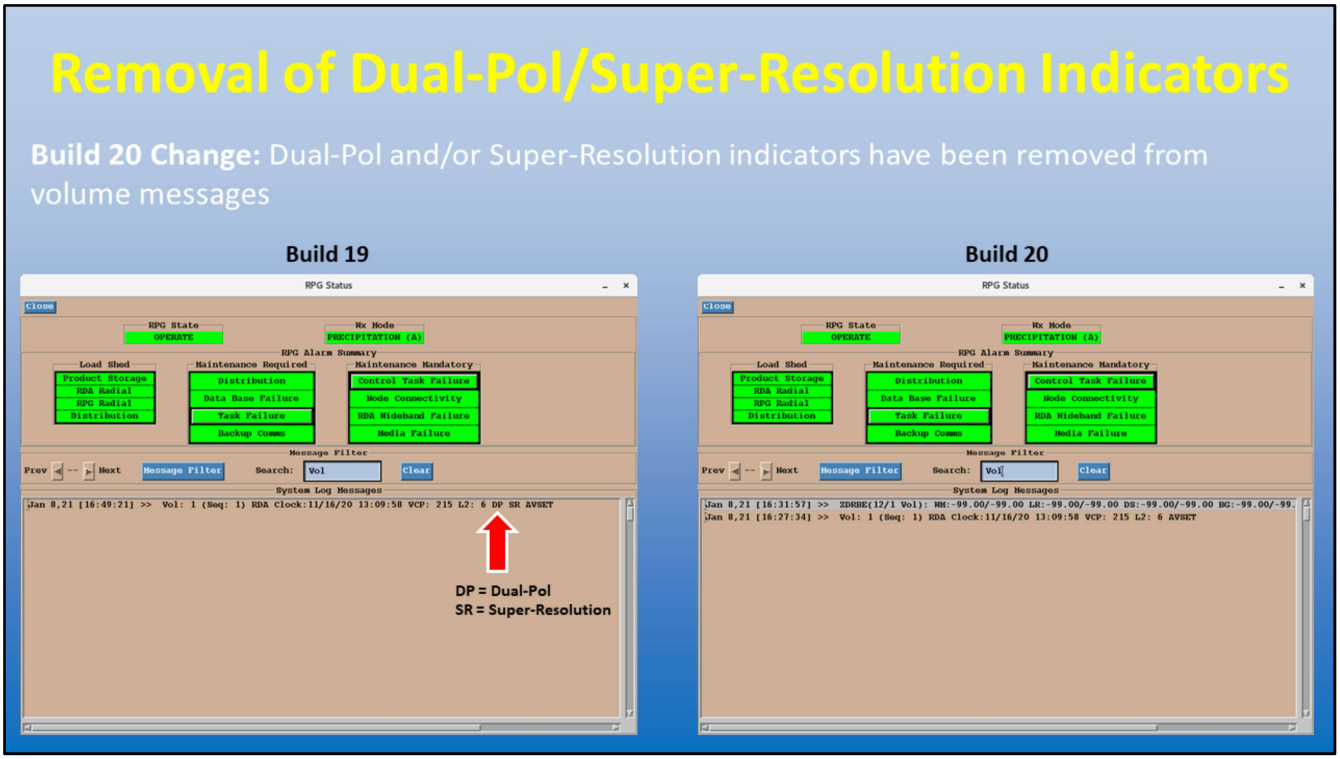


Welcome to this module on major changes associated with the WSR-88D RDA/RPG Build 20. I'm Kevin Grempler with the Warning Decision Training Division on behalf of the WDTD 88D build team.

Build 20 Overview

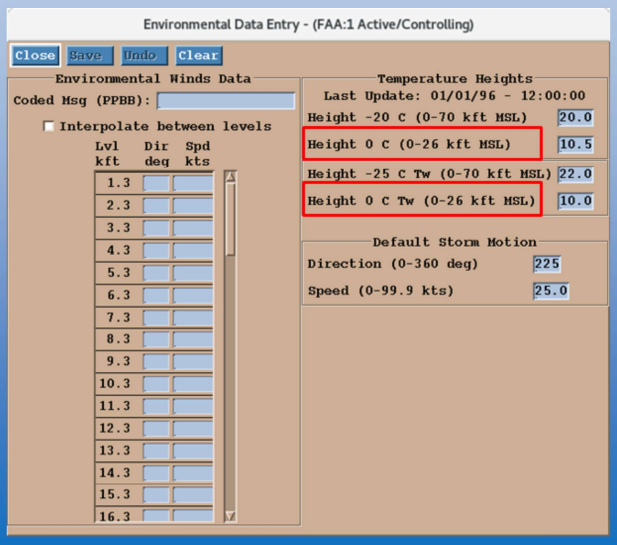
- Removal of Dual-Pol/Super-Resolution Indicators
- Environmental Data Entry GUI discrepancy with labels
- RPG HCI Archive II Window Update
- Removal of agency level password and all references to agency LOCA Adaptable Parameters
- Updates to Shift Change Checklist
- Use of Supplemental Scans added to alphanumeric information for QPE
- R(Z, ZDR) rainfall rate relationship name is added to the QPE Digital Accumulation Adaptation data text

Headlines of this release include: Removal of Dual-Pol/ Super-Resolution Indicators, Environmental Data Entry GUI discrepancy with labels, RPG HCI Archive II Window Update, Removal of agency level password and all references to agency LOCA Adaptable Parameters, Updates to Shift Change Checklist page, the use of supplemental scans added to alphanumeric information for QPE, and the rainfall rate as a function of Z and ZDR relationship name (e.g., STRAT/TROP) is added to the Digital Storm Total Accumulation Adaptation data text.

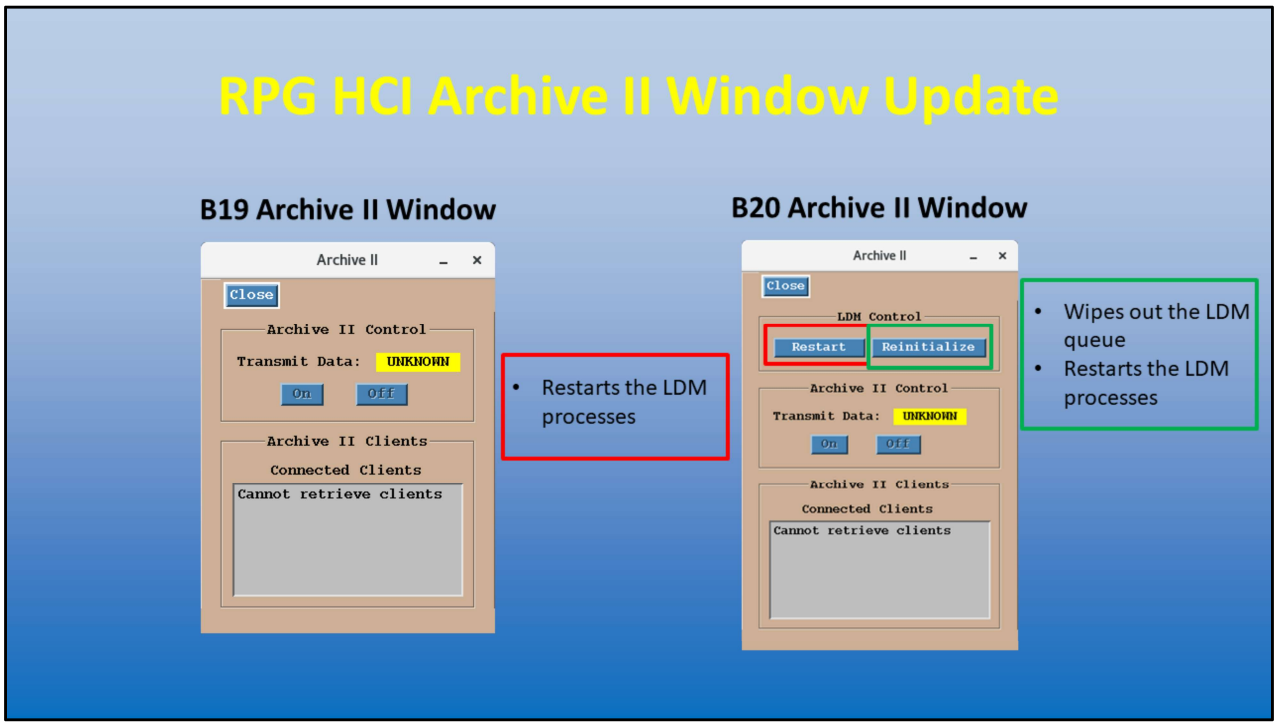


In previous radar builds, users wanted a way to know if the data coming in were Dual-Pol, abbreviated DP, Super-Resolution, or abbreviated SR. As such, indicators were added to the volume messages in the RPG Status window as shown here. However, now that Dual-Pol and Super-Resolution are standard, users no longer need these indicators. As a result, Build 20 no longer includes these indicators in the system log messages.

Range Labels Updated for the 0C height and 0C wet bulb height



In Build 19, the labels for 0 degrees Celsius height and 0 degrees Celsius wet bulb temperatures were listed as 0 – 70 kft, however restrictions were put in place that did not allow the operator to set these parameters at values higher than 26 kft. This created a discrepancy between what was visible in the Environmental Data Editor and what was allowed. In Build 20, this discrepancy is corrected with the labels as shown here.



In the past, if Level II data stopped flowing and was caused by the LDM task itself, sites had to restart their RPG B processor and then restart their RPG A processor to get Level II data flowing again because this was the only way to restore the LDM processes. The drawback to this was this action interrupted all data flow, so a site would be completely down during these reboots. With this build, there are now two buttons added to the Archive II Window, "Restart" and "Reinitialize". The "Restart" button restarts the LDM processes. "Reinitialize" does a little more. It wipes out the LDM queue and then restarts the LDM processes. With these buttons, sites won't go completely down during the restart/reinitialize of the LDM processes since the need for reboots are now removed, but it is important to note that it will not solve all Level 2 data flow problems.

GUI Changes

- When velocity increments changed from 1.94 back to 0.97 kt a RPG restart was required
- STA references removed from selectable parameters
- Excessive red banners from non-dedicated connections fixed

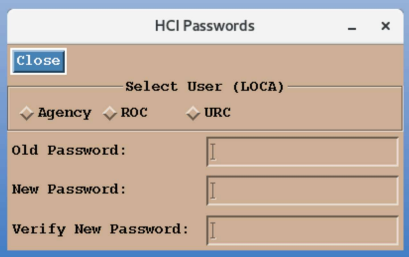
A bug previously caused a need for an RPG restart when you changed the velocity increment back to 0.97 from 1.94 kts. That bug has now been fixed.

With STA being removed in Build 19, references to it have been removed from the selectable parameters window.

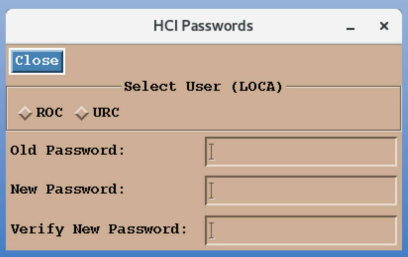
Excessive red banner alerts normally coming from RMRs have also been addressed.

Removal of the Agency Level Password and all References to Agency LOCA Adaptable Parameters

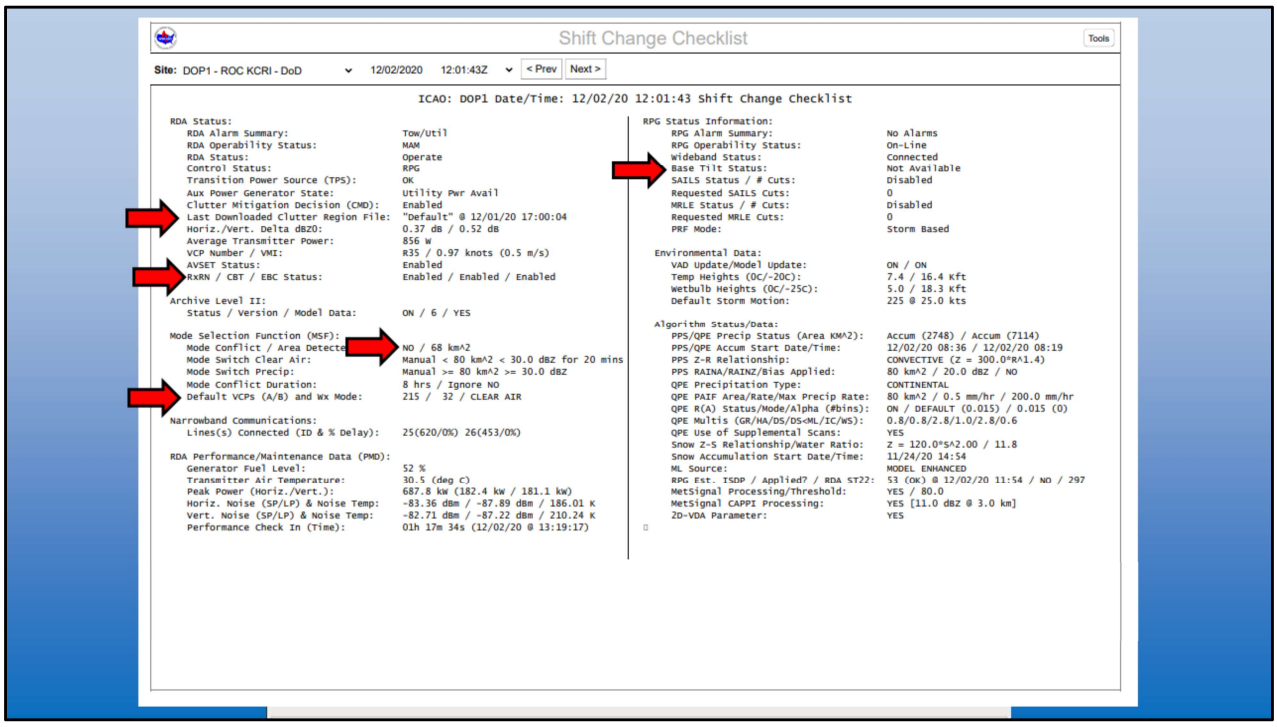
B19 HCI Passwords GUI



B20 HCI Passwords GUI



All parameters now reside at the ROC and URC change authority and so the Agency authority is no longer needed. Anytime you click the padlock button within the Algorithms window to change adaptable parameters or click Miscellaneous from the RPG HCI and click HCI Passwords, you'll no longer see the Agency radio button. You can see this in the GUI update comparison between Build 19 on the left and Build 20 on the right.



The shift change checklist has undergone some changes. The super-resolution entry in the RDA section was removed, as mentioned before, assuming now that you'll always have that enabled.

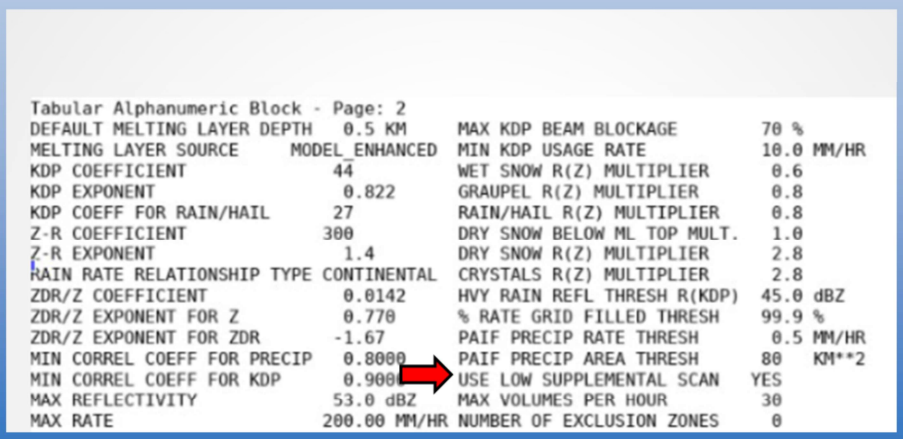
The last downloaded clutter region file was moved up the RDA list, just below the CMD status.

Status information for RxRN, CBT, and EBC were added to the RDA section.

For mode conflict the size of the area detected has been added.

The radars default VCPs have been added, and Base-tilt status was added. When Base-Tilt is enabled, PPS and QPE use the low level angle in their estimates. In other words, if the radar is scanning at that angle, then it is being used by the precipitation algorithms. This is the status of supplementary low elevation angle tilts on sites that have added (in Build 19) tilts below zero point five degrees.

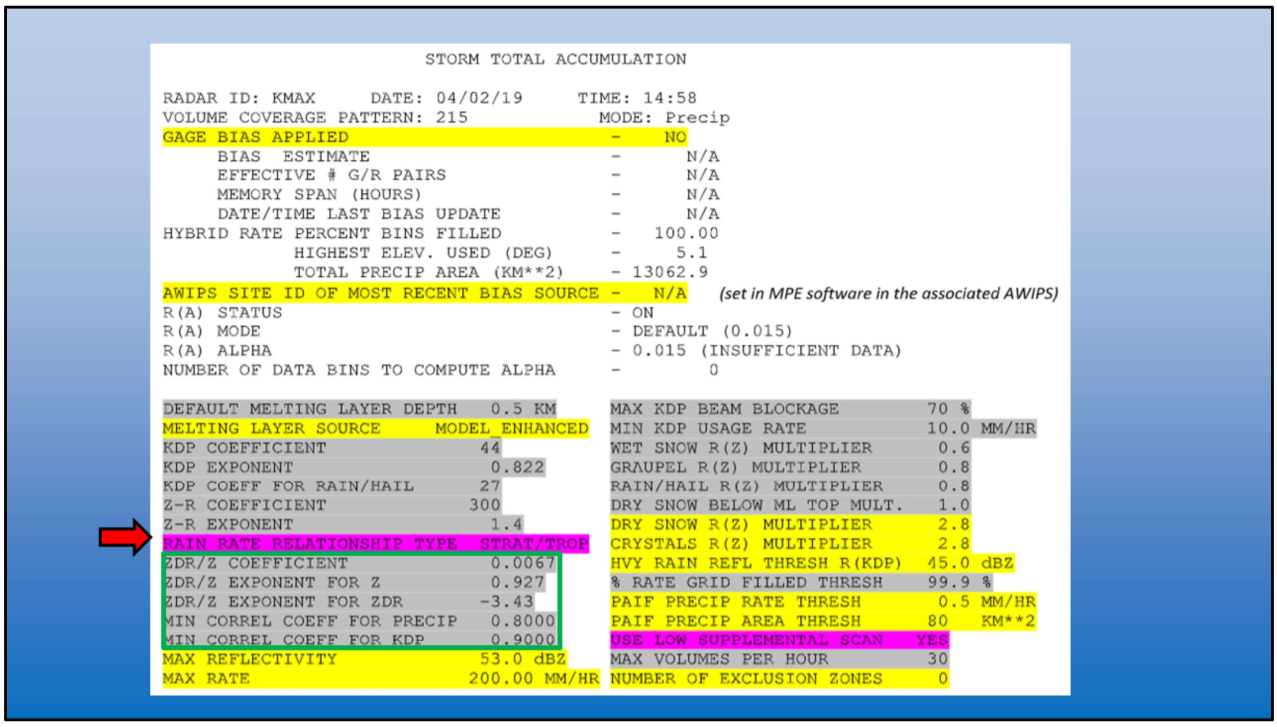
Included supplemental scans to DP QPE Adaptation Data



Tabular Alphanumeric Block - Page: 2

DEFAULT MELTING LAYER DEPTH	0.5 KM	MAX KDP BEAM BLOCKAGE	70 %	
MELTING LAYER SOURCE	MODEL_ENHANCED	MIN KDP USAGE RATE	10.0	MM/HR
KDP COEFFICIENT	44	WET SNOW R(Z) MULTIPLIER	0.6	
KDP EXPONENT	0.822	GRAUPEL R(Z) MULTIPLIER	0.8	
KDP COEFF FOR RAIN/HAIL	27	RAIN/HAIL R(Z) MULTIPLIER	0.8	
Z-R COEFFICIENT	300	DRY SNOW BELOW ML TOP MULT.	1.0	
Z-R EXPONENT	1.4	DRY SNOW R(Z) MULTIPLIER	2.8	
RAIN RATE RELATIONSHIP TYPE	CONTINENTAL	CRYSTALS R(Z) MULTIPLIER	2.8	
ZDR/Z COEFFICIENT	0.0142	HVY RAIN REFL THRESH R(KDP)	45.0	dBZ
ZDR/Z EXPONENT FOR Z	0.770	% RATE GRID FILLED THRESH	99.9	%
ZDR/Z EXPONENT FOR ZDR	-1.67	PAIF PRECIP RATE THRESH	0.5	MM/HR
MIN CORREL COEFF FOR PRECIP	0.8000	PAIF PRECIP AREA THRESH	80	KM**2
MIN CORREL COEFF FOR KDP	0.9000	USE LOW SUPPLEMENTAL SCAN	YES	
MAX REFLECTIVITY	53.0 dBZ	MAX VOLUMES PER HOUR	30	
MAX RATE	200.00 MM/HR	NUMBER OF EXCLUSION ZONES	0	

The inclusion of supplemental scans, like SAILS and MRLE scans, to the dual pol QPE adaptation data are now confirmed in the alphanumeric adaptation data product. The capability of using this data was already included in Build 19, but it was not reported in the adaptation data product.



STORM TOTAL ACCUMULATION

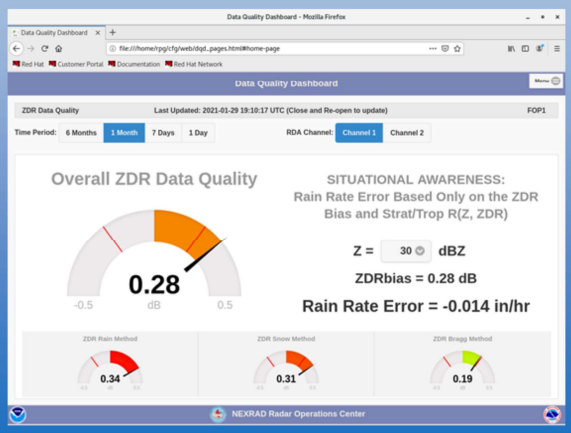
RADAR ID: KMAX DATE: 04/02/19 TIME: 14:58
VOLUME COVERAGE PATTERN: 215 MODE: Precip

GAGE BIAS APPLIED	- NO		
BIAS ESTIMATE	- N/A		
EFFECTIVE # G/R PAIRS	- N/A		
MEMORY SPAN (HOURS)	- N/A		
DATE/TIME LAST BIAS UPDATE	- N/A		
HYBRID RATE PERCENT BINS FILLED	- 100.00		
HIGHEST ELEV. USED (DEG)	- 5.1		
TOTAL PRECIP AREA (KM**2)	- 13062.9		
AWIPS SITE ID OF MOST RECENT BIAS SOURCE	- N/A	*(set in MPE software in the associated AWIPS)*	
R(A) STATUS	- ON		
R(A) MODE	- DEFAULT (0.015)		
R(A) ALPHA	- 0.015 (INSUFFICIENT DATA)		
NUMBER OF DATA BINS TO COMPUTE ALPHA	- 0		
DEFAULT MELTING LAYER DEPTH	0.5 KM	MAX KDP BEAM BLOCKAGE	70 %
MELTING LAYER SOURCE	MODEL_ENHANCED	MIN KDP USAGE RATE	10.0 MM/HR
KDP COEFFICIENT	44	WET SNOW R(Z) MULTIPLIER	0.6
KDP EXPONENT	0.822	GRAUPEL R(Z) MULTIPLIER	0.8
KDP COEFF FOR RAIN/HAIL	27	RAIN/HAIL R(Z) MULTIPLIER	0.8
Z-R COEFFICIENT	300	DRY SNOW BELOW ML TOP MULT.	1.0
Z-R EXPONENT	1.4	DRY SNOW R(Z) MULTIPLIER	2.8
RAIN RATE RELATIONSHIP TYPE	STRAT/TROP	CRYSTALS R(Z) MULTIPLIER	2.8
ZDR/Z COEFFICIENT	0.0067	HVY RAIN REFL THRESH R(KDP)	45.0 dBZ
ZDR/Z EXPONENT FOR Z	0.927	% RATE GRID FILLED THRESH	99.9 %
ZDR/Z EXPONENT FOR ZDR	-3.43	PAIF PRECIP RATE THRESH	0.5 MM/HR
MIN CORREL COEFF FOR PRECIP	0.8000	PAIF PRECIP AREA THRESH	80 KM**2
MIN CORREL COEFF FOR KDP	0.9000	USE LOW SUPPLEMENTAL SCAN	YES
MAX REFLECTIVITY	53.0 dBZ	MAX VOLUMES PER HOUR	30
MAX RATE	200.00 MM/HR	NUMBER OF EXCLUSION ZONES	0

Build 20 is adding the name of the R of Z ZDR rainfall rate relationship to the DP QPE Digital Storm Total Accumulation Adaptation data text. The coefficient and exponents are still listed (see in the green square below STRAT/TROP in the example). It's just now, you don't have to remember which relationship has which exponents.

ZDR Bias Estimate and DQD Update

- Weighted ZDR bias estimate now available in Level II data



External users have requested that the weighted ZDR bias estimate be available in the Level II data, so this is implemented in Build 20. This update should have little to no impact for operators, as NWS users will still primarily get ZDR bias information from the Data Quality Dashboard. It may be helpful to be aware of this change, however, when it comes to supporting our partners. Additionally, the data quality dashboard has been updated to show Strat/Trop instead of Tropical when the RPG is using that relationship for R of Z, ZDR.

ZDR Changes

- ZDR Bias Estimate for Light rain updated
  -Reduces possible contamination from convective big drops

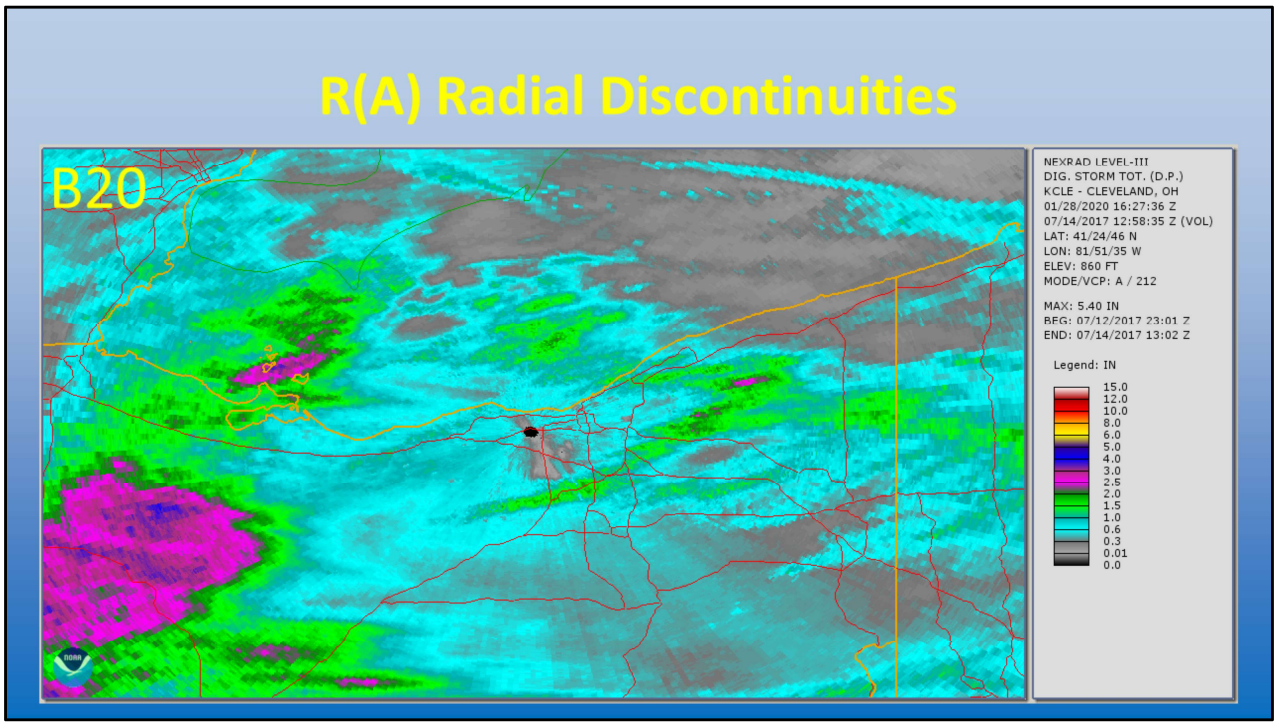
The ZDR bias estimate for light rain has been updated. The new method uses a narrower range of reflectivity in an effort to reduce contamination from big convective drops. The light rain method currently in use, tends to a high bias because big drops have a higher ZDR.

QPE Changes

- QPERATE Fix
  - -Occasional error where CPU usage exceeded thresholds stopping QPE

A bug was uncovered in Build 19 where the specific attenuation algorithm caused CPU usage to occasionally exceed 50% in widespread precip. events, which led to QPE Failure. QPERATE has been optimized to reduce CPU usage to below 50%, but it will be allowed to go up to 80% which should keep QPE working with no issues.

R(A) Radial Discontinuities

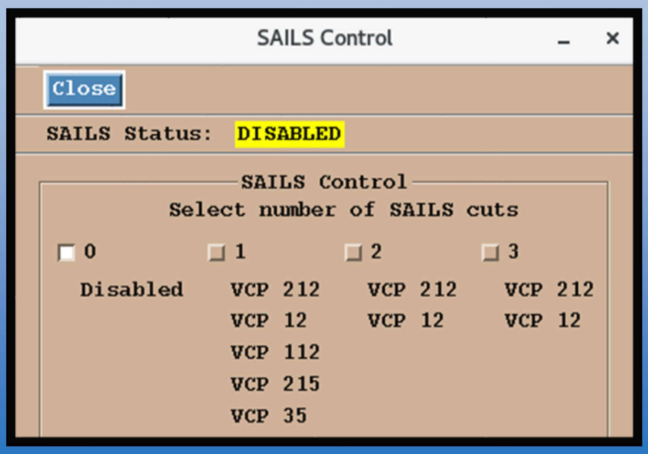


Early specific attenuation or R of A showed radial discontinuities in widespread stratiform precip. events. Changes have been made which should improve this.

In this example, you can see digital storm total precip. data from Build 19.

And now for Build 20 a subtly smoother product is apparent.

SAILS Control Window Updated



The list of VCPs allowed for SAILS x1, x2, and x3 were updated to have the same look and feel as the MRLE window.

RDA Changes

- RDA now gets its time from the National Level 2 servers.
- RDA Router Replaced
- Elevation Bias Correction now on by Default

The RDA used to get its time from an on-site GPS. That GPS is being removed and the RDA will get its time from the RPG which gets its time from the National Level 2 servers.

The RDA router is being replaced.

Elevation Bias Correction (EBC), which is where the RDA measures potential errors in dish elevation has previously been turned off by default. With Build 20, the EBC is being turned on, and when EBC is outside acceptable tolerances an RDA alarm will be triggered indicating a potential hardware issue.

Questions/Feedback

- Email: Justin.gibbs@noaa.gov

This concludes the NEXRAD Build 20 training. If you have any questions please contact Justin Gibbs at the email address listed on this slide.