

FY16 RAC Flash Flood Decision-Making Aid

1. How to pick your optimal precip source (for manual comparison and use in FFMP)

- a. Look at 1- and 3-hr FFG (Procedure #1)
 - o Become familiar with the values across your CWA
- b. Look for nearest radar and assess Melting Layer (Procedure #2)
 - o Use the ML as a proxy for where you have more confidence in your Dual-Pol QPE values
- c. Assess radar QPE biases: **BIAS/#G-R** (Procedure #2)
 - o **BIAS**: multiplicative factor (>1: radar QPE under-estimating, <1: radar QPE over-estimating)
 - o **#G-R**: num. of gauge-radar pairs used to calculate bias → need at least 10 pairs to use bias info
- d. Assess radar QPE biases: Compare QPE with observations (Procedure #3)
 - o NOTE: Make sure to compare QPEs with the same time as the observation
 - o 1-hr Legacy (OHP) and DP (OHA) compared to METARs (inches)
 - PXXXX group displays amount in XX.XX inches (e.g. P0324 = 3.24")
 - o Storm-total Legacy (STP) and DP (STA) compared to Mesonet gauges (mm)
 - Mesonets are daily accumulations, so need to compare the running totals
 - o Can use the QPE difference products (DOD and DSD) to compare how Legacy and DP differ
 - Difference = DP – Legacy (pos: DP > Leg, neg: Leg > DP)
- e. RAC precip source options for FFMP (Procedure #5+)
 - o ***DHR** (Legacy): good near the radar and when you want to use Legacy estimates
 - o DPR (DP): broken in FFMP this year - **do not use**, otherwise good to compare with Legacy in QPE products (step c)
 - o ***HPE** (DP mosaic): only source of Dual-Pol in FFMP, so use it if DP has better estimates
 - o BHPE (DP mosaic w/ biases applied): bad RFC biases this year - **do not use**
*options in FFMP

Constantly do #1!
Optimal precip
source can change
during event

2. Dual-Pol heavy rainfall signatures (Procedure #4)

Dual-Pol product	Values	Interpretation
Z	50-60 dBZ	Enhanced reflectivity
ZDR	2.0-5.0 dB	Increasing drop size
CC	> 0.96	Uniform precip type
KDP	> 1.0 deg/km*	Increasing liquid water content

- a. *Areas of KDP > 4.0 deg/km could indicate water-coated hail, so rain rates in these areas are suspect (use ZDR and CC to help diagnose hail)
- b. Supercells can still produce heavy rainfall without showing these signatures

3. FFMP best practices

- a. Set-up with “All & Only Small Basins” and “Ratio” product
 - o Ratio > 100% to identify areas of flash flooding (w/ consideration of biases found in #1)
 - o Diff > 0” to assess severity of the flash flooding
- b. Looks at 1-, 3-, and 6-hour durations (for both short-term and training potential)

4. Flash Flood Warning fundamentals

- a. Duration: no less than 3 hours
- b. Polygon size: As small as possible to account for the current and evolving threats
 - o Extend 1-2 basins downstream (use streams overlay or downstream trace)
 - o Extend in areas where short-term threat is evolving
- c. Text includes:
 - o How much rain fell?
 - o How much more is expected over the warning duration?
 - o Includes cities impacted
 - o 1-2 CTAs and LSRs included