

MPE Software Upgrades for Dual Pol Radars

Edward Clark, Paul Tilles, David Kitzmiller

Mark Fenbers, Joshua Palmer

Staff of SERFC, OHRFC, WFO FFC

Sep 19, 2012

Topics for Today

- Goals of the project
- Brief science review
- Feedback from field offices:
 - OHRFC
 - SERFC
 - WFO FFC
- AWIPS II

Project Goals

- Enable ingest and use of dual-polarization QPE (DPQPE)
- Enable multisensor merging of DPQPE, gauge data
- Calculate mean-field bias for DPQPE
- Enable comparison of DPQPE and legacy products:
 - Radar-only
 - Radar-gauge
- Hourly Digital Accumulation Array (DAA) provides dual-polarization analog to Digital Precipitation Array (DPA)

Science Notes

- **Comparisons of DPQPE and PPS by NSSL (Steve Vasiloff):**
 - Analysis of approximately 75 study cases
 - A case is 30-400 gauge/radar pairs in one radar umbrella in 24-hour period
 - Statistics based on 24-h precipitation totals
 - Primarily radars east of 105° W
 - April-July 2012
- 73 cases using all gauge sites within 230km:
- 62 cases using all gauge sites within 120-150km:
- **Dual-pol gave smaller RMS error in majority of cases**
- **Comparisons of DPQPE and PPS by ROC (Steve Cocks)**
 - Analysis for KICT, KVNK, KOUN, KMHX, total 38 cases
 - Data from 2011
- **Significantly smaller RMS errors for DPQPE in heavy precip events**

New and Changed Software

DAA Product Decoder

- Runs in same manner as the DPA decoder
- Background job
- Writes to a daily log
- Writes to the new DAARadar table in IHFS db
- Outputs grid as a binary file read by MPE FieldGen
- DAA Decoder Operations Guide written

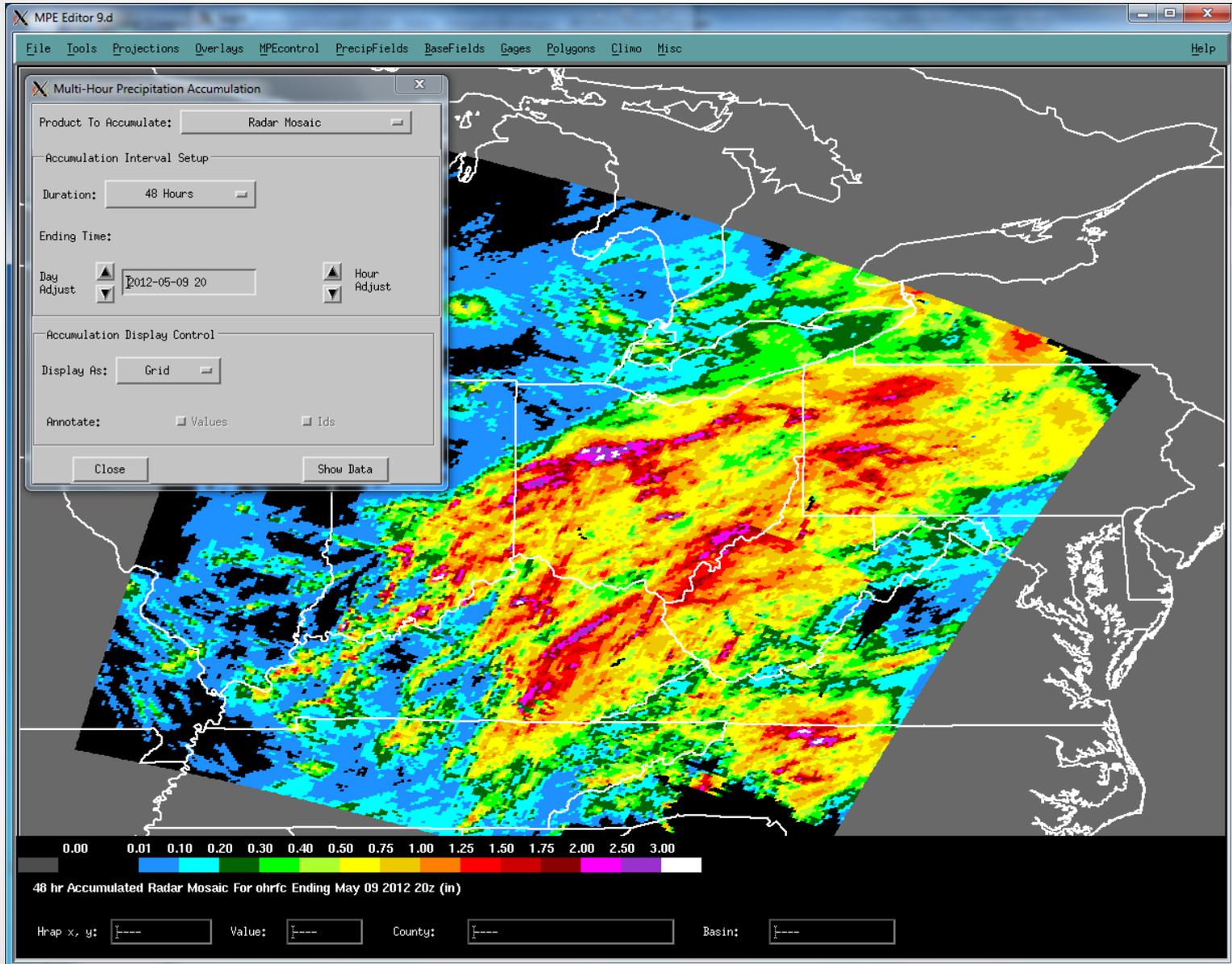
MPE FieldGen Changes

- 11 New Directories, 12 New Tokens
- 3 New IHFS db Tables
- 9 New DP related fields
 - RDMOSAIC
 - BDMOSAIC
 - LDMOSAIC
 - MDMOSAIC
 - MLDMOSAIC
 - SRDMOSAIC, SRDGMOSAIC
 - LOCDPBIAS, LOCDPSPAN
- Mean Field Bias and Local Bias generation for DP radars
 - Use same logic as for SP radars

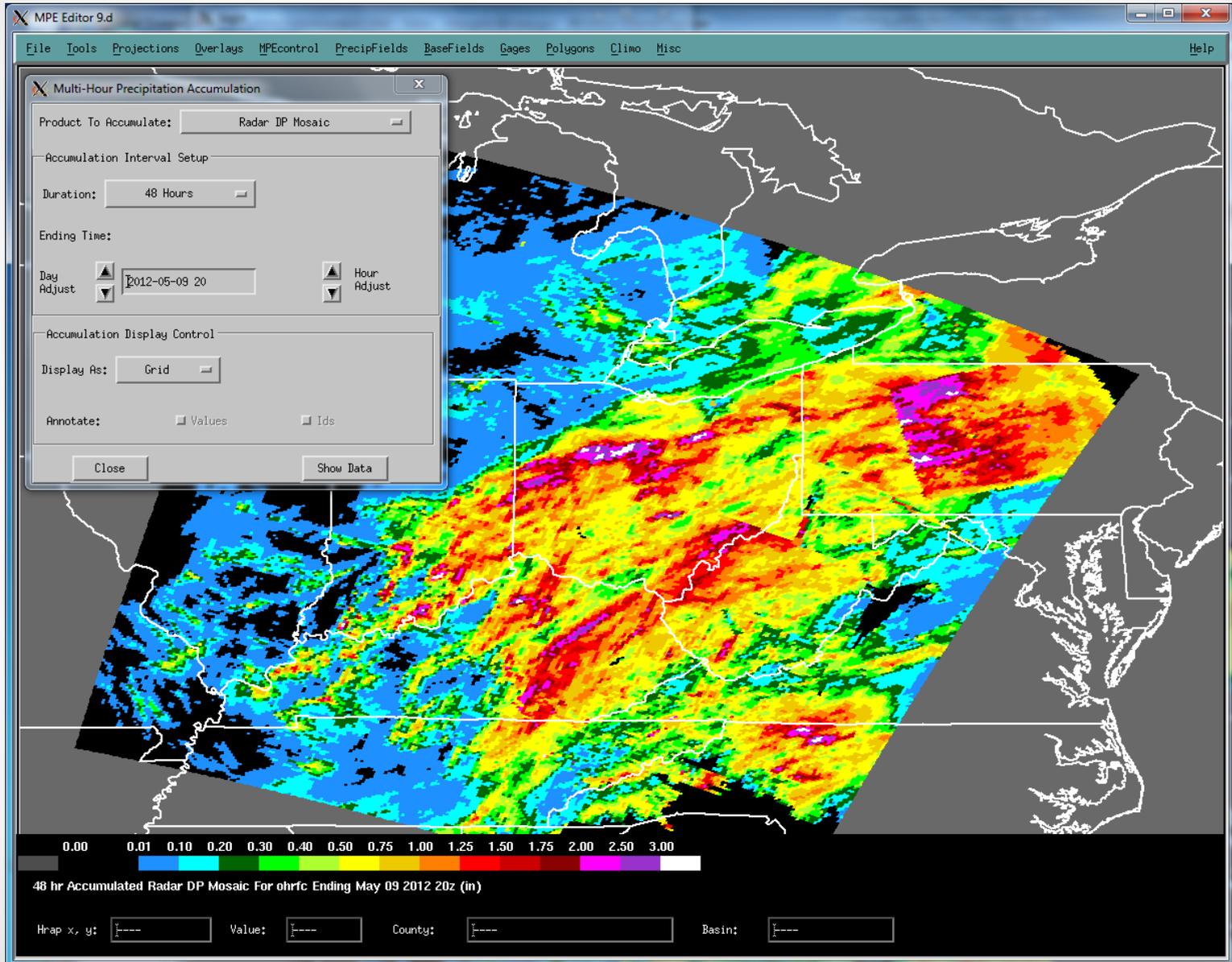
MPE FieldGen Changes

- RDMOSAIC Field Logic
- For each radar
 - If DAA product is available, use it
 - Else If DPA product is available, use it
 - Else radar field is set to all missing
- Each step above also checks the ignoreRadar flag

48-Hour Single-pol Accumulation Ending 20Z 09 May 2012



48-Hour Dual-pol Accumulation Ending 20Z 09 May 2012



MPE Editor Changes

- Display of 7 new DP fields
- New Difference Field option
 - Can be used for both DP and SP fields
- New Ratio Field option
 - Can be used for both DP and SP fields
- Modified Radar Coverage Field legend
 - Added "S", "D", "M" signifying SP/DP/Missing field
- Added display of DP Radar MFB Values to Edit Bias Table Window
- Four-Panel Window
 - Added display of DP radar field
 - Enhanced "Ignore Radar" option to include DP radar (in progress)
- New DP fields added to all field lists (7x7, Gage Table, polygon edits, Multi-Hour)

Enhancements in Aug/Sep 2012:

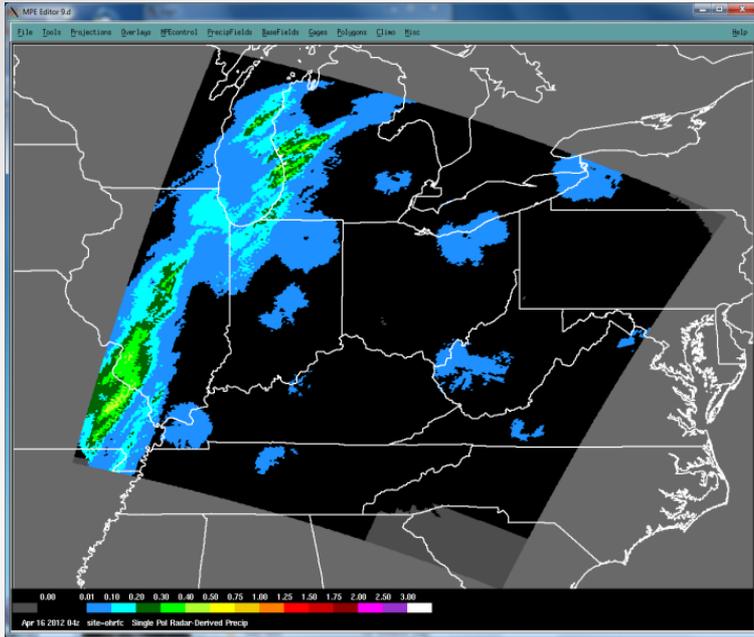
- Enhancements

- Ignore Radar option expanded to include both DP and SP radars
- Added option to edit mean-field bias value for DP radars
- Field names spelled out on polygon window

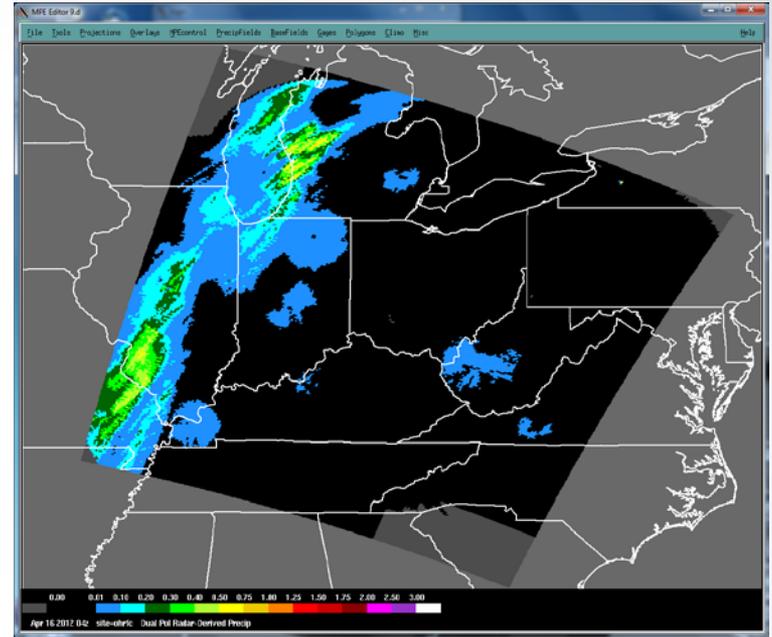
- Bug fixes

- DP multi-sensor field grid values not equal to gage values at location of gage
- Max and Avg RDMOSAIC fields same as RDMOSAIC field
- SP radar MFB values not applied properly in the BDMOSAIC (affects MDMOSAIC field also)

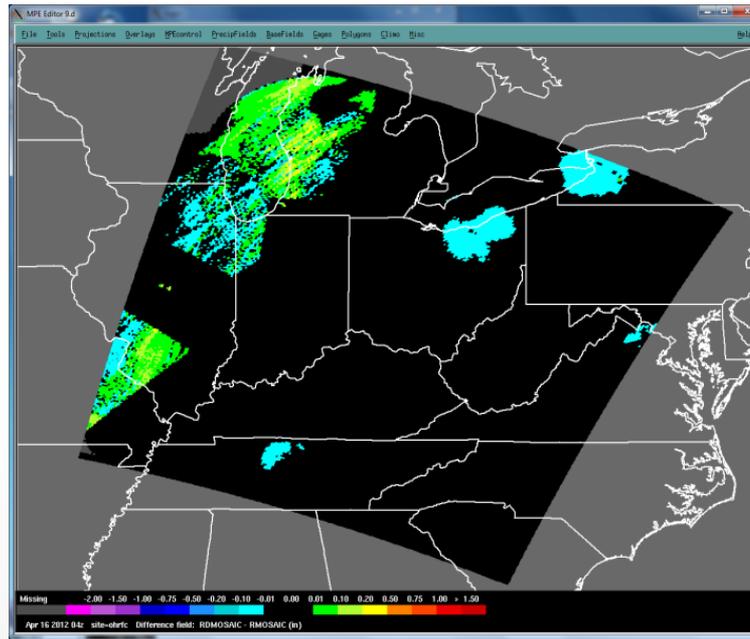
Single-pol 1-h accumulation



Dual-pol 1-h accumulation



Single-pol minus Dual-pol



Testing

Testing at OHD

- Running DAA decoder and MPE for MARFC and OHRFC areas
- Running DAA decoder for WGRFC area

Field Testing

- ATAN 1077
- nmtw
 - Installed on June 18
- SERFC
 - Installed on June 20
- OHRFC
 - Installed on June 26
- FFC (Peachtree City WFO)
 - Installed on July 25

Comments from Field Testers:

- OHRFC (Mark Fenbers and others)
- SERFC (Josh Palmer and others)
- WFO FFC (Kent Frantz)

Comments from OHRFC:

- Mark Fenbers and other HAS staff reported
- General impression of DP products:
- “We don’t see much difference...”
- “ ...DP does show light precip much better ... at cost of ... more ground clutter”
- Have applied dual-pol QPE in a few final products
- Still needs to be done:
- “[time/space] shifting of DP data needs to be fixed...”
- “ ...need to see what DP data looks like in cold weather.”
- “ ... more needs to be done with eliminating clutter.”

Comments from SERFC:

Integration into AWIPS 2

- Now being planned
- Schedule subject to many staff/system constraints
- Current target late 2013

Thanks to...

- OHRFC staff
- SERFC staff
- WFO FFC staff
- OST staff:
 - Oanh Nguyen
 - Ana Rivera
 - Dario Leonardo
- ROC staff