A Review of the 23 June 2016 West Virginia Historic Flash Floods: Use of emerging observational technologies to monitor threats

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Summary of Historic Flash Flood/Flood Impacts

- Multiple waves of organized convection developed south of stationary front and in vicinity of outflow boundary, with high rain rates and damaging winds
- Max 24hr rainfall 8-10" (200-250mm), much of which fell in less than 12 hrs
- Multiple locations experienced record and near-record flooding on streams/rivers
- 23 fatalities (15 in Greenbrier County), well over $100 million in road/property damage with thousands of homes damaged/destroyed

Hydrologic Impacts

- Record flooding on Dunlap Cr. near Covington VA (16.49 ft.) on 23 June 2016, indicating position of outflow boundary and convective complexes. Maps created by NOAA/NCEP/WPC.
- Summary of significant stream/river flooding (left) and two hydrographs (right): highest
- Radar reflectivity mosaic sequence for 0555 UTC (left) and 1600 UTC (right) on 23 June 2016, indicating position of front boundaries and convective complexes. Maps created by NOAA/NCEP/WPC.
- Recorded locations and stream hydrographs (FLASH) (Courtesy Univ. of Oklahoma/CIMMS/NSSL, but now available real-time at NWS Blacksburg and other offices).

Summary

- Historic FF event in terms of rainfall return frequency, fatalities, and stream/river flood levels
- Radar estimates, including MRMS, proved quite accurate (perhaps slightly on the high side) in areas with sparse gauge coverage and other radar limitations (range, topography of region, partial beam blockage), and were crucial for good warning decisions
- FLASH products (not viewed in real time during this event) show tremendous potential for monitoring FF and river flood threat levels, increasing lead times, and determining downstream impacts and locations as well as FFW polygon geography