

Best Practices of National Weather Service Blacksburg, VA as demonstrated during the 15 May 2009 Christiansburg, VA Flash Flood

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ABSTRACT

A significant flash flood occurred during the early morning of 15 May 2009 in Christiansburg, VA. Rainfall rates of 4 inches per hour and rainfall totals of more than 4 inches in less than 2 hours were observed. The NOAA Atlas-14 precipitation frequency estimates categorized the annual chance of occurrence of these precipitation totals at less than 1 percent in this area. The most intense rain fell over the downtown Christiansburg area, which also includes several small streams forming the headwaters of the North Fork Roanoke River, including Wilson Creek, as well as tributaries of the New River, including Crab Creek.

Analysis of the pre-storm environment is examined, including the elements listed in the National Weather Service (NWS) Blacksburg Severe Weather and Flash Flood Parameter Checklist. Methods used to enhance situational awareness on the mesoscale and storm scale are also reviewed. Key data from real-time rain and stream gage networks, as well as the NWS WSR-88D radar in Floyd County, Virginia is presented. This includes radar precipitation estimates as represented in the Flash Flood Monitoring and

Prediction (FFMP) and Areal Mean Basin Estimated Rainfall (AMBER) applications. The process by which NWS Blacksburg, VA forecasters assess these datasets, apply local expertise, and convey the heightened threat to the end users through warnings and other public products is discussed. Warning operations incorporate training from the Advanced Weather Operations Courses and the Weather Event Simulator. Local research of precipitable water trends and specific vulnerable locations are used, which includes a well-established database of historical flash flood locations and GIS displays of high threat small stream basins from geophysical datasets.

The sharing of successful practices with other NWS Offices contributes to the achievement of the overall mission of the agency. Other additional resources and methodologies that would further enhance flash flood warning operations at NWS Blacksburg and surrounding offices are suggested.