Title: Predicting flash flooding over the Washington/Baltimore National Weather Service Forecast Office's area of responsibility

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Abstract:

The Baltimore Washington National Weather Service (NWS) Weather Forecast Office (WFO), Sterling, VA, is responsible for issuing Flash Flood Watches and Warnings for much of Maryland, Northern Virginia, Eastern West Virginia, and the District of Columbia. This diverse region, bounded by the Chesapeake Bay to the east and the Appalachian Mountains to the west, is prone to flash flooding for a variety of factors. Flash flooding in this area varies year-to-year and month-to-month. This variability means forecasters have varying degrees of experience in working flash flood events.

This study gives forecasters additional tools to aid in anticipating favorable scenarios for flash flooding across the Baltimore/Washington NWS WFO's area of responsibility. Historical flash flood data were gathered from local storm data and the Storm Prediction Center's Severe Weather Events Database. These events were categorized into groups of similar traits (i.e., tropical, convective, cool season, snow melt, etc.). After the historical data and characteristics were established, research was conducted on a number of potential flash flood predictors. Using NCEP/NCAR reanalysis data, mean synoptic environments leading to flash flood events were developed in the form of regional maps. Additional meteorological parameters were analyzed from archived ROAB observations and other sources. In addition, geographic features, the influence of urbanization, and other non-meteorological factors were determined. The accumulated information was then used to develop training for forecasters to help them better decipher the risk for flash flooding in the WFO Baltimore/Washington County Warning Area.