

## **ABSTRACT**

**THESIS:** Flash Flooding Across the Southern Appalachian Mountains: An Abbreviated Climatology

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From 1981 to 2010 flooding claimed an average of 92 lives each year in the United States. According to the National Oceanic and Atmospheric Administration National Weather Service, in 2010 the number of flood-related fatalities (103) was second only to heat (138). Flash flooding is especially dangerous as sudden, torrential downpours from thunderstorms can cause gullies, streams, and creeks to rise quickly and become an immediate risk to life and property. Across the southern Appalachian Mountains this threat is aggravated by steep terrain and the rapid accumulation of rainfall in narrow valleys and gorges.

Severe storm reports were gathered from the National Climatic Data Center from 1996 to 2010. An emphasis was placed on flash flood events collected after the modernization of the National Weather Service in the mid-1990s when verification of storm reports became mandatory. Using a Geographic Information System, an abbreviated climatology of flash flood events was constructed to better understand the frequency and distribution of such events over the extent of the southern Appalachians. Additionally, forecasters and hydrologists provided insight on where flash floods occur most frequently across their County Warning Areas.

In total, there were 4,938 flash flood reports across the southern Appalachian Mountains from 1996 to 2010. Of those reports there were 71 fatalities and 64 injuries, many of which

occurred during the evening and overnight hours. Nearly 33 percent of all fatalities were associated with a vehicle and another 38 percent occurred when residents were swept away while traversing swollen creeks and streams. The information presented herein will assist meteorologists and hydrologists as well as those who would like to gain additional knowledge about flash flood climatology across the southern Appalachians.