

Appalachian Debris Flows: The Need to Increase Awareness and Preparedness

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ABSTRACT

The U.S. Geological Survey (USGS), as well as various state geological services and universities, have documented numerous landslide and debris flow (a specific category of landslide) events in the Appalachian region, both in modern times and inferred historical activity. Based on this history, as well as favorable geography and proximity to significant moisture sources which lead to a high frequency of heavy rain events, the USGS has concluded that a “high” level of susceptibility exists for landslides in this region. Furthermore, the Appalachian region is the most expansive high threat area identified in the United States.

Several well-documented significant debris flow events in the North Carolina and Virginia Appalachian region are briefly reviewed, and a summary of basic debris flow geology will also be presented. A majority of the most significant events occurred in association with remnants of tropical storm systems, and in many cases antecedent moisture was high due to previous heavy rainfall. A brief summary of the climatology of heavy rain associated with tropical remnants in the Appalachians will also be presented. Lessons learned from these events, including some geological reviews, have lead to some suggested criteria for considering an enhanced debris flow threat. The USGS has also published several preparedness and safety “fact sheets”, and has also released public alerts in the past (an example is provided for Hurricane Ivan in 2004).

Considering that the threat to the public from landslides and debris flows is steadily increasing in the Appalachians from continued development and slope modifications, often in areas already prone to these events, it is suggested that the NWS consider placing more emphasis on partnerships with the USGS and state geological agencies., The establishment ofing best practices for when to use enhanced debris flow wording in watches and warnings, and helping to provassistance in providinge public education during other preparedness activities should be explored. This has already begun in at least one office in the Appalachian region (WFO Greenville-Spartanburg). In addition, efforts to better-utilize GIS tools to display and overlay landslide-prone areas, including temporary fire scars, along with other physiographic information, along with observational data sets such as rainfall estimates and gridded flash flood guidance, should be aggressively pursued.