

## **Atmospheric conditions associated with the September 2013 Colorado extreme rainfall and flooding**

Russ Schumacher

Department of Atmospheric Science, Colorado State University

**Abstract.** From 9-16 September 2013, extremely heavy rain fell over a large portion of northern Colorado, and especially in Boulder and Larimer Counties. This resulted in deadly and destructive flash flooding in many creeks and rivers in the foothills and mountains, and record flooding of the South Platte River on the Plains. This presentation will review the synoptic and mesoscale conditions typically associated with extreme rainfall along the Front Range of the Rockies, and will assess how the conditions during the September 2013 compare with those identified in past research. Inferences about the importance of a terrain-induced mesoscale vortex and deep convective storms to the rainfall totals will be presented based on synthesis of radar, satellite, and lightning observations. The predictive skill of operational and research-based numerical prediction models will be assessed, and the output of convection-allowing numerical simulations will be examined to assess both the important processes and the potential sources of errors in the precipitation forecasts. Finally, discussion will be initiated about the broader implications of this event and directions for research going forward.