

Ensemble-Based Analysis of the June 2012 Rain and Hailstorm in Colorado Springs, CO: Forecast Uncertainty and Communication of Weather Information to Front Range Decision-Makers

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Abstract. On the evening of 6 June 2012, a severe thunderstorm caused significant damage within the city of Colorado Springs, Colorado. The aftermath included flooded homes, stranded motorists, and debris-filled streets, as the storm produced more than four inches of heavy rain and destructive hail. Such localized, high impact precipitation events have motivated this study into assessing how well warm-season convection along the Front Range may be resolved using high-resolution ensemble forecasts from the Weather Research and Forecasting model. Herein, an in-depth case study of the Colorado Springs hailstorm event is presented. Meteorological observations are used to investigate the conditions favorable to the development of the hailstorm event and its associated precipitation. In addition, the ensemble forecasts are evaluated in terms of the predictability of the event and forecast uncertainty. Preliminary results show that the high-resolution ensemble forecasts generated a realistic range of representations on the development and evolution of convection along the Front Range area during this particular event. This case is also used as a hypothetical weather scenario in order to examine how forecast information is gathered, interpreted, and used by local decision-makers under risk for such hazardous weather. Interviews with Front Range emergency managers are conducted to learn how weather information, presented in various formats, is understood and responded too. Examples include weather icons and text, modeled probabilities of precipitation, and simulated radar reflectivity. Overall, this study hopes to address the needs of decision-makers in relation to improving hazardous weather communication, understanding, and response.