

Russ Schumacher  
Colorado State University Department of Atmospheric Science

Wet weeks in the warm season: Patterns and processes supporting widespread multi-day heavy rainfall episodes

Warm-season precipitation in the central and eastern United States is produced in large part by mesoscale convective systems (MCSs). In general, heavy precipitation from these MCSs falls in relatively narrow corridors, which may cause extremes in the seasonal climate for small regions but not for large portions of the country. However, some warm seasons are characterized by widespread heavy precipitation, which can be caused by series of MCSs, by anomalous transport of tropical moisture into the subtropics and midlatitudes, or by long-lived slow-moving circulations. In these situations, large regions of the country may experience extreme rainfall and flooding, which can have relatively limited predictability at the medium to long range. In this presentation, we explore the weather systems associated with widespread, multiple-day heavy rainfall in the warm season. First, a climatology of heavy rainfall episodes is presented, which reveals that widespread heavy rainfall is relatively rare in the warm season, but when it does occur the impacts can be significant. Probabilistic medium-range forecast skill and uncertainty will be examined using ensemble forecasts from the THORPEX Interactive Grand Global Ensemble (TIGGE). Finally, the processes associated with long-lived, slow-moving, convectively induced circulations and their associated heavy precipitation will be presented, with a focus on cases from the warm seasons of 2002 and 2007.