A Predecessor Rainfall Event (PRE) Across Sections of the Ohio River Valley – Associated with Hurricane Katrina

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Katrina was the costliest and one of the deadliest Hurricanes ever to impact the United States, making it one of the most devastating natural disasters in modern American history. Katrina made landfall along the southeastern Louisiana coast as a Category 3 storm on the Saffir-Simpson scale, during the early morning hours of August 29, 2005. In the following days, the destruction this storm incurred along the immediate Gulf Coastal region translated into heavy rainfall and flooding, which spread well inland as the remnants moved north.

This presentation will focus on one of several predecessor rainfall events (PREs) associated with Katrina, which primarily affected sections of Kentucky and Southern Ohio on August 29, 2005, just hours after the center of Katrina first made landfall. PREs are coherent areas of heavy rainfall that occur well in advance of tropical cyclones (TCs), and are separate from the main precipitation shields. A brief review of past and current research on PREs will be given, concentrating most notably on large-scale ingredients that favor or discourage their occurrence, different categorizations of PREs, and the relationship between PREs and their parent TCs.

Areas of heavy convective rainfall developed during the morning of August 29, 2005, from Arkansas northeastward to Ohio. Eventually, one consolidated band of heavy rain formed, which produced as much as 150-200 mm (6-8”) of accumulated rainfall within a 6-12 hour period, over western and central Kentucky, with resultant flash flooding. Unfortunately, the larger rain shield directly associated with the remnants of Katrina also impacted this same area the next day (August 30, 2005). Subsequent heavy rainfall only exacerbated existing flood problems. As such, this became classified as an along-track PRE. These types of PREs can be especially dangerous, as two or more distinct heavy rain episodes tend to take place within a relatively short period of time.