

The Effects of Extreme Precipitation Events on Climatology

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Extreme weather events can drastically affect the local climate. For example, in September 2010, Albany, New York received 0.76 inches of rain over the first 29 days of the month. On 30 September, 2.68 inches of rain fell in association with a quasi-stationary boundary, resulting in a 0.13-inch precipitation surplus for the month. On paper, the total precipitation recorded for this month appears to be nearly normal. However, this “normal” month resulted from a singular extreme event. Three years earlier during May 2007 in Albany, NY, relatively small amounts of precipitation fell on 8 separate days, resulting in a cumulative monthly rainfall total of 3.51 inches, near the mean of 3.67 inches. Despite the extreme variation in the two monthly precipitation distributions, both of these months appear on paper to be “normal” because the cumulative monthly precipitation for both are comparable to the mean and monthly precipitation totals do not take into account the distribution of precipitation throughout the entire month.

This presentation will examine precipitation data records from a number of sites across the United States in an attempt to understand whether “normal” monthly cumulative precipitation is made up of several days of little precipitation, or a few days of extreme precipitation. A 30-year climatology of daily precipitation totals spanning 1981-2010 has been gathered for ten different cities across the United States. Each city was selected based on climate, geographic location, topography, and proximity to water bodies. Only the months of April through September were studied to limit issues associated with measuring liquid equivalent from snowfall. Preliminary results indicate that months with smaller rainfall totals generally featured fewer precipitation events per month and larger percentages of the total monthly rainfall accumulating during the largest single event. Conversely, months with larger rainfall totals generally featured more precipitation events each month and smaller percentages of the total monthly rainfall accumulating during the largest single event. One of the main controlling factors for extreme precipitation events was found to be the distribution of convection.