

Anomalous Summer Precipitation over New Mexico during 2006: Natural Climate Variability or Climate Change?

Shawn Bennett, Deirdre Kann, Ed Polasko
*National Weather Service, Albuquerque
Albuquerque, New Mexico*

David Gutzler
*University of New Mexico
Albuquerque, New Mexico*

In the summer of 2006, record amounts of precipitation were reported for much of New Mexico. For the combined months of July and August statewide precipitation was 210 mm, the highest since 1895, with 172 percent of the 1985-2006 average. Five of New Mexico's eight climate divisions also reported record precipitation during this period.

The months of July and August are generally considered to be thunderstorm season across New Mexico. While several different patterns can contribute to precipitation during these months, the North American Monsoon System is a major component of the thunderstorm season. Two distinct patterns were evident during the July/August period of 2006, with one pattern occurring in July and a second more persistent pattern in August.

In July, higher than normal pressure was located over or northwest of the state. Subtropical moisture took an indirect route into the state as associated with the pressure pattern. Thunderstorms often moved from north to south. In late July, a more typical monsoon regime developed with high pressure centered east of New Mexico and a low pressure trough located to the west. This circulation pattern was exceptionally persistent in August, and resulted in a large plume of moist air over the state for 28 consecutive days. Numerous days of heavy rainfall and flash flooding occurred, and record amounts of precipitation were reported at several stations.

For all areas across the state, the year started out very dry with an unusually low winter snow pack. Despite deficient precipitation in the winter and spring, the wet summer helped to lift both the calendar and water year precipitation to near or above normal for much of the state. In Albuquerque, calendar year 2006 remained very dry until the summer season, but by the end of August precipitation for the January through August period was 140% of the 30-year normal.

The extremes from winter to summer led to a number of inquiries – was the record-breaking monsoon a sign of climate change or an example of climate variability? Early results of this study indicate that while the summer of 2006 was exceptional in terms of precipitation for New Mexico, the anomalies were confined to a regional scale, with positive precipitation anomalies limited to New Mexico and extreme western Texas. We can surmise that the monsoon season of 2006 was not particularly abnormal averaged across the entire North American monsoon domain, but instead quite persistent on a local scale. Thus, we suggest that the summer of 2006 is likely an example of natural climate variability rather than climate change.