

## Another Flooding Rain Event in Louisiana Captured by a USCRN Station

The USCRN station at Lafayette, Louisiana, recorded an all-time record two-day storm total of 22.89 inches on 11-12 August 2016; this was also the largest two-day total for any USCRN station in the conterminous U.S., exceeded only by a two-day event at the USCRN station in Hilo, Hawaii, of 26.29 inches recorded in February 2008. The total at Lafayette also exceeded the 13-year station history maximum monthly total of 18.88 inches, set in June 2003. This event has an expected return period of over 500 years, meaning that for any given year, there is a 0.2% chance of this much rain falling in two days. Interestingly, the other USCRN station in Louisiana, near Monroe, also had a 1-in-500 year 2-day rainfall event earlier in 2016, when 16.30 inches of rain fell starting at around noon on March 8 (the amount to qualify as a 500-year event is less in northern Louisiana). The chance of two 500-year events occurring in one place in one year is 0.0004%, or once in 250,000 years. However, since these locations are almost 200 miles apart, the odds of both occurring in one year are closer to 0.2% due to the locations being independent of each other. It is still extremely unusual to have two independent events occur of such magnitude in one state in one year. Finally, the 30-day precipitation total for Lafayette station was 34.76 inches from 24 Jul – 22 Aug 2016, the third largest station 30-day maximum in network history, second only to USCRN stations at Hilo, Hawaii, and Quinault, Washington. The August 2016 total at Lafayette was 30.22 inches, exceeding June 2003 by more than 12 inches.

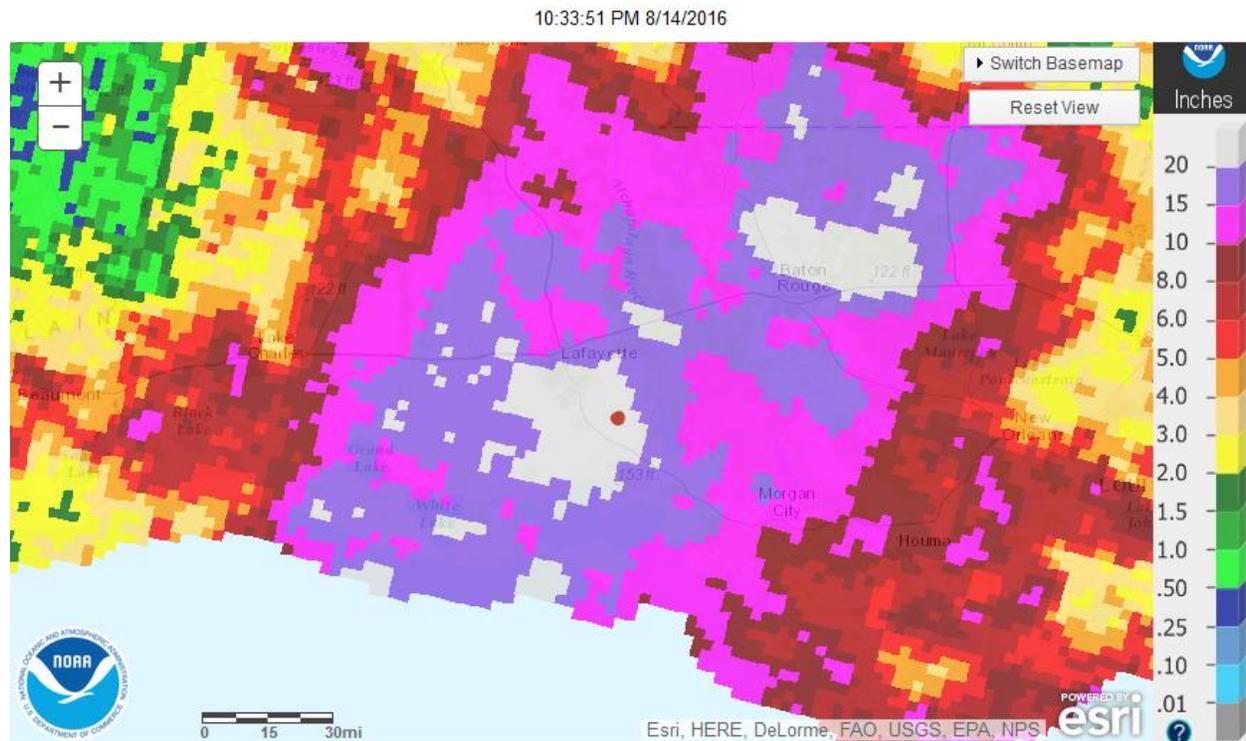


Figure 1. NOAA National Weather Service radar estimate of precipitation, 7-14 Aug 2016. The red dot is the location of the USCRN station near Lafayette, Louisiana.

While the damage caused by the rain event in March was significant, the August rain event greatly eclipsed that event in impact due to the much greater precipitation total and larger area impacted. The 7-day radar estimate of precipitation exceeded 20 inches by the morning of August 14 over two large areas near Lafayette and Baton Rouge (white areas in Figure 1), and exceeded 10 inches over most of the central area of the state (magenta areas in Figure 1). As of August 25, over 112,000 families had filed for assistance with FEMA, more than 60,000 homes and thousands of businesses were seriously damaged, and 20 Louisiana parishes were declared disaster areas. Water rose so quickly that more than 30,000 needed to be rescued by boat and high wheelbase vehicles, and 13 died. Major interstates were flooded, and over 100 state highway closures limited travel for days after the peak of the rain event.

The USCRN station near Lafayette operated throughout the event. However, during the morning of the 13<sup>th</sup>, the primary rain gauge filled to capacity. While this might have ended precipitation data collection in some networks, the USCRN maintains a back-up tipping rain gauge. It records liquid precipitation by counting how many times a container holding the equivalent of 0.01 inches of precipitation is filled and tips over. While not as accurate as the primary weighing bucket gauge, it has no limit on capacity so it kept recording on the 13<sup>th</sup>. Figure 2 shows the period when precipitation was recorded by the weighing gauge (red bar) and tipping gauge (gray bar). The USCRN site host was able to drain the bucket and restore the primary gauge once the site could be accessed a few days later.

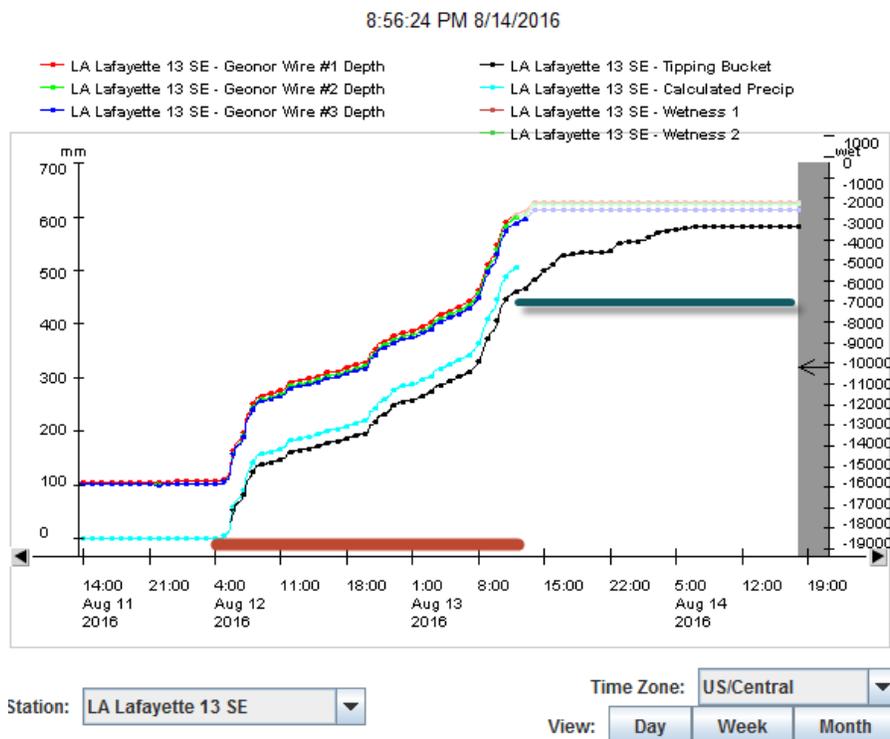


Figure 2. Precipitation graph from the USCRN Lafayette station on 11-14 August 2016. The red bar shows when the primary rain gauge operated; the gray bar shows the secondary gauge.