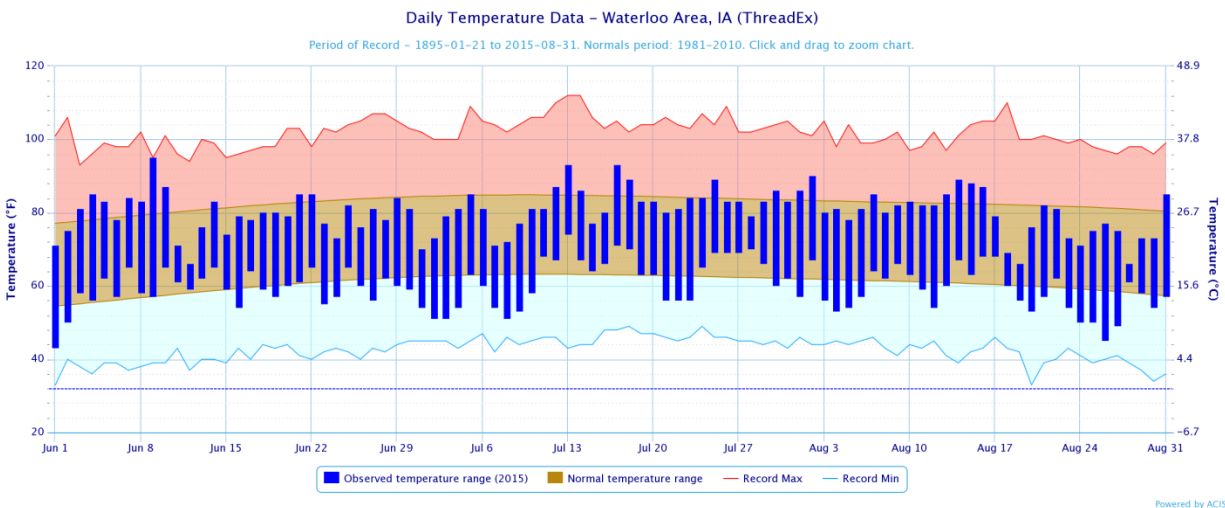


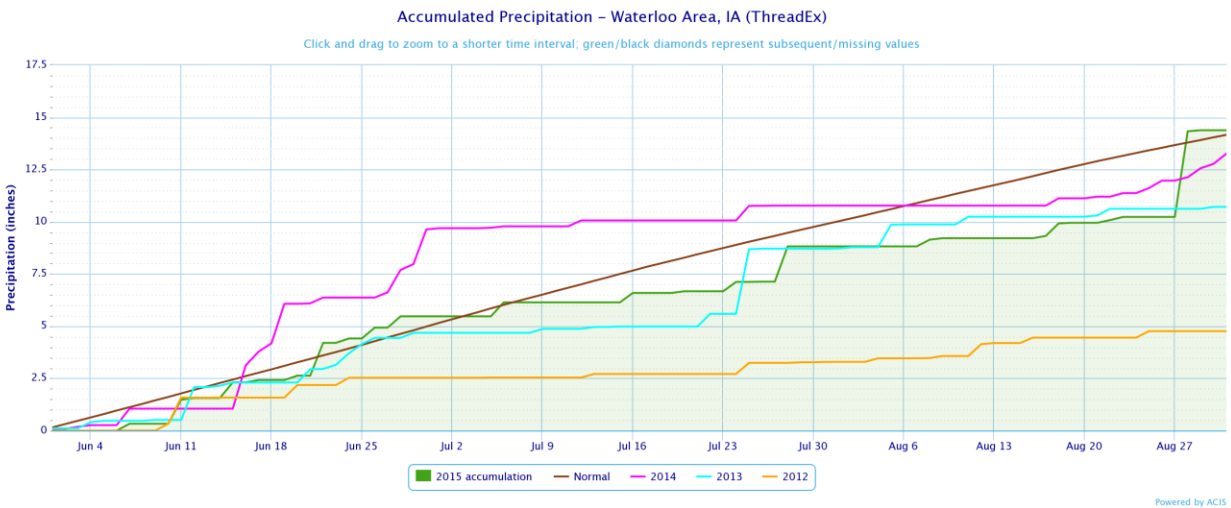
# A look back at Summer 2015 and A look forward to Autumn For Waterloo, IA

Summer 2015, defined by meteorologists as June through August, is now in the books. At Waterloo the average temperature over these three months was 70.0 degrees, which is a little below the normal value of 71.6 degrees. That places this summer in a tie for the 24<sup>th</sup>-coldest with records going back to 1895, and makes it the 3<sup>rd</sup>-coldest in the last 20 years. Meanwhile 14.38 inches of rain fell, which is only 0.22 inches above the normal value of 14.16 inches. Remarkably, 4.10 inches of the 2015 total fell in just one day on August 28, making it the 8<sup>th</sup>-wettest day on record at Waterloo and the 2<sup>nd</sup>-wettest day in the last 35 years.

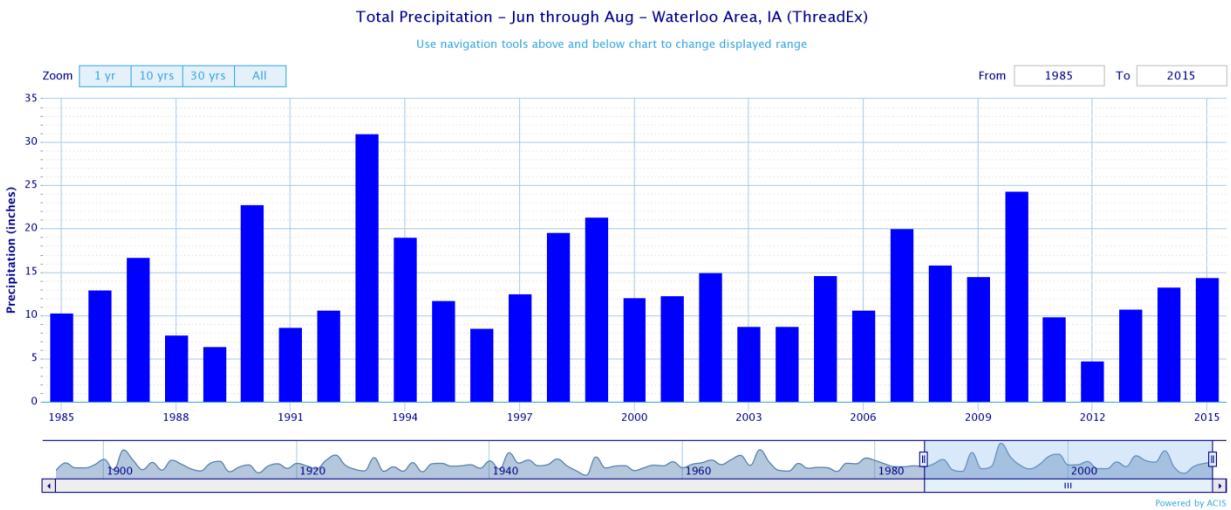
The graph below shows the high and low temperatures (represented by a blue bar) for each day this summer, with the normal values (brown band) and record values (red and blue lines) also plotted. Note that for most of the summer, temperatures stayed within or close to the normal range and no daily records were broken.



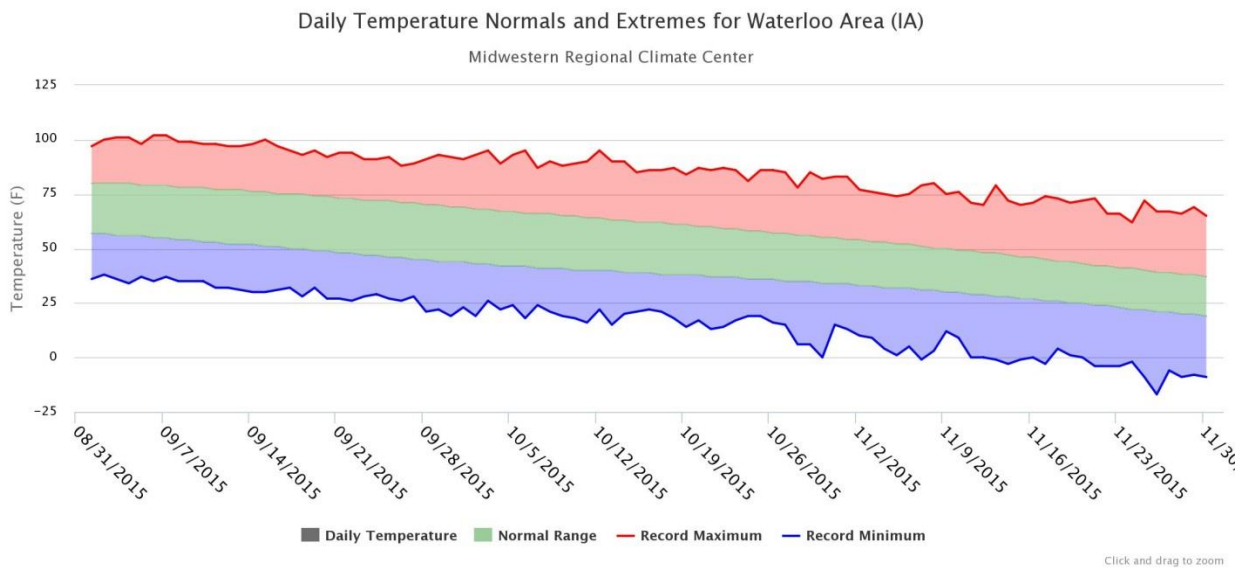
While summer 2015 saw a near-normal total rainfall at Waterloo, the graph below shows that precipitation was actually below normal for most of July and August until the impressive 4.10 inch rainfall discussed above. The graph also shows accumulation for 2014 and 2013, which were a little drier than normal, as well as 2012 which was a very dry year.



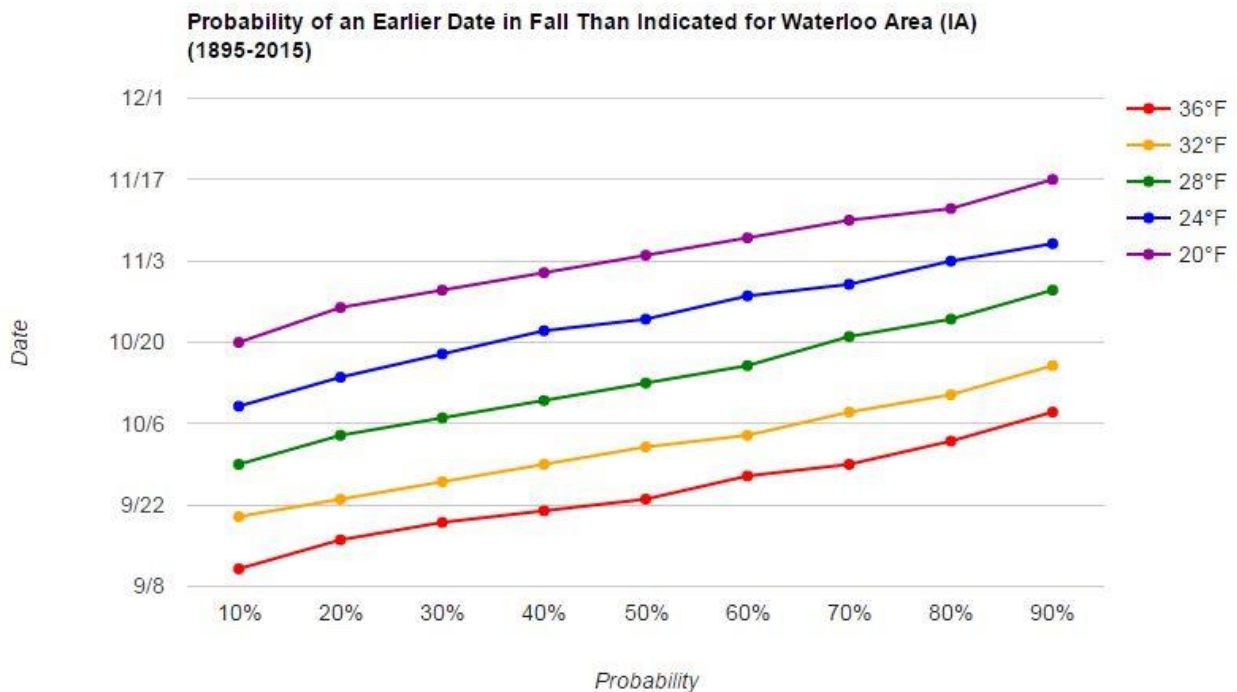
The 14.38 inches of rain that fell this summer, while only slightly above normal, makes it the wettest summer since 2010. Below is a graph of total precipitation for each of the last 30 summers, with 1993 standing out as easily the wettest during that time, and 2012 in particular depicted as remarkably dry.



Looking ahead to autumn, it is always a time of great transition particularly with regards to temperature. Daily normal temperatures will be falling steadily, accelerating downward from late October through November as depicted in the plot of daily normal and record temperatures below.



Along with the falling temperatures comes the question of when the first frost and freeze will occur. As can be seen below, half of the years on record at Waterloo have seen a freeze (temperature of 32 degrees or lower) by October 2<sup>nd</sup>, while 90 percent of years have seen a freeze by October 16<sup>th</sup>.



Finally, autumn also brings the first appearance of snow. At Waterloo the average date of the first flakes is November 2<sup>nd</sup>, but snow has fallen as early as September 25<sup>th</sup> during the remarkable storm of 1942. The average date of the first one inch snowfall is not until November 24<sup>th</sup>, but it has come as early as October 18<sup>th</sup> which occurred during the remarkably cold autumn of 1991.