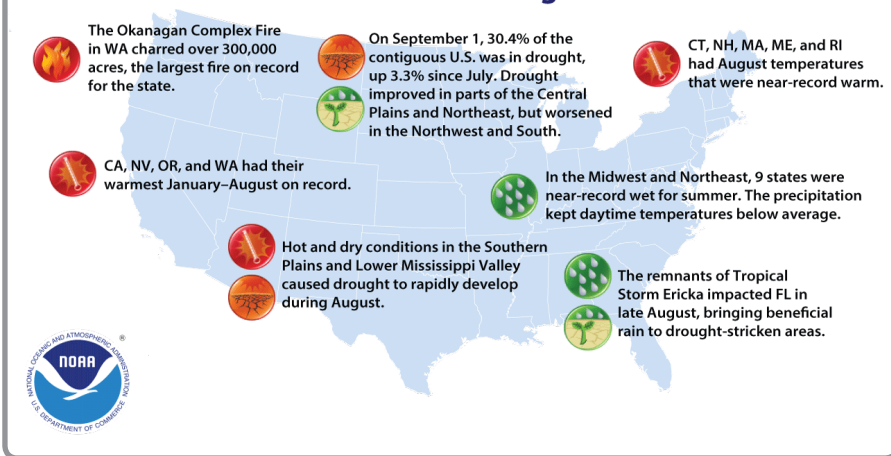


National - Significant Events for June - August 2015

U.S. Selected Significant Climate Anomalies and Events August and Summer 2015



The average U.S. temperature during August was 73.0°F, 0.9°F above average. The summer U.S. temperature was 72.7°F, 1.3°F above average. August U.S. precipitation was 2.36 inches, 0.26 inch below average. The summer U.S. precipitation was 9.14 inches, 0.82 inch above average.

Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: <http://www.ncdc.noaa.gov/sotc>

Highlights for the Basin

Although average temperatures were generally within a couple degrees of normal this summer, record warm minimums were a common occurrence in the region. For instance, in Cheyenne, WY, minimum temperatures in June never dipped below normal and ranked as the 2nd warmest on record.

It was an extremely wet summer for Missouri, which had its 5th wettest summer on record. June was 10th wettest and July was 4th wettest for the state. Numerous impacts resulted from the wet conditions.

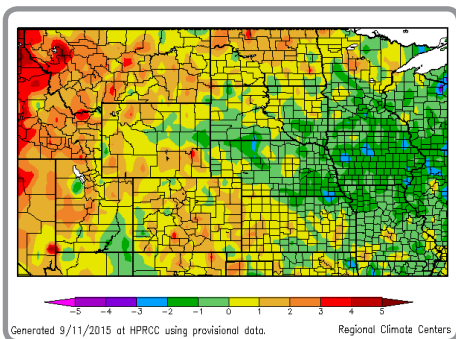
Heavy rainfall events continued to cause localized flash flooding in some locations. One example was Sioux Falls, SD, which received 6-8 inches of rain on the south side of the town during the evening of August 27th.

Due to the wet spring and summer, many locations have already surpassed their average annual precipitation totals, including Pueblo, CO, Lincoln, NE, and Rapid City, SD. With records going back to 1948, 2015 already ranks as the 4th wettest year on record for Rapid City.

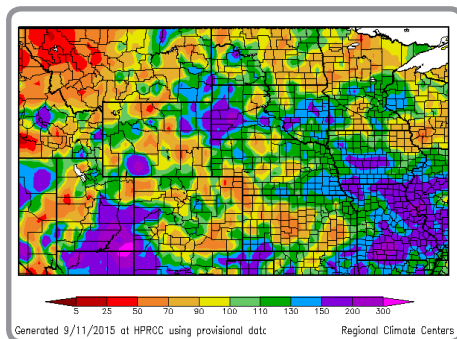
Regional - Climate Overview for June - August 2015

Temperature and Precipitation Anomalies

Departure from Normal Temperature (°F)
June 1 - August 31, 2015

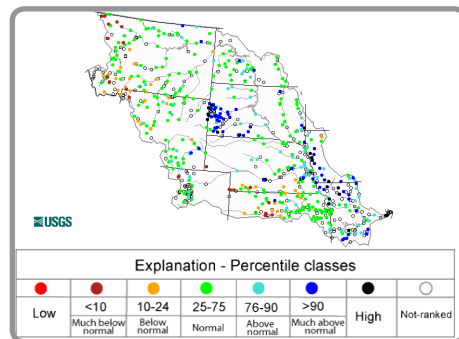


Percent of Normal Precipitation (%)
June 1 - August 31, 2015



Streamflow

Missouri Basin Monthly Average Streamflow
August 2015



Summer was, overall, near normal across the region with average temperature departures that were within a few degrees of normal. The summer started off quite warm, with above normal temperatures for much of the basin, especially in the west. In contrast, July temperatures were on the cool side with below normal temperatures through much of Colorado, Wyoming, Nebraska, and Missouri. August temperatures were also largely below normal with areas of Kansas, Missouri, and Nebraska recording the largest departures.

Precipitation varied across the region this summer. Generally, rains were lacking in upper parts of the basin, such as Montana, where drought conditions expanded and intensified. Meanwhile, central and lower parts of the basin, including Missouri, eastern Nebraska, and much of South Dakota, received at least 130% of normal precipitation. The last drought areas in Colorado, Kansas, Nebraska, and South Dakota were all eliminated by this summer's rainfall. In the areas of heaviest precipitation, flooding in urban and rural areas occurred.

According to data from the U.S. Geological Survey, both high and low streamflows occurred throughout the summer across the Basin. High streamflows were common all summer in the Black Hills of South Dakota, much of the early summer in areas of the Front Range in Colorado, and later in the summer along portions of the Missouri River in Nebraska, Iowa, Kansas, and Missouri. Below normal streamflows continued along the Republican River in Nebraska and also north-central Kansas.

Regional - Impacts for June - August 2015

Heavy Rains Continued

Heavy rains this year have continued to impact a variety of sectors in the region, from ecosystems and agriculture to water resources and utilities. On a broad scale, revenues were down for many local utilities along the Front Range due to the excessive and abundant water supplies. In Kansas, water even flowed in parts of the Arkansas River that have not seen water in several years. With the wet conditions this year, there are some initial indications that bird populations in the region are showing increases in population numbers as well.

Positive and Negative Impacts to Agriculture

Favorable growing season conditions for certain crops occurred in central and northern areas of the region where record corn and soybean yields are expected in Nebraska and South Dakota, and record hard spring wheat yields are forecast in North Dakota. But, wet conditions were problematic to other crops. Several winter wheat diseases were reported in Kansas, Nebraska, and South Dakota, and a rare disease, flag smut, was found in Kansas for the first time in 80 years. Agriculture, horticulture, and the timber industry in Missouri were also greatly impacted by wet conditions. For more detailed information see: <http://extension.missouri.edu/2015weather>

Persistent Smoke from Wildfires

Smoke from wildfires in Alaska, Canada, and the Pacific Northwest made its way to the central U.S. many times this summer. The persistent smoke created hazy skies, which reduced daytime high temperatures and increased nighttime low temperatures. Many people noted that the hazy skies led to beautiful sunrises and sunsets, but also obscured the mountain views in areas of the Rockies and Black Hills. On a serious note, some days there was enough smoke to impact air quality and create health issues for sensitive groups. Additionally, the haze reduced the incoming solar radiation, which is important for crop development; however, it does not appear to have had an impact on crops at this time.



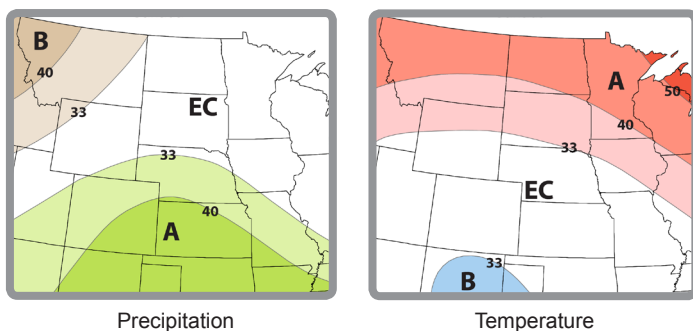
Above: (Top) Flooding in Cape Girardeau, MO, courtesy *The Washington Post*; (Center) winter wheat field with Fusarium head blight in South Dakota, courtesy SDSU Extension; and (Bottom) smoke over the skyline of Lincoln, NE, courtesy Ken Dewey.

Regional - Outlook for October - December 2015

MO River Basin Partners

3-Month Precipitation and Temperature Outlooks

Valid for October - December 2015



EC: Equal chances of above, near or below normal, A: Above normal, B: Below normal

According to the Climate Prediction Center, El Niño conditions continued this summer and will continue at least through the end of winter. This El Niño is expected to peak as a strong event later this fall and then slowly weaken through the winter and spring. There is a possibility that this event will be the strongest since records began in 1950.

Over the next three months, the outlooks favor increased chances for above-normal temperatures for northern parts of the region, such as Montana, North Dakota, South Dakota, and northern Wyoming. Meanwhile, the precipitation outlook shows increased chances for below-normal precipitation for upper parts of the basin, in areas of Montana and Wyoming, and above-normal precipitation for most of the central and southern parts of the basin, including Colorado, Kansas, much of Missouri, southeastern Wyoming, and the majority of Nebraska. Although not an issue at this time, above-normal precipitation later this fall could impact the harvest season if fields are wet and crops cannot dry down properly.

For more information about the El Niño and potential impacts this winter, please see the special report on El Niño in the Missouri River Basin here:

<http://www.drought.gov/media/pgfiles/ENSO-MOBasin-2015-Final.pdf>

High Plains Regional Climate Center
www.hprcc.unl.edu
Kansas State, Department of Agronomy
www.agronomy.k-state.edu
National Drought Mitigation Center
www.drought.unl.edu
National Integrated Drought Information System
www.drought.gov
National Oceanic and Atmospheric Administration
National Weather Service - Central Region
www.crh.noaa.gov/crh
National Centers for Environmental Information
www.ncdc.noaa.gov
Missouri River Basin Forecast Center
www.crh.noaa.gov/mbrfc
Climate Prediction Center
www.cpc.ncep.noaa.gov
National Operational Hydrologic Remote Sensing Center
www.nohrsc.noaa.gov

South Dakota State University Extension
<http://igrow.org>
State Climatologists
www.stateclimate.org
U.S. Army Corps of Engineers - Missouri River Basin
Water Management Division
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