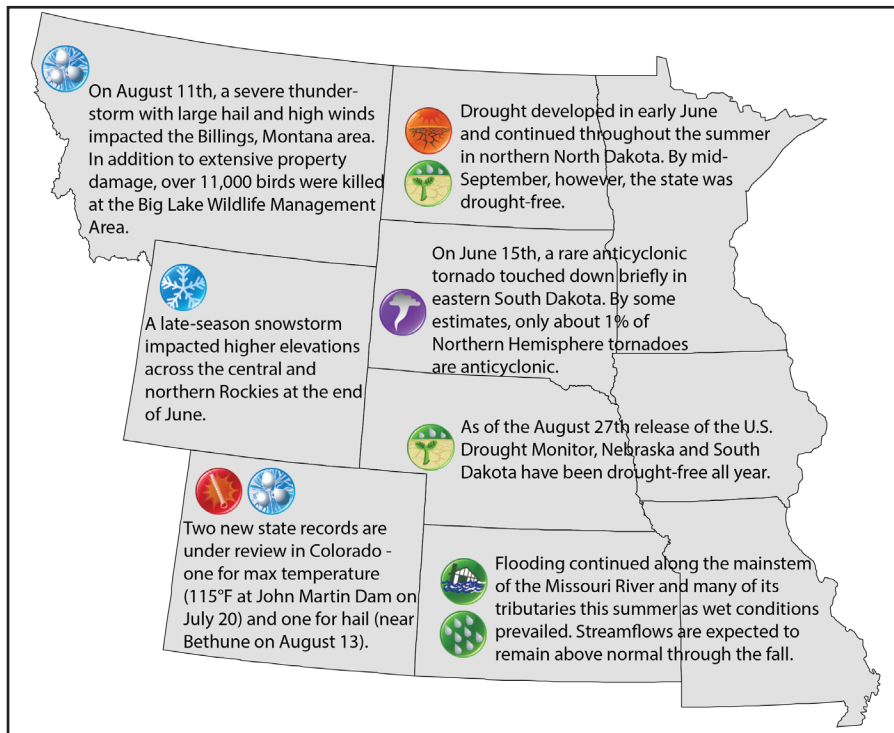




Regional – Significant Events for June - August 2019



Highlights for the Basin

The wet pattern continued across portions of the Missouri River Basin. Overall, summer 2019 was one of the wettest on record for SD (5th), NE (10th), and MO (12th).

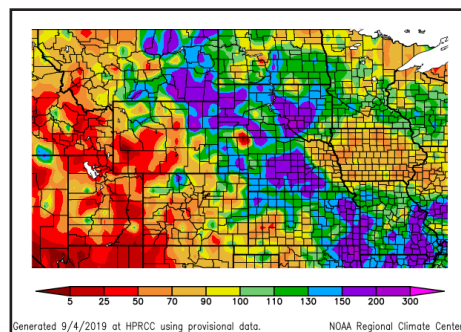
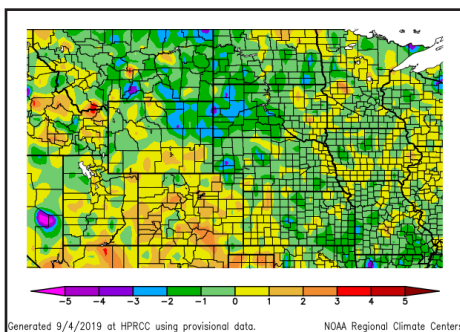
By the start of Fall, year-to-date precipitation at many locations was enough to already rank in the top 10 wettest years on record. With several months to go, annual records could be broken.

The 2019 runoff season is still on track to be one of the highest on record. As of September 13, the U.S. Army Corps of Engineers' 2019 runoff forecast for the upper Basin (above Sioux City, IA) was 58.8 MAF. If realized, this would rank as the 2nd highest upper Basin runoff since records began 121 years ago. The record of 61.0 MAF was set in 2011.

Regional – Climate Overview for June - August 2019

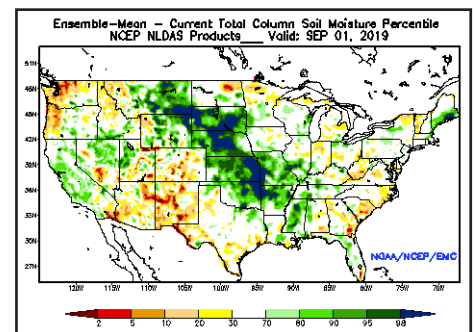
Temperature and Precipitation Anomalies

Departure from Normal Temperature (°F) (left) and Percent of Normal Precipitation (right) for Summer 2019



Soil Moisture Conditions

September 1, 2019



This summer, temperatures were largely near normal; however, minimum temperatures were slightly above normal, while maximum temperatures were below normal. These lower maximum temperatures hindered crop development. Meanwhile, extremes in precipitation occurred across the region. Areas of western Colorado and Wyoming ranked among the driest summers on record, while areas just to the east ranked among the wettest. August was particularly wet, with Kansas and Nebraska both having their wettest August on record. This summer's wet conditions were a further continuation of a generally wet pattern that has been in place since last year. The previous twelve month period (Sept. 2018-Aug. 2019) was the wettest on record for Kansas and South Dakota, and second wettest for Missouri and Nebraska.

Wet conditions continued to impact soil moisture this summer. By September 1, wet soils were evident along a line from eastern Montana through western Missouri where many fields were muddy or completely inundated. This could be problematic for fall harvest. The map above shows soil moisture conditions in percentiles from an ensemble of land surface models from NOAA's NLDAS.

Regional – Impacts for June - August 2019

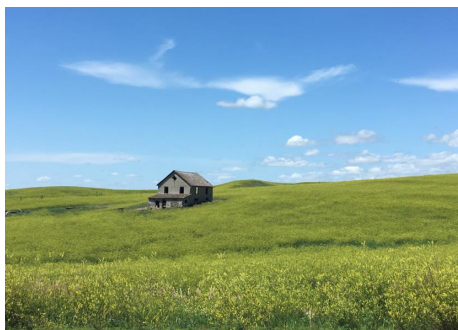
Delayed/Prevented Planting

Cool, wet conditions continued to impact producers this summer. A large number of acres went unplanted, with South Dakota leading the nation in prevented plant acres (3.9 million). For crops that did go in, progress was slow due to a combination of cool, wet conditions and late planting. This has some producers concerned about having a freeze before crops mature. At this time, there is no indication of when the first freeze will occur.



Forage Production

Overall there was ample forage production this summer, but extreme wetness and high humidity prevented grazing or haying, or degraded the quality of the forage. In parts of North Dakota, forage supplies were low due to drought. As a result, livestock producers in some areas have started selling off cattle. Conditions were also ideal for yellow sweet clover. Although a good source of forage, it can cause issues for cattle if not dried properly.



Infrastructure

Ongoing flooding continued to impact infrastructure this summer. But, where conditions improved, many roads and bridges were repaired and reopened.

Wet conditions also contributed to a collapse in the Goshen/Gering-Fort Laramie irrigation canal in eastern Wyoming on July 17. Water did not flow through the canal for six weeks, impacting more than 100,000 acres of irrigated crops in Nebraska and Wyoming.

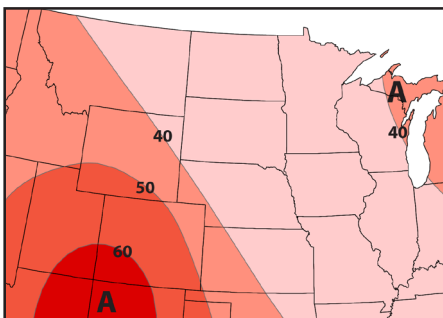


Above: Missouri River flooding, looking toward Omaha, NE, photo courtesy Dennis Today, USDA (left); Yellow sweet clover in South Dakota, photo courtesy Laura Edwards, SDSCO (middle); Flooding at the Nebraska State Fair, photo courtesy NWS Hastings (right).

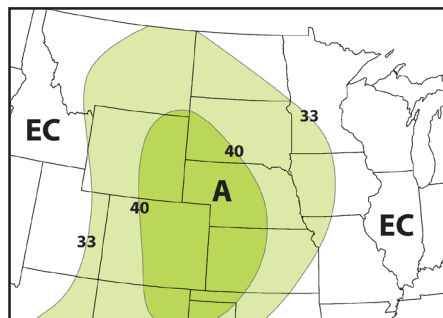
Regional – Outlook for October - December 2019

Temperature

Outlooks for October - December 2019



Precipitation



EC: Equal chances of above, near, or below normal

A: Above normal, B: Below normal

According to NOAA's Climate Prediction Center, El Niño conditions weakened this summer and transitioned to ENSO-neutral conditions in August. Over the next three months, above-normal temperatures are favored for the entire Basin. Above-normal precipitation is also favored across much of the Basin. Although precipitation is typically lower this time of the year, additional precipitation in saturated areas will cause further issues with runoff and flooding. Regardless of the conditions over the next few months, fall harvest will be delayed. In wet areas, additional moisture could slow harvest even further. Fall moisture could be beneficial for winter wheat planting, however.

MO River Basin Partners

High Plains Regional Climate Center
www.hprcc.unl.edu

National Drought Mitigation Center
<http://drought.unl.edu/>

National Integrated Drought Information System
<https://www.drought.gov/>

NOAA NCEI
www.ncdc.noaa.gov

NOAA NWS- Central Region
www.weather.gov/crh

NOAA NWS Climate Prediction Center
www.cpc.ncep.noaa.gov

NOAA NWS Missouri Basin River Forecast Center
www.weather.gov/mbrfc

American Association of State Climatologists
<https://www.stateclimate.org/>

U.S. Army Corps of Engineers
www.nwd-mr.usace.army.mil/rcc/

U.S. Bureau of Reclamation
<https://www.usbr.gov/>

USDA Natural Resources Conservation Service
www.nrcs.usda.gov

USDA Northern Plains Climate Hub
www.climatehubs.ocs.usda.gov

USGS, Water Mission Area
www.usgs.gov/water

Western Governors' Association
<http://westgov.org>