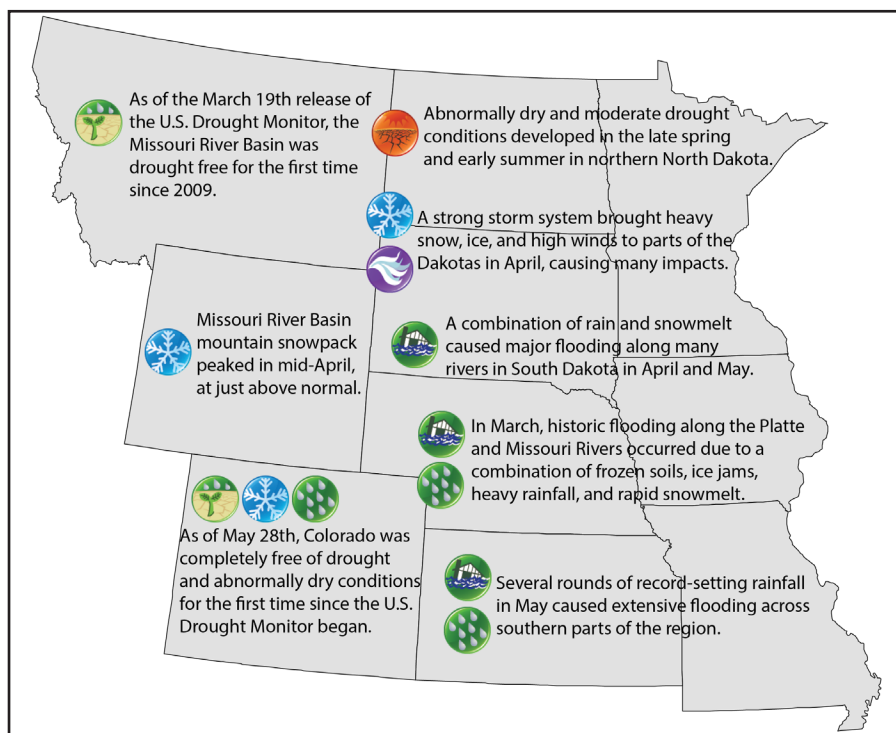


### Regional – Significant Events for March - May 2019



### Highlights for the Basin

Spring 2019 was one of the wettest on record for states in the Missouri River Basin, including KS (wettest), NE (3rd), SD (4th), MO (7th), and IA (10th).

Heavy snows impacted the region with many locations ranking in the top 10 snowiest springs on record. Pierre, SD had its 2nd snowiest with 32.0 inches.

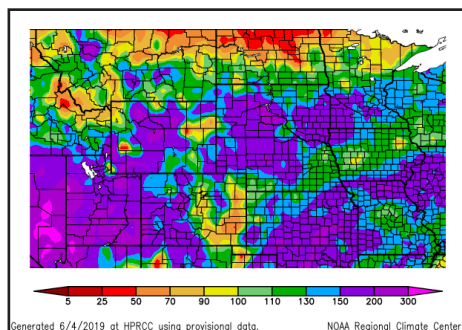
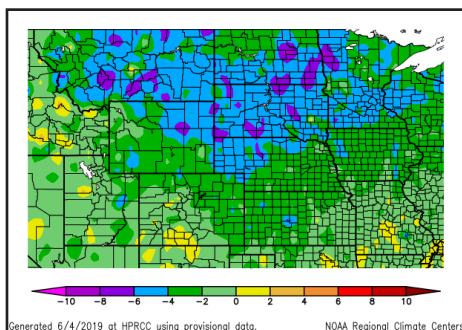
Significant flooding impacted areas in and around the Basin this spring. Based on preliminary data, record crests occurred at over 40 locations along the Missouri River and its tributaries.

As of June 1, the U.S. Army Corps of Engineers' 2019 runoff forecast for the upper Basin (above Sioux City, IA) was 50 MAF. If realized, 2019 would rank as the 2nd highest upper Basin runoff since records began 121 years ago.

### Regional – Climate Overview for March - May 2019

#### Temperature and Precipitation Anomalies

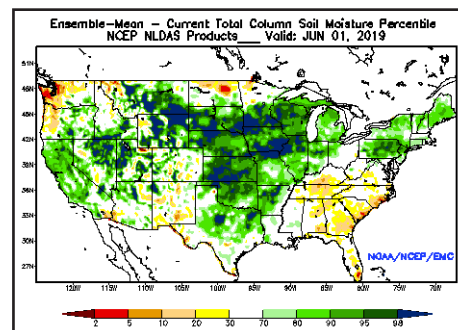
Departure from Normal Temperature (°F) (left) and Percent of Normal Precipitation (right) for Spring 2019



Overall, it was a cool and extremely wet spring. Average temperatures generally ranged from 2-8°F below normal, with the greatest departures in the upper Basin. Although not record-breaking, cooler conditions kept soil temperatures low and delayed green-up by a few weeks. Precipitation, on the other hand, was extreme, with spring totals exceeding 150% of normal in many areas. May was particularly wet, with Kansas, Missouri, and Nebraska all having their wettest May on record. For Kansas, this was also the wettest month on record. This spring's wet conditions were a continuation of a generally wet pattern that has been in place for months, and directly contributed to the severity of the flooding this spring. In fact, the past twelve months (June 2018-May 2019) was the wettest on record for several states in the region.

#### Soil Moisture Conditions

June 1, 2019



Persistent cool, wet conditions over the last several months have continued to impact soil moisture. Wet soils were evident across much of the Basin, with many fields either muddy or completely flooded, which has had a significant impact on this year's planting season. The map above shows the percent of average soil moisture conditions from a NOAA model called NLDAS.

## Regional – Impacts for March - May 2019

### Delayed/Prevented Planting

Cool, wet conditions have significantly impacted producers this spring, with 2019 being the slowest corn and soybean planting and emergence on record (since 1995, according to USDA NASS). Crops that have emerged, however, are in good condition.

With the impacts from early spring flooding, in addition to ongoing flooding, it is possible that a large number of acres will not be planted this year. More details to come.



### Impacts to Cattle

Cattle endured a range of extreme conditions this spring, including blizzards, heavy rain, flooding, and extreme cold. For some areas, untimely blizzards buried cattle and made calving and feeding difficult or impossible. In other areas, cattle were swept away by floodwaters, or stuck in muddy fields. Stress on cattle is also a big concern as it not only causes health issues in the short-term, but could also impact future reproduction.



### Damage to Infrastructure

Widespread flooding has severely impacted infrastructure this spring. Road damage has been extensive and many major routes were closed at times. In some areas, bridges were washed away and dams and levees were breached. Some rail lines were also closed, impacting the flow of goods into the region. Total economic losses from this spring's flooding are still being processed, but will likely be in the billions of dollars.



Above: Flooded field in southwest Iowa, photo courtesy Doug Kluck, NOAA (left); Cattle in snow near Willow Lake, SD, photo courtesy Carolyn Edelman, via NWS Sioux Falls (middle); Flooded road by Tuttle Creek Reservoir, KS, photo courtesy Judith O'Mara, KSU (right).

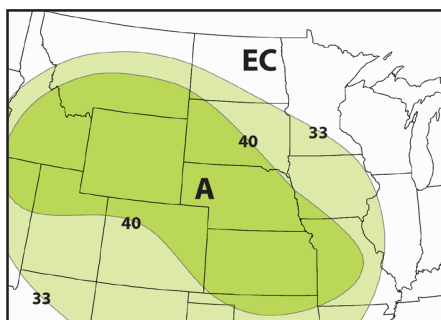
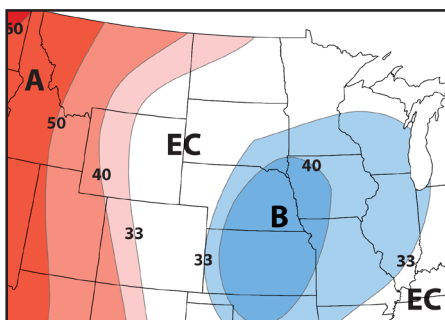
## Regional – Outlook for July - September 2019

## MO River Basin Partners

### Temperature

### Precipitation

#### Outlooks for July - September 2019



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 are present and expected to continue through the summer and possibly into the fall and winter. Over the next three months, below-normal temperatures are favored for much of the lower Basin and above-normal temperatures are favored for western parts. Meanwhile, above-normal precipitation is favored across the majority of the region.

With cooler conditions possible through early fall, crop progress could be impacted. This could especially be an issue with late-planted crops as some crops may not reach maturity before the first fall frost. Continued wet conditions could also impact crops, with disease issues a concern.

High Plains Regional Climate Center  
[www.hprcc.unl.edu](http://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](http://www.ncdc.noaa.gov)

NOAA NWS - Central Region  
[www.weather.gov/crh](http://www.weather.gov/crh)

NOAA NWS Climate Prediction Center  
[www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)

NOAA NWS Missouri Basin River Forecast Center  
[www.weather.gov/mbrfc](http://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/](http://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](http://www.nrcs.usda.gov)

USDA Northern Plains Climate Hub  
[www.climatehubs.ocs.usda.gov](http://www.climatehubs.ocs.usda.gov)

USGS, Water Mission Area  
[www.usgs.gov/water](http://www.usgs.gov/water)

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