



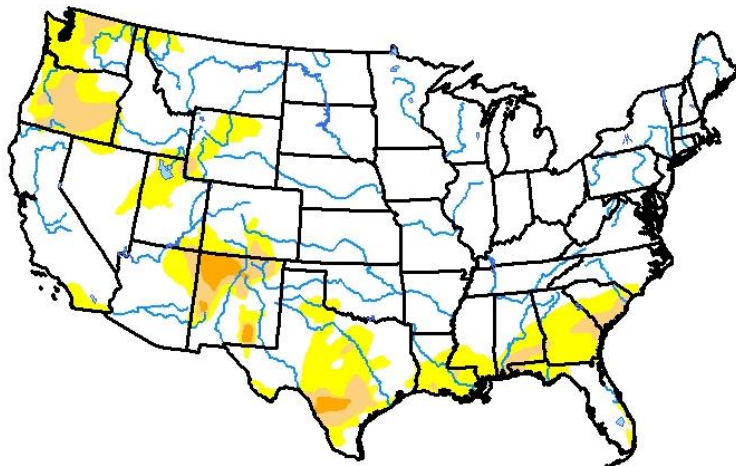
WATER SUMMARY UPDATE

Published Date April 4, 2019 | Issue 94

A snapshot of water resource trends for the month of March 2019

Drought Monitor - Conditions as of April 2, 2019 at 7 a.m.

National Drought Mitigation Center and partners

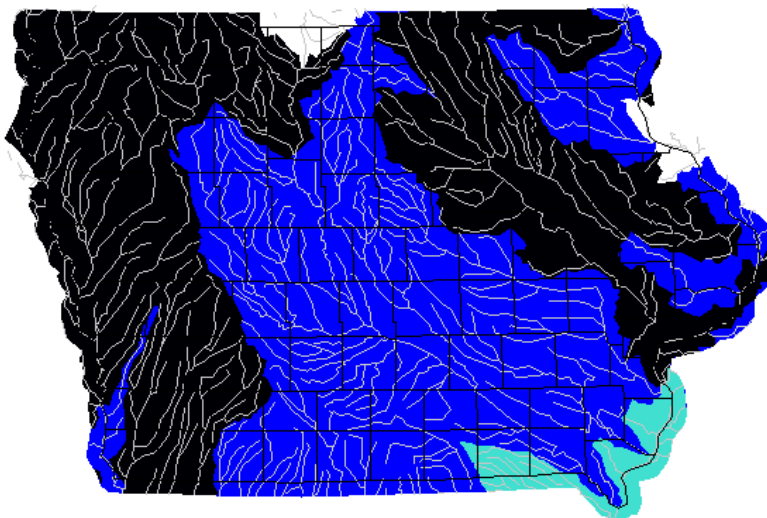


Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Stream Flow – March 2019



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

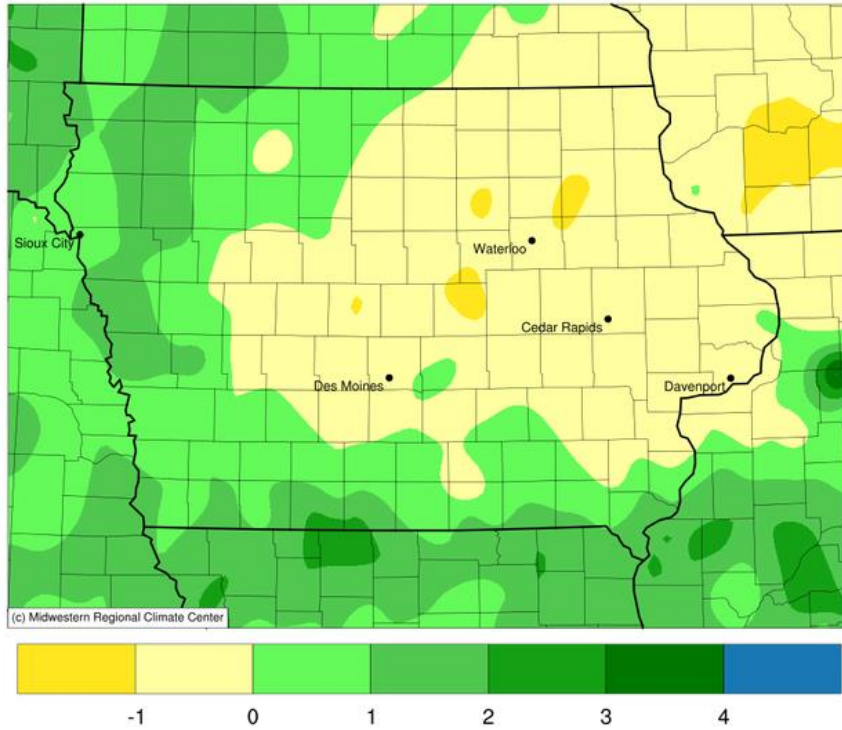


Precipitation and Temperature – Departure from normal for March, 2019.

State Climatologist

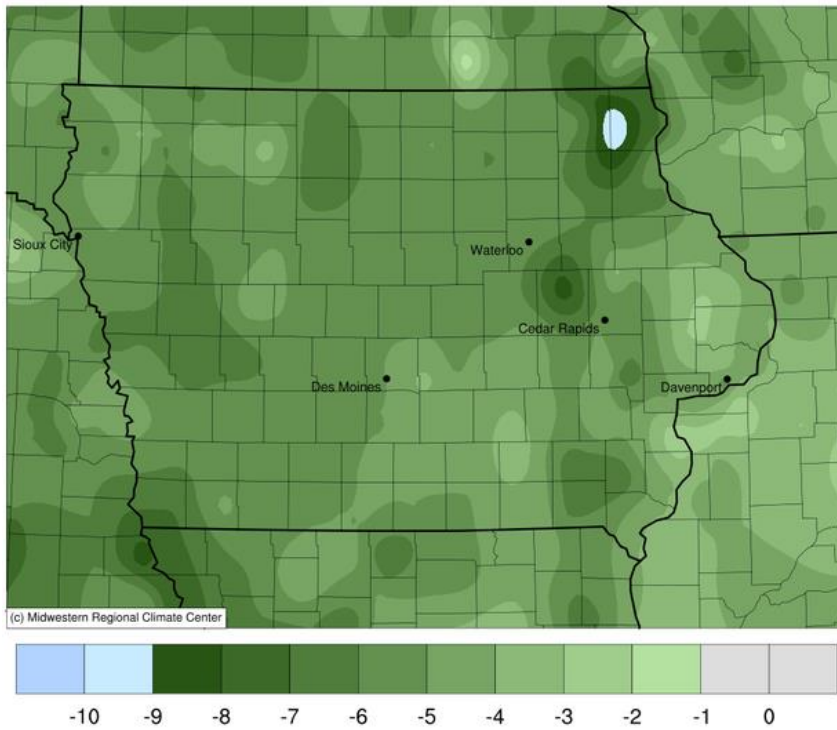
Accumulated Precipitation (in): Departure from 1981-2010 Normals

March 01, 2019 to March 31, 2019



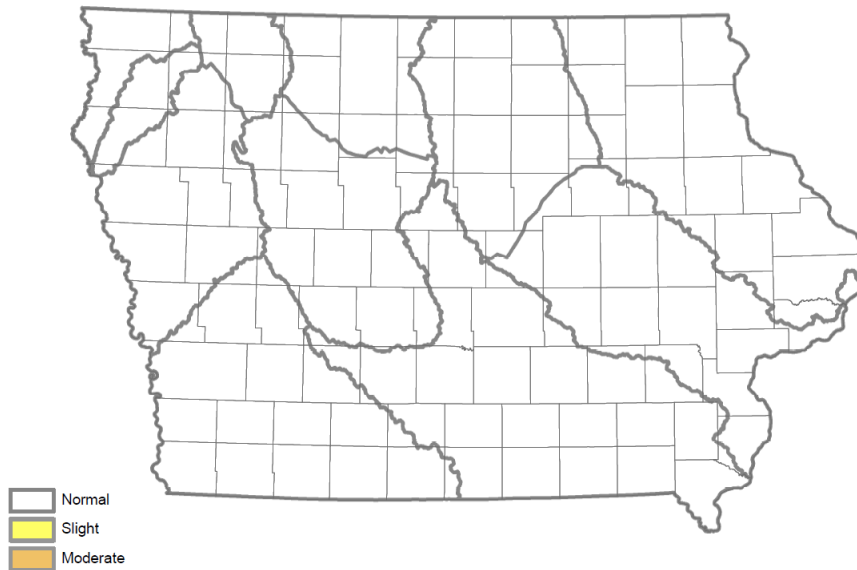
Average Temperature (°F): Departure from 1981-2010 Normals

March 01, 2019 to March 31, 2019



Shallow Groundwater - Conditions for March 2019

Iowa DNR and IIHR-Hydroscience and Engineering



RECENT DEVELOPMENTS AND CHANGES

SUMMARY

March 2019 just slightly wetter than normal, but high precipitation in Nebraska, combined with snowmelt and runoff, resulted in significant flooding along the Missouri River in western Iowa. Streamflow in the state is above normal, but is trending downward. The most notable event of the month occurred between March 12th and 14th when a very strong low pressure system (bomb cyclone) moved out of Colorado and into Nebraska and Iowa. Eastern Nebraska experienced extremely heavy rainfall transitioning to blizzard conditions moving farther west. With that storm, nearly 50 stations reported rainfall totals above one inch with rainfall in parts of Harrison County measuring well over three inches.

DROUGHT MONITOR

Iowa continues to be free from any dryness, and is surrounded by states that are also drought and dryness free. The National Drought Monitor continues to show that nearly the entire eastern two thirds of the country is free from drought, and large areas of extreme drought in the southwest have been significantly reduced over the past several months. There are areas of Severe Drought (D2) in New Mexico and Texas, but these areas are less than one percent of the overall continental US.

CURRENT STREAM FLOW

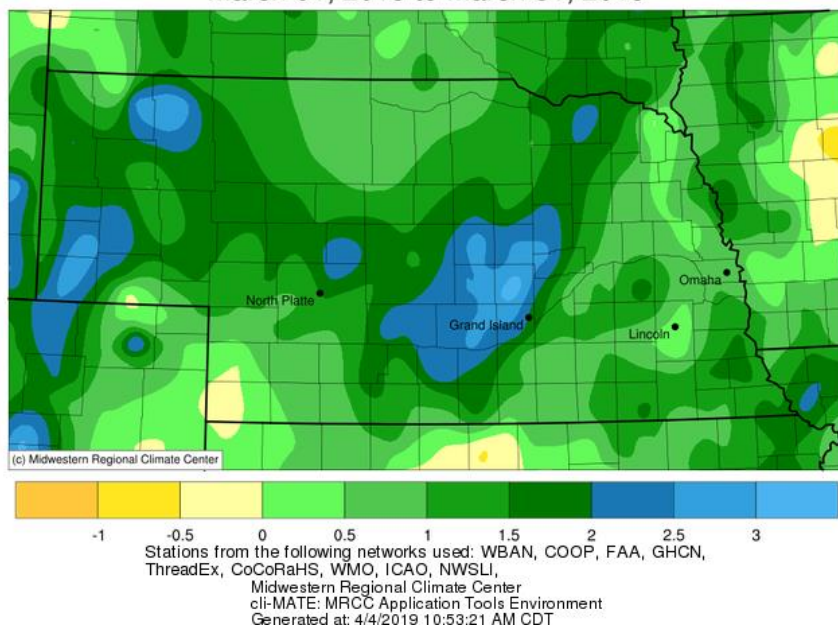
Streamflow conditions in much of the state increased were rates as “much above normal” or “high” in March. These are the blue and black shaded watersheds across the state. Streamflow conditions across western and northeast Iowa were the highest. March warm temperatures, snowmelt, and precipitation events caused many streams in Iowa to move above flood stage. Overall streamflow is currently trending down, but many areas remain well above normal for streamflow.

MARCH PRECIPITATION AND TEMPERATURE

Preliminary statewide precipitation was just over 2 inches - about 0.10 inches below average. This ranks March about in the middle of pack for historical March precipitation. Western and southern Iowa were above normal for rainfall, with the remainder of the state slightly below average. Western Iowa was on the warmer and relatively drier side of the system, though the system brought measurable rainfall to the entire state through the 14th. With that storm, nearly 50 stations reported totals above one inch with Little Sioux (Harrison County) observing 3.17 inches. Above freezing temperatures, combined with heavy rainfall on top of a substantial snowpack and frozen soil led to rapid melting and runoff into streams and river across the state. Historical flooding occurred in western Iowa and eastern Nebraska levees below Council Bluffs (Pottawattamie County) were breached. Monthly precipitation totals (rain plus liquid equivalent of snow) varied from only 0.59 inches at Marshalltown (Marshall County), to 5.24 inches at Keokuk (Lee County). The statewide average snowfall was 2.20 inches or 2.50 inches below average. Sibley (Osceola County) reported 9.5 inches of snow, 1.6 inches above average. This ranks as the 28th lowest March total in 132 years. The state of Nebraska received about 3 inches of rainfall for the month of March, which is about double their normal for the month.

Accumulated Precipitation (in): Departure from 1981-2010 Normals

March 01, 2019 to March 31, 2019



Iowa temperatures averaged 30.7 degrees or 5.2 degrees below normal, ranking March 2019 as the 30th coldest among 147 years of state records. Below average temperatures experienced in February across Iowa continued through March. The first eleven days of the month were unseasonably cold with March 3rd and 4th being the coldest two days of March. Daytime highs on the 3rd ranged from the single digits in southern Iowa to negative single digits in the north. Estherville Municipal Airport (Emmet County) reported a wind chill value of -42 degrees.

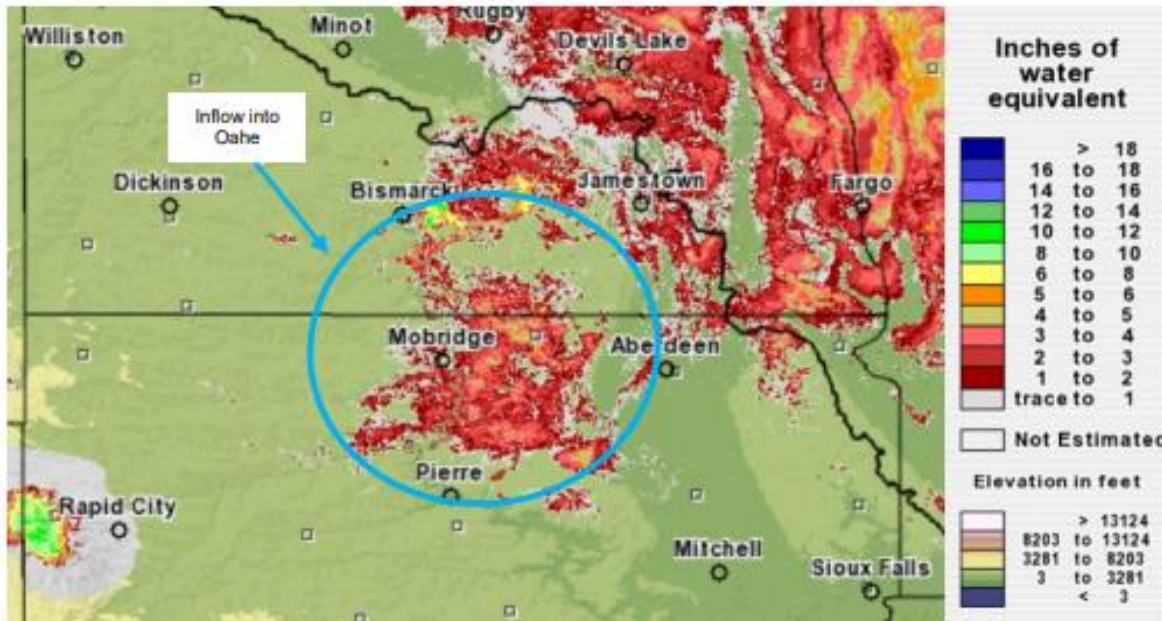
SHALLOW GROUNDWATER

Shallow groundwater conditions were normal to above normal across the entire state in March. Groundwater recharge should be normal to above normal this spring.

MISSOURI RIVER BASIN

The US Army Corps of Engineers reports that as of April 3, about 56% of the flood control storage in their system is available to store runoff this spring and summer, with some plains snowpack still remaining in areas of North Dakota and South Dakota. The figure below shows several inches of snow water equivalent remaining in the snowpack that will ultimately drain into the Oahe Reservoir. The Corps is estimating that runoff in the Missouri River Basin will be over 150% of average. The March runoff was 11 million acre feet (MAF) – almost 30% of the total 38.2 MAF of runoff predicted for the entire year for the Missouri River above Sioux City, Iowa.

**NOHRSC Plains Snowpack
April 3, 2019**



ADDITIONAL INFORMATION

For additional information on the information in this Water Summary Update please contact any of the following:

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