

Upper Missouri River Basin
January 2025 Calendar Year Runoff Forecast
January 2, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

The 2024 calendar year runoff summation for the Missouri Basin above Sioux City, IA was 23.3 MAF, 91% of average.

December 2024 runoff was 0.8 MAF, 105% of average. Runoff was slightly above average in all the reaches except Oahe, which was below average.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **20.2 MAF, 79% of average**. The 2024 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **18.2 MAF, 78% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next twelve months, expected inflow could range from the 13.5 MAF lower basic forecast to the 27.9 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for December 31 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 89% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of March 2025, indicates drought conditions are likely to improve in Montana but persist through most of the rest of the Basin.

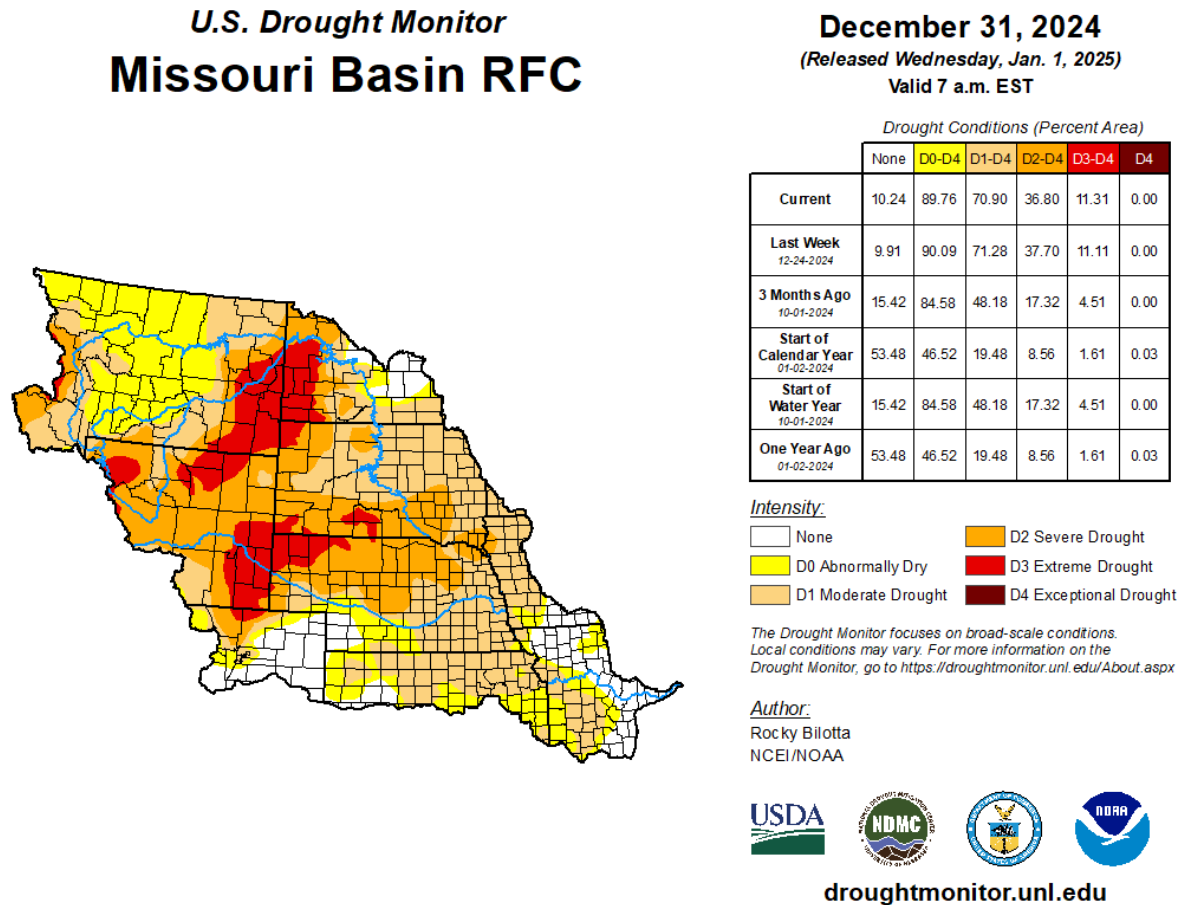


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for January 1 - March 31, 2025
Released December 31, 2024

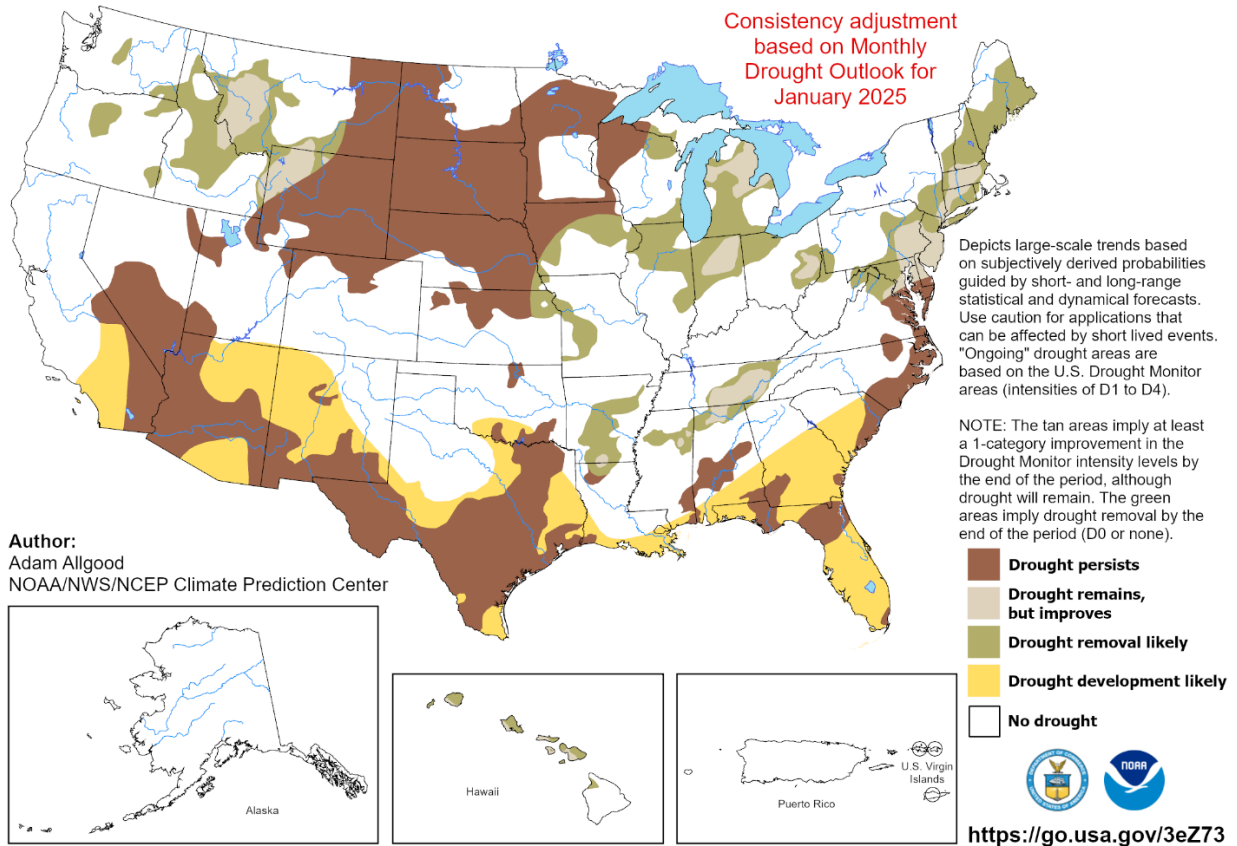


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The December precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Precipitation was mixed across the upper Basin and dry in the lower Basin. Pockets of above-normal precipitation were observed in east-central Montana, northern North Dakota, and central South Dakota, but the rest of the Basin saw 5-75% of normal precipitation.

Precipitation as a percent of normal for the October-November-December period (**Figure 4**) was below normal across the upper Basin and Nebraska. Near to slightly above-normal precipitation was observed in most of the lower Basin.

Percent of Normal Precipitation (%)
12/1/2024 – 12/31/2024

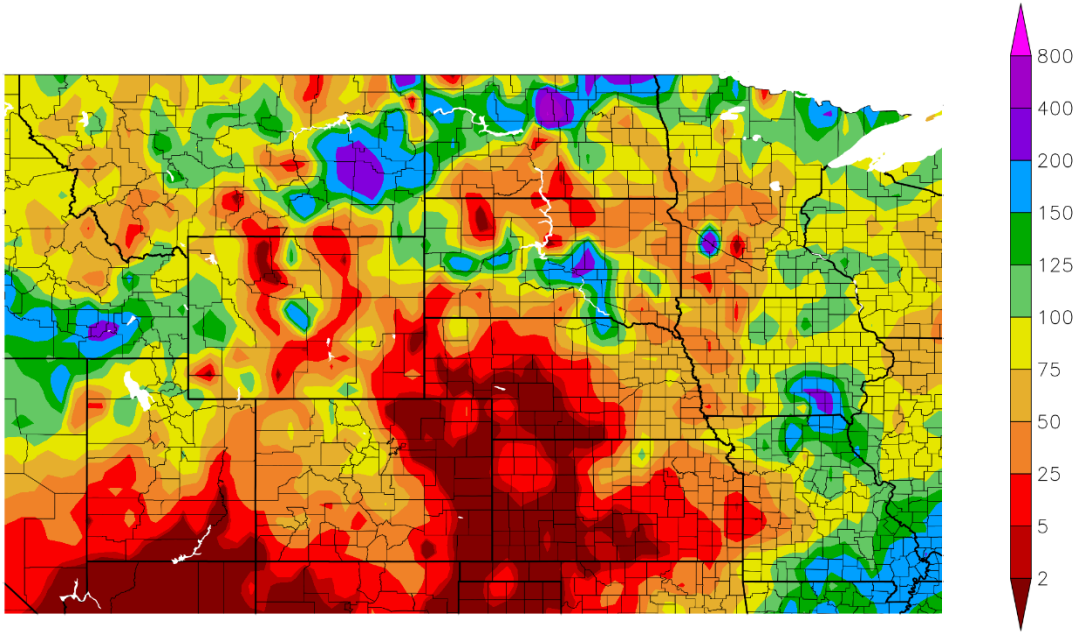


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
10/1/2024 – 12/31/2024

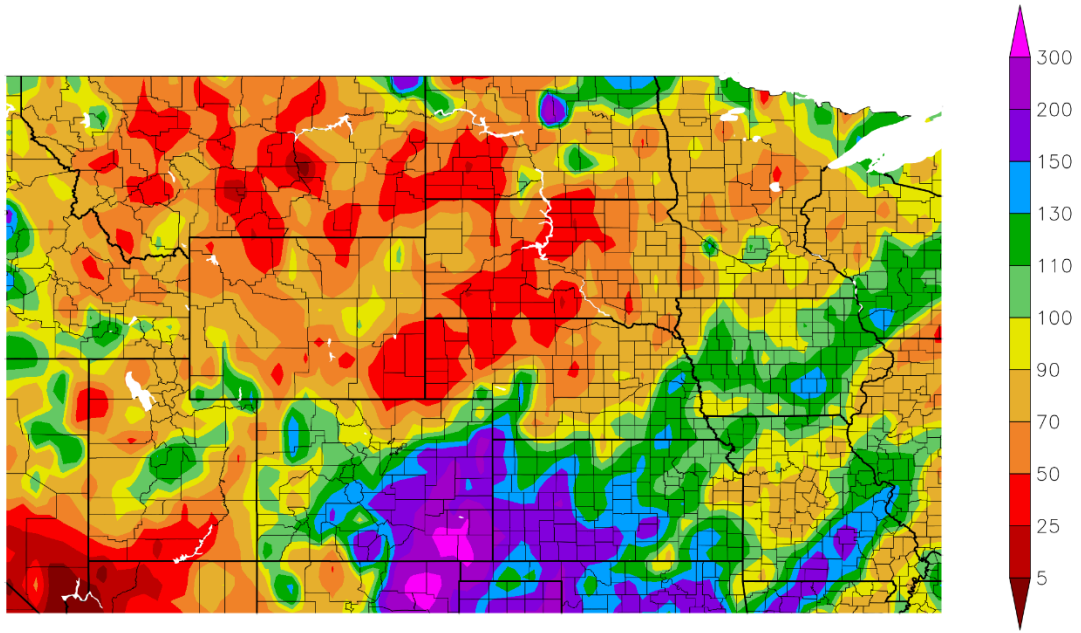


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

December temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were above normal across the Basin. In western Montana and central Wyoming, average temperatures deviated by up to 12 degrees above normal. October-November-December temperature departures are shown in **Figure 6**. The three-month average temperature departures are also warmer than normal across the Basin.

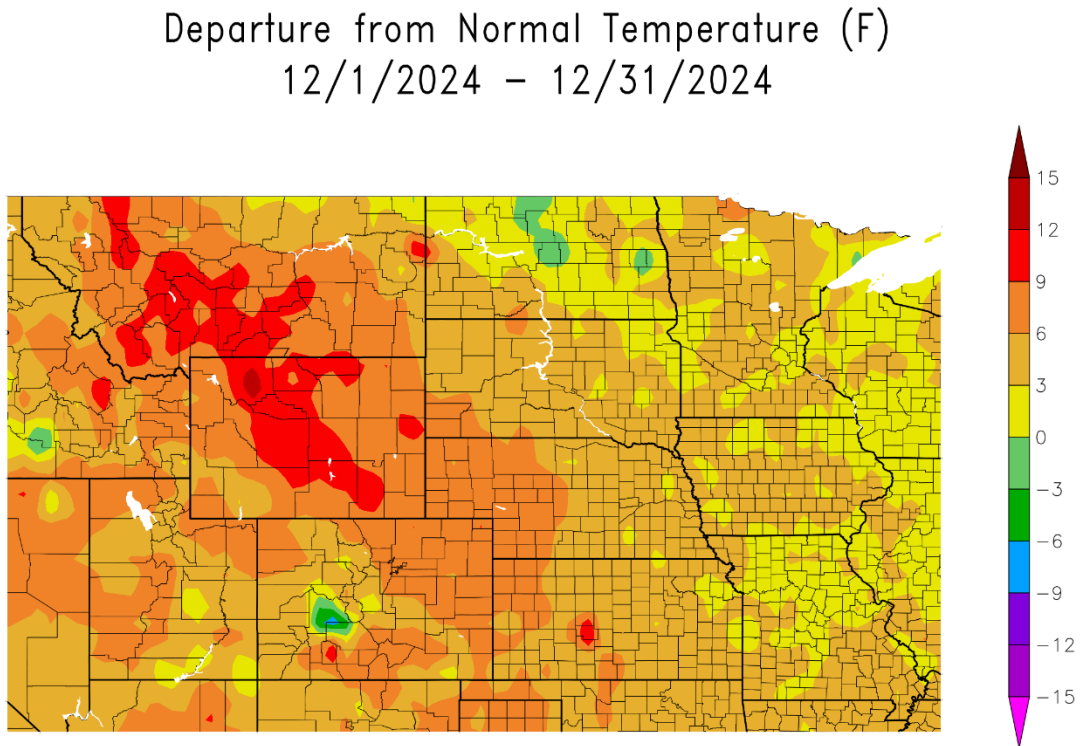


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 10/1/2024 – 12/31/2024

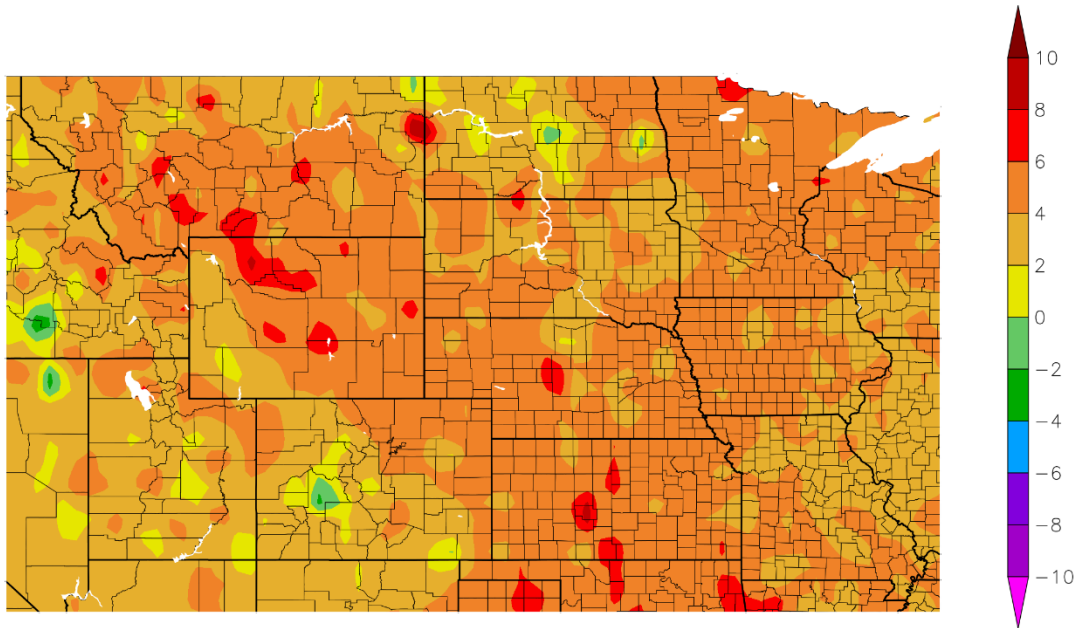


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff. As the calendar year approaches winter, the soil moisture conditions will provide some insight into late winter and early spring runoff potential.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of December 2024 are shown in **Figure 7** along with a comparison of soil moisture last year at this time. Soil moisture continues to be dry across the Basin, with soils ranking below the 20th percentile in the western side of the Basin.

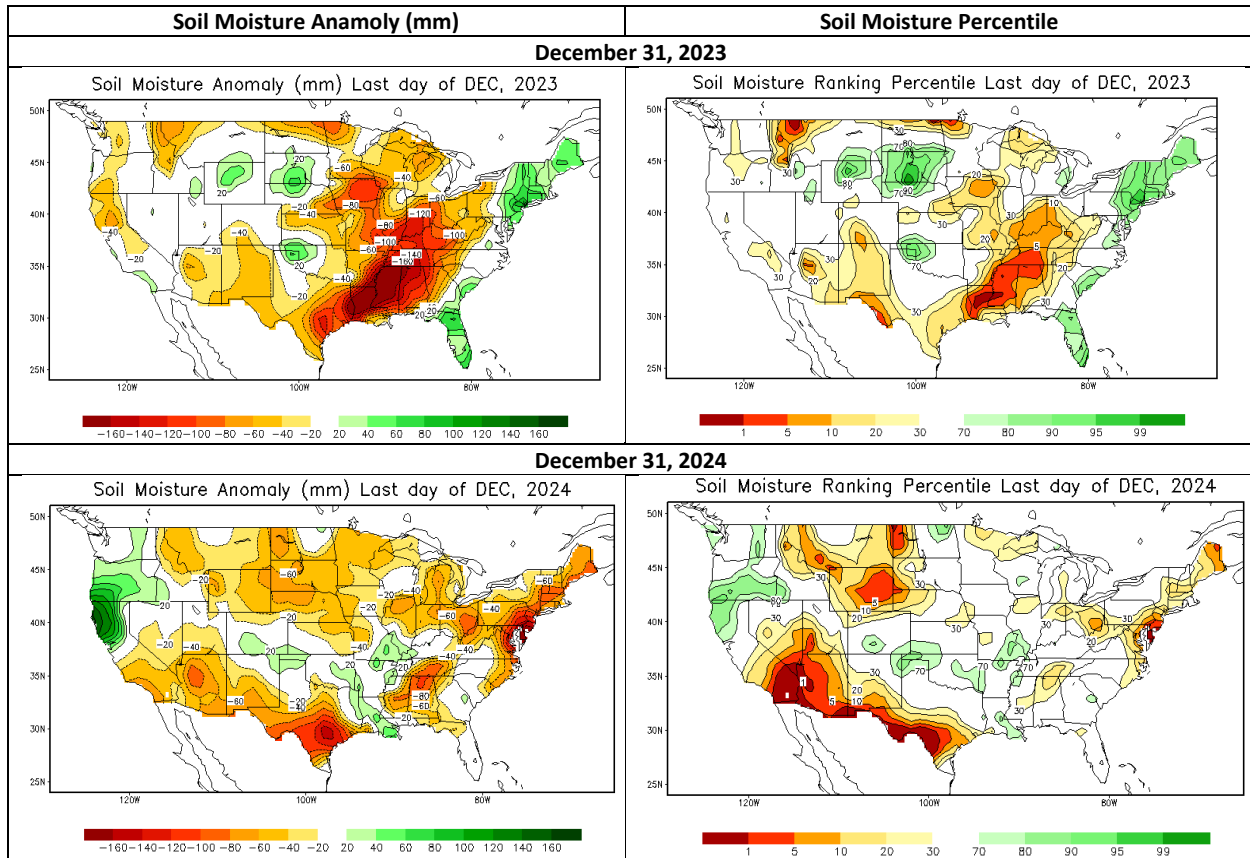


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts. At this time of year, plains snowpack provides some indication of March-April runoff; however, as the snowpack reaches its ultimate peak accumulation, better forecasts of future runoff can be made.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) from January 1, 2025, shown in **Figure 8**. NOHRSC Modeled Snow Water Equivalent, shows below-normal accumulated plains snowpack for this time of year. Trace to 1” of snow water equivalent (SWE) is modeled across parts of Montana, the Dakotas, and Nebraska. The amount of runoff received in March and April will depend greatly on precipitation and temperatures over the next few months.

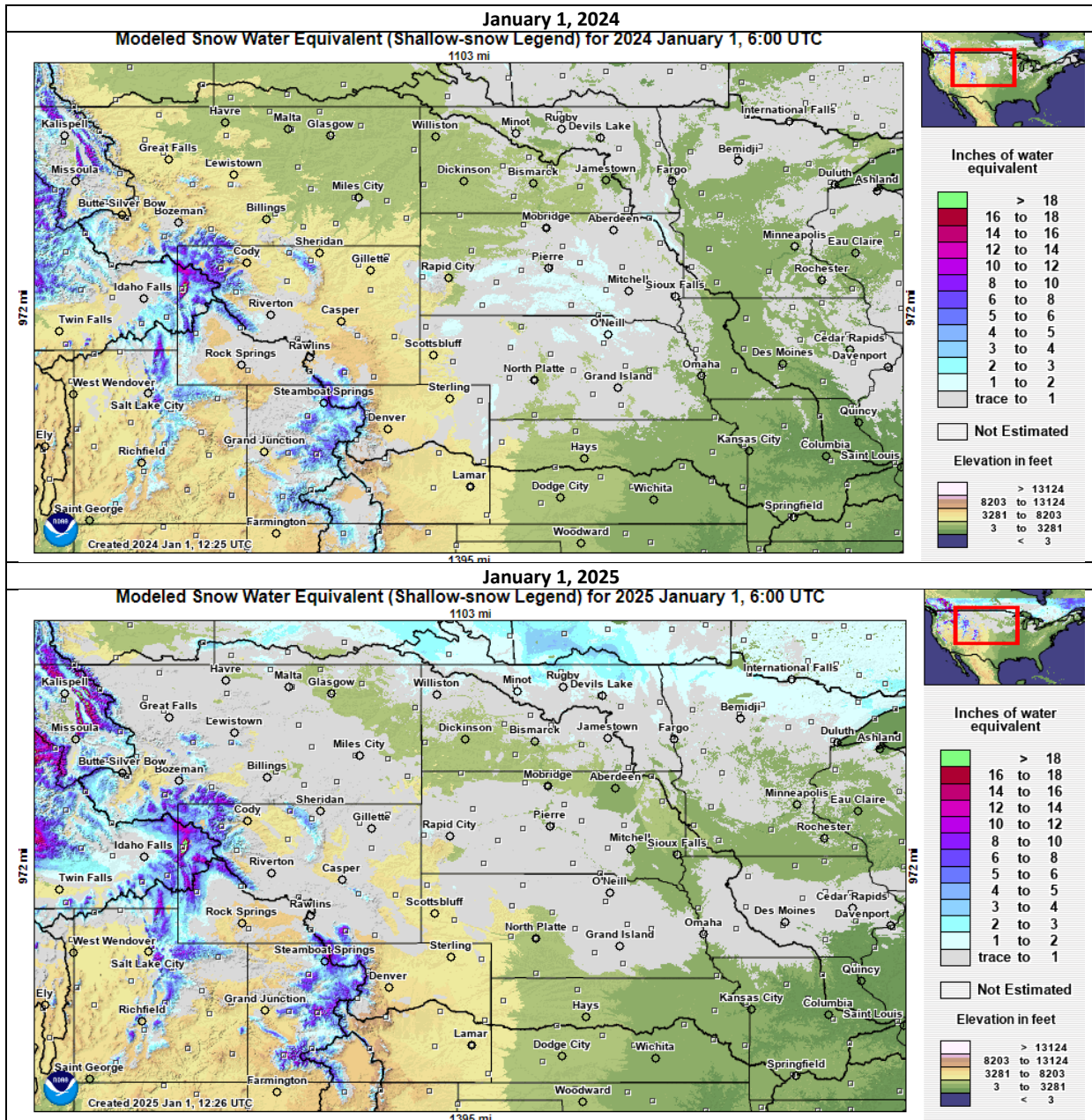


Figure 8. NOHRSC Modeled Snow Water Equivalent

Mountain Snowpack

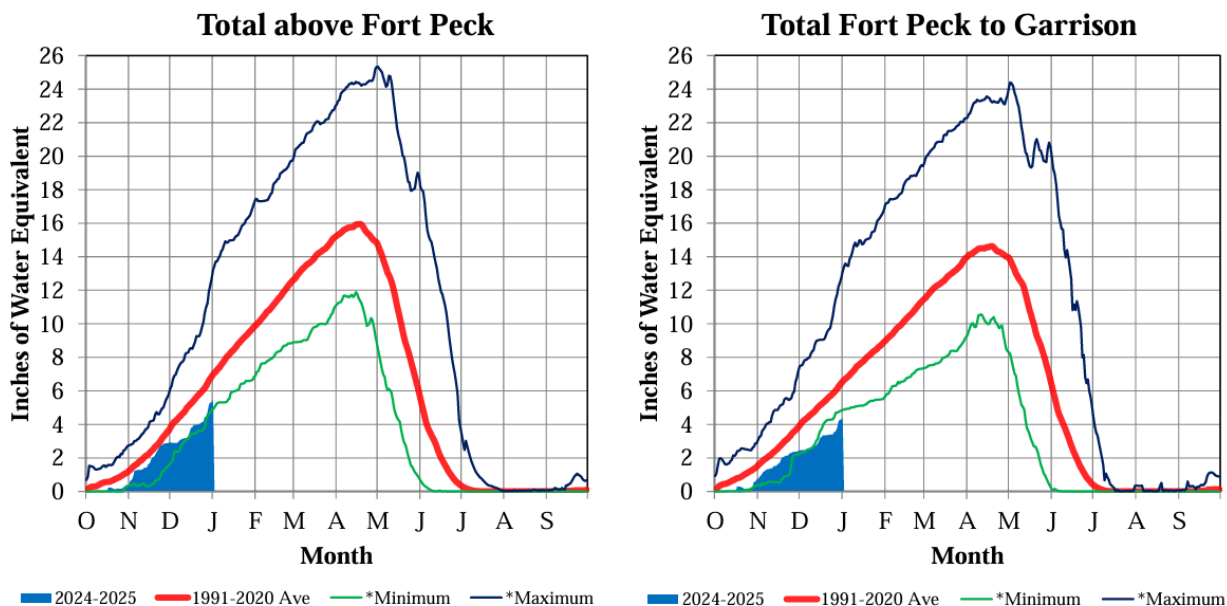
Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches has very little correlation to the January 1 snowpack because less than half of the mountain snowpack has accumulated by January 1. Mountain snowpack typically peaks in mid-April; therefore, later measurements of mountain snowpack are better runoff indicators.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources and Conservation District SNOW TELEmetry (SNOTEL) data for the headwater basin above Fort

Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

1-Jan-2025



On January 1, 2025 the mountain Snow Water Equivalent (SWE) in the "Total above Fort Peck" reach is 5.4" and 78% of the (1991-2020) average. The mountain SWE in the "Fort Peck to Garrison" reach is 4.4" and 67% of the (1991-2020) average. The normal peak for both reaches occurs near April 17.

Figure 9. Mountain Snowpack Water Content

As of January 1, the average mountain SWE in the Fort Peck reservoir reach was 5.4", 78% of average. In the reservoir reach between Fort Peck and Garrison dams, the average mountain SWE was 4.4", 67% of average. Typically, 44% of the total mountain SWE accumulation has occurred by January 1, and snowpack generally peaks near April 17.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is an oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

ENSO-neutral conditions are currently present. La Niña conditions are 59% likely to occur during the next month and ENSO-neutral conditions will be most likely by March-May 2025.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The temperature outlook for January (**Figure 10**) indicates increased chances for below-normal temperatures across most of the Basin. The precipitation outlook (**Figure 10**) for the same period shows increased chances for above-normal precipitation across much of the upper Basin, and equal chances for above-normal, normal, or below-normal precipitation in the lower Basin.

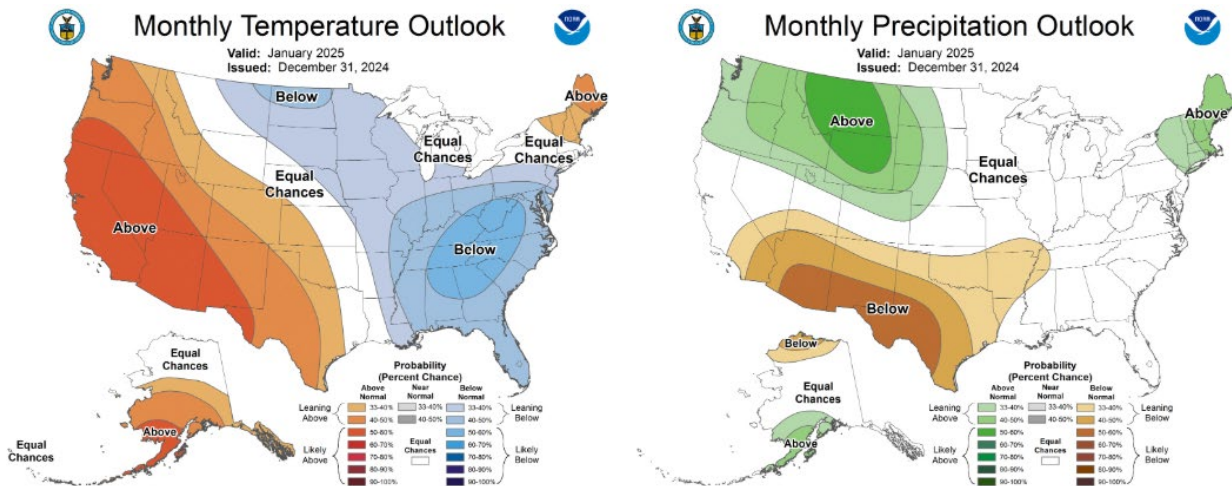


Figure 10. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the four 3-month periods in 2025 are shown in **Figure 11**. The January-February-March temperature outlook indicates increased chances for below-normal temperatures in the upper Basin and equal chances for above-normal, normal, or below-normal temperatures in the lower Basin. The precipitation outlook for the same period indicates increased chances for above-normal precipitation in Montana and Wyoming and equal chances for above-normal, normal, or below-normal precipitation in the rest of the Basin.

The April-May-June temperature outlook shows no strong indicators, with equal chances for below-normal, normal, or above-normal temperatures across the Basin. The precipitation outlook for the same period shows increased chances for below-normal precipitation in the western side of the Basin and equal chances for above-normal, normal, or below normal precipitation in the eastern side of the Basin.

The July-August-September temperature outlook shows increased chances for above-normal temperatures in Montana and Wyoming and equal chances for the rest of the Basin. The precipitation outlook for the same period shows increased chances for below-normal precipitation in the Basin.

The October-November-December temperature and precipitation outlooks show increased chances for warmer-than-normal temperatures across the Basin and increased chances for below-normal precipitation across the Basin.

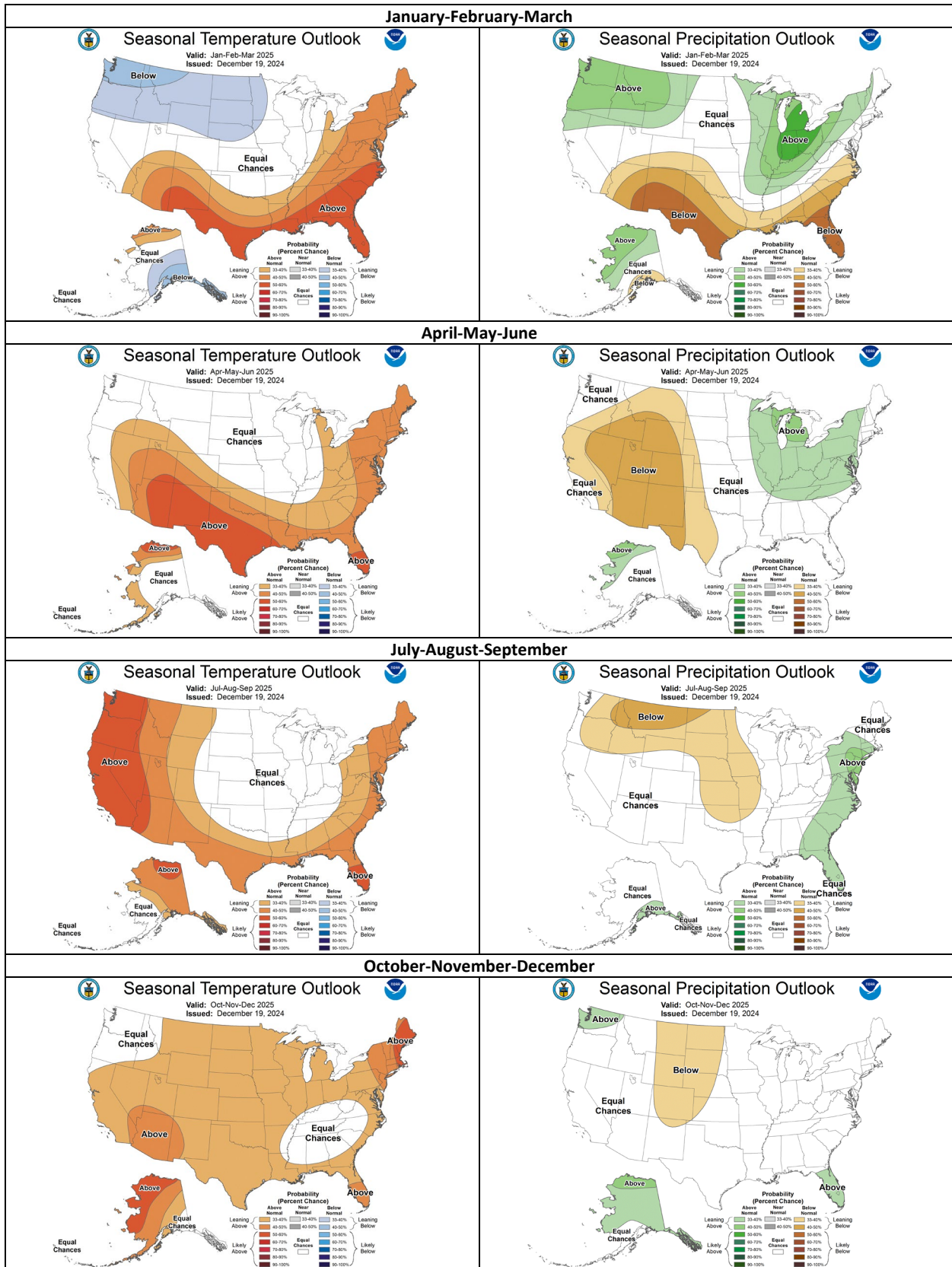


Figure 11. CPC Three-Month Temperature and Precipitation Outlooks

Summary

Given current streamflow and the potential for cooler weather in January, we expect total runoff above Sioux City, IA in January and February to be near normal. March and April runoff potential is below normal due to the below-normal plains snowpack and soil moisture conditions but will depend greatly on the accumulation of additional plains snowpack and temperatures over the next two to three months. During May, June, and July, Fort Peck and Garrison runoff is forecast to be below average due to below-normal mountain snowpack.

In summary, the 2025 calendar year runoff forecast is **20.2 MAF, 79% of average**.

Upper Missouri River Basin
February 2025 Calendar Year Runoff Forecast
February 4, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

January runoff was 0.7 MAF, 92% of average. Runoff was near average in the Fort Peck, Garrison and Gavins Point reaches, below average in the Oahe and Fort Randall reaches, and well above average in the Sioux City reach.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **20.6 MAF, 80% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **18.4 MAF, 79% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next eleven months, expected inflow could range from the 14.0 MAF lower basic forecast to the 28.3 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for January 28 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 89% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of April 2025, indicates drought conditions are likely to improve in Montana and northwestern Wyoming, but persist through the rest of the Basin.

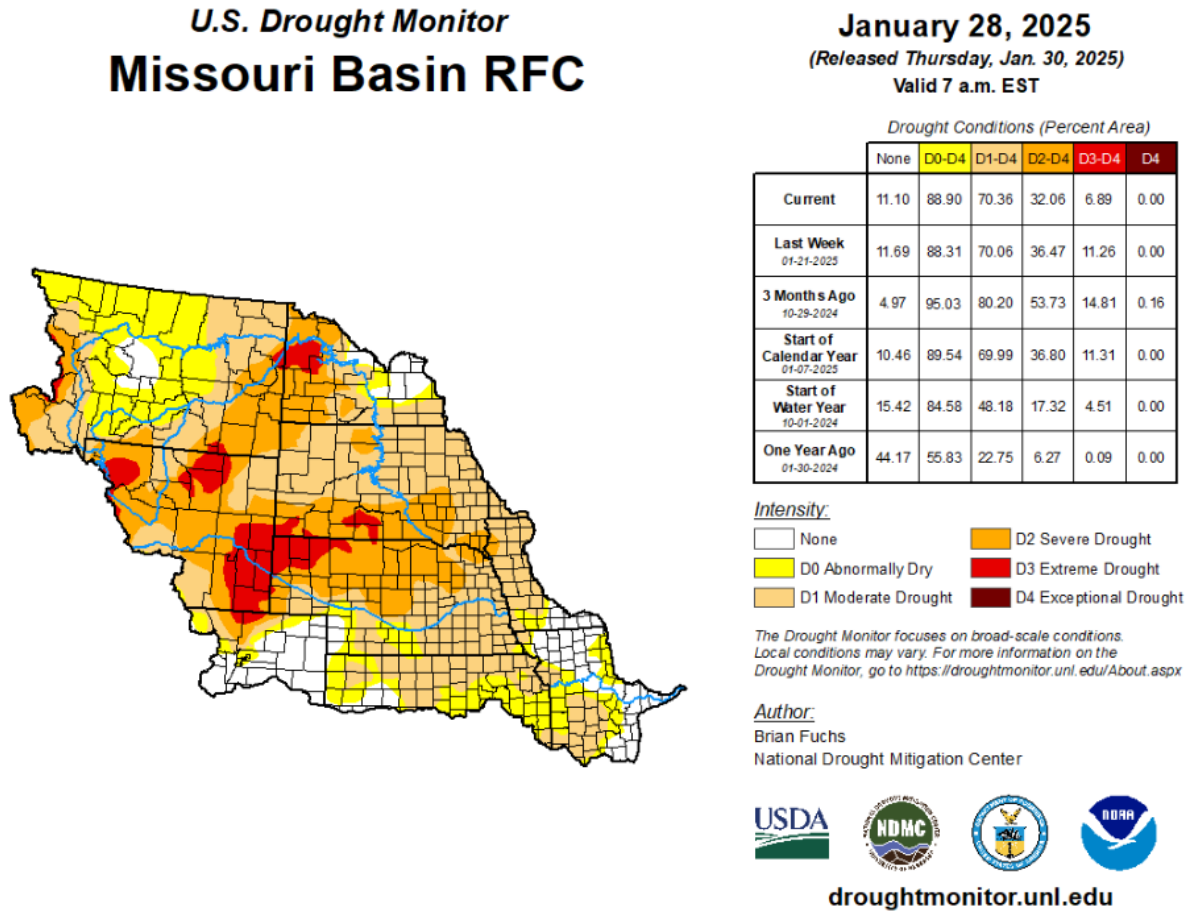


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for February 1 - April 30, 2025
Released January 31, 2025

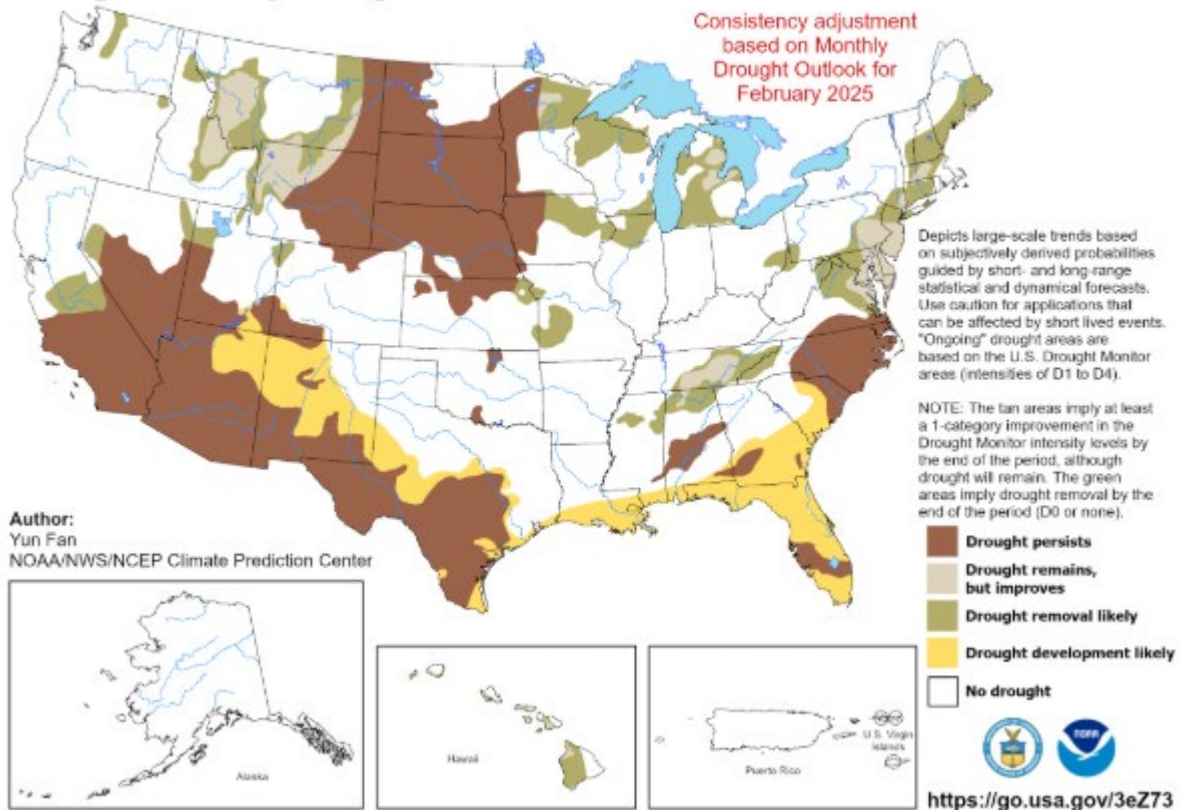


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The January precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. The January map shows two contrasting precipitation patterns: 1) above-normal precipitation in the mountains and plains extending from central Montana into eastern Colorado, and 2) well-below normal precipitation in the plains of North Dakota, South Dakota, Nebraska and Iowa. Above-normal precipitation in Montana and Wyoming has led to the development of a light plains snow cover, while the lack of January precipitation in the Dakotas, Nebraska, and Iowa has led to well-below normal plains snow cover. January precipitation in large areas of North Dakota, South Dakota, Nebraska and Iowa has been less than 50 percent of normal, and some areas have received less than 5 percent of normal.

Precipitation as a percent of normal for the November-December-January period (**Figure 4**) was near normal for most of the upper Basin, and slightly above normal for most of the lower Basin. Above-normal lower basin precipitation, however, is a reflection of a very wet November.

Percent of Normal Precipitation (%)
1/1/2025 - 1/31/2025

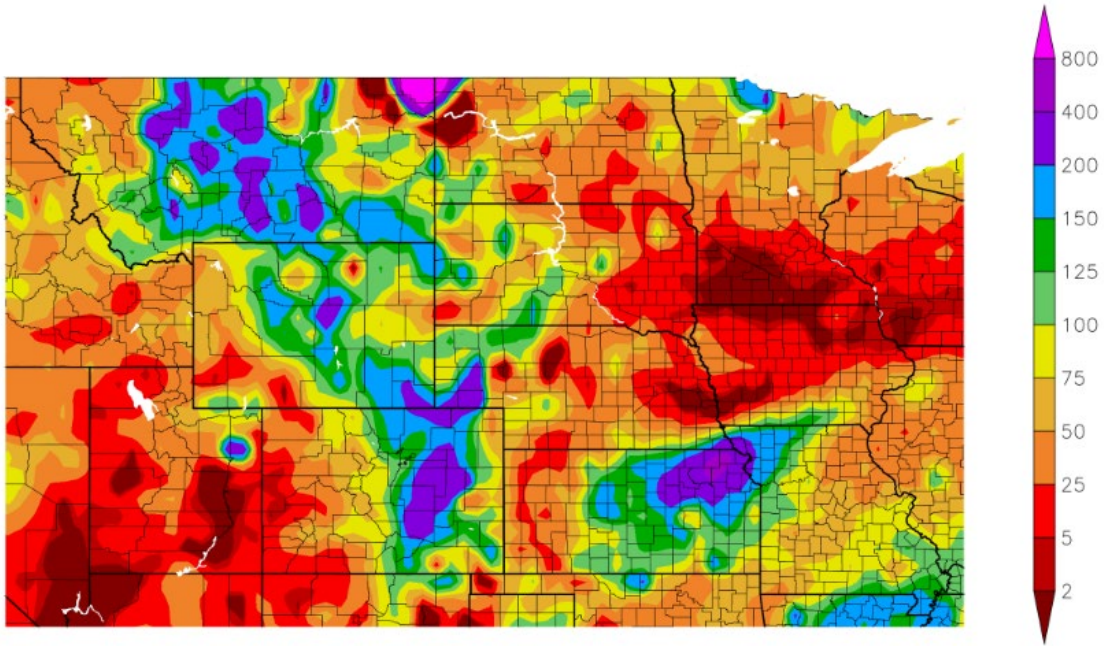


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
11/1/2024 - 1/31/2025

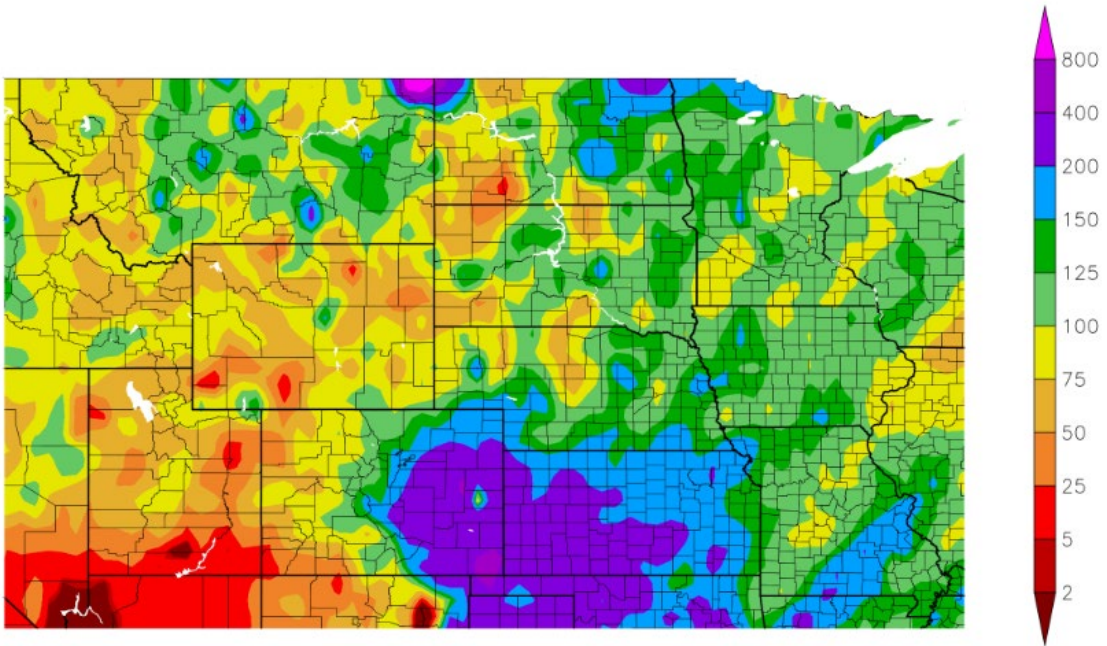


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

January temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were mixed across the Basin. In Wyoming, Colorado, and Kansas, average temperatures deviated by up to 10 degrees below normal. November-December-January temperature departures are shown in **Figure 6**. The three-month average temperature departures were warmer than normal across the Basin.

Departure from Normal Temperature (F)
1/1/2025 – 1/31/2025

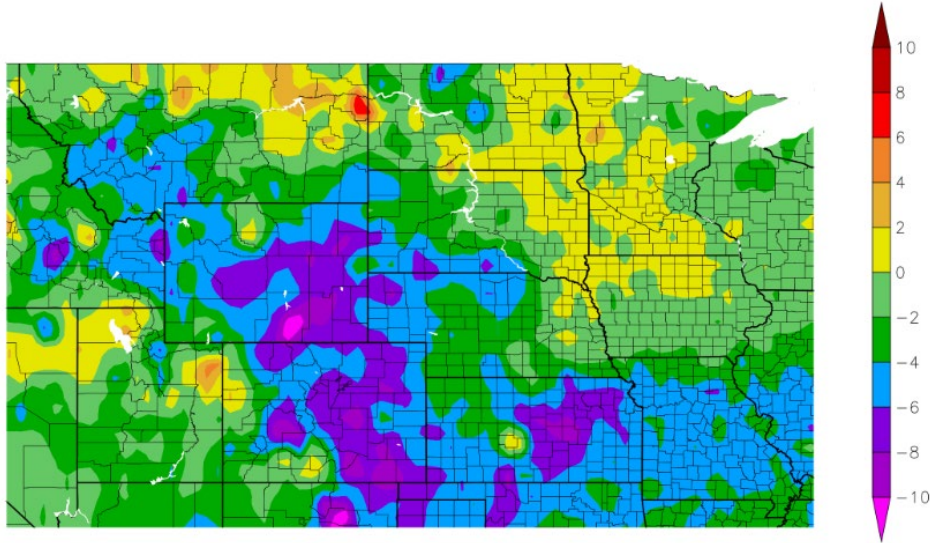


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F)
11/1/2024 – 1/31/2025

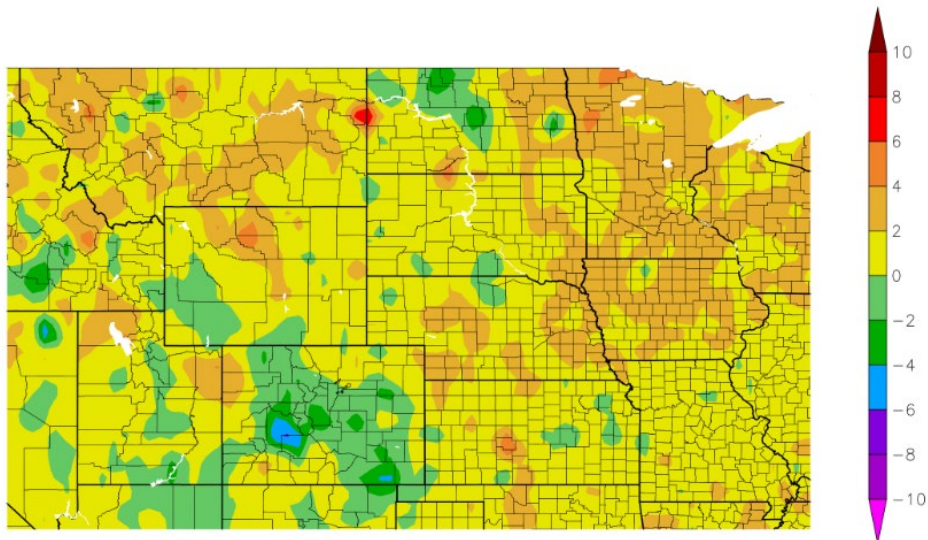


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff. As the calendar year approaches winter, the soil moisture conditions will provide some insight into late winter and early spring runoff potential.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of January 2025 are shown in **Figure 7**. Soil moisture continues to be dry across the Basin, with soils ranking below the 10th percentile in the western side of the Basin.

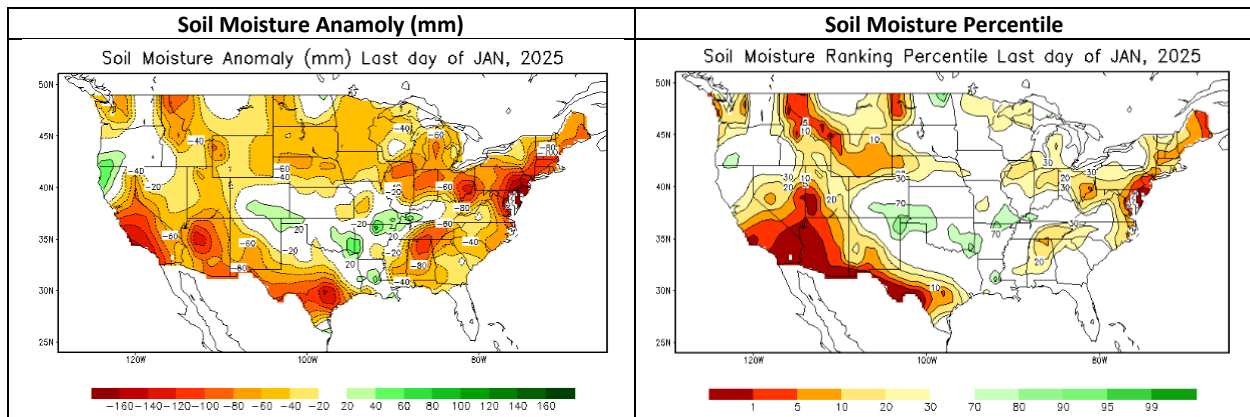


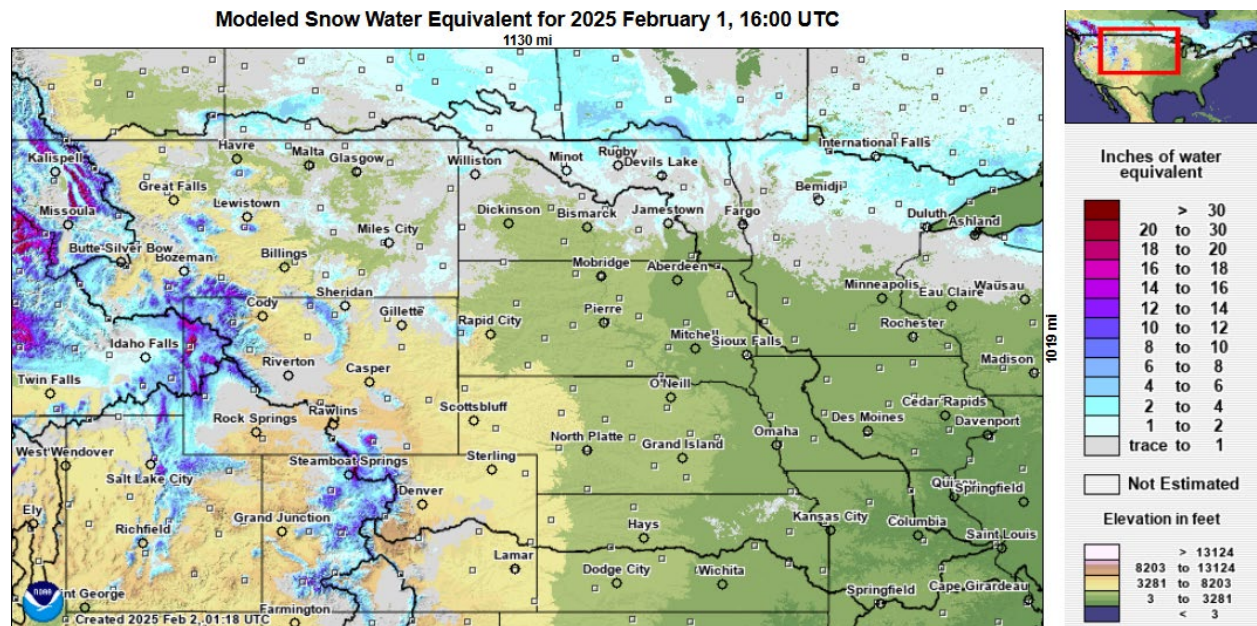
Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts. At this time of year, plains snowpack provides some indication of March-April runoff; however, as the snowpack reaches its ultimate peak accumulation, better forecasts of future runoff can be made.

The National Weather Service's National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) from February 1, 2025, is shown in **Figure 8**. NOHRSC Modeled Snow Water Equivalent shows below-normal accumulated plains snowpack for this time of year. Trace to 2" of snow water equivalent (SWE) is modeled across small areas of Montana, Wyoming,

and the Dakotas. The amount of runoff received in March and April will depend greatly on precipitation and temperatures over the next few months.



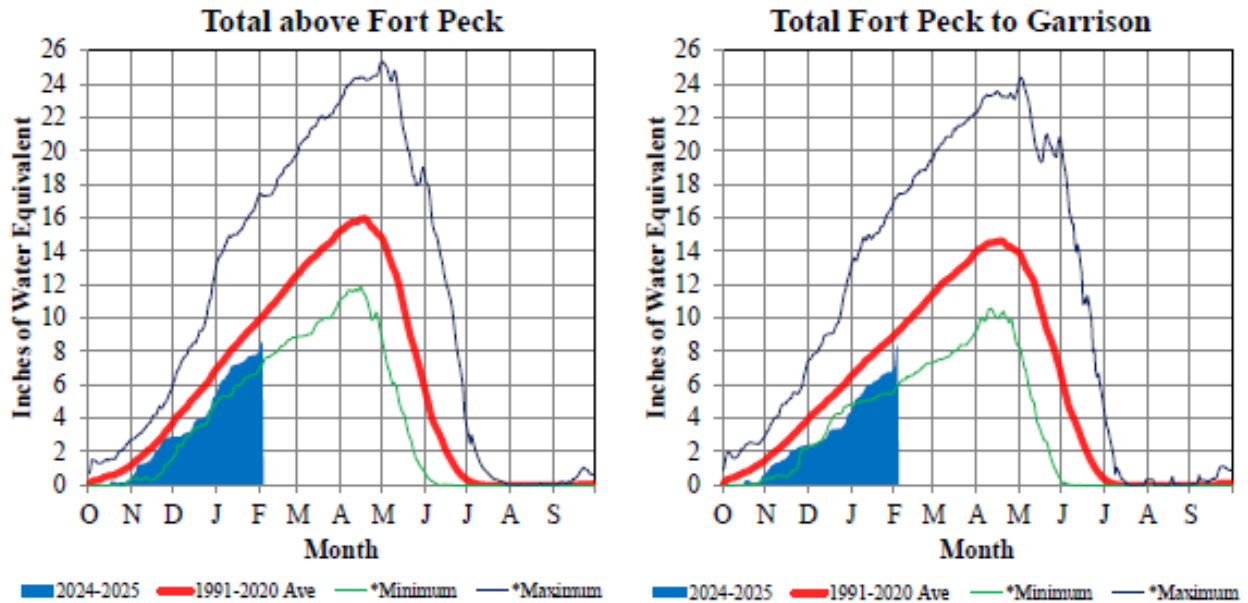
Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches has limited correlation to the February 1 snowpack because only around 64 percent of the mountain snowpack has accumulated by February 1. Mountain snowpack typically peaks in mid-April; therefore, later measurements of mountain snowpack are better runoff indicators.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources and Conservation District SNOw TELelemetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

3-Feb-2025



On February 3, 2025 the mountain Snow Water Equivalent (SWE) in the "Total above Fort Peck" reach is 8.6" and 85% of the (1991-2020) average. The mountain SWE in the "Fort Peck to Garrison" reach is 8.4" and 92% of the (1991-2020) average. The normal peak for both reaches occurs near April 17.

*Refers to the minimum or maximum SWE in the basin for that day in the historical years 1991-2020.

Figure 9. Mountain Snowpack Water Content

As of February 3, the average mountain SWE in the Fort Peck reservoir reach was 8.6", 85% of average. In the reservoir reach between Fort Peck and Garrison dams, the average mountain SWE was 8.4", 92% of average. Typically, 64% of the total mountain SWE accumulation has occurred by February 1, and snowpack generally peaks near April 17.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is an oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

La Niña conditions are currently present. La Niña conditions are 59% likely to continue through April, with a transition to ENSO-neutral conditions likely by March-May 2025 (60% chance).

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The temperature outlook for February (**Figure 10**) indicates increased chances for below-normal temperatures across most of the upper Basin. The precipitation outlook (**Figure 10**) for the same period shows increased chances for above-normal precipitation in Montana and western Wyoming, and equal chances for above-normal, normal, or below-normal precipitation in the rest of the Basin.

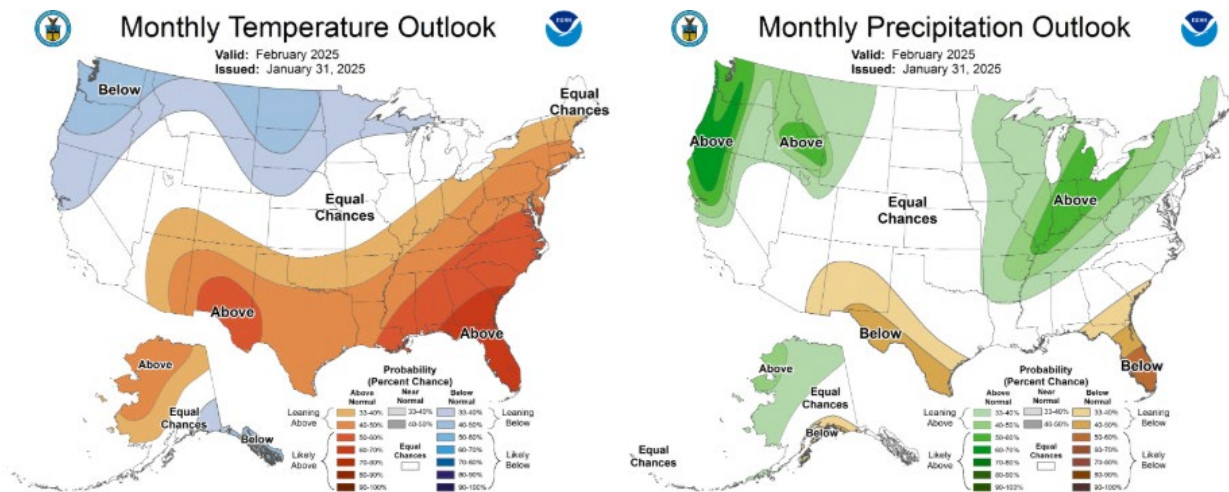


Figure 10. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the four 3-month periods in 2025 are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases. The March-April-May temperature outlook indicates increased chances for below-normal temperatures in Montana and equal chances for above-normal, normal, or below-normal temperatures elsewhere in the Basin. The precipitation outlook for the same period indicates increased chances for below-normal precipitation in Colorado and equal chances for above-normal, normal, or below-normal precipitation in the rest of the Basin.

The June-July-August temperature outlook shows increased chances for warmer-than-normal temperatures along the western side of the Basin, and equal chances for below-normal, normal, or above-normal temperatures across the remainder of the Basin. The precipitation outlook for the same period shows increased chances for below-normal precipitation across most of the Basin.

The September-October-November temperature outlook shows equal chances for below-normal, normal, or above-normal temperatures across the Basin. The precipitation outlook for the same period shows increased chances for below-normal precipitation in the upper Basin, and equal chances for above-normal, normal, or below-normal precipitation in the lower Basin.

The December 2025-January 2026-February 2026 temperature outlook shows no strong indicators, with equal chances for below-normal, normal, or above-normal temperatures across the Basin. The precipitation outlook shows increased chances for above-normal precipitation in the upper Basin, centered in South Dakota.

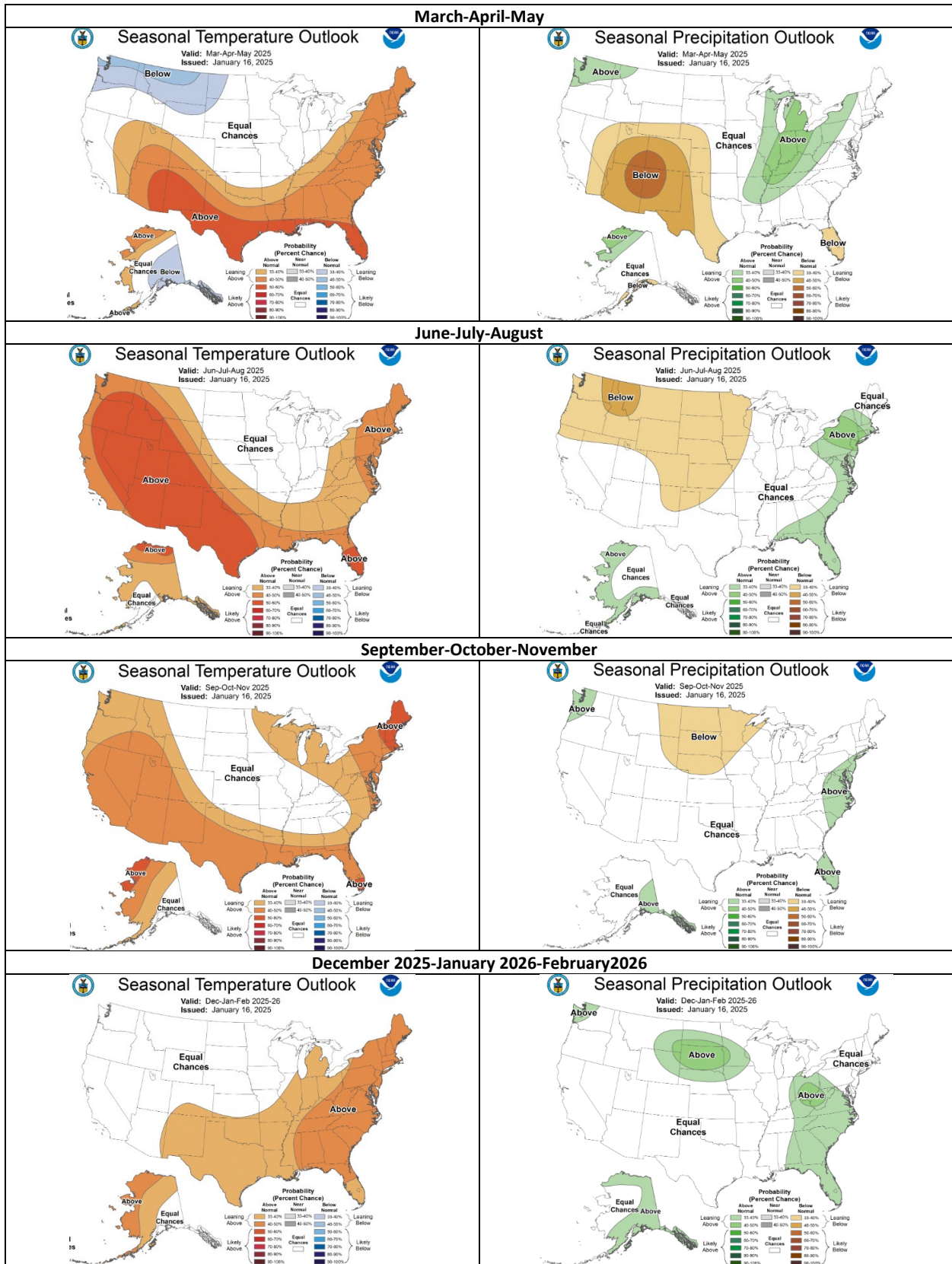


Figure 11. CPC Three-Month Temperature and Precipitation Outlooks

Summary

Given past observed runoff, soil conditions, and recent temperature outlooks, February runoff is expected to be below normal for Fort Peck, Oahe, and Fort Randall, but near normal in the other 3 reaches. March and April runoff potential is below normal due to the below-normal plains snowpack and soil moisture conditions, but it will depend greatly on the accumulation of additional plains snowpack and temperatures, and actual in-season precipitation during the next two to three months. During May, June, and July, Fort Peck and Garrison runoff is forecast to be below average due to below-normal mountain snowpack and dry soil conditions.

In summary, the 2025 calendar year runoff forecast is **20.6 MAF, 80% of average**.

Upper Missouri River Basin
March 2025 Calendar Year Runoff Forecast
March 4, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

February runoff was 1.0 MAF, 91% of average. Runoff was above average in the Fort Peck, Fort Randall, and Sioux City reaches and below normal in the Garrison, Oahe, and Gavins Point reaches.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **22.1 MAF, 86% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **19.6 MAF, 85% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next ten months, expected inflow could range from the 15.2 MAF lower basic forecast to the 30.1 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for January 28 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 79% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of May 2025, indicates drought conditions are likely to remain.

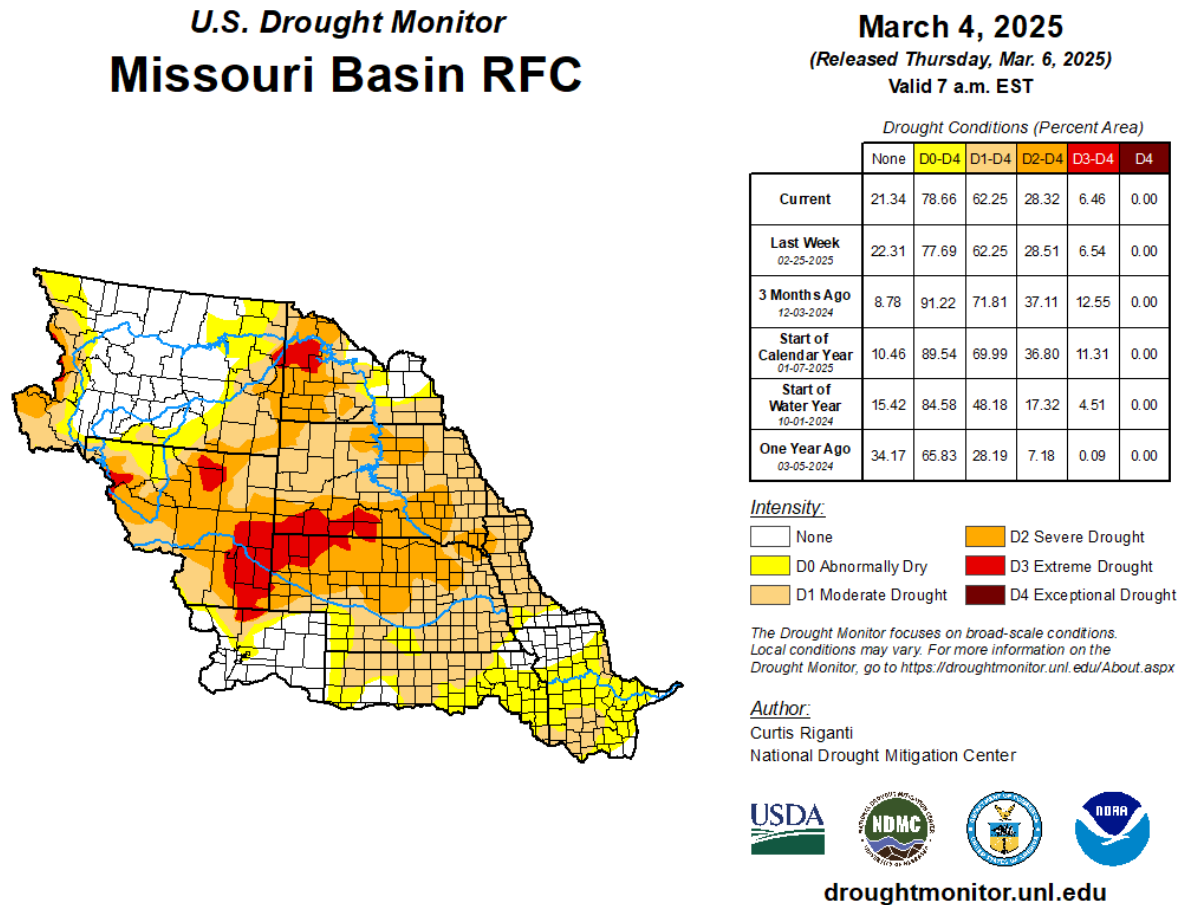


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for March 1 - May 31, 2025
Released February 28, 2025

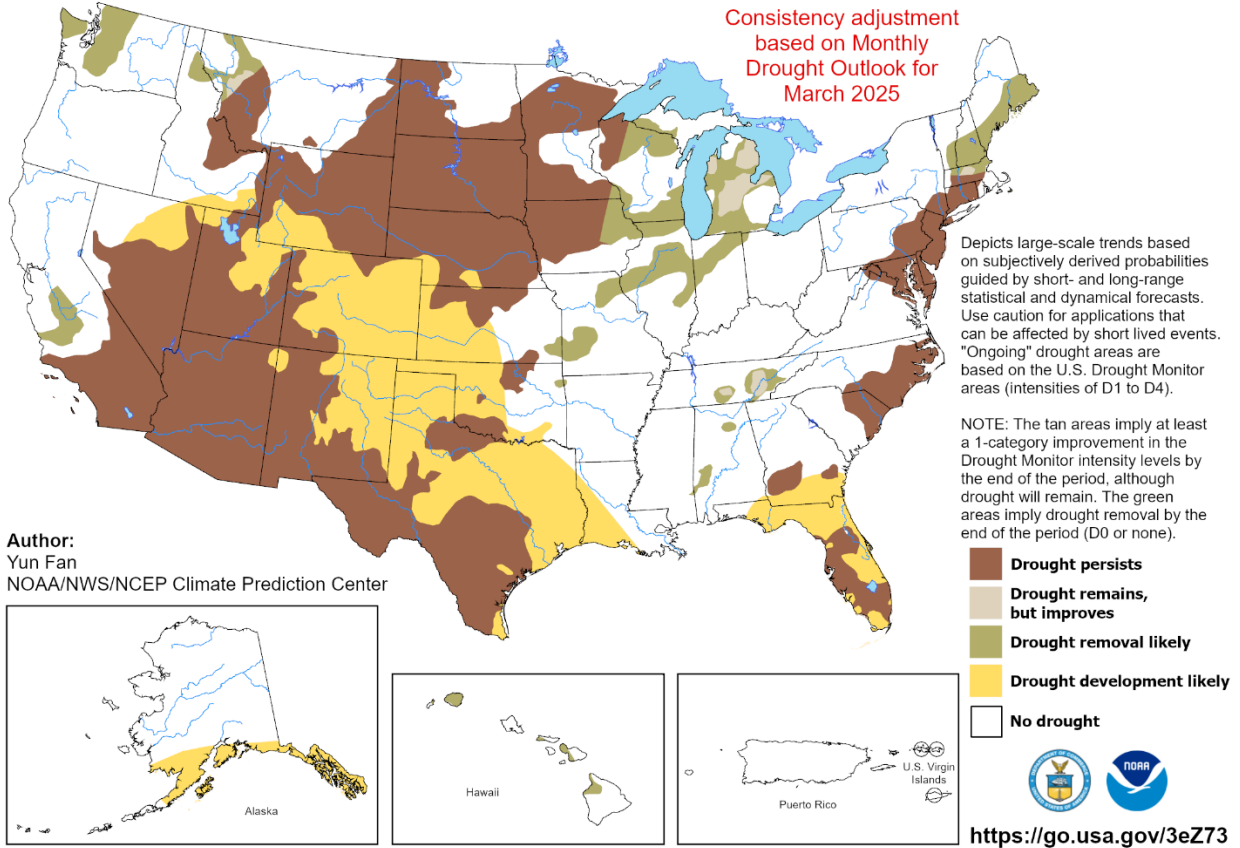


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The February precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Most of the basin observed below-normal precipitation except for Montana and far southwestern North Dakota, which saw as much as 400% of normal precipitation.

Precipitation as a percent of normal for the December-January-February period (**Figure 4**) was similar to the February precipitation. Below-normal precipitation was observed over most of the Basin except most of Montana and far southwestern North Dakota, which saw as much as 300% of normal precipitation.

Percent of Normal Precipitation (%)
2/1/2025 – 2/28/2025

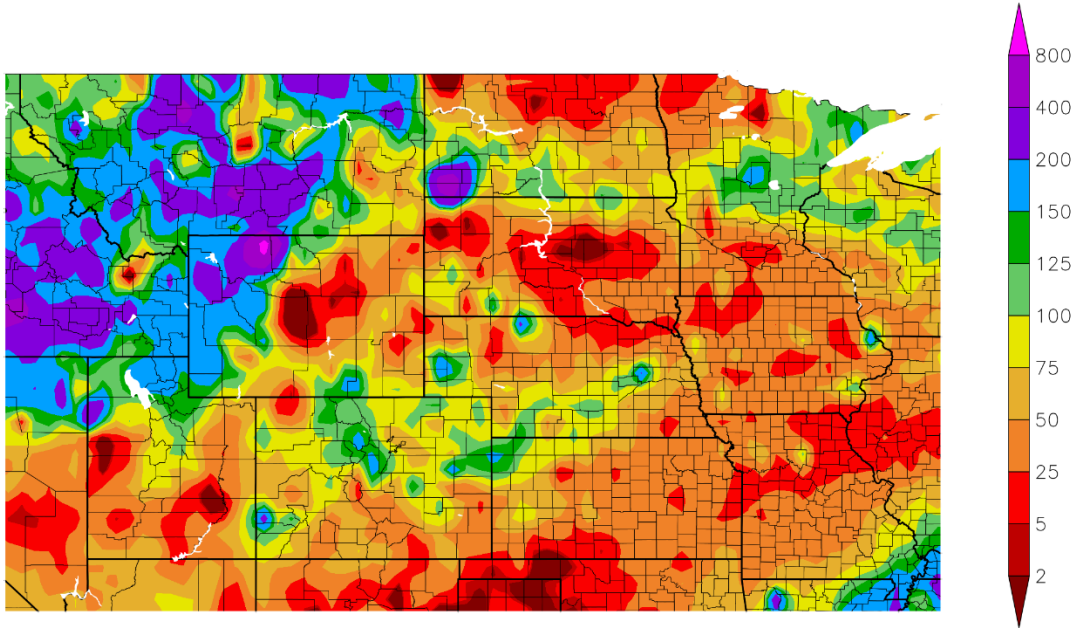


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
12/1/2024 – 2/28/2025

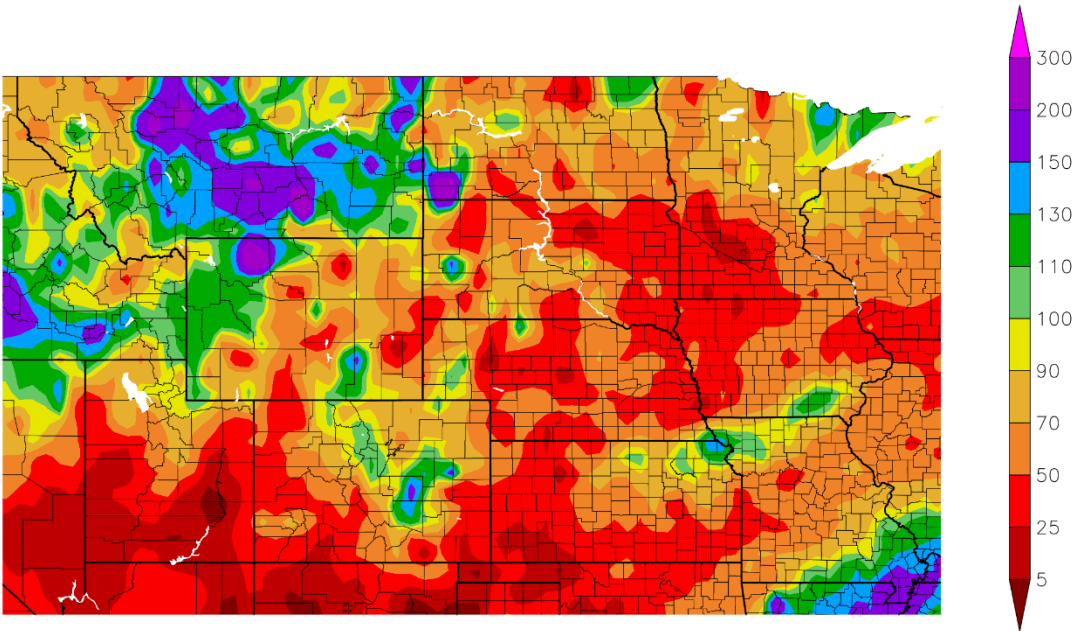


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

February temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were below normal across the Basin. The northern part of the Basin saw extreme cold over the last month, with temperature departures from 9 to more than fifteen degrees below normal. December-January-February temperature departures are shown in **Figure 6**. The three-month average temperature departures were cooler than normal across the Basin.

Departure from Normal Temperature (F) 2/1/2025 – 2/28/2025

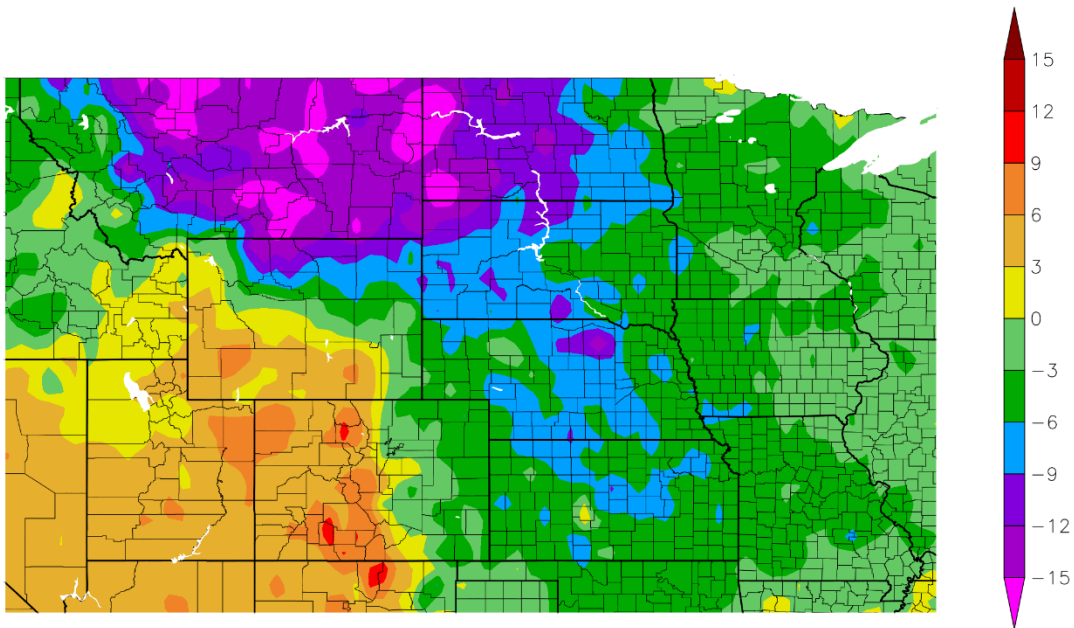


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 12/1/2024 – 2/28/2025

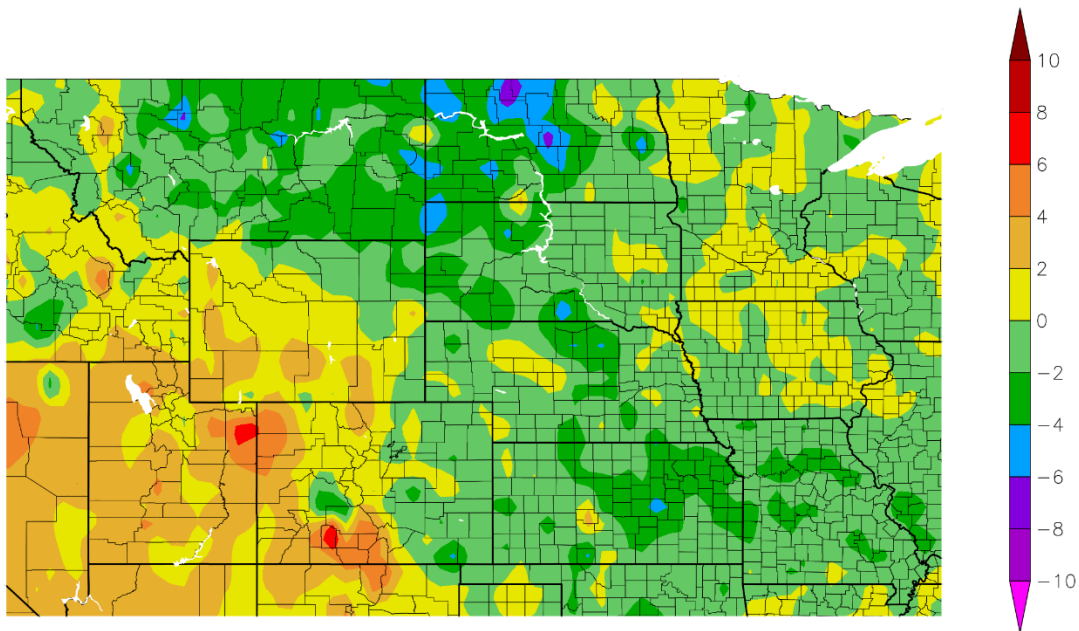


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of February 2025 are shown in **Figure 7**. Soil moisture is dry across most of the Basin except Montana, where above-normal precipitation and early plains snowmelt resulted in more normal soil conditions.

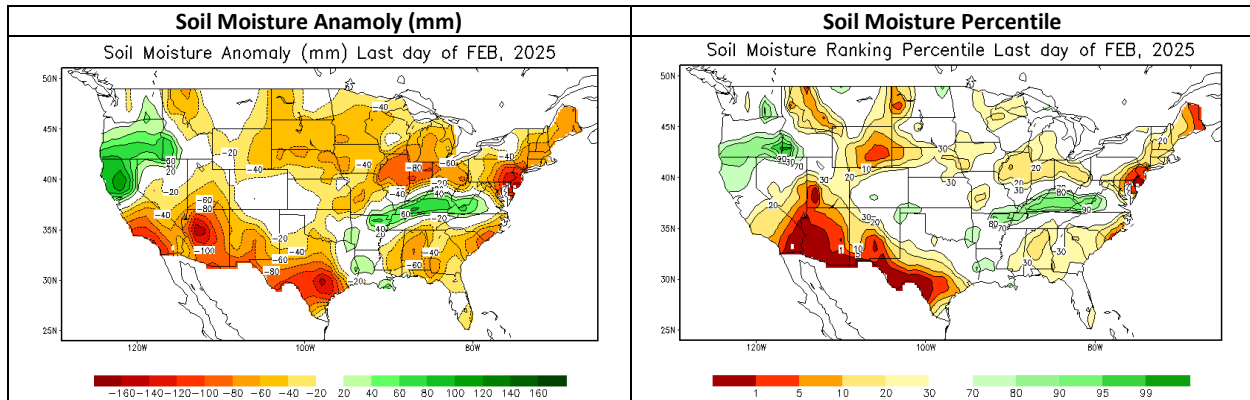


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) from March 1, 2025, is shown in

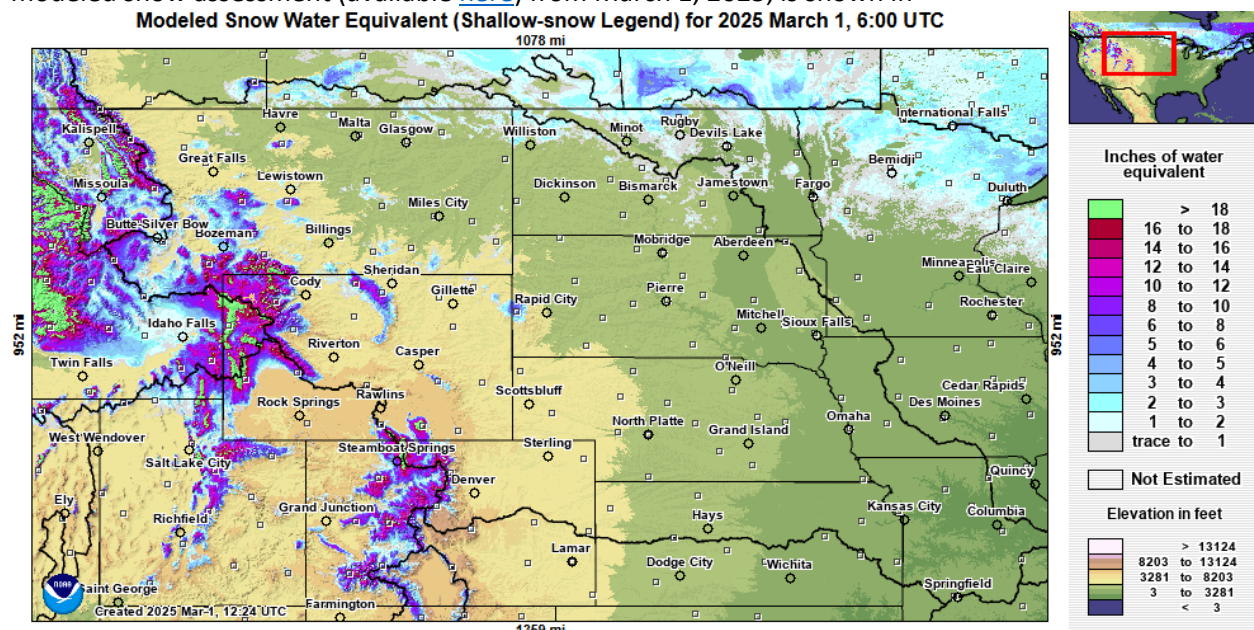


Figure 8. NOHRSC Modeled Snow Water Equivalent shows almost no plains snowpack, much below normal for this time of year. Warmer-than-normal temperatures at the end of February melted most of the existing plains snowpack by March 1. On February 19, before warm temperatures set in, trace to 1” of snow water equivalent (SWE) was modeled across most of the Basin. Highest amounts of SWE were

in central North Dakota and Montana, which had up to 4" of SWE. Due to the early melting of the Missouri Basin plains snowpack, the amount of runoff received in March and April will depend on precipitation and temperatures over the next two months.

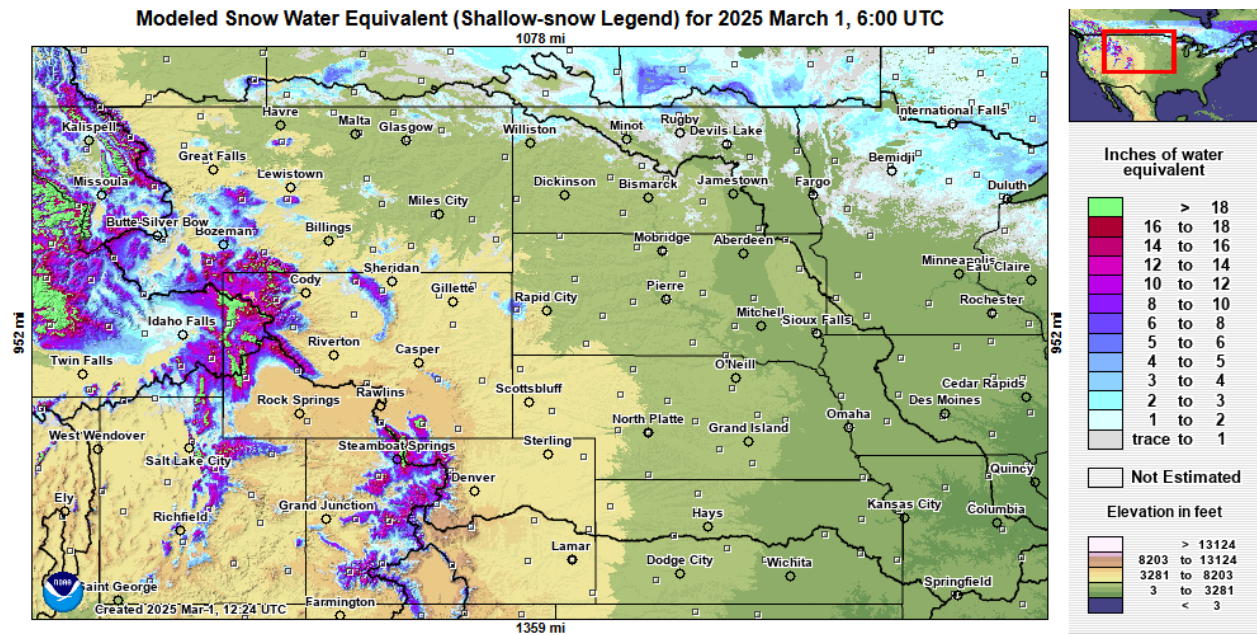


Figure 8. NOHRSC Modeled Snow Water Equivalent

Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlation to the March 1 snowpack because around 80 percent of the mountain snowpack has accumulated by March 1. Mountain snowpack typically peaks in mid-April; therefore, later measurements of mountain snowpack become better runoff indicators.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources and Conservation District SNOw TELelemetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

3-Mar-2025

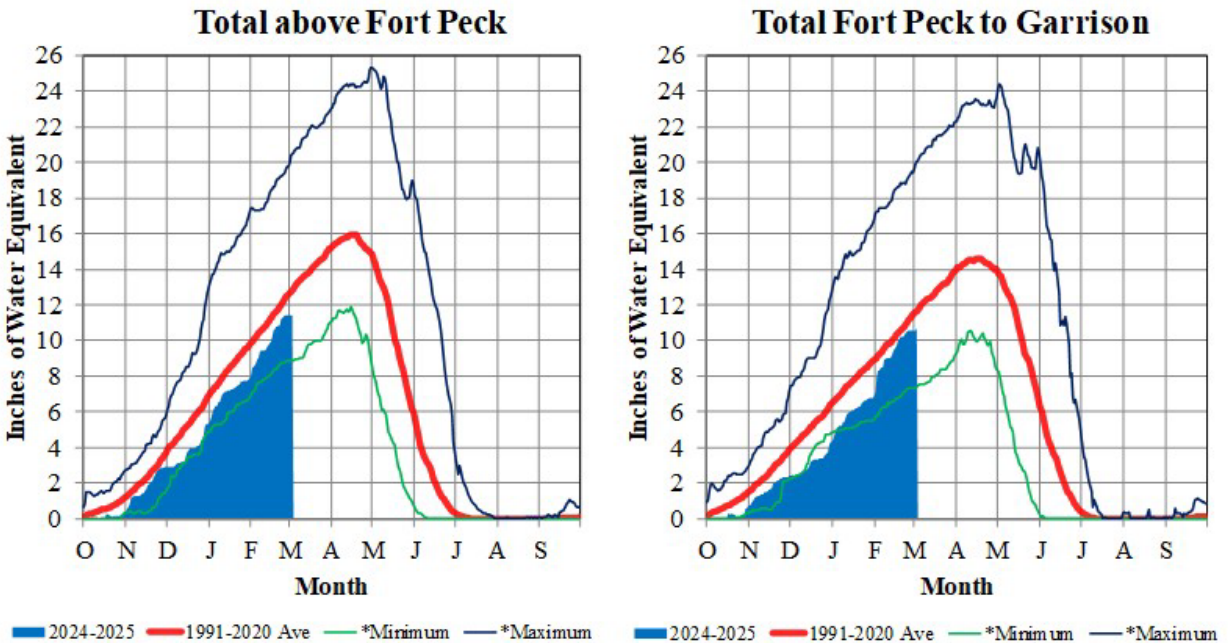


Figure 9. Mountain Snowpack Water Content

As of March 3, the average mountain SWE in the Fort Peck reservoir reach was 11.4”, 89% of average. In the reservoir reach between Fort Peck and Garrison dams, the average mountain SWE was 10.7”, 91% of average.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is an oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

La Niña conditions are currently present. La Niña conditions are 66% likely to transition to ENSO-neutral during March-May 2025.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for March (**Figure 10**) show increased chances for warmer-than-normal temperatures, and equal chances for below normal, normal, or above normal precipitation in the Basin.

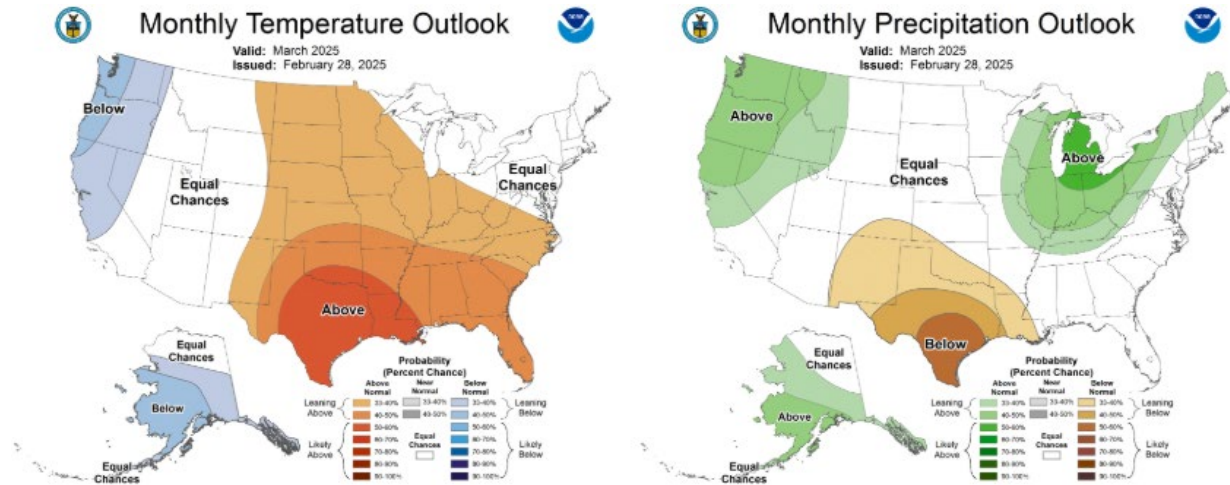


Figure 10. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases. The April-May-June temperature outlook indicates increased chances for cooler-than-normal temperatures in Montana and the western Dakotas and equal chances for below normal, normal, or above normal temperatures in the rest of the Basin. The precipitation outlook for the same period shows equal chance for below normal, normal, or above normal precipitation everywhere except across Wyoming, Colorado, Nebraska, and Kansas, which show increased chances for below normal precipitation.

The July-August-September outlooks show increased chances for warmer-than-normal temperatures and below normal precipitation for the Basin.

The October-November-December temperature outlook indicates increased chances for warmer-than-normal temperatures across the Basin. The precipitation outlook for the same period indicates below normal precipitation in the upper Basin, western Nebraska, and Colorado, and equal chances for below normal, normal, or above normal precipitation in the rest of the Basin.

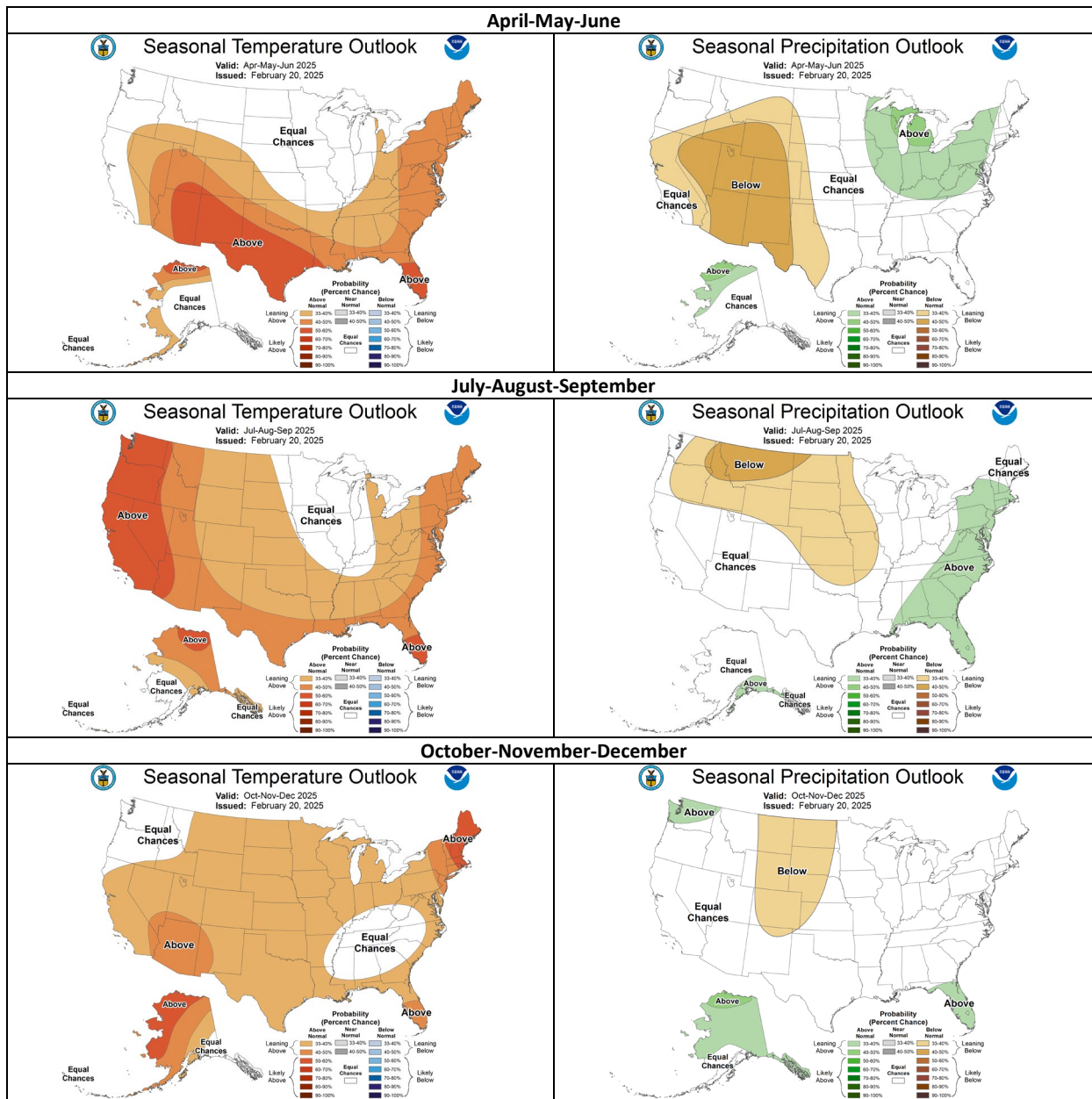


Figure 11. CPC Three-Month Temperature and Precipitation Outlooks

Summary

Given current reach runoff and basin conditions including the current lack of plains snow, we expect runoff in March and April to be below normal for most reaches, but it will depend on the accumulation of additional plains snowpack, precipitation, and temperatures over the next two months. During May, June, and July, Fort Peck and Garrison runoff is forecast to be slightly below average due to the below normal mountain snowpack and dry soil moisture conditions.

In summary, the 2025 calendar year runoff forecast is **22.1 MAF, 86% of average**.

NRCS Water Supply Forecasts

USDA NRCS National Water & Climate Center

* - DATA CURRENT AS OF: Thu, 06 Mar 2025 16:07:58 GMT

- Based on 03-01-2025 forecast values - Not filtered by publish status(es)

PRELIMINARY MISSOURI RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Lake Sherburne Inflow (2)	APR-JUL	84	84	102	92	77	67	99
	APR-SEP	97	83	117	106	90	79	116
St. Mary R at Intl Boundary (2)	APR-JUL	375	83	475	415	330	270	450
	APR-SEP	435	85	555	480	390	325	510
Red Rock R bl Lima Res nr Monida (2)	APR-JUL	55	87	89	68	42	26	63
	APR-SEP	61	83	98	76	48	33	73
Beaverhead R nr Grant (2)	APR-JUL	46	73	105	72	25	7	63
	APR-SEP	50	71	111	74	36	22	70
Jefferson R nr Three Forks (2)	APR-JUL	515	71	940	690	365	205	720
	APR-SEP	550	78	1030	735	400	250	705
Madison R bl Hebgen Lake nr Grayling (2)	APR-JUL	315	90	395	350	285	250	350
	APR-SEP	380	83	460	415	355	310	455
Madison R bl Ennis Lake nr McAllister (2)	APR-JUL	560	91	710	615	505	445	615
	APR-SEP	705	94	880	775	645	575	750
Missouri R at Toston (2)	APR-JUL	1490	83	2220	1800	1250	980	1780
	APR-SEP	1690	85	2550	2020	1420	1080	1970
Smith R bl Eagle Ck	APR-JUL	101	93	152	122	80	50	108
	APR-SEP	110	96	166	132	88	54	114
Gibson Reservoir Inflow (2)	APR-JUL	280	74	390	325	235	169	375
	APR-SEP	315	75	435	360	265	191	415
Marias R nr Shelby (2)	APR-JUL	260	78	420	320	199	127	330
	APR-SEP	245	72	440	315	181	108	340
Missouri R at Fort Benton	APR-JUL	2230	85	3330	2690	1860	1420	2620
	APR-SEP	2600	84	3910	3070	2170	1690	3060
Missouri R nr Virgelle	APR-JUL	2470	80	3590	2930	2000	1460	3060
	APR-SEP	2870	82	4310	3410	2340	1740	3500
Missouri R nr Landusky	APR-JUL	2760	87	4120	3290	2260	1610	3150
	APR-SEP	3080	84	4530	3650	2530	1910	3630
Missouri R bl Fort Peck Dam	APR-JUL	2690	87	3900	3180	2290	1750	3060
	APR-SEP	3110	93	4860	3740	2600	1990	3320
Missouri R nr Williston ND	APR-JUL	7740	85	11100	8940	6660	5130	9080
	APR-SEP	8600	85	12800	10200	7270	5430	10100

PRELIMINARY YELLOWSTONE RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Yellowstone R at Yellowstone Lake Outlet	APR-JUL	525	88	655	570	470	415	590
	APR-SEP	625	80	785	685	565	480	775
Yellowstone R at Corwin Springs	APR-JUL	1540	93	1850	1670	1420	1250	1650
	APR-SEP	1850	97	2270	2030	1690	1460	1900
Yellowstone R at Livingston	APR-JUL	1870	98	2280	2050	1690	1460	1900
	APR-SEP	2110	95	2590	2330	1890	1610	2200
Shields R nr Livingston	APR-JUL	130	102	192	157	106	69	127
	APR-SEP	134	97	205	160	109	66	138
Boulder R at Big Timber	APR-JUL	340	117	420	375	310	265	290
	APR-SEP	345	111	430	380	310	260	310
Mystic Lake Inflow	APR-JUL	58	100	67	62	54	49	58
	APR-SEP	73	97	85	78	68	62	75
Wind R Ab Bull Lake Ck (2)	APR-JUL	425	88	590	495	360	270	480
	APR-SEP	455	96	620	525	395	310	470
Bull Lake Ck nr Lenore (2)	APR-JUL	141	100	177	156	125	107	141
	APR-SEP	170	101	210	186	154	132	168
Boysen Reservoir Inflow (2)	APR-JUL	655	89	1050	830	495	305	730
	APR-SEP	740	94	1150	925	575	355	785
Greybull R at Meeteetse	APR-JUL	143	101	210	169	119	91	141
	APR-SEP	190	95	275	225	159	121	199
Shell Ck nr Shell	APR-JUL	47	79	66	55	40	30	59
	APR-SEP	60	84	81	69	53	41	71
Bighorn R at Kane (2)	APR-JUL	915	91	1580	1200	625	285	1000

	APR-SEP	1010	97	1710	1320	700	325	1040
NF Shoshone R at Wapiti	APR-JUL	445	98	550	490	400	330	450
	APR-SEP	500	97	625	555	435	370	515
SF Shoshone R nr Valley	APR-JUL	215	95	270	235	193	164	225
	APR-SEP	255	98	315	280	225	191	260
Buffalo Bill Reservoir Inflow (2)	APR-JUL	625	93	815	700	565	480	670
	APR-SEP	705	96	955	810	625	525	730
Bighorn R nr St. Xavier (2)	APR-JUL	1160	72	2040	1530	825	430	1610
	APR-SEP	1360	79	2380	1830	980	470	1720
Little Bighorn R nr Hardin	APR-JUL	103	100	181	131	75	35	102
	APR-SEP	123	101	205	148	91	56	121
Tongue R nr Dayton (2)	APR-JUL	80	90	112	94	65	34	88
	APR-SEP	94	92	127	108	82	63	102
Tongue River Reservoir Inflow (2)	APR-JUL	230	104	335	275	174	107	220
	APR-SEP	230	92	360	290	170	99	250
NF Powder R nr Hazelton	APR-JUL	6.8	66	10.6	8.4	5.3	3.4	10.3
	APR-SEP	7.3	65	11.1	8.9	5.6	2.5	11.1
Powder R at Moorhead	APR-JUL	164	85	330	235	100	16	191
	APR-SEP	220	107	405	300	155	79	205
Powder R nr Locate	APR-JUL	186	82	435	275	110	31	225
	APR-SEP	260	108	535	355	172	90	240
Yellowstone R at Miles City	APR-JUL	4070	80	6080	4770	3320	2300	5040
	APR-SEP	5010	88	7560	6030	4020	2680	5670
Yellowstone R nr Sidney	APR-JUL	4010	80	5760	4730	3370	2560	5000
	APR-SEP	4900	87	6980	5660	4150	3280	5580

PRELIMINARY RAPID VALLEY UNIT FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
Deerfield Reservoir Inflow	MAR-JUL	6.2	95	9.4	7.6	5.1	3.4	6.5
Pactola Reservoir Inflow	MAR-JUL	21	75	40	28	14.9	5.3	28

PRELIMINARY PLATTE RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
North Platte R nr Northgate	APR-JUL	180	90	295	220	143	96	200
	APR-SEP	210	95	335	260	167	118	220
Encampment R nr Encampment	APR-JUL	109	80	155	130	91	63	135
	APR-SEP	115	81	173	136	96	72	141
Rock Ck ab King Canyon Cnl nr Arlington	APR-JUL	55	112	75	62	49	40	49
	APR-SEP	56	109	75	64	49	42	51
Seminole Reservoir Inflow	APR-JUL	630	95	1010	770	485	310	660
	APR-SEP	675	94	1070	820	535	335	715
Sweetwater R nr Alcova	APR-JUL	49	108	84	61	35	14.4	45
	APR-SEP	54	110	91	68	40	19.6	49
La Prele Ck nr Douglas	APR-JUL	18	85	35	25	10.7	1.1	21
	APR-SEP	17.4	89	34	24	10.3	0.9	19.5
North Platte R bl Glendo Reservoir	APR-JUL	690	92	1280	920	485	210	745
	APR-SEP	710	93	1420	955	515	250	760
North Platte R bl Guernsey Reservoir	APR-JUL	680	91	1320	945	425	147	745
	APR-SEP	700	90	1300	955	445	108	775
Laramie R and Pioneer Cnl nr Woods Lg	APR-JUL	115	98	166	135	95	70	117
	APR-SEP	125	99	183	147	104	78	126
Little Laramie R nr Filmore	APR-JUL	63	118	81	70	55	45	53
	APR-SEP	66	117	89	75	58	48	56

Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.

Medians are for the 1991-2020 period.

All volumes are in thousands of acre-feet.

Upper Missouri River Basin
April 2025 Calendar Year Runoff Forecast
April 10, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

March runoff was 2.3 MAF, 76% of average. Runoff was above average in the Fort Peck and Garrison reaches and below average in the Oahe, Fort Randall, and Sioux City reaches. Runoff in the Gavins Point reach was approximately average.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **21.9 MAF, 85% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **20.1 MAF, 86% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next ten months, expected inflow could range from the 16.0 MAF lower basic forecast to the 28.8 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for March 25 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 79% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of May 2025, indicates drought conditions are likely to remain.

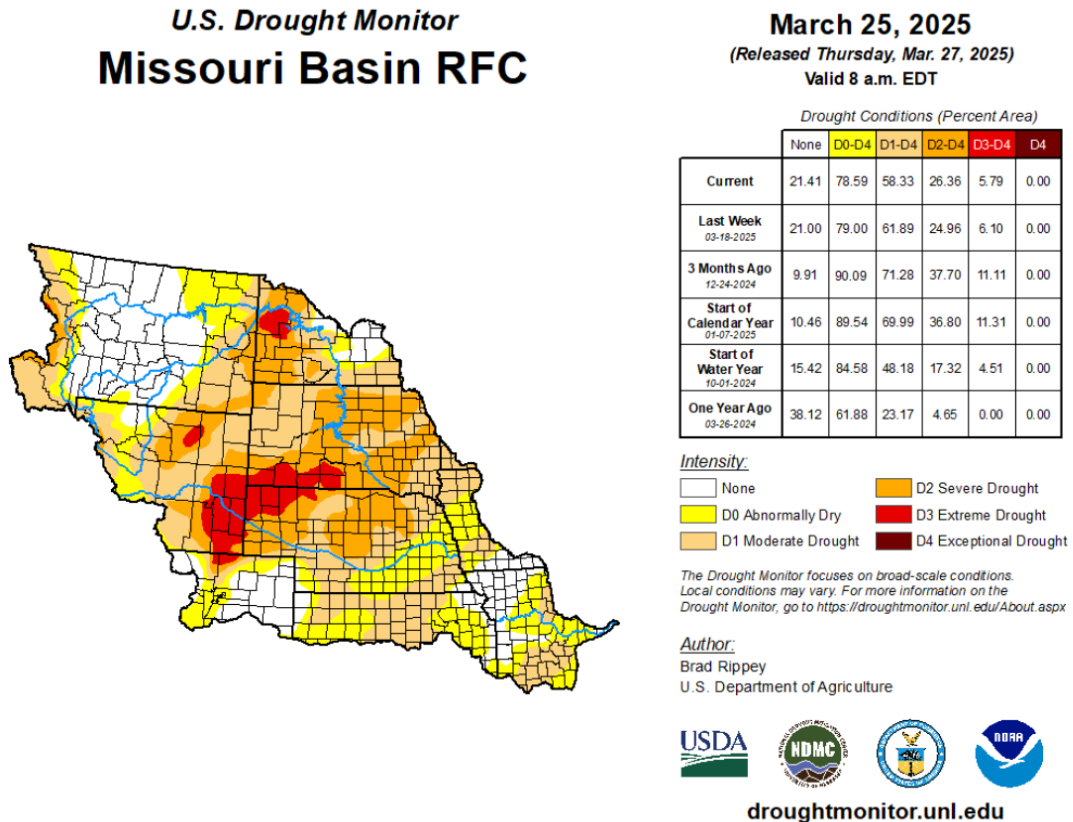


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Monthly Drought Outlook

Drought Tendency During the Valid Period

Valid for April 2025
Released March 31, 2025

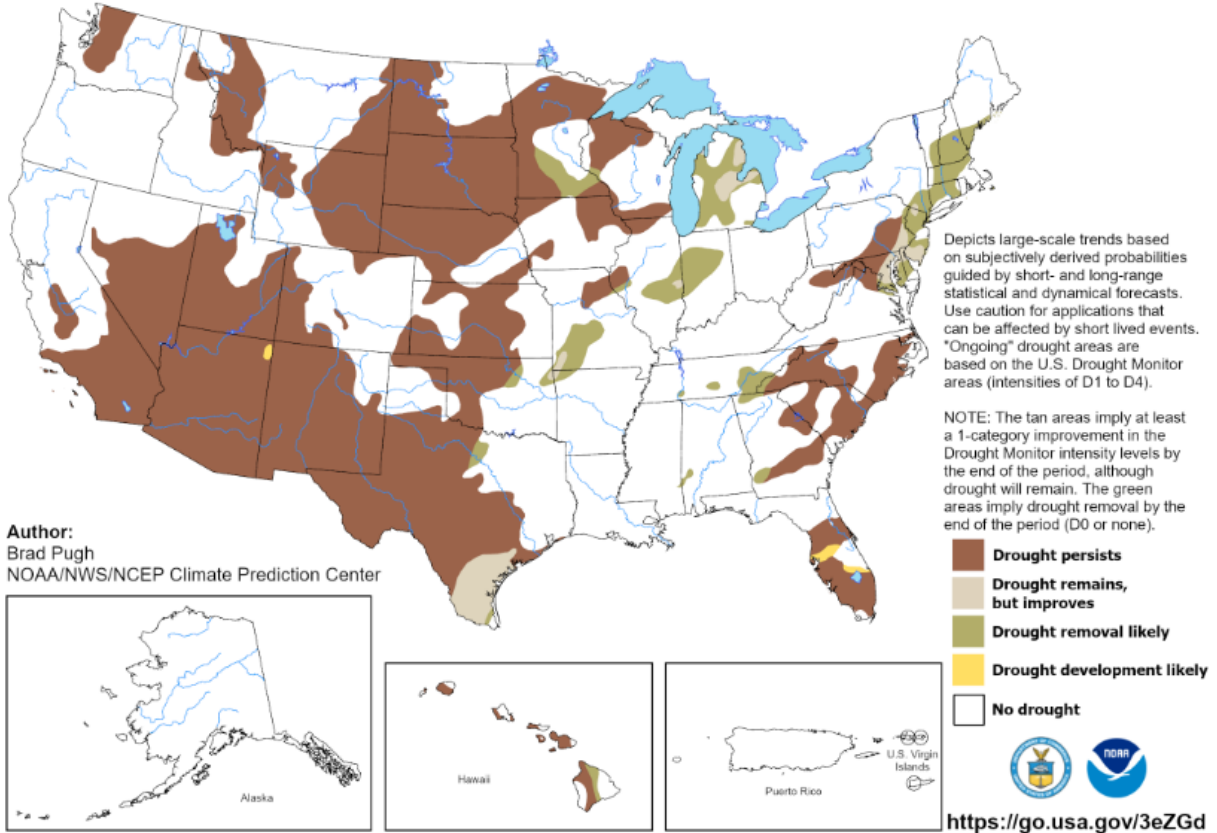


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The March precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Most of the basin observed below-normal precipitation except for southeastern South Dakota, northeastern Nebraska, and central Wyoming which saw as much as 200% of normal precipitation.

Precipitation as a percent of normal for the January-February-March period (**Figure 4**) was similar to the February precipitation. Below-normal precipitation was observed over most of the Basin except in northeastern Colorado, western Wyoming, and Montana which saw over 200% of normal precipitation.

Percent of Normal Precipitation (%)
3/1/2025 – 3/31/2025

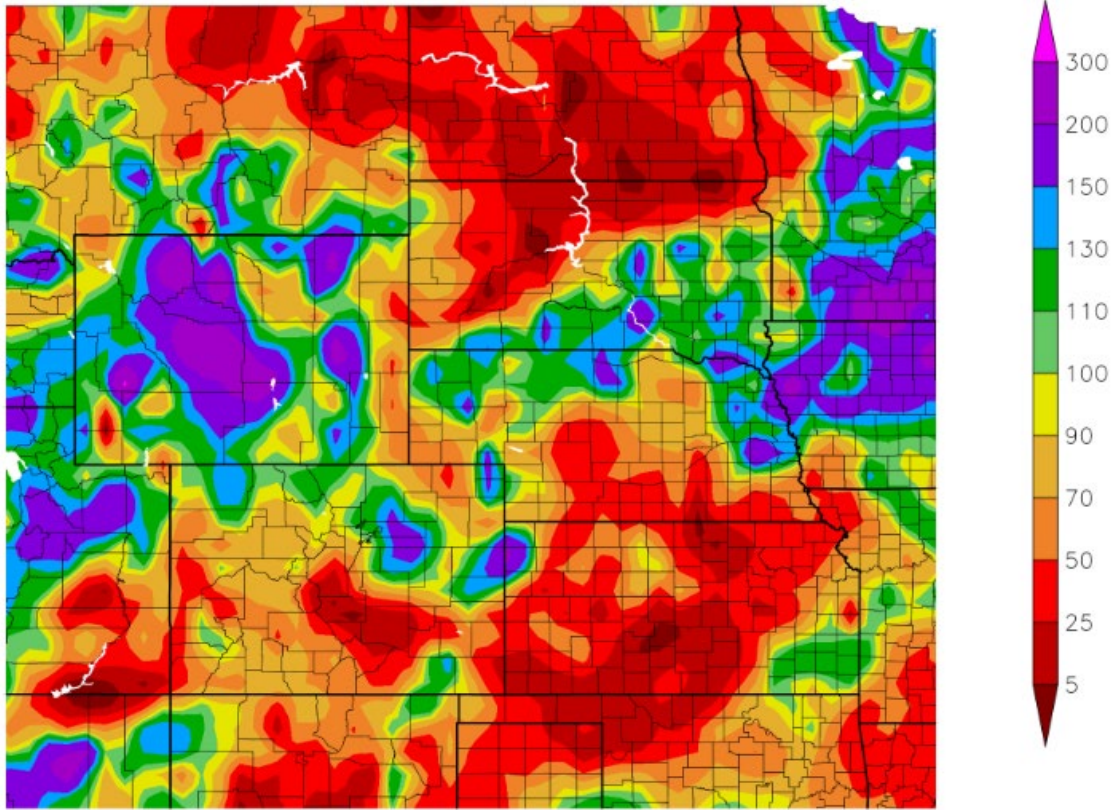


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%) 1/1/2025 – 3/31/2025

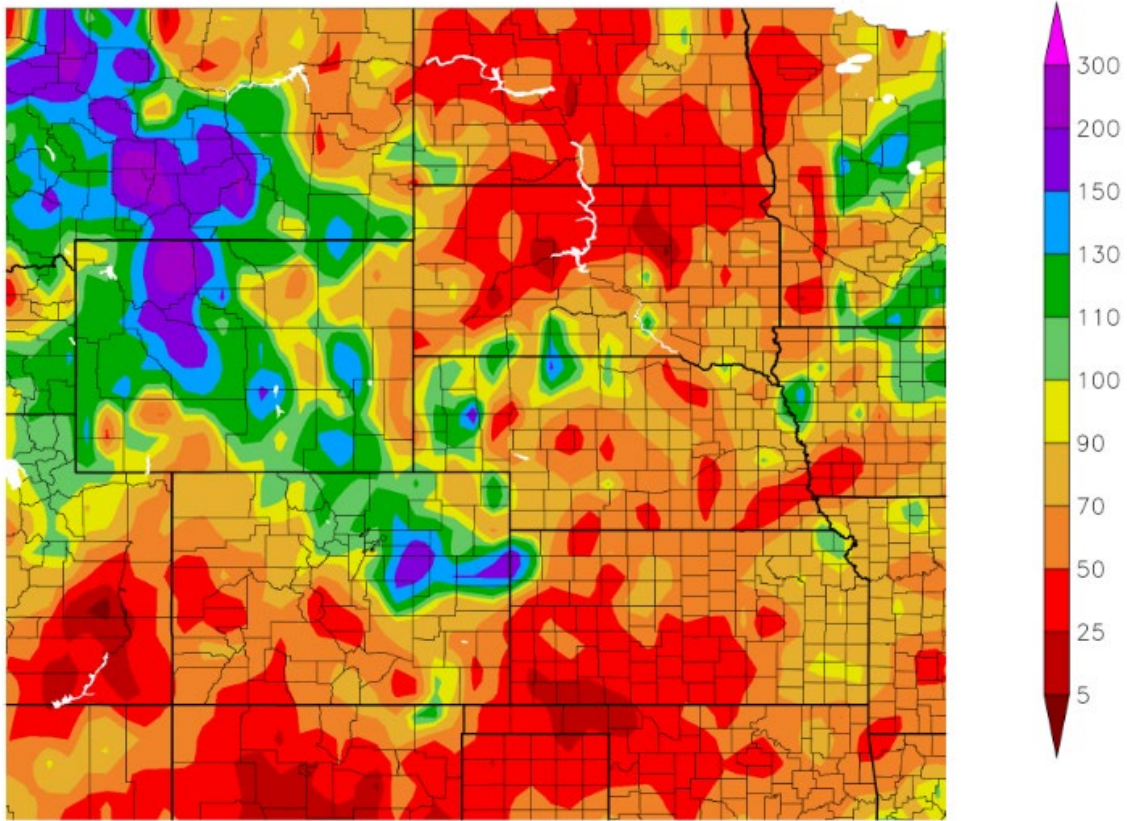


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

March temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were above normal across the Basin. Most of the Basin saw warmer than average temperatures over the last month, with the northern part seeing temperature departures over 10 degrees above normal. January-February-March temperature departures are shown in **Figure 6**. The three-month average temperature departures ranged from slightly above normal in the eastern Dakotas to more than 4 degrees below normal in Montana and Wyoming.

Departure from Normal Temperature (F)
3/1/2025 - 3/31/2025

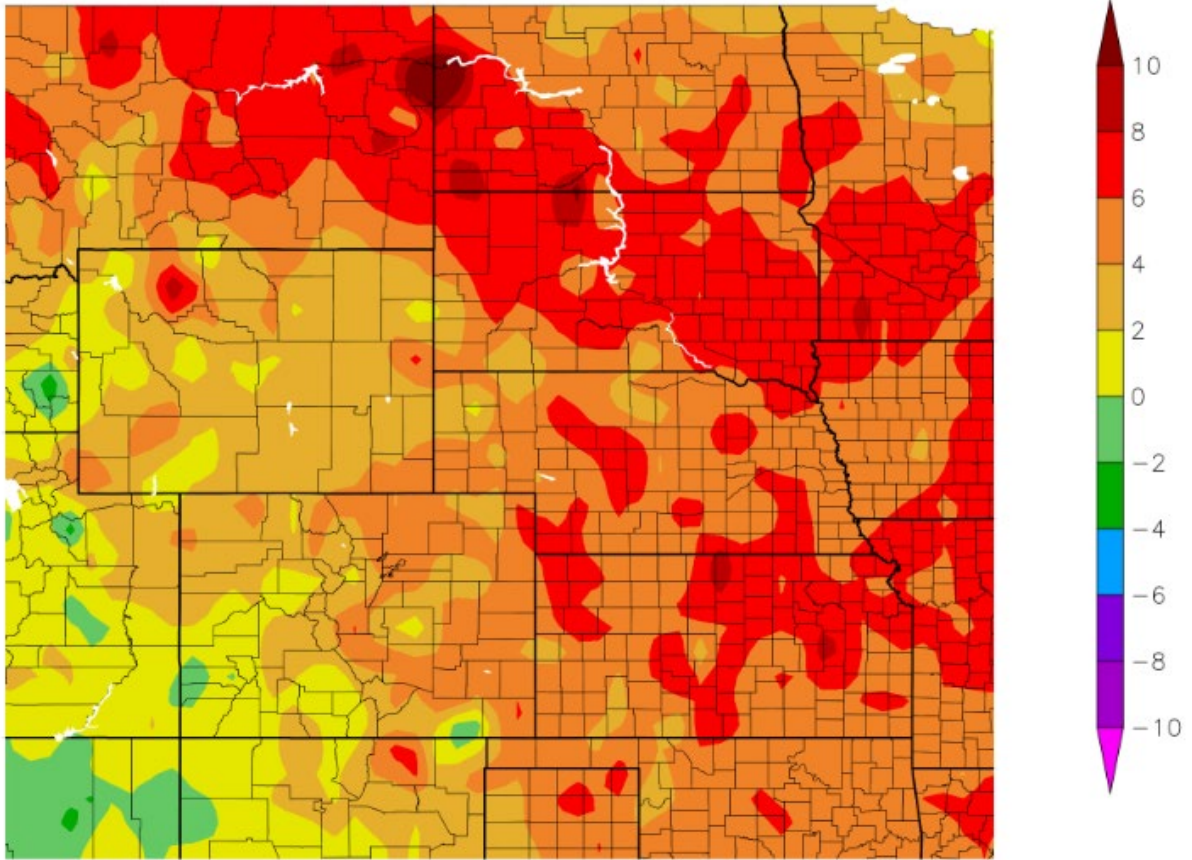


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 1/1/2025 – 3/31/2025

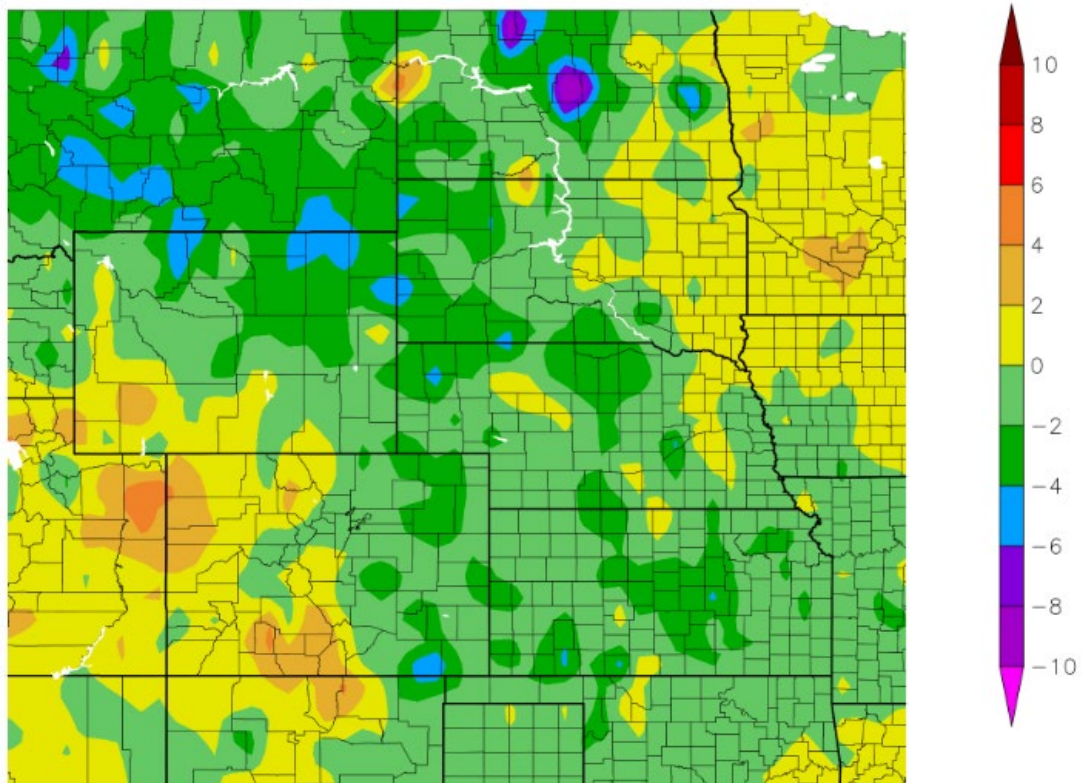


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of March 2025 are shown in **Figure 7**. Soil moisture was dry across most of the Basin except Montana, where above-normal precipitation and early plains snowmelt resulted in more normal soil conditions.

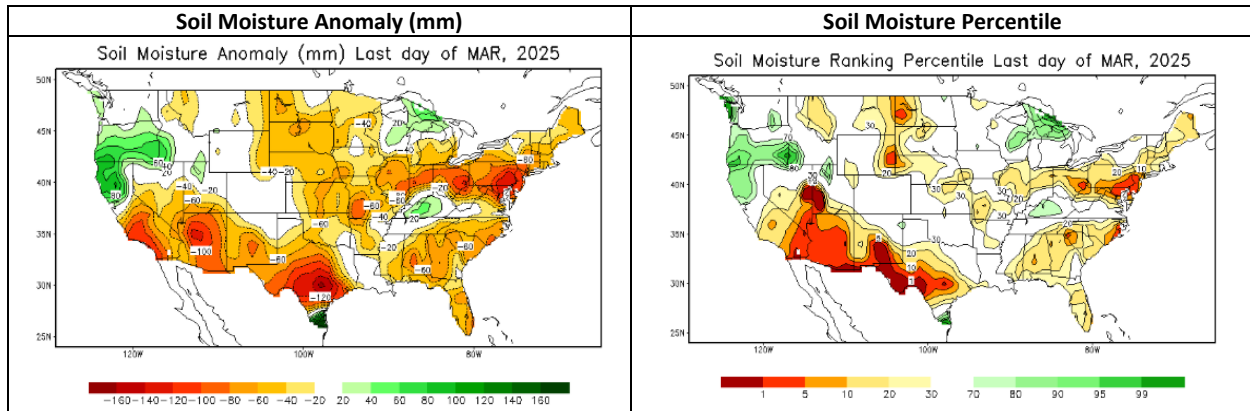
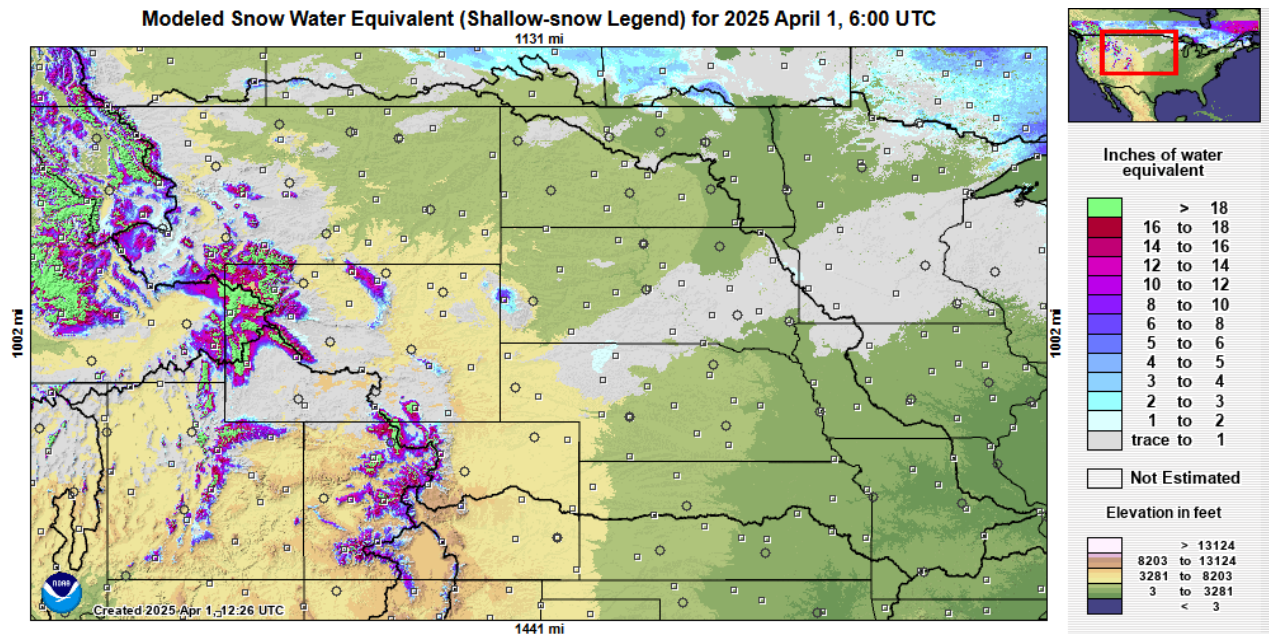


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) from April 1, 2025, is shown in **Figure 8**. NOHRSC Modeled Snow Water Equivalent shows very little plains snowpack, much below normal for this time of year. Trace to 1” of snow water equivalent is modeled in South Dakota, Nebraska and northern Iowa. Warmer-than-normal temperatures at the end of February melted most of the existing plains snowpack by March 1. Due to the early melting of the Missouri Basin plains snowpack, the amount of runoff received in April will depend on precipitation and temperatures over the next month.



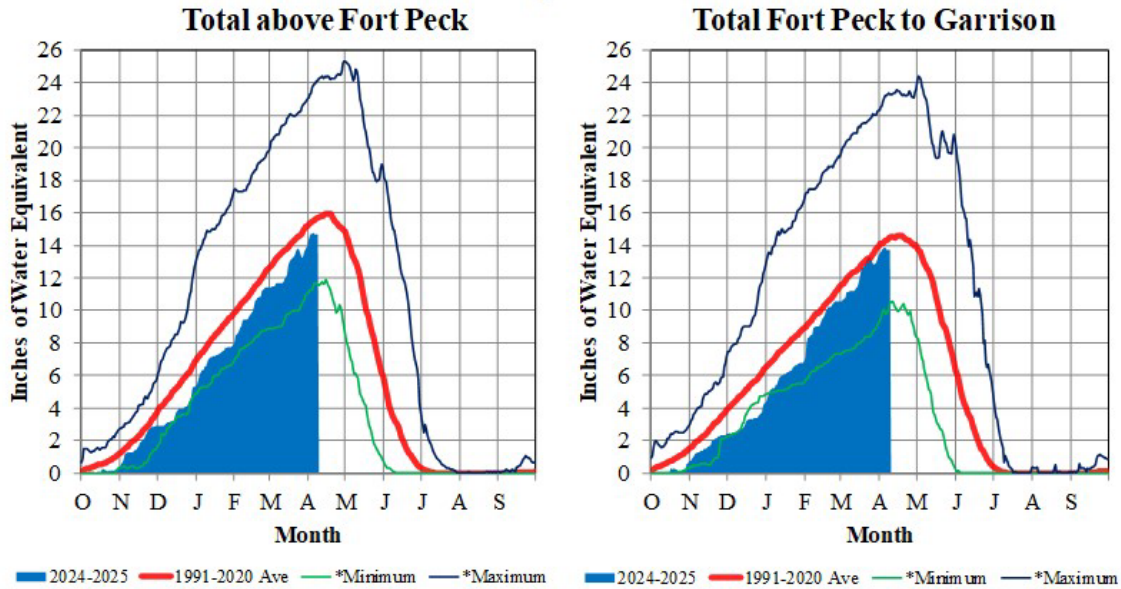
Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlations to mountain snowpack as the season reaches the date of peak accumulation, which typically occurs in mid-April. The best predictor of May-July runoff in the mountain reaches is the peak SWE accumulation.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources and Conservation District SNOW TELEmetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

9-Apr-2025



On April 9, 2025 the mountain Snow Water Equivalent (SWE) in the "Total above Fort Peck" reach is 14.6" and 93% of the (1991-2020) average. The mountain SWE in the "Fort Peck to Garrison" reach is 13.7" and 95% of the (1991-2020) average. The normal peak for both reaches occurs near April 17.

*Refers to the minimum or maximum SWE in the basin for that day in the historical years 1991-2020.

Provisional data. Subject to revision

Figure 9. Mountain Snowpack Water Content

As of April 9, the average mountain SWE in the Fort Peck reservoir reach was 14.6", 93% of average. In the reservoir reach between Fort Peck and Garrison dams, the average mountain SWE was 13.7", 95% of average.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is an oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

La Niña conditions are currently present. ENSO-neutral conditions are favored to develop in the next month and persist through the Northern Hemisphere summer (62% chance in June-August 2025).

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for April (**Figure 10**) show equal chances for all temperature and precipitation scenarios throughout the upper Missouri Basin.

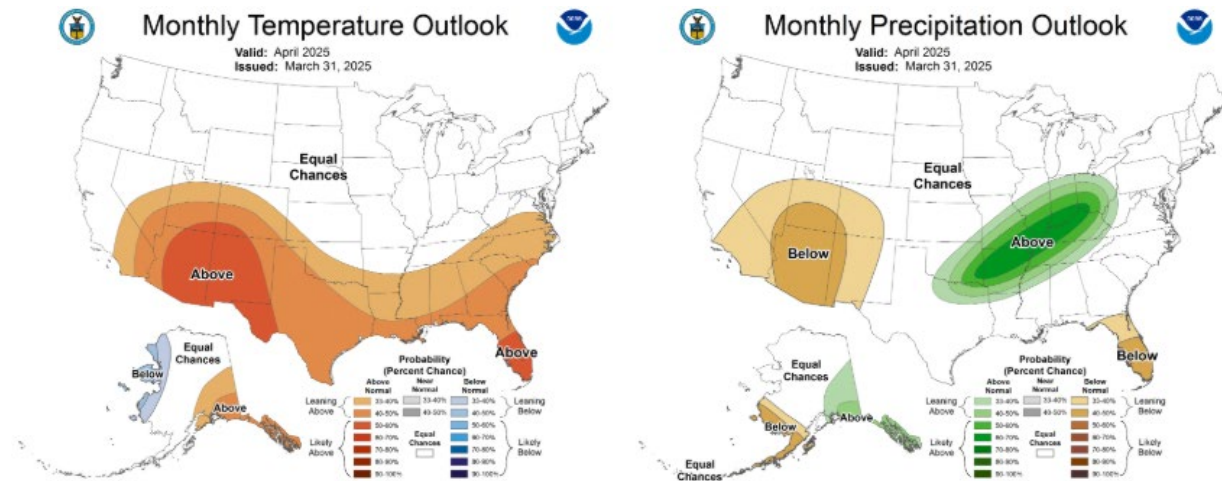


Figure 10. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases. The May-June-July temperature outlook indicates increased chances for warmer-than-normal temperatures in Colorado, Missouri, Southern Iowa, and most of Wyoming and Nebraska. The outlook indicates equal chances for below normal, normal, or above normal temperatures in the rest of the Basin. The precipitation outlook for the same period shows below normal precipitation everywhere except portions of Iowa and Missouri which show equal chances for below normal precipitation, normal, or above normal chances.

The August-September-October outlook shows increased chances for warmer-than-normal temperatures in Montana, Wyoming, Nebraska, Iowa, Colorado, and Missouri and equal chances for below normal, normal, or above normal temperatures in the rest of the Basin. The precipitation outlook for the same period shows increased chances for below normal precipitation all other areas of the Basin, especially in the Dakotas.

The November-December-January temperature outlook indicates increased chances for warmer-than-normal temperatures in Colorado, Missouri, southern Wyoming, southern Nebraska, and southern Iowa. The outlook shows equal chances for below normal, normal, or above normal temperatures in the rest of the Basin. The precipitation outlook for the same period indicates increased chances for above normal precipitation in Montana, northern Wyoming, and the Western Dakotas. It indicates equal chances for below normal, normal, or above normal precipitation in the rest of the Basin.

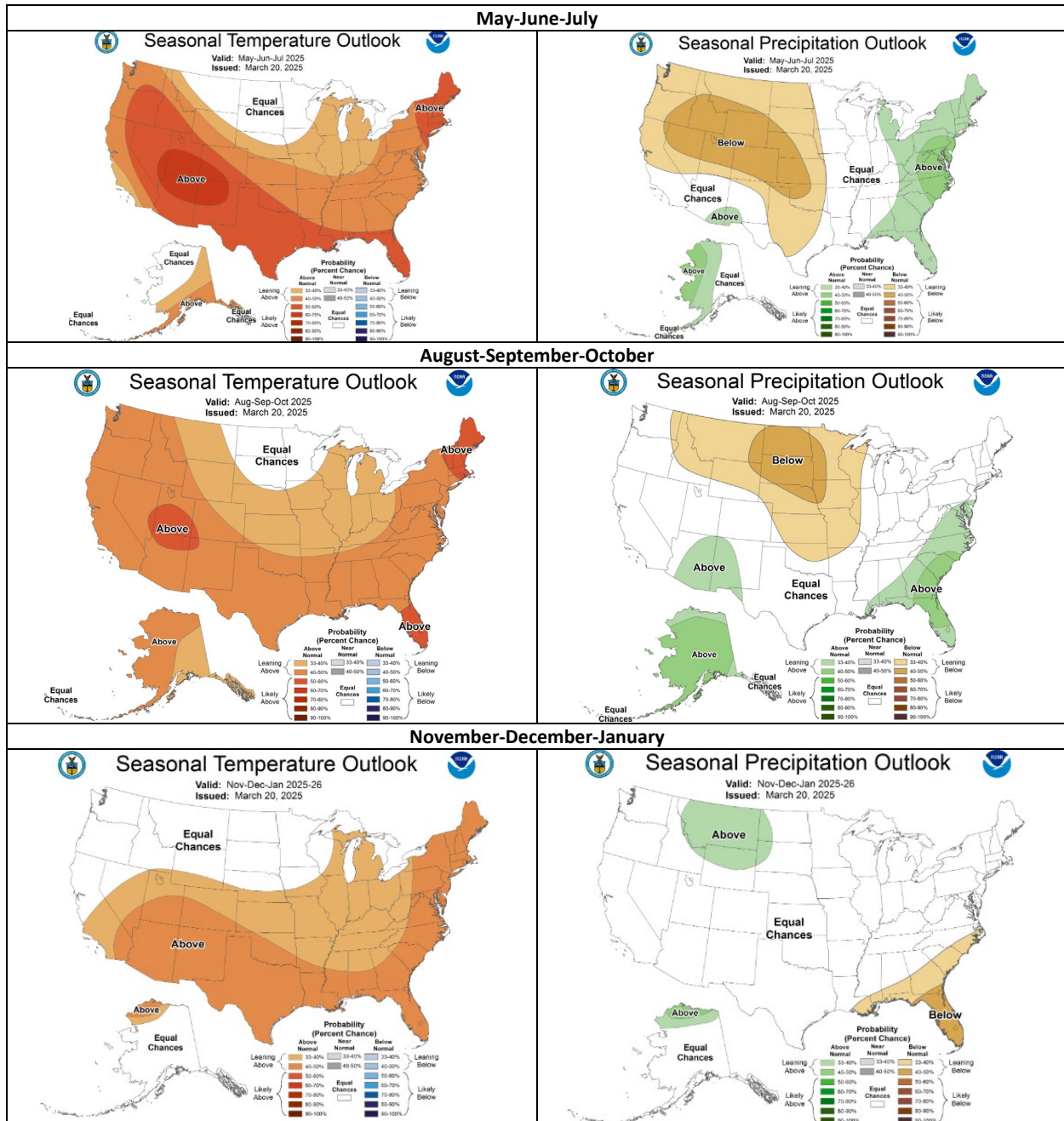


Figure 11. CPC Three-Month Temperature and Precipitation Outlooks

Summary

Given current reach runoff and basin conditions including the current lack of plains snow, we expect runoff in April and May to be below normal for most reaches, but it will depend on the accumulation of additional plains snowpack, precipitation, and temperatures over the next two months. During May, June, and July, Fort Peck and Garrison runoff is forecast to be slightly below average due to the below normal mountain snowpack and dry soil moisture conditions.

In summary, the 2025 calendar year runoff forecast is **21.9 MAF, 85% of average**.

NRCS Water Supply Forecasts

USDA NRCS National Water & Climate Center

* - DATA CURRENT AS OF: 08 Apr 2025 11:30 AM

- Based on 04-01-2025 forecast values

PRELIMINARY MISSOURI RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Lake Sherburne Inflow (2)	APR-JUL	84	84	99	90	77	71	99
	APR-SEP	98	84	116	104	91	82	116
St. Mary R at Intl Boundary (2)	APR-JUL	390	86	470	420	350	305	450
	APR-SEP	445	87	545	490	400	350	510
Red Rock R bl Lima Res nr Monida (2)	APR-JUL	56	88	82	66	44	32	63
	APR-SEP	61	83	88	73	48	34	73
Beaverhead R nr Grant (2)	APR-JUL	57	90	106	77	37	8	63
	APR-SEP	64	91	119	86	42	9	70
Jefferson R nr Three Forks (2)	APR-JUL	580	80	955	710	455	325	720
	APR-SEP	625	88	1070	780	500	355	705
Madison R bl Hebgen Lake nr Grayling (2)	APR-JUL	320	91	380	345	290	255	350
	APR-SEP	415	91	490	445	380	345	455
Madison R bl Ennis Lake nr McAllister (2)	APR-JUL	580	94	695	630	535	480	615
	APR-SEP	710	94	850	765	660	595	750
Missouri R at Toston (2)	APR-JUL	1620	91	2270	1860	1400	1170	1780
	APR-SEP	1820	92	2580	2100	1580	1300	1970
Smith R bl Eagle Ck	APR-JUL	115	106	166	136	94	64	108
	APR-SEP	126	110	181	148	104	71	114
Gibson Reservoir Inflow (2)	APR-JUL	315	84	380	340	290	250	375
	APR-SEP	330	79	410	360	305	265	415
Marias R nr Shelby (2)	APR-JUL	240	72	420	295	172	109	330
	APR-SEP	245	72	425	315	190	132	340
Missouri R at Fort Benton	APR-JUL	2350	89	3400	2740	2000	1610	2620
	APR-SEP	2870	93	4130	3340	2440	1990	3060
Missouri R nr Virgelle	APR-JUL	2600	84	3670	3030	2250	1750	3060
	APR-SEP	3020	86	4310	3510	2580	2040	3500
Missouri R nr Landusky	APR-JUL	2800	88	4010	3250	2360	1860	3150
	APR-SEP	3250	89	4690	3760	2790	2200	3630
Missouri R bl Fort Peck Dam	APR-JUL	2890	94	4080	3360	2470	1980	3060
	APR-SEP	3100	93	4590	3610	2540	1980	3320
Missouri R nr Williston ND	APR-JUL	8160	89	11700	9440	7080	5730	9080
	APR-SEP	8580	84	12700	10100	7450	5750	10100

PRELIMINARY YELLOWSTONE RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Yellowstone R at Yellowstone Lake Outlet	APR-JUL	555	94	660	595	510	460	590
	APR-SEP	705	90	850	765	650	570	775
Yellowstone R at Corwin Springs	APR-JUL	1490	90	1800	1610	1370	1220	1650
	APR-SEP	1780	93	2140	1910	1650	1480	1900
Yellowstone R at Livingston	APR-JUL	1810	95	2190	1960	1690	1500	1900
	APR-SEP	2030	92	2470	2190	1860	1660	2200
Shields R nr Livingston	APR-JUL	120	94	179	145	97	67	127
	APR-SEP	133	96	200	161	109	79	138
Boulder R at Big Timber	APR-JUL	280	96	340	305	255	220	290
	APR-SEP	300	96	370	330	270	235	310
Mystic Lake Inflow	APR-JUL	57	98	65	60	54	50	58
	APR-SEP	72	96	83	76	68	63	75
Wind R Ab Bull Lake Ck (2)	APR-JUL	530	110	740	615	460	385	480
	APR-SEP	560	119	770	645	485	400	470
Bull Lake Ck nr Lenore (2)	APR-JUL	151	107	187	166	137	119	141
	APR-SEP	191	113	230	210	174	153	168
Boysen Reservoir Inflow (2)	APR-JUL	825	113	1310	1010	670	465	730
	APR-SEP	920	117	1500	1110	760	550	785
Greybull R at Meeteetse	APR-JUL	149	105	215	176	124	89	141
	APR-SEP	205	103	285	235	165	124	199
Shell Ck nr Shell	APR-JUL	45	76	62	52	39	29	59
	APR-SEP	57	80	74	64	51	42	71
Bighorn R at Kane (2)	APR-JUL	895	89	1610	1170	640	365	1000

	APR-SEP	970	93	2180	1390	655	380	1040
NF Shoshone R at Wapiti	APR-JUL	515	114	615	555	480	430	450
	APR-SEP	550	106	665	595	505	455	515
SF Shoshone R nr Valley	APR-JUL	245	108	295	265	230	205	225
	APR-SEP	280	107	345	305	260	230	260
Buffalo Bill Reservoir Inflow (2)	APR-JUL	765	114	955	840	695	615	670
	APR-SEP	815	111	1050	900	735	640	730
Bighorn R nr St. Xavier (2)	APR-JUL	1480	91	2630	1930	1160	840	1610
	APR-SEP	1600	93	3050	2150	1220	900	1720
Little Bighorn R nr Hardin	APR-JUL	109	106	196	136	82	53	102
	APR-SEP	123	101	205	153	97	65	121
Tongue R nr Dayton (2)	APR-JUL	74	84	109	89	62	46	88
	APR-SEP	87	85	122	102	74	51	102
Tongue River Reservoir Inflow (2)	APR-JUL	193	87	330	255	147	87	220
	APR-SEP	200	80	325	255	146	75	250
NF Powder R nr Hazelton	APR-JUL	6.8	66	10	8.3	5.2	3.5	10.3
	APR-SEP	7.4	66	10.9	8.9	5.6	3.8	11.1
Powder R at Moorhead	APR-JUL	147	76	335	230	83	4	191
	APR-SEP	177	86	400	275	111	40	205
Powder R nr Locate	APR-JUL	188	83	490	290	114	54	225
	APR-SEP	185	77	455	290	117	35	240
Yellowstone R at Miles City	APR-JUL	4330	85	6490	5110	3620	2570	5040
	APR-SEP	4600	81	6950	5400	3750	2600	5670
Yellowstone R nr Sidney	APR-JUL	4310	86	7230	5220	3460	2300	5000
	APR-SEP	4530	81	7480	5620	3620	2570	5580

PRELIMINARY RAPID VALLEY UNIT FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
Deerfield Reservoir Inflow	APR-JUL	4.5	84	7.4	5.7	3.4	1.9	5.3
Pactola Reservoir Inflow	APR-JUL	18.9	75	42	26	11.9	2.5	25

PRELIMINARY PLATTE RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
North Platte R nr Northgate	APR-JUL	205	102	315	245	170	129	200
	APR-SEP	215	97	340	265	182	139	220
Encampment R nr Encampment	APR-JUL	128	94	180	147	111	86	135
	APR-SEP	134	95	187	153	117	95	141
Rock Ck ab King Canyon Cnl nr Arlington	APR-JUL	56	114	72	62	50	42	49
	APR-SEP	58	113	75	64	52	45	51
Seminole Reservoir Inflow	APR-JUL	725	109	1140	865	605	460	660
	APR-SEP	835	116	1260	990	705	520	715
Sweetwater R nr Alcova	APR-JUL	56	124	96	71	44	31	45
	APR-SEP	60	122	100	75	47	34	49
La Prele Ck nr Douglas	APR-JUL	16.1	76	31	23	9.7	1	21
	APR-SEP	16.7	85	32	23	10.5	3.8	19.5
North Platte R bl Glendo Reservoir	APR-JUL	845	113	1420	1050	665	435	745
	APR-SEP	940	123	1560	1170	715	420	760
North Platte R bl Guernsey Reservoir	APR-JUL	870	116	1430	1080	655	370	745
	APR-SEP	890	114	1690	1170	615	335	775
Laramie R and Pioneer Cnl nr Woods Lg	APR-JUL	113	96	167	134	96	78	117
	APR-SEP	126	100	187	148	106	84	126
Little Laramie R nr Filmore	APR-JUL	61	115	83	68	53	44	53
	APR-SEP	66	117	91	74	58	48	56

Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.
Medians are for the 1991-2020 period.
All volumes are in thousands of acre-feet.

Footnotes:

- 1) Max and Min are 5% and 95% chance that actual volume will exceed forecast
- 2) streamflow is adjusted for upstream storage

**Upper Missouri River Basin
May 2025 Calendar Year Runoff Forecast
May 6, 2025**

**US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE**

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

April runoff was 1.4 MAF, 48% of average. Runoff was below average in all reaches.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **20.0 MAF, 78% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **18.4 MAF, 79% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next eight months, expected inflow could range from the 15.4 MAF lower basic forecast to the 25.4 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for April 29 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 75% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of July 2025, indicates drought conditions are likely to remain in areas which are already dry, and could expand into the rest of the Dakotas. Some drought improvement or removal is possible in Kansas.

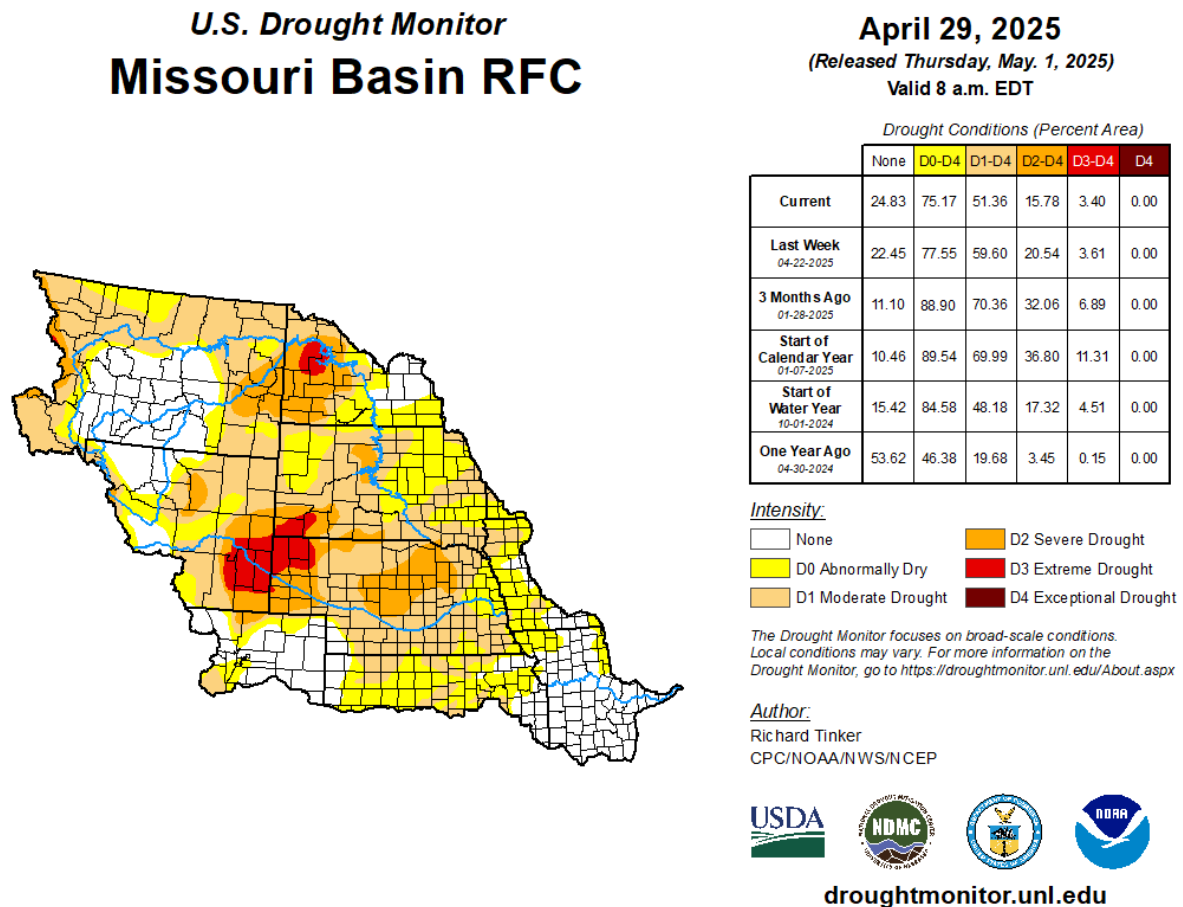


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for May 1 - July 31, 2025
Released April 30, 2025

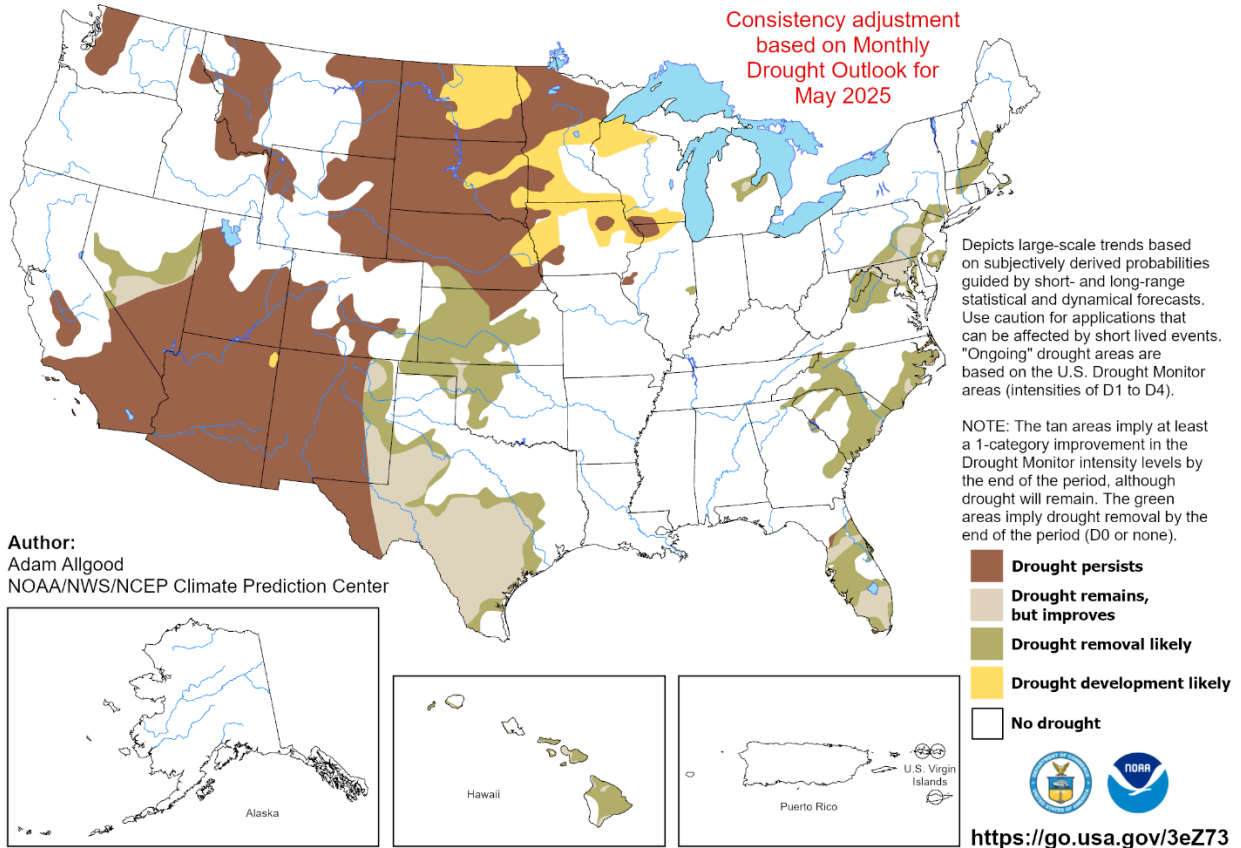


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The April precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Precipitation was mixed across the Basin last month, with dryer conditions across northern Montana, central North Dakota, southern South Dakota, and into Nebraska and Iowa. Wetter than normal conditions were observed across southern Montana, along the North Dakota-South Dakota border, and into eastern North Dakota.

Precipitation as a percent of normal for the February-March-April period (**Figure 4**) was dryer than normal for most of the Basin except in southern Montana, southern North Dakota, and parts of northern South Dakota, which saw above-normal precipitation.

Percent of Normal Precipitation (%)
4/1/2025 - 4/30/2025

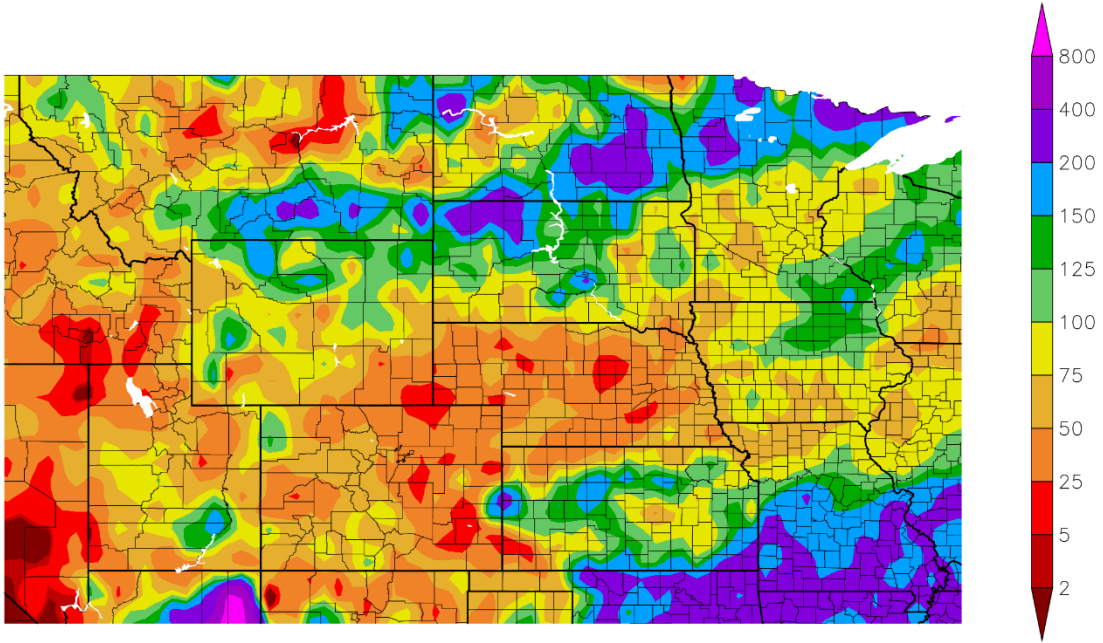


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
2/1/2025 - 4/30/2025

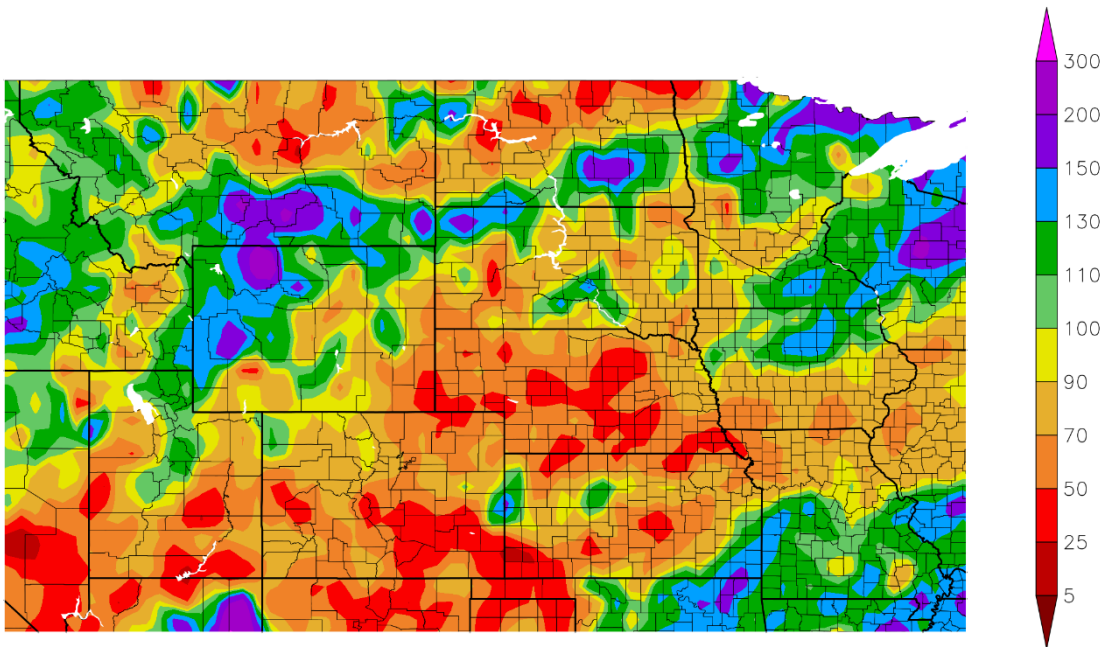


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

April temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were near normal in Montana and Wyoming and slightly above normal in western South Dakota, Nebraska, and the other lower Basin states. February-March-April temperature departures are shown in **Figure 6**. The three-month average temperature departures ranged from below normal across Montana and North Dakota to above normal in Kansas, Iowa, and Missouri.

Departure from Normal Temperature (F) 4/1/2025 – 4/30/2025

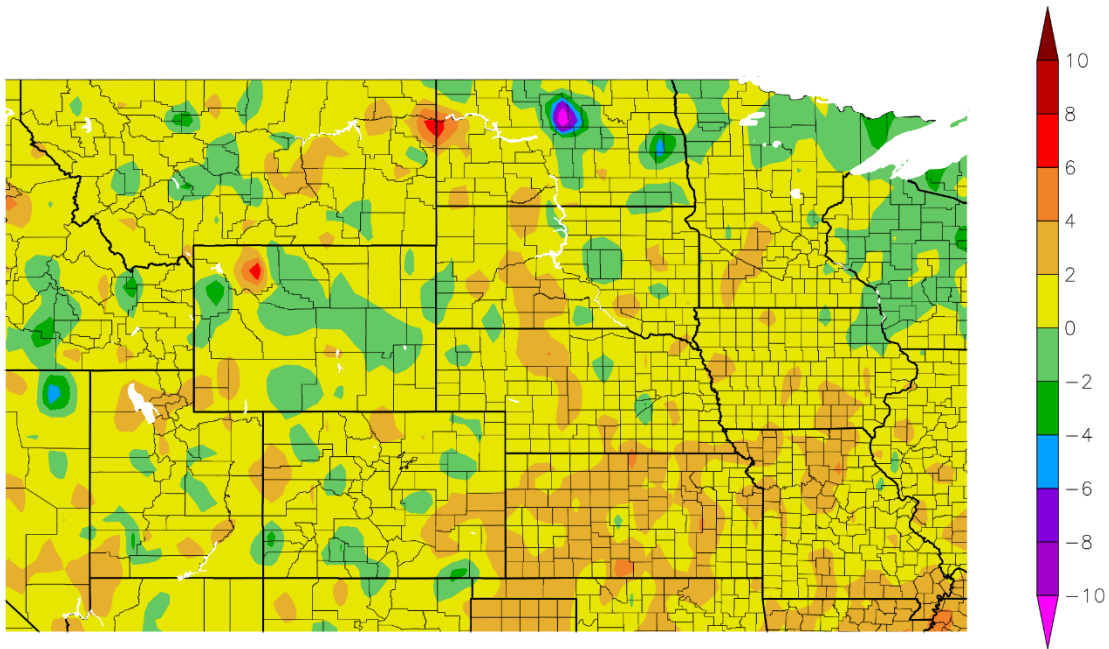


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 2/1/2025 – 4/30/2025

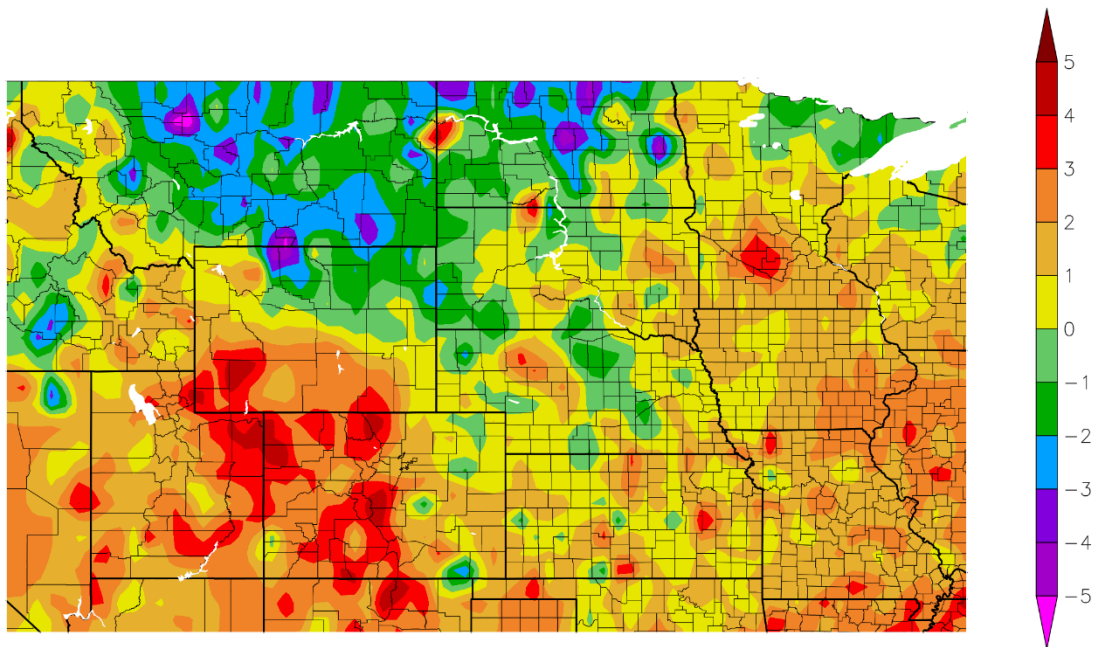


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of April 2025 are shown in **Figure 7**. Soil moisture was dry across most of the Basin except in central Montana and eastern North Dakota, which were closer to normal.

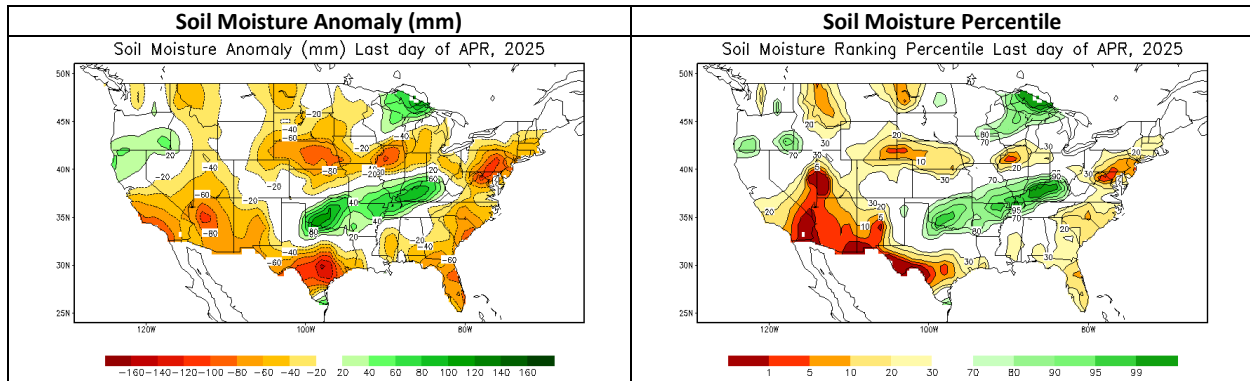


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) from May 1, 2025, shows no plains snow remaining in the Basin and is not a factor in the May runoff forecast.

Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlations to mountain snowpack as the season reaches the date of peak accumulation, which typically occurs in mid-April. The best predictor of May-July runoff in the mountain reaches is the peak snow water equivalent (SWE) accumulation.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources and Conservation District SNOW TELelemetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

4-May-2025

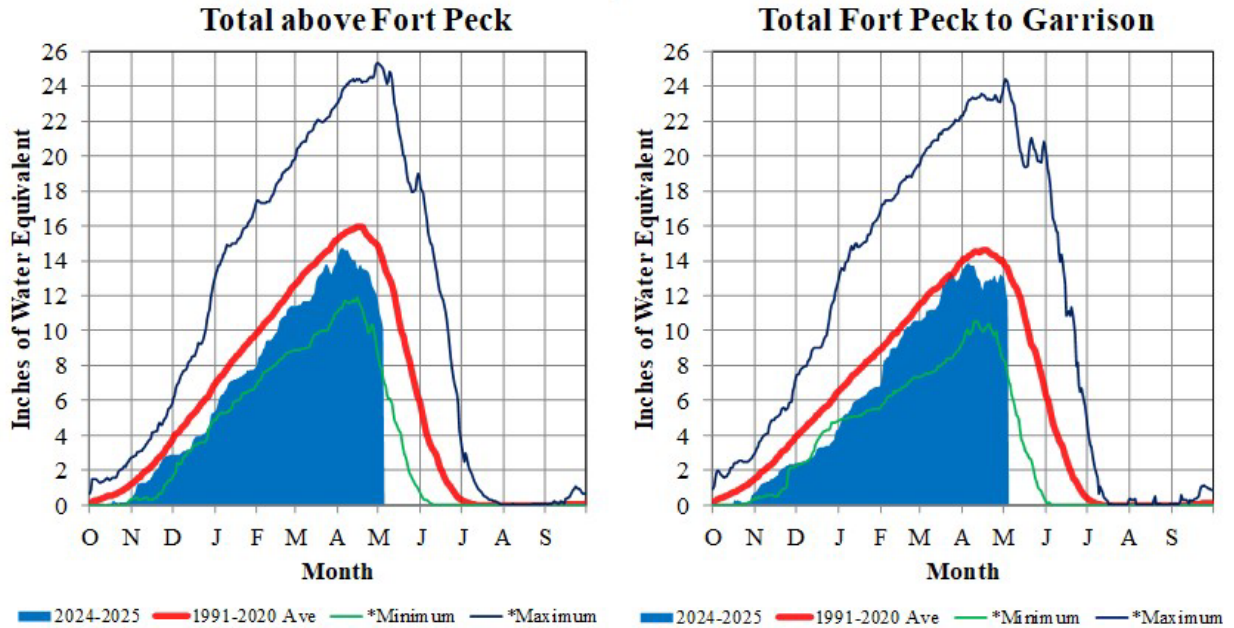


Figure 8. Mountain Snowpack Water Content

The Fort Peck reach peaked on April 5 at 14.7 inches of SWE and 92% of the average peak. The Garrison reach peaked on April 5 at 13.9 inches of SWE and 95% of the average peak. As of May 4, the Fort Peck reach had 10.1 inches of SWE and 69% of the annual peak remaining, and the Garrison reach had 11.7 inches of SWE and 84% of the annual peak remaining.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is a sea surface temperature oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

ENSO-neutral conditions are currently present and have a greater than 50% chance of continuing through August-October 2025.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for May (**Figure 10**) show increased chances for warmer-than-normal temperatures across the Basin. Increased chances for below-normal precipitation are possible across the northern part of the Basin, with increased chances for above-normal precipitation in southwestern Montana, Wyoming, and Kansas. Equal chances for below-normal, normal, or above-normal precipitation are likely across the remainder of Montana, Nebraska, western Iowa, and Missouri.

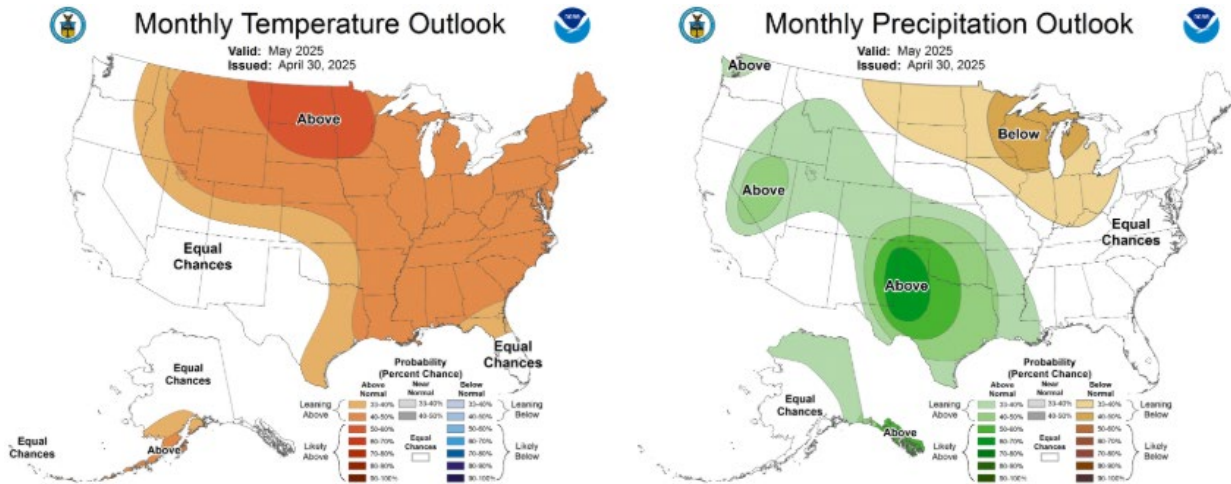


Figure 9. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases.

The three-month precipitation outlook for May-June-July indicates increased chances for below-normal precipitation across the Basin. The temperature outlook for the same period indicates equal chances for below-normal, normal, or above-normal temperatures in the Dakotas, and increased chances for above-normal temperatures across the rest of the Basin.

The outlooks for August-September-October indicate increased chances for above-normal temperatures and increase chances for below-normal precipitation across the Basin.

The three-month temperature outlook for November-December-January indicates equal chances for below-normal, normal, or above-normal temperatures across the upper Basin and increased chances for above-normal temperatures in the lower Basin. The precipitation outlook for the same period indicates increased chances for above-normal precipitation in Montana, Wyoming, and the western Dakotas, and equal chances for below-normal, normal, or above-normal precipitation in the rest of the Basin.

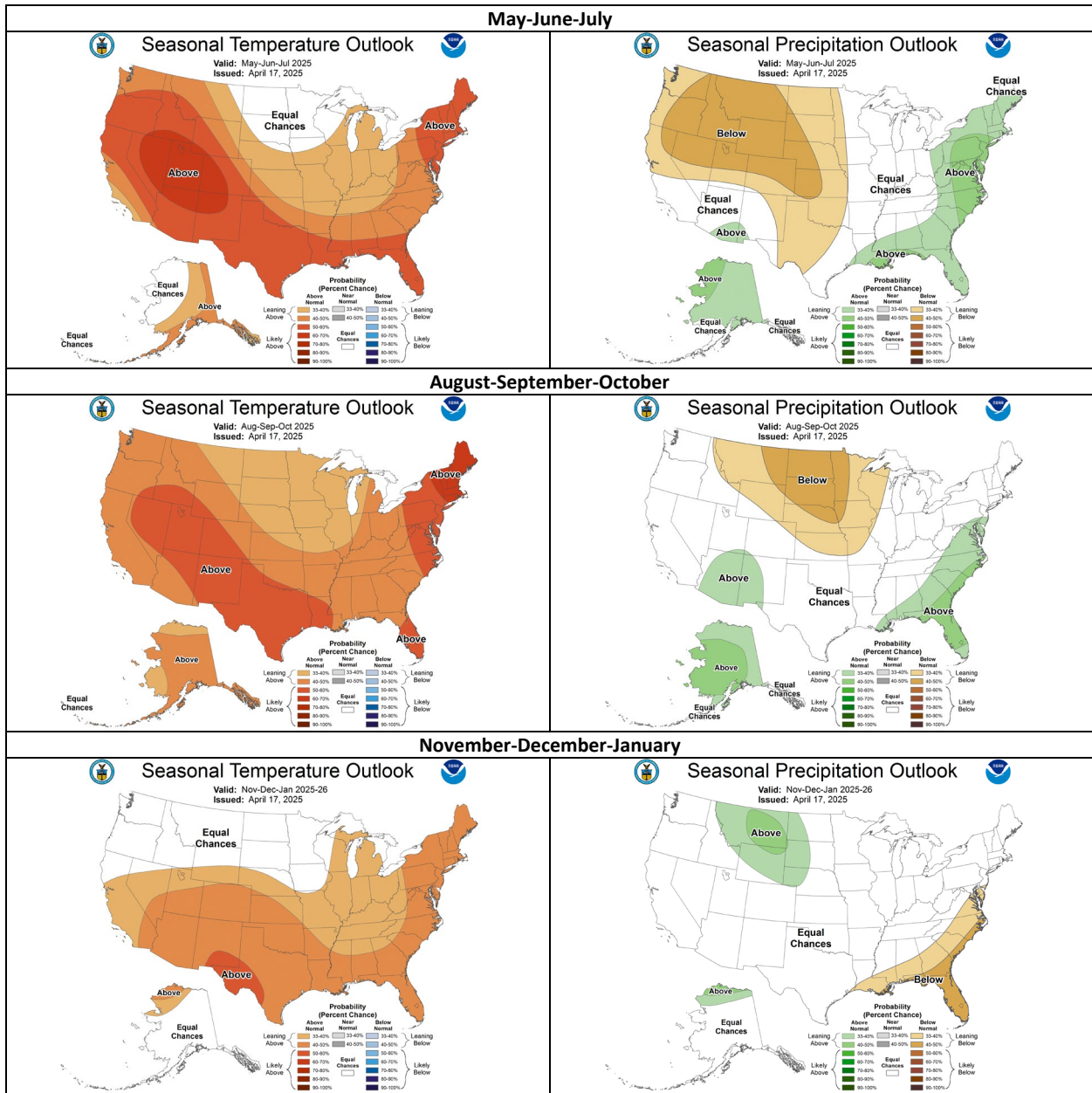


Figure 10. CPC Three-Month Temperature and Precipitation Outlooks

Summary

Given current reach runoff, basin conditions, and outlooks, mountain snowmelt runoff in May, June, and July for Fort Peck to be below normal and for Garrison to be slightly below normal. Runoff in the lower four reaches is also expected to be below normal.

In summary, the 2025 calendar year runoff forecast is **20.0 MAF, 78% of average**.

NRCS Water Supply Forecasts

USDA NRCS National Water & Climate Center

* - DATA CURRENT AS OF: 08 Apr 2025 11:30 AM

- Based on 04-01-2025 forecast values

PRELIMINARY MISSOURI RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Lake Sherburne Inflow (2)	APR-JUL	84	84	99	90	77	71	99
	APR-SEP	98	84	116	104	91	82	116
St. Mary R at Intl Boundary (2)	APR-JUL	390	86	470	420	350	305	450
	APR-SEP	445	87	545	490	400	350	510
Red Rock R bl Lima Res nr Monida (2)	APR-JUL	56	88	82	66	44	32	63
	APR-SEP	61	83	88	73	48	34	73
Beaverhead R nr Grant (2)	APR-JUL	57	90	106	77	37	8	63
	APR-SEP	64	91	119	86	42	9	70
Jefferson R nr Three Forks (2)	APR-JUL	580	80	955	710	455	325	720
	APR-SEP	625	88	1070	780	500	355	705
Madison R bl Hebgen Lake nr Grayling (2)	APR-JUL	320	91	380	345	290	255	350
	APR-SEP	415	91	490	445	380	345	455
Madison R bl Ennis Lake nr McAllister (2)	APR-JUL	580	94	695	630	535	480	615
	APR-SEP	710	94	850	765	660	595	750
Missouri R at Toston (2)	APR-JUL	1620	91	2270	1860	1400	1170	1780
	APR-SEP	1820	92	2580	2100	1580	1300	1970
Smith R bl Eagle Ck	APR-JUL	115	106	166	136	94	64	108
	APR-SEP	126	110	181	148	104	71	114
Gibson Reservoir Inflow (2)	APR-JUL	315	84	380	340	290	250	375
	APR-SEP	330	79	410	360	305	265	415
Marias R nr Shelby (2)	APR-JUL	240	72	420	295	172	109	330
	APR-SEP	245	72	425	315	190	132	340
Missouri R at Fort Benton	APR-JUL	2350	89	3400	2740	2000	1610	2620
	APR-SEP	2870	93	4130	3340	2440	1990	3060
Missouri R nr Virgelle	APR-JUL	2600	84	3670	3030	2250	1750	3060
	APR-SEP	3020	86	4310	3510	2580	2040	3500
Missouri R nr Landusky	APR-JUL	2800	88	4010	3250	2360	1860	3150
	APR-SEP	3250	89	4690	3760	2790	2200	3630
Missouri R bl Fort Peck Dam	APR-JUL	2890	94	4080	3360	2470	1980	3060
	APR-SEP	3100	93	4590	3610	2540	1980	3320
Missouri R nr Williston ND	APR-JUL	8160	89	11700	9440	7080	5730	9080
	APR-SEP	8580	84	12700	10100	7450	5750	10100

PRELIMINARY YELLOWSTONE RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Yellowstone R at Yellowstone Lake Outlet	APR-JUL	555	94	660	595	510	460	590
	APR-SEP	705	90	850	765	650	570	775
Yellowstone R at Corwin Springs	APR-JUL	1490	90	1800	1610	1370	1220	1650
	APR-SEP	1780	93	2140	1910	1650	1480	1900
Yellowstone R at Livingston	APR-JUL	1810	95	2190	1960	1690	1500	1900
	APR-SEP	2030	92	2470	2190	1860	1660	2200
Shields R nr Livingston	APR-JUL	120	94	179	145	97	67	127
	APR-SEP	133	96	200	161	109	79	138
Boulder R at Big Timber	APR-JUL	280	96	340	305	255	220	290
	APR-SEP	300	96	370	330	270	235	310
Mystic Lake Inflow	APR-JUL	57	98	65	60	54	50	58
	APR-SEP	72	96	83	76	68	63	75
Wind R Ab Bull Lake Ck (2)	APR-JUL	530	110	740	615	460	385	480
	APR-SEP	560	119	770	645	485	400	470
Bull Lake Ck nr Lenore (2)	APR-JUL	151	107	187	166	137	119	141
	APR-SEP	191	113	230	210	174	153	168
Boysen Reservoir Inflow (2)	APR-JUL	825	113	1310	1010	670	465	730
	APR-SEP	920	117	1500	1110	760	550	785
Greybull R at Meeteetse	APR-JUL	149	105	215	176	124	89	141
	APR-SEP	205	103	285	235	165	124	199
Shell Ck nr Shell	APR-JUL	45	76	62	52	39	29	59
	APR-SEP	57	80	74	64	51	42	71
Bighorn R at Kane (2)	APR-JUL	895	89	1610	1170	640	365	1000

	APR-SEP	970	93	2180	1390	655	380	1040
NF Shoshone R at Wapiti	APR-JUL	515	114	615	555	480	430	450
	APR-SEP	550	106	665	595	505	455	515
SF Shoshone R nr Valley	APR-JUL	245	108	295	265	230	205	225
	APR-SEP	280	107	345	305	260	230	260
Buffalo Bill Reservoir Inflow (2)	APR-JUL	765	114	955	840	695	615	670
	APR-SEP	815	111	1050	900	735	640	730
Bighorn R nr St. Xavier (2)	APR-JUL	1480	91	2630	1930	1160	840	1610
	APR-SEP	1600	93	3050	2150	1220	900	1720
Little Bighorn R nr Hardin	APR-JUL	109	106	196	136	82	53	102
	APR-SEP	123	101	205	153	97	65	121
Tongue R nr Dayton (2)	APR-JUL	74	84	109	89	62	46	88
	APR-SEP	87	85	122	102	74	51	102
Tongue River Reservoir Inflow (2)	APR-JUL	193	87	330	255	147	87	220
	APR-SEP	200	80	325	255	146	75	250
NF Powder R nr Hazelton	APR-JUL	6.8	66	10	8.3	5.2	3.5	10.3
	APR-SEP	7.4	66	10.9	8.9	5.6	3.8	11.1
Powder R at Moorhead	APR-JUL	147	76	335	230	83	4	191
	APR-SEP	177	86	400	275	111	40	205
Powder R nr Locate	APR-JUL	188	83	490	290	114	54	225
	APR-SEP	185	77	455	290	117	35	240
Yellowstone R at Miles City	APR-JUL	4330	85	6490	5110	3620	2570	5040
	APR-SEP	4600	81	6950	5400	3750	2600	5670
Yellowstone R nr Sidney	APR-JUL	4310	86	7230	5220	3460	2300	5000
	APR-SEP	4530	81	7480	5620	3620	2570	5580

PRELIMINARY RAPID VALLEY UNIT FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
Deerfield Reservoir Inflow	APR-JUL	4.5	84	7.4	5.7	3.4	1.9	5.3
Pactola Reservoir Inflow	APR-JUL	18.9	75	42	26	11.9	2.5	25

PRELIMINARY PLATTE RIVER BASIN FORECASTS

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
North Platte R nr Northgate	APR-JUL	205	102	315	245	170	129	200
	APR-SEP	215	97	340	265	182	139	220
Encampment R nr Encampment	APR-JUL	128	94	180	147	111	86	135
	APR-SEP	134	95	187	153	117	95	141
Rock Ck ab King Canyon Cnl nr Arlington	APR-JUL	56	114	72	62	50	42	49
	APR-SEP	58	113	75	64	52	45	51
Seminole Reservoir Inflow	APR-JUL	725	109	1140	865	605	460	660
	APR-SEP	835	116	1260	990	705	520	715
Sweetwater R nr Alcova	APR-JUL	56	124	96	71	44	31	45
	APR-SEP	60	122	100	75	47	34	49
La Prele Ck nr Douglas	APR-JUL	16.1	76	31	23	9.7	1	21
	APR-SEP	16.7	85	32	23	10.5	3.8	19.5
North Platte R bl Glendo Reservoir	APR-JUL	845	113	1420	1050	665	435	745
	APR-SEP	940	123	1560	1170	715	420	760
North Platte R bl Guernsey Reservoir	APR-JUL	870	116	1430	1080	655	370	745
	APR-SEP	890	114	1690	1170	615	335	775
Laramie R and Pioneer Cnl nr Woods Lg	APR-JUL	113	96	167	134	96	78	117
	APR-SEP	126	100	187	148	106	84	126
Little Laramie R nr Filmore	APR-JUL	61	115	83	68	53	44	53
	APR-SEP	66	117	91	74	58	48	56

Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.
Medians are for the 1991-2020 period.
All volumes are in thousands of acre-feet.

Footnotes:

- 1) Max and Min are 5% and 95% chance that actual volume will exceed forecast
- 2) streamflow is adjusted for upstream storage

Upper Missouri River Basin
June 2025 Calendar Year Runoff Forecast
June 4, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

May runoff was 3.4 MAF, 100% of average. Runoff was well above average in the Garrison and Oahe reaches, which saw up to 400% of normal precipitation. Runoff was below average in the other reaches, which saw as little as 25% of normal precipitation.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **19.7 MAF, 77% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **18.2 MAF, 78% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next seven months, expected inflow could range from the 16.2 MAF lower basic forecast to the 23.7 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for May 27 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 76% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of August 2025, indicates drought conditions are likely to remain in areas that are already dry, and could expand in additional areas of the upper Basin. Some drought improvement or removal is possible in very small areas of Kansas and Colorado.

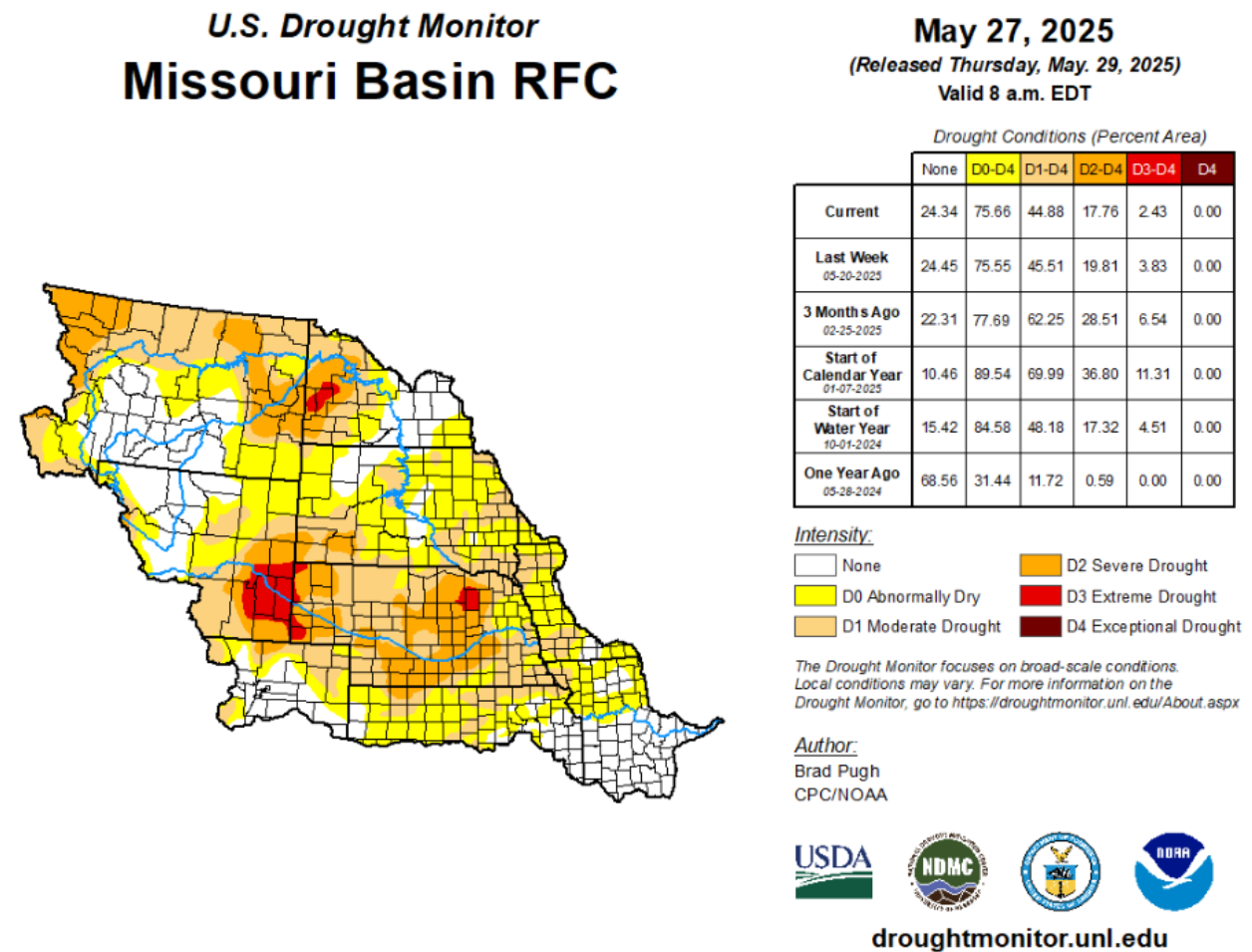


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for June 1 - August 31, 2025
Released May 31, 2025

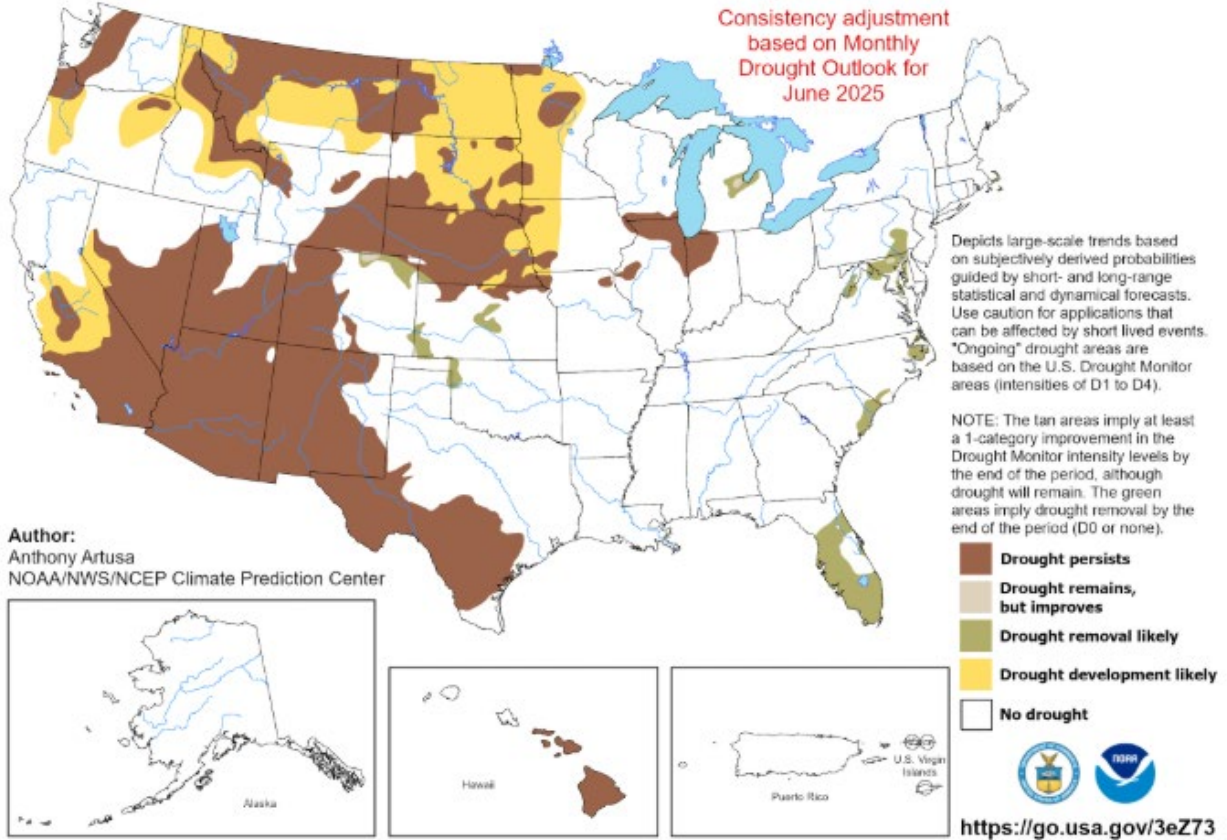


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The May precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Precipitation was mixed across the Basin last month, with areas of the Dakotas experiencing up to 400% of normal precipitation while widespread areas elsewhere saw as little as 25% of normal precipitation.

Precipitation as a percent of normal for the March-April-May period (**Figure 4**) was also mixed, following a similar distribution as the May monthly precipitation. The lower Basin received lower-than-normal precipitation over most areas, while large areas in North and South Dakota received higher-than-normal precipitation.

Percent of Normal Precipitation (%)
5/1/2025 – 5/31/2025

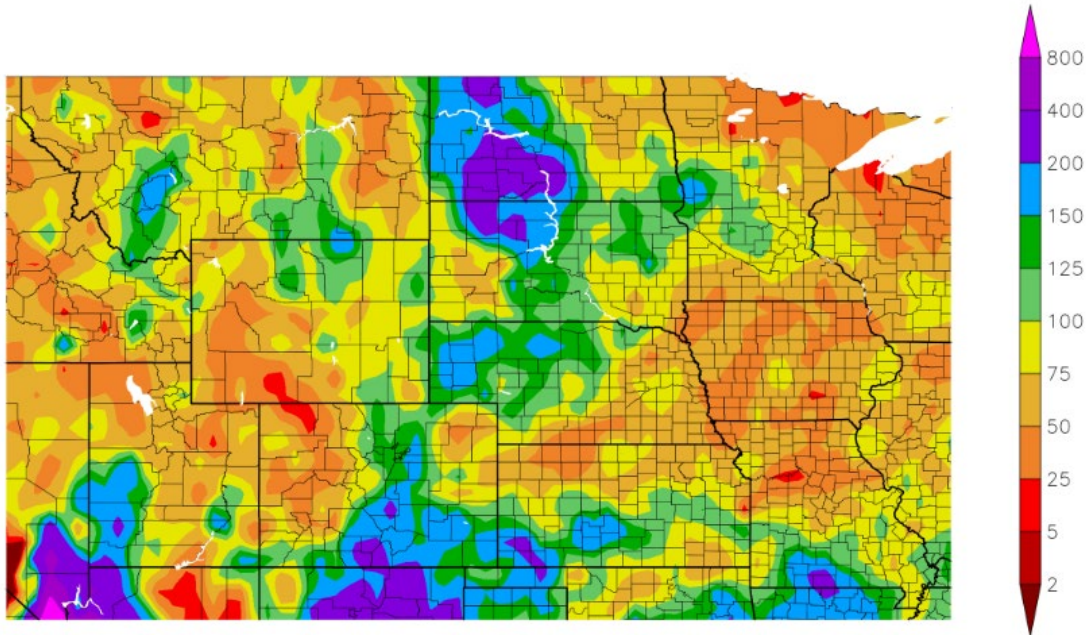


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
3/1/2025 – 5/31/2025

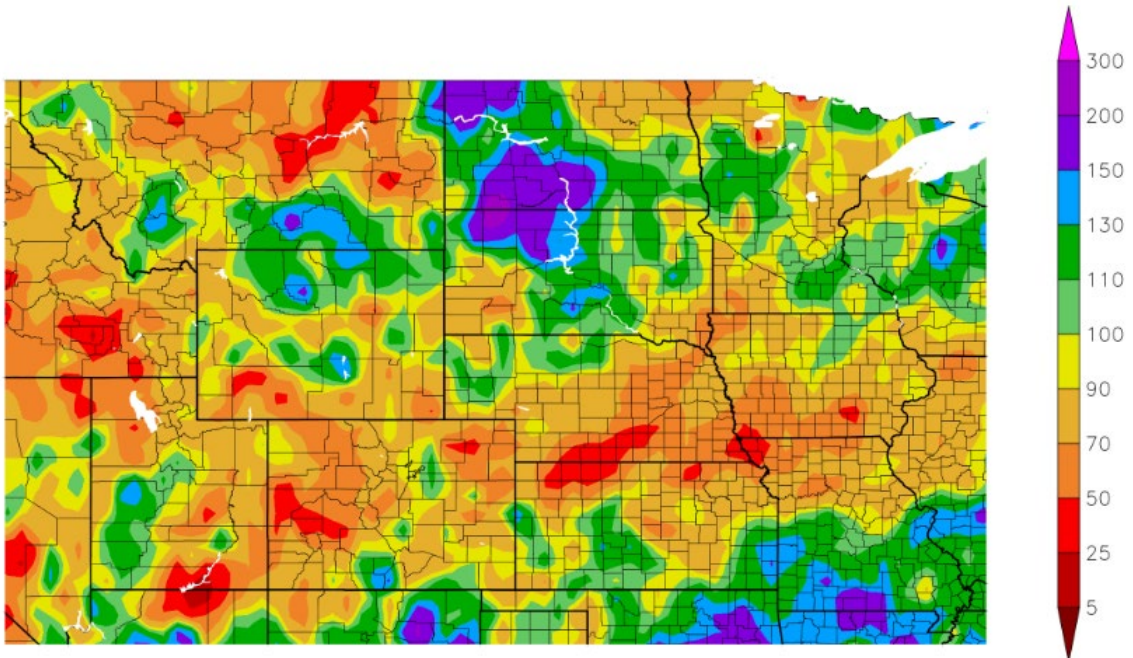


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

May temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were slightly warmer than normal in the upper Basin and slightly cooler than normal in the lower Basin. March-April-May temperature departures are shown in **Figure 6**. The three-month average temperature departures were warmer than normal across the entire Basin, ranging from 2 degrees above normal up to 10 degrees above normal on the North Dakota-Montana border.

Departure from Normal Temperature (F) 5/1/2025 – 5/31/2025

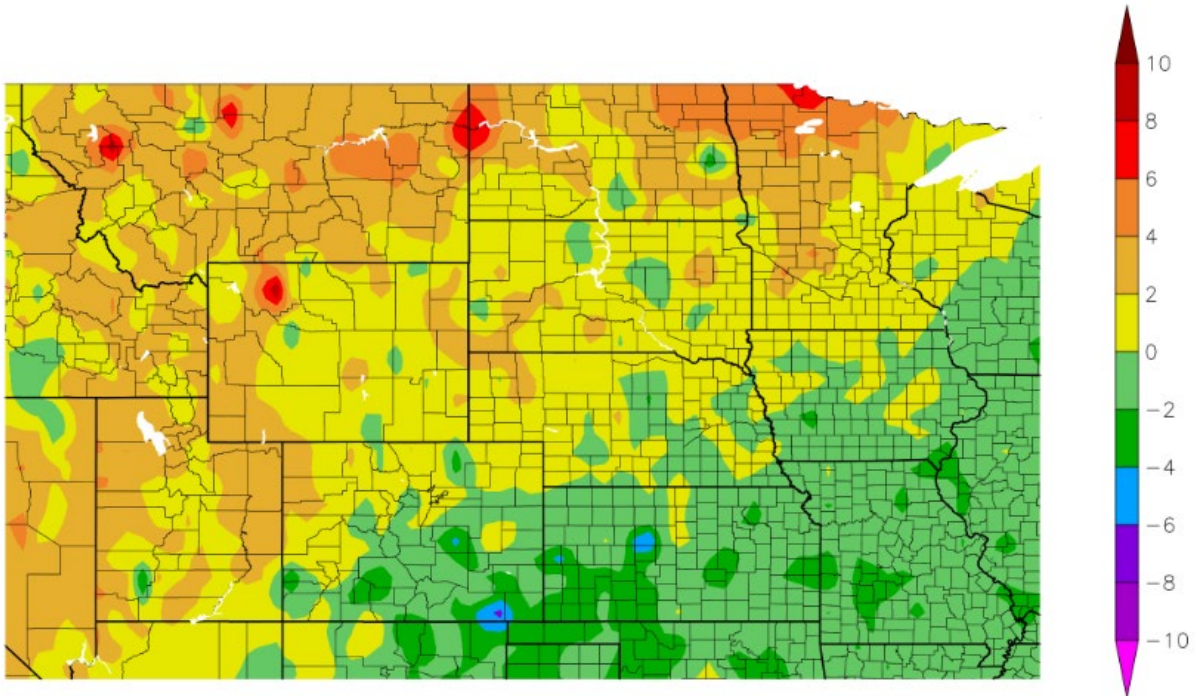


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 3/1/2025 – 5/31/2025

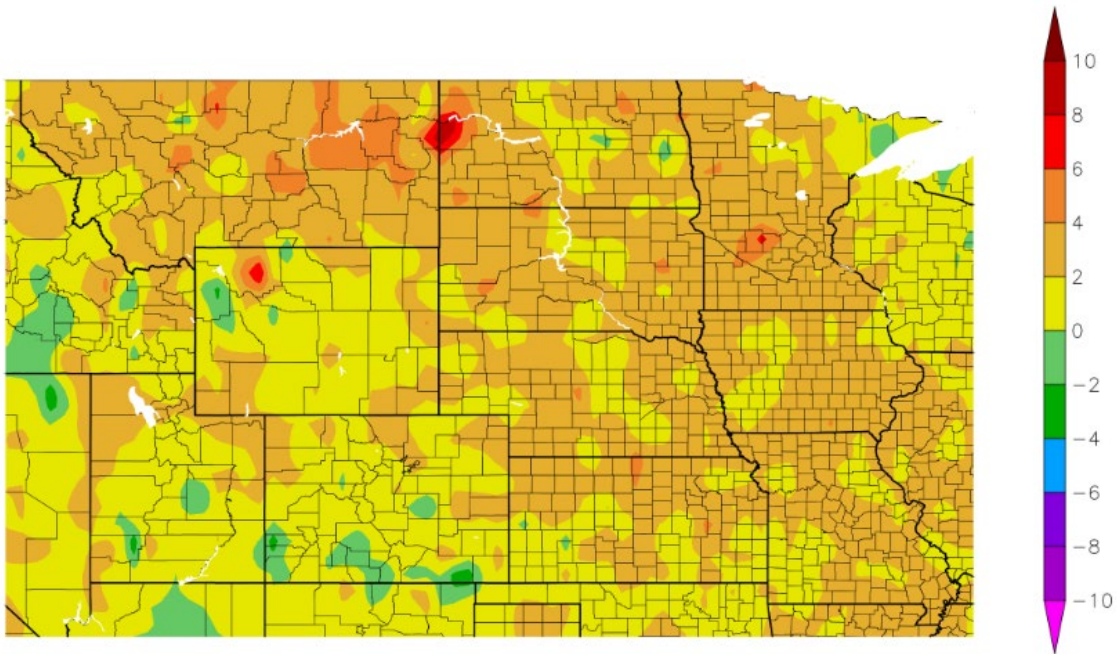


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of May 2025 are shown in **Figure 7**. Soil moisture was dry across most of the Basin except in areas of northern Wyoming and the central Dakotas, which were wetter than normal.

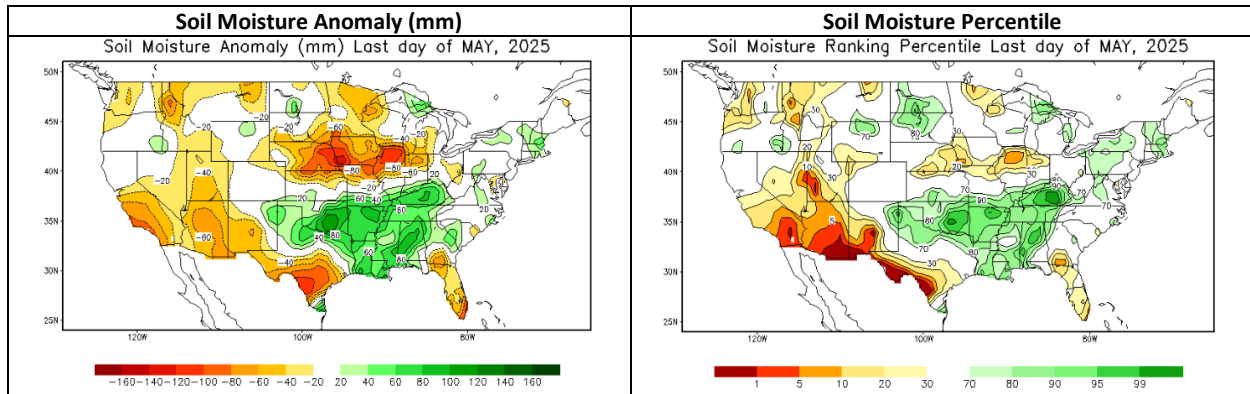


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) from June 1, 2025, shows no plains snow remaining in the Basin and is not a factor in the June runoff forecast.

Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlations to mountain snowpack as the season reaches the date of peak accumulation, which typically occurs in mid-April. The best predictor of May-July runoff in the mountain reaches is the peak snow water equivalent (SWE) accumulation.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 8** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources Conservation Service SNOw TELEmetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

1-Jun-2025

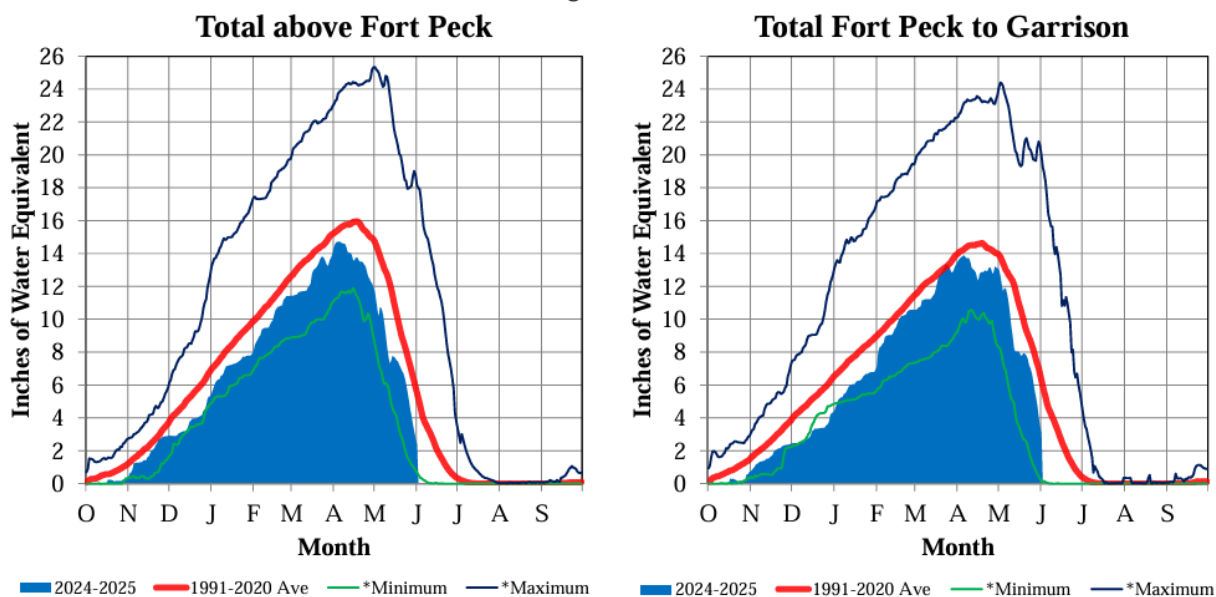


Figure 8. Mountain Snowpack Water Content

The Fort Peck reach peaked on April 5 at 14.7 inches of SWE and 92% of the average peak. The Garrison reach peaked on April 5 at 13.9 inches of SWE and 95% of the average peak. As of June 1, the Fort Peck reach had 2.4 inches of SWE and 16% of the annual peak remaining, and the Garrison reach had 3.1 inches of SWE and 22% of the annual peak remaining.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is a sea surface temperature oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

ENSO-neutral conditions are currently present with a 74% chance of continuing through summer, and have a greater than 50% chance of continuing in August-October 2025.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for June (**Figure 9**) show increased chances for warmer-than-normal temperatures across the upper Basin. Increased chances for below-normal precipitation are possible across Montana, northern Wyoming, and the western Dakotas, with increased chances for above-normal precipitation in Colorado, Kansas, Missouri, and southern Nebraska.

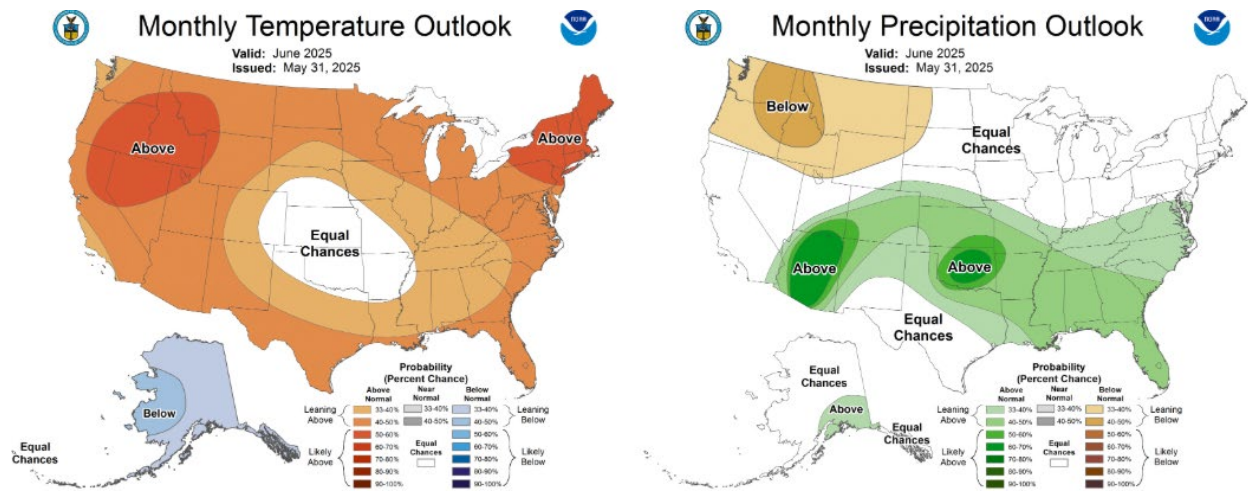


Figure 9. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 10**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases.

The three-month precipitation outlook for July-August-September indicates increased chances for below-normal precipitation across the Basin. The temperature outlook for the same period indicates increased chances for above-normal temperatures across the entire Basin.

The outlooks for October-November-December indicate equal chances for below-normal, normal, or above-normal temperatures across the upper Basin and increased chances for above-normal temperatures in the lower Basin. The precipitation outlook for the same period indicates equal chances for below-normal, normal, or above-normal precipitation across the Basin.

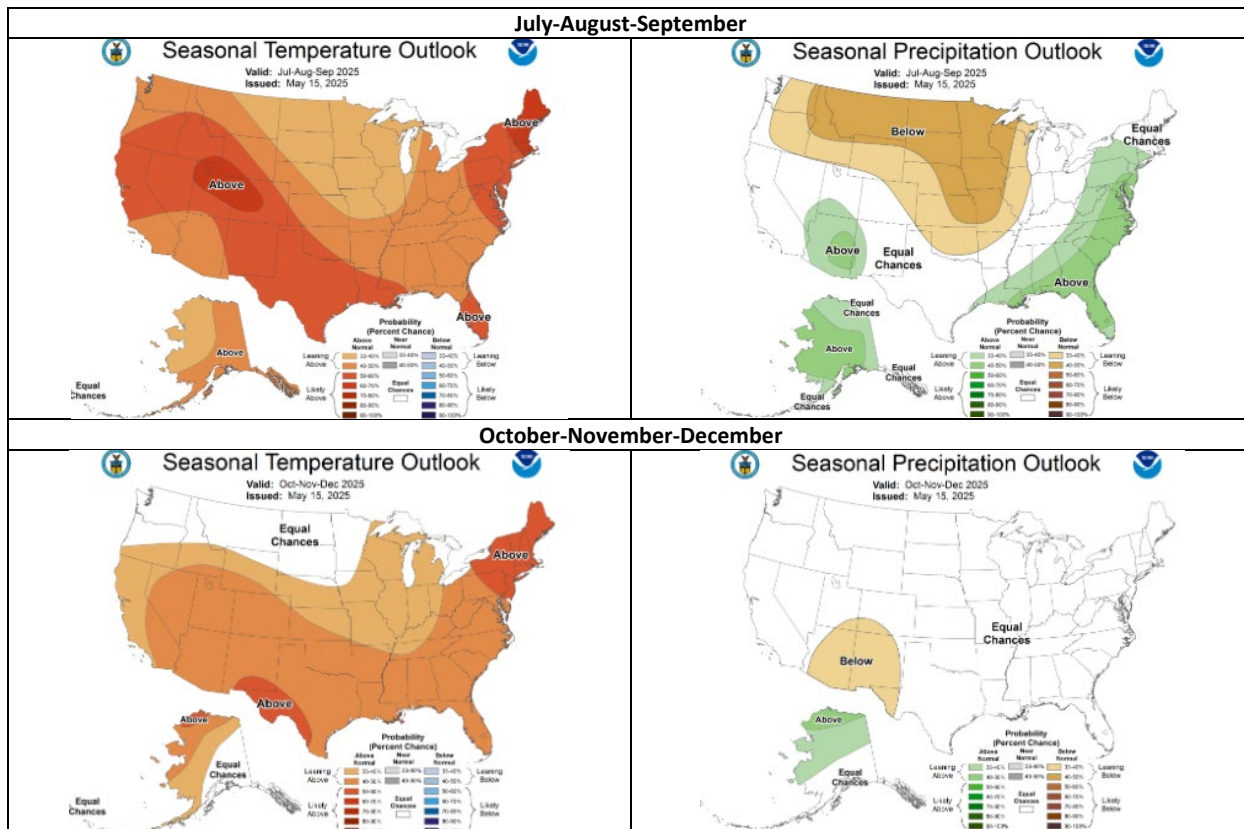


Figure 10. CPC Three-Month Temperature and Precipitation Outlooks

Summary

Given current reach runoff, basin conditions, and outlooks, mountain snowmelt runoff in June and July for Fort Peck is expected to be below normal and for Garrison to be slightly below normal. Runoff in the lower four reaches is also expected to be below normal.

In summary, the 2025 calendar year runoff forecast is **19.7 MAF, 77% of average**.

NRCS Water Supply Forecasts

USDA NRCS National Water & Climate Center

* - DATA CURRENT AS OF: Wed, 11 Jun 2025 20:08:36 GMT

- Based on 06-01-2025 forecast values - Publish Status(es): FINAL

Upper South Saskatchewan River

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
Lake Sherburne Inflow	Jun F-Jul L	38	73	47	42	34	30	52
	Jun F-Sep L	51	77	64	56	46	40	66
St. Mary R nr Babb	Jun F-Jul L	162	70	199	178	148	133	230
	Jun F-Sep L	215	77	265	235	195	169	280
St. Mary R at Intl Boundary	Jun F-Jul L	195	75	265	225	165	127	260
	Jun F-Sep L	250	76	330	280	215	174	330

Missouri Headwaters

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
Red Rock R bl Lima Res nr Monida	Jun F-Jul L	12.7	49	25	18.0	8.7	3.6	26
	Jun F-Sep L	16.2	46	31	22	11.1	5.5	35
Beaverhead R nr Grant	Jun F-Jul L	-9.6	-99	18.6	2.5	-22	-40	9.7
	Jun F-Sep L	3.8	20	38	16.7	-9.9	-29	18.9
Beaverhead R at Barretts	Jun F-Jul L	3.5	15	38	18.6	-11.0	-31	24
	Jun F-Sep L	16.1	42	55	32	0.21	-23	38
Ruby R abv Res nr Alder MT	Jun F-Jul L	28	80	42	33	23	17.1	35
	Jun F-Sep L	40	82	55	46	34	27	49
Big Hole R bl Big Lake Ck at Wisdom	Jun F-Jul L	25	71	62	39	14.1	5.4	35
	Jun F-Sep L	29	71	72	44	16.9	8.1	41
Big Hole R nr Melrose	Jun F-Jul L	183	76	290	230	149	101	240
	Jun F-Sep L	235	78	350	280	187	141	300
Jefferson R nr Twin Bridges	Jun F-Jul L	140	65	325	205	71	-19.6	215
	Jun F-Sep L	167	71	370	255	85	-10.8	235
Willow Ck nr Harrison MT	Jun F-Jul L	9.9	97	17.6	13.0	6.8	2.2	10.2
Boulder R nr Boulder	Jun F-Jul L	23	82	43	30	17.0	10.8	28
	Jun F-Sep L	27	90	51	36	20	12.2	30
Jefferson R nr Three Forks	Jun F-Jul L	182	62	415	275	98	-15.8	295
	Jun F-Sep L	193	60	485	300	92	-31	320
Madison R bl Hebgen Lake nr Grayling MT	Jun F-Jul L	117	75	146	127	106	92	155
	Jun F-Sep L	200	80	240	215	187	168	250
Madison R bl Ennis Lake nr McAllister MT	Jun F-Jul L	215	69	280	240	196	168	310
	Jun F-Sep L	340	75	410	365	310	275	455
Gallatin R nr Gateway	Jun F-Jul L	199	81	245	215	184	164	245
	Jun F-Sep L	250	82	305	270	230	205	305
Middle Creek blw Res	Jun F-Jul L	13.0	96	16.3	14.1	11.9	10.7	13.6
	Jun F-Sep L	14.9	94	19.2	16.3	13.7	12.2	15.9
Gallatin R at Logan	Jun F-Jul L	169	77	235	192	145	119	220
	Jun F-Sep L	215	81	300	250	186	142	265

Upper Missouri

Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med
Missouri R at Toston	Jun F-Jul L	665	71	1060	815	515	345	935
	Jun F-Sep L	830	73	1260	1000	675	485	1130
Missouri R at Fort Benton	Jun F-Jul L	940	71	1490	1170	760	545	1320
	Jun F-Sep L	1380	78	2190	1640	1100	785	1780
Smith R bl Eagle Ck	Jun F-Jul L	44	98	82	55	33	18.7	45
	Jun F-Sep L	50	96	93	64	38	27	52
Gibson Reservoir Inflow	Jun F-Jul L	93	53	131	106	78	57	176
	Jun F-Sep L	125	56	175	145	108	84	225

Marias		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Two Medicine R bl South Fork nr Browning	Jun F-Jul L	43	57	75	54	31	17.0	76
	Jun F-Sep L	47	54	79	58	34	15.3	87
Badger Ck nr Browning	Jun F-Jul L	15.3	43	29	21	10.2	3.3	36
	Jun F-Sep L	21	44	40	28	14.4	5.4	48
Dupuyer Ck nr Valier	Jun F-Jul L	2.5	57	5.7	3.6	1.54	0.80	4.4
	Jun F-Sep L	3.0	58	7.1	4.4	1.63	0.93	5.2
Birch Creek above Res	Jun F-Jul L	14.6	56	26	18.5	11.1	6.8	26
	Jun F-Sep L	19.9	60	35	26	16.2	11.1	33
Marias R nr Shelby	Jun F-Jul L	58	38	164	96	28	16.9	153
	Jun F-Sep L	54	40	210	103	26	4.5	135
Teton R bl South Fork nr Choteau MT	Jun F-Jul L	14.5	52	21	17.3	12.0	8.9	28
	Jun F-Sep L	19.8	52	29	24	16.3	10.5	38
Teton R nr Dutton	Jun F-Jul L	5.1	36	25	12.5	2.2	0.10	14.1
	Jun F-Sep L	7.1	43	29	12.8	3.4	0.85	16.5

Fort Peck Lake		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Missouri R nr Virgelle	Jun F-Jul L	1040	64	1640	1230	860	605	1630
	Jun F-Sep L	1340	64	2040	1570	1080	815	2090
Missouri R nr Landusky	Jun F-Jul L	1140	67	1770	1340	920	680	1690
	Jun F-Sep L	1620	73	2420	1860	1280	985	2230

Musselshell		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Musselshell R at Harlowton	Jun F-Jul L	19.5	72	48	30	9.2	-4.2	27
	Jun F-Sep L	41	152	96	58	29	16.1	27
Musselshell R nr Roundup	Jun F-Jul L	22	73	73	42	2.2	-25	30
	Jun F-Sep L	14.5	58	58	31	-4.7	-29	25

Missouri-Poplar		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Missouri R bl Fort Peck Dam	Jun F-Jul L	1190	73	1960	1500	875	415	1640
	Jun F-Sep L	1380	71	2460	1820	940	300	1950

Upper Yellowstone		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Yellowstone R at Yellowstone Lake Outlet	Jun F-Jul L	395	84	480	425	360	320	470
	Jun F-Sep L	555	82	675	605	510	450	680
Boulder R at Big Timber	Jun F-Jul L	190	88	235	205	173	152	215
	Jun F-Sep L	210	88	265	230	189	165	240
Yellowstone R at Livingston	Jun F-Jul L	1050	82	1310	1150	955	835	1280
	Jun F-Sep L	1230	78	1510	1340	1130	1000	1580
Yellowstone R at Corwin Springs	Jun F-Jul L	800	73	1000	880	730	640	1100
	Jun F-Sep L	985	69	1220	1080	895	790	1420
Shields R nr Livingston	Jun F-Jul L	46	82	74	56	36	24	56
	Jun F-Sep L	53	83	90	67	43	29	64
Yellowstone R at Billings	Jun F-Jul L	1750	76	2210	1940	1600	1410	2290
	Jun F-Sep L	2110	74	2700	2360	1890	1650	2860
West Rosebud Ck nr Roscoe	Jun F-Jul L	43	90	49	46	41	38	48
	Jun F-Sep L	58	89	67	62	54	50	65
Stillwater R nr Absarokee	Jun F-Jul L	295	88	360	320	270	235	335
	Jun F-Sep L	355	85	450	390	325	285	420
Clarks Fk Yellowstone R nr Belfry	Jun F-Jul L	325	88	395	355	300	265	370
	Jun F-Sep L	370	93	455	405	335	295	400
Red Lodge + Willow Ck nr Boyd	Jun F-Jul L	19.2	87	31	24	15.5	11.2	22

	Jun F-Sep L	25	78	40	30	16.3	8.4	32
Wind - Bighorn								
Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Bull Lake Ck nr Lenore	Jun F-Jul L	87	84	106	94	80	70	103
	Jun F-Sep L	114	88	139	124	104	93	130
Dinwoody Ck nr Burris	Jun F-Jul L	46	79	53	49	43	39	58
	Jun F-Sep L	73	87	83	76	68	63	84
Wind R ab Bull Lake Ck	Jun F-Jul L	295	84	470	350	240	180	350
	Jun F-Sep L	320	89	485	380	265	200	360
Wind R at Riverton	Jun F-Jul L	270	73	350	300	240	200	370
	Jun F-Sep L	305	73	400	345	265	215	420
Little Wind R nr Riverton	Jun F-Jul L	151	83	220	175	128	100	181
	Jun F-Sep L	172	84	260	205	142	107	205
Little Popo Agie R nr Lander	Jun F-Jul L	23	82	29	25	21	18.1	28
	Jun F-Sep L	29	88	36	32	27	24	33
Greybull R at Meeteetse	Jun F-Jul L	100	98	133	113	87	69	102
	Jun F-Sep L	143	93	178	157	124	104	153
Wind R bl Boysen Reservoir	Jun F-Jul L	320	70	460	380	260	191	455
	Jun F-Sep L	335	69	510	410	265	172	485
Bighorn R at Kane	Jun F-Jul L	490	73	760	605	380	250	675
	Jun F-Sep L	505	68	785	630	380	235	740
Shell Ck nr Shell	Jun F-Jul L	26	76	33	29	23	19.3	34
	Jun F-Sep L	35	74	45	39	32	28	47
NF Shoshone R at Wapiti	Jun F-Jul L	270	86	330	295	250	220	315
	Jun F-Sep L	335	91	405	365	310	275	370
SF Shoshone R nr Valley	Jun F-Jul L	124	78	156	138	111	95	160
	Jun F-Sep L	147	76	182	160	135	118	194
SF Shoshone R ab Buffalo Bill Reservoir	Jun F-Jul L	117	77	160	136	100	78	151
	Jun F-Sep L	128	80	178	147	109	86	160
Buffalo Bill Reservoir Inflow	Jun F-Jul L	370	80	470	410	330	275	460
	Jun F-Sep L	450	87	575	495	410	355	520
Bighorn R nr St. Xavier	Jun F-Jul L	725	69	1120	905	580	410	1050
	Jun F-Sep L	735	66	1200	925	555	350	1110
Little Bighorn R nr Hardin	Jun F-Jul L	66	120	108	81	54	39	55
	Jun F-Sep L	76	112	119	93	63	47	68
Tongue								
Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

Little Goose Ck nr Big Horn	Jun F-Jul L	17.3	89	23	19.4	15.3	13.2	19.4
	Jun F-Sep L	26	90	33	28	23	20	29
Tongue R at State Line nr Decker	Jun F-Jul L	101	82	147	120	81	58	123
	Jun F-Sep L	124	86	183	147	101	75	144
Big Goose Ck nr Sheridan	Jun F-Jul L	28	88	37	31	24	19.0	32
	Jun F-Sep L	36	88	46	40	32	27	41
Tongue R nr Dayton	Jun F-Jul L	46	96	59	52	41	35	48
	Jun F-Sep L	56	90	72	63	49	41	62
Powder								
Forecast Point	period	50% (KAF)	% of med	10% (KAF)	30% (KAF)	70% (KAF)	90% (KAF)	30-yr med

NF Powder R nr Hazelton	Jun F-Jul L	3.6	82	5.5	4.2	2.9	2.2	4.4
	Jun F-Sep L	3.9	74	6.1	4.7	3.3	2.5	5.3
Mf Powder R nr Barnum	Jun F-Jul L	2.6	67	5.1	3.6	1.77	0.59	3.9
	Jun F-Sep L	3.8	78	6.8	5.0	2.7	1.45	4.9
Piney Ck at Kearny	Jun F-Jul L	19.9	77	33	25	15.5	10.6	26
	Jun F-Sep L	22	71	37	27	17.5	12.2	31
Rock Ck nr Buffalo	Jun F-Jul L	9.9	83	14.7	11.8	8.4	6.6	11.9
	Jun F-Sep L	13.2	82	19.6	15.7	11.2	8.9	16.1
Powder R at Moorehead	Jun F-Jul L	62	70	116	83	45	25	88
	Jun F-Sep L	70	66	139	96	47	21	106
Powder R nr Locate	Jun F-Jul L	68	69	148	101	46	23	99
	Jun F-Sep L	78	64	197	118	47	24	121

Lower Yellowstone		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Yellowstone R at Miles City	Jun F-Jul L	2310	68	3170	2630	2040	1610	3390
	Jun F-Sep L	2640	64	3800	3080	2250	1810	4100
Yellowstone R nr Sidney	Jun F-Jul L	2280	68	3180	2640	1960	1590	3360
	Jun F-Sep L	2600	66	3840	3080	2180	1690	3950
Lake Sakakawea		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Missouri R nr Williston ND	Jun F-Jul L	4020	72	5950	4720	3390	2710	5560
	Jun F-Sep L	4570	71	7290	5410	3700	2860	6450
Cheyenne		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

Deerfield Reservoir Inflow	Jun F-Jul L	1.00	42	2.0	1.33	0.70	0.32	2.4
Pactola Reservoir Inflow	Jun F-Jul L	3.9	38	10.2	6.3	2.2	1.36	10.3
North Platte		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

North Platte R nr Northgate	Jun F-Jul L	72	59	106	84	62	51	122
	Jun F-Sep L	90	63	137	105	78	61	143
North Platte R bl Seminoe Reservoir	Jun F-Jul L	205	58	300	240	178	143	355
	Jun F-Sep L	265	66	360	305	225	188	400
Rock Ck ab King Canyon Cnl nr Arlington	Jun F-Jul L	29	97	36	32	27	24	30
	Jun F-Sep L	31	94	37	33	29	26	33
Sweetwater R nr Alcova	Jun F-Jul L	12.5	54	26	17.2	8.6	4.5	23
	Jun F-Sep L	15.9	61	28	21	11.8	7.0	26
La Prele Ck nr Douglas	Jun F-Jul L	1.17	43	3.4	2.00	0.57	0.03	2.7
	Jun F-Sep L	1.87	49	5.2	2.9	1.09	0.46	3.8
North Platte R bl Glendo Reservoir	Jun F-Jul L	175	48	305	225	125	66	365
	Jun F-Sep L	195	50	375	270	128	47	390
North Platte R bl Guernsey Reservoir	Jun F-Jul L	153	43	305	220	91	14.6	355
	Jun F-Sep L	175	46	340	245	108	17.0	380
Little Laramie R nr Filmore	Jun F-Jul L	35	100	46	39	32	27	35
	Jun F-Sep L	38	97	49	42	35	30	39
Laramie R and Pioneer Cnl nr Woods Lndg	Jun F-Jul L	43	60	60	48	38	32	72
	Jun F-Sep L	44	54	57	49	39	32	81
South Platte		50%	% of	10%	30%	70%	90%	30-yr
Forecast Point	period	(KAF)	med	(KAF)	(KAF)	(KAF)	(KAF)	med

South Platte R ab Spinney Res	Jun F-Jul L	24	75	28	26	22	19.1	32
	Jun F-Sep L	32	74	38	34	29	24	43
South Platte R nr Lake George	Jun F-Jul L	25	76	29	26	23	20.0	33
	Jun F-Sep L	34	76	42	37	30	26	45
South Platte R bl Antero Reservoir	Jun F-Jul L	5.5	61	7.3	6.3	4.7	3.8	9
	Jun F-Sep L	7.0	63	9.5	8.1	5.9	4.6	11.2
Bear Ck ab Evergreen	Jun F-Jul L	4.2	66	7.1	5.3	3.3	2.4	6.4
	Jun F-Sep L	7.9	76	13.4	10.0	6.4	4.7	10.4
South Platte R bl Cheesman Lk	Jun F-Jul L	35	66	45	39	32	27	53
	Jun F-Sep L	50	64	67	56	43	35	78
South Platte R at South Platte	Jun F-Jul L	55	60	73	61	48	39	92
	Jun F-Sep L	83	63	114	96	72	59	131
Clear Ck at Golden	Jun F-Jul L	73	96	83	77	68	63	76
	Jun F-Sep L	92	92	105	99	85	79	100

Boulder Ck nr Orodell	Jun F-Jul L	33	92	42	37	30	26	36
	Jun F-Sep L	41	91	52	46	37	31	45
St. Vrain Ck at Lyons	Jun F-Jul L	47	80	59	52	42	37	59
	Jun F-Sep L	61	81	77	67	56	49	75
South Boulder Ck nr Eldorado Springs	Jun F-Jul L	21	91	26	23	19.0	16.6	23
	Jun F-Sep L	26	96	33	29	23	19.5	27
Big Thompson R at Canyon Mouth	Jun F-Jul L	45	74	59	50	41	35	61
	Jun F-Sep L	60	76	78	67	54	44	79
Cache La Poudre at Canyon Mouth	Jun F-Jul L	109	76	135	119	98	84	143
	Jun F-Sep L	129	76	164	143	117	101	169

Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.
 Medians are for the 1991-2020 period.
 All volumes are in thousands of acre-feet.

Upper Missouri River Basin
July 2025 Calendar Year Runoff Forecast
July 7, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

June runoff was 3.3 MAF, 60% of average. Runoff was below average in all the reaches except Gavins Point, which was slightly above normal. All reaches except the Sioux City reach saw below normal precipitation over the last month.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **19.1 MAF, 74% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **17.4 MAF, 75% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next six months, expected inflow could range from the 17.1 MAF lower basic forecast to the 21.3 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for July 1 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows at least Abnormally Dry conditions are present over approximately 62% of the Basin. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of September 2025, indicates drought conditions are expected to persist and slightly expand in Montana, Wyoming, and western North Dakota. Drought conditions in South Dakota and Nebraska are expected to persist except in eastern Nebraska and South Dakota, where drought conditions could improve or be removed.

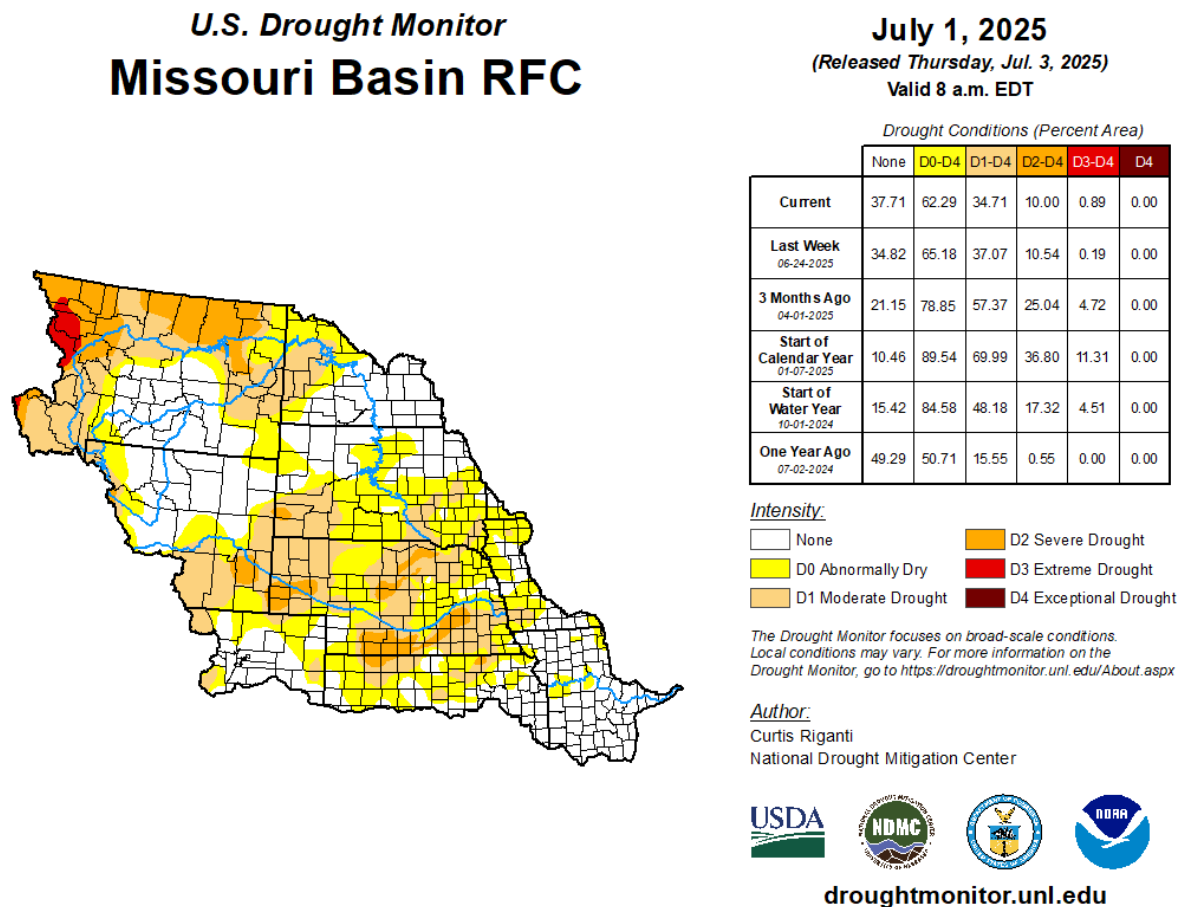


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for July 1 - September 30, 2025
Released June 30, 2025

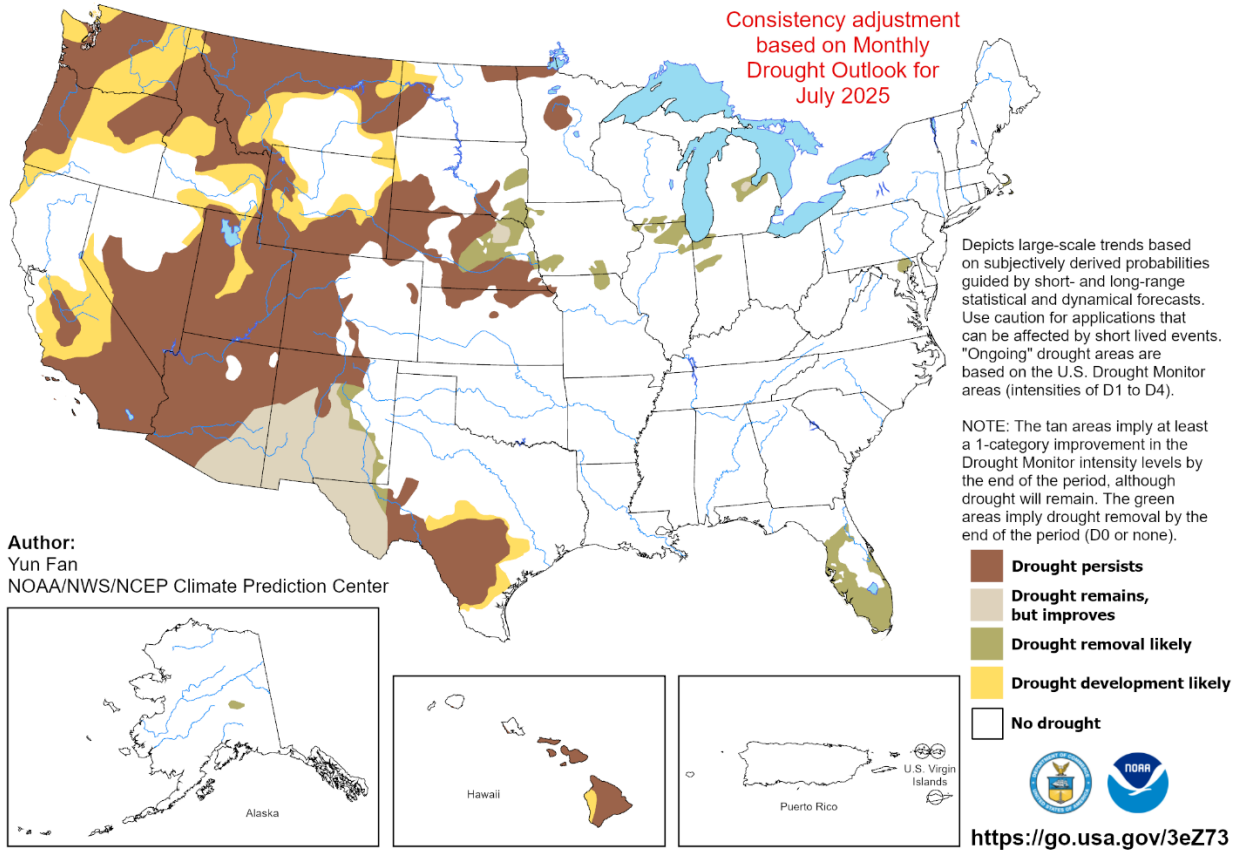


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The June precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Precipitation was mostly below normal in the upper Basin except in far eastern South Dakota, which saw above-normal precipitation. In most of the lower Basin precipitation was above normal.

Precipitation as a percent of normal for the April-May-June period (**Figure 4**) was mixed, with below normal precipitation occurring in Montana, northwestern North Dakota, southern South Dakota, eastern and southern Nebraska, western Iowa, and into northern Kansas and Missouri. Pockets of above-normal precipitation occurred in western and southern North Dakota, northern South Dakota, central Nebraska, and along the MT-WY border.

Percent of Normal Precipitation (%)
6/1/2025 – 6/30/2025

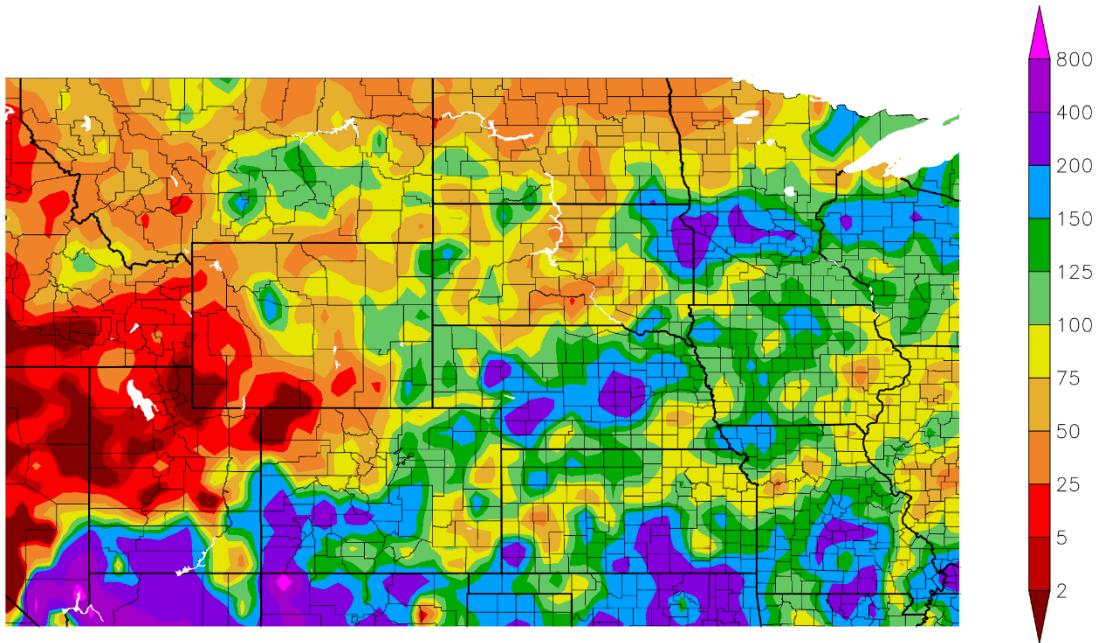


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
4/1/2025 – 6/30/2025

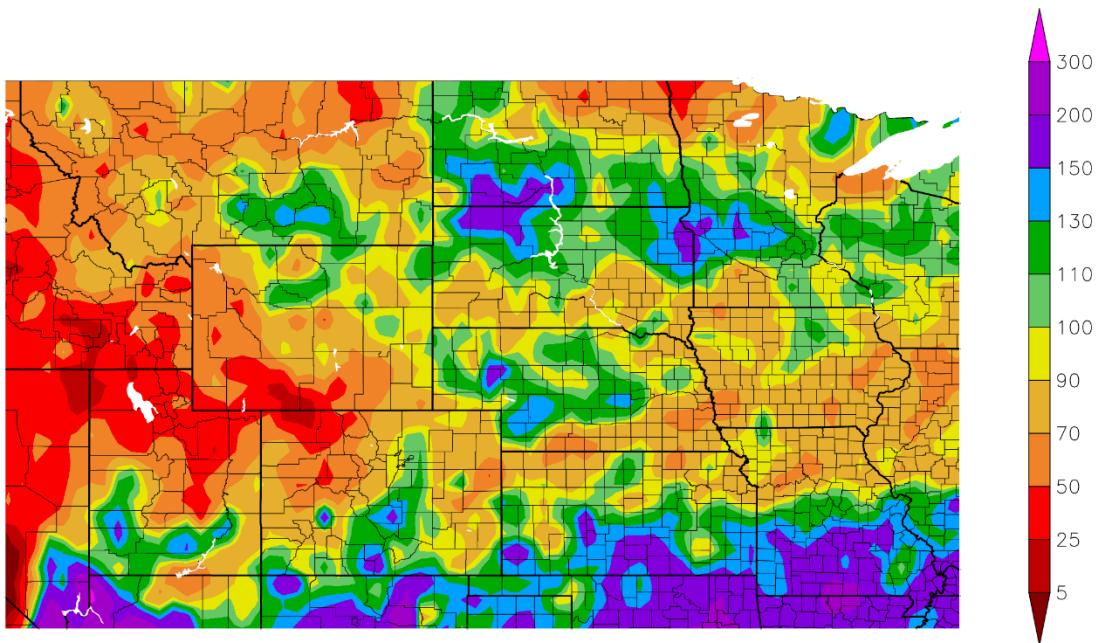


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

June temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were slightly warmer than normal for most of the Basin. April-May-June temperature departures are shown in **Figure 6**. The three-month average temperatures were slightly above normal for the Basin.

Departure from Normal Temperature (F) 6/1/2025 – 6/30/2025

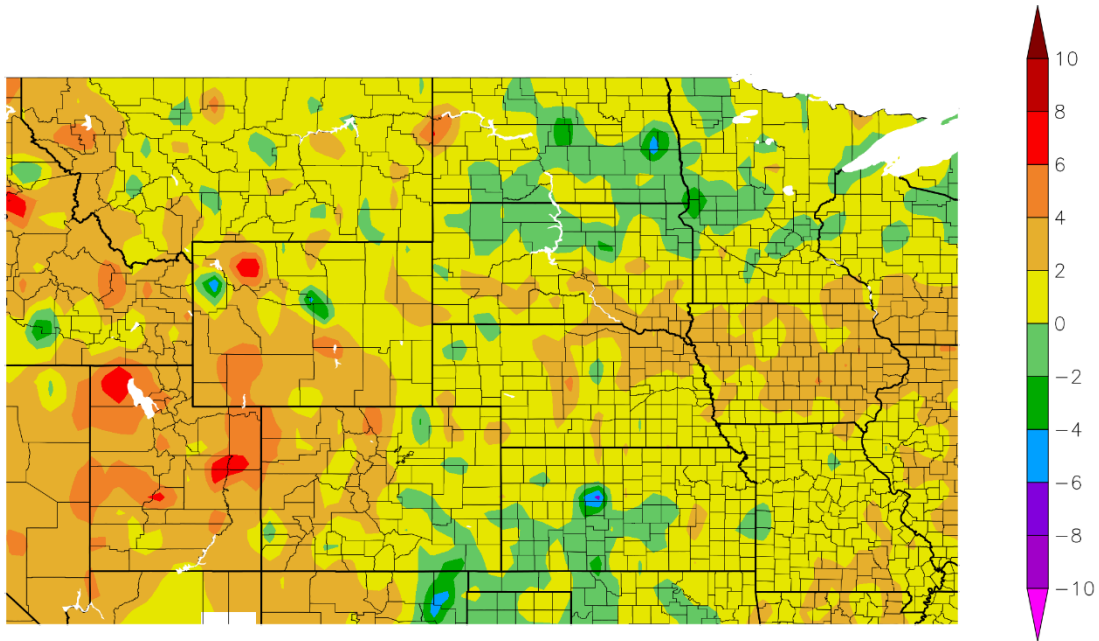


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 4/1/2025 – 6/30/2025

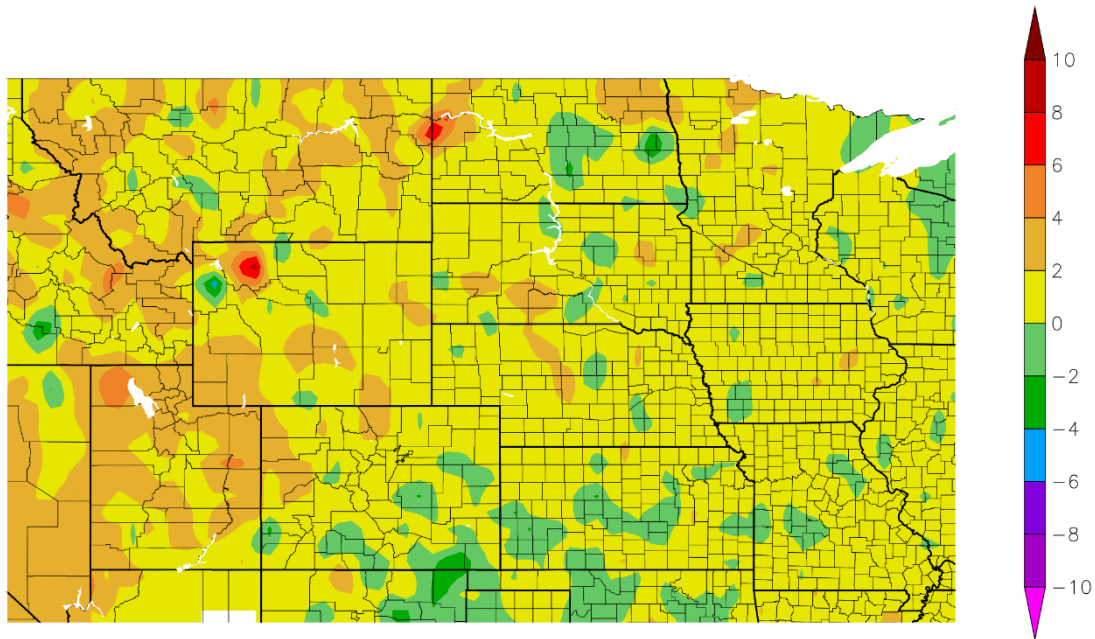


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of June 2025 are shown in **Figure 7**. Soil moisture is dry in much of the Basin except northeastern South Dakota where a small pocket of wetter-than-normal soils are modeled.

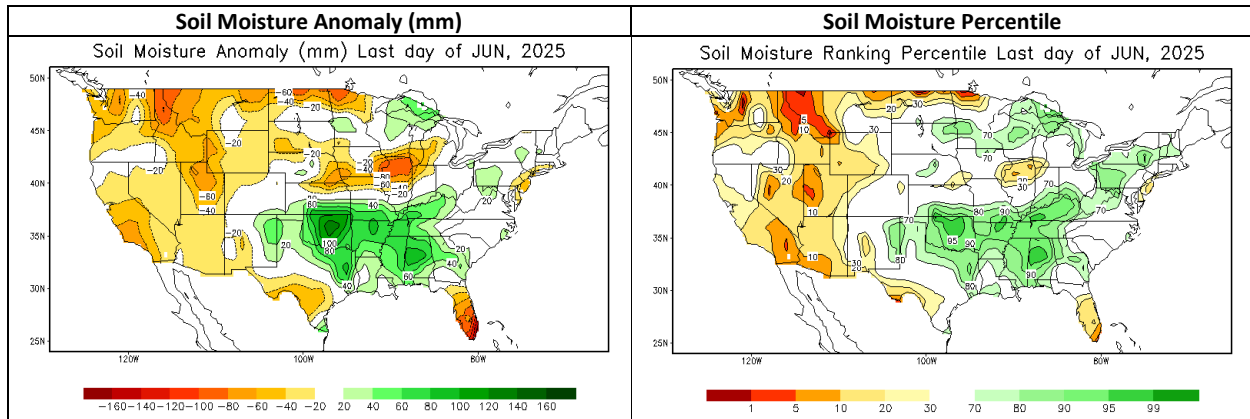


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) is not a factor in the July runoff forecast.

Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlations to mountain snowpack as the season reaches the date of peak accumulation, which typically occurs in mid-April. The best predictor of May-July runoff in the mountain reaches is the peak snow water equivalent (SWE) accumulation.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources Conservation Service SNOw TELEmetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

25-Jun-2025

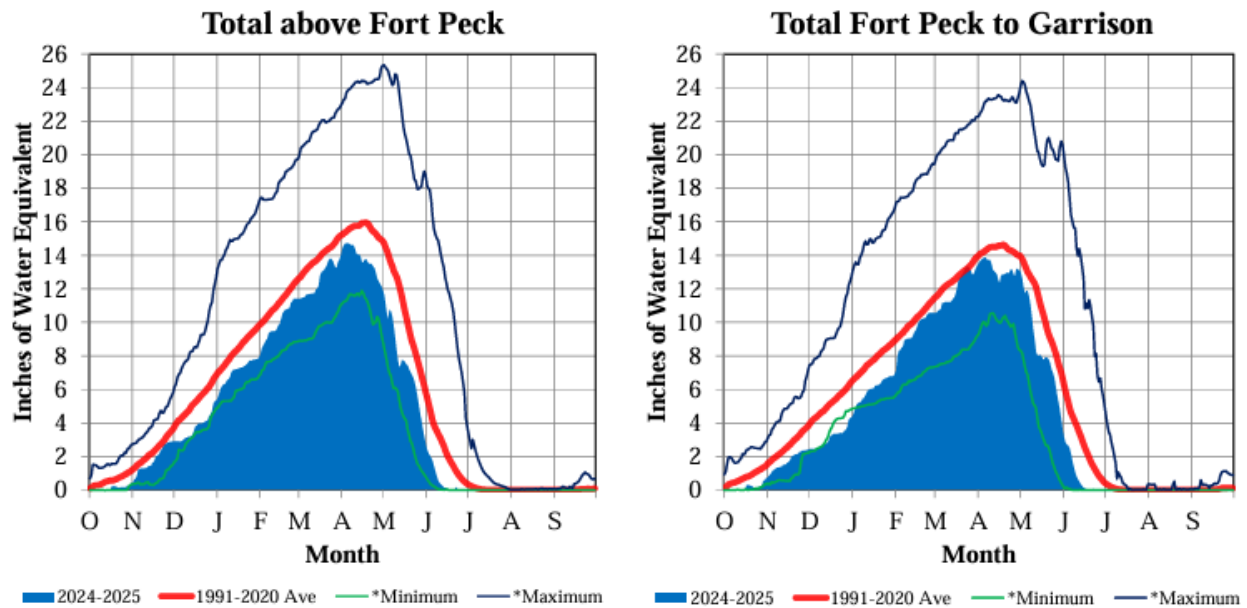


Figure 8. Mountain Snowpack Water Content

The Fort Peck reach peaked on April 5 at 14.7 inches of SWE and 92% of the average peak. The Garrison reach peaked on April 5 at 13.9 inches of SWE and 95% of the average peak. As of June 25, the snow in both reaches had completely melted.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is a sea surface temperature oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

ENSO-neutral conditions are currently present in the Basin. ENSO-neutral conditions are 82% likely to continue through August. Into the winter 2025-2026 there is a 48% chance of ENSO-neutral conditions and a 41% chance of transitioning to La Niña conditions.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for July (**Figure 10**) show increased chances for warmer-than-normal temperatures across the Basin. Most of the upper Basin shows equal chances for below-normal, normal, or above-normal precipitation. Western Montana and the lower Basin show increased chances for below-normal precipitation.

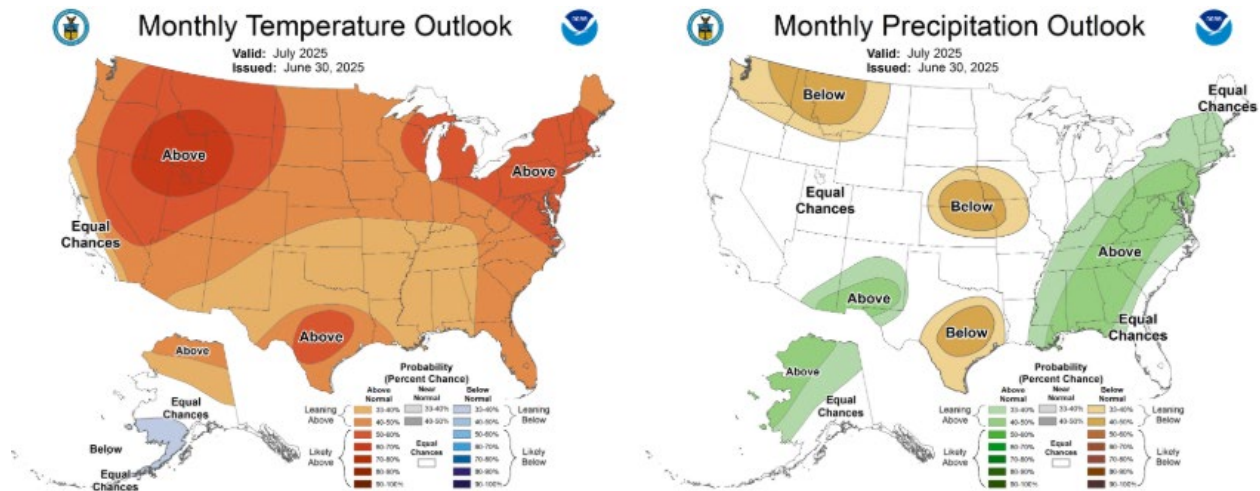


Figure 9. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases.

The three-month temperature outlook for July-August-September indicates increased chances for warmer-than-normal temperatures across the Basin. The precipitation outlook for the same period indicates increased chances for below-normal precipitation across most of the Basin.

The outlooks for October-November-December indicate equal chances for cooler-than-normal, normal, or warmer-than-normal temperatures in the upper Basin, and increased chances for warmer-than-normal temperatures in the lower Basin. The precipitation outlook for the same period shows equal chances for below-normal, normal, or above-normal precipitation across the entire Basin.

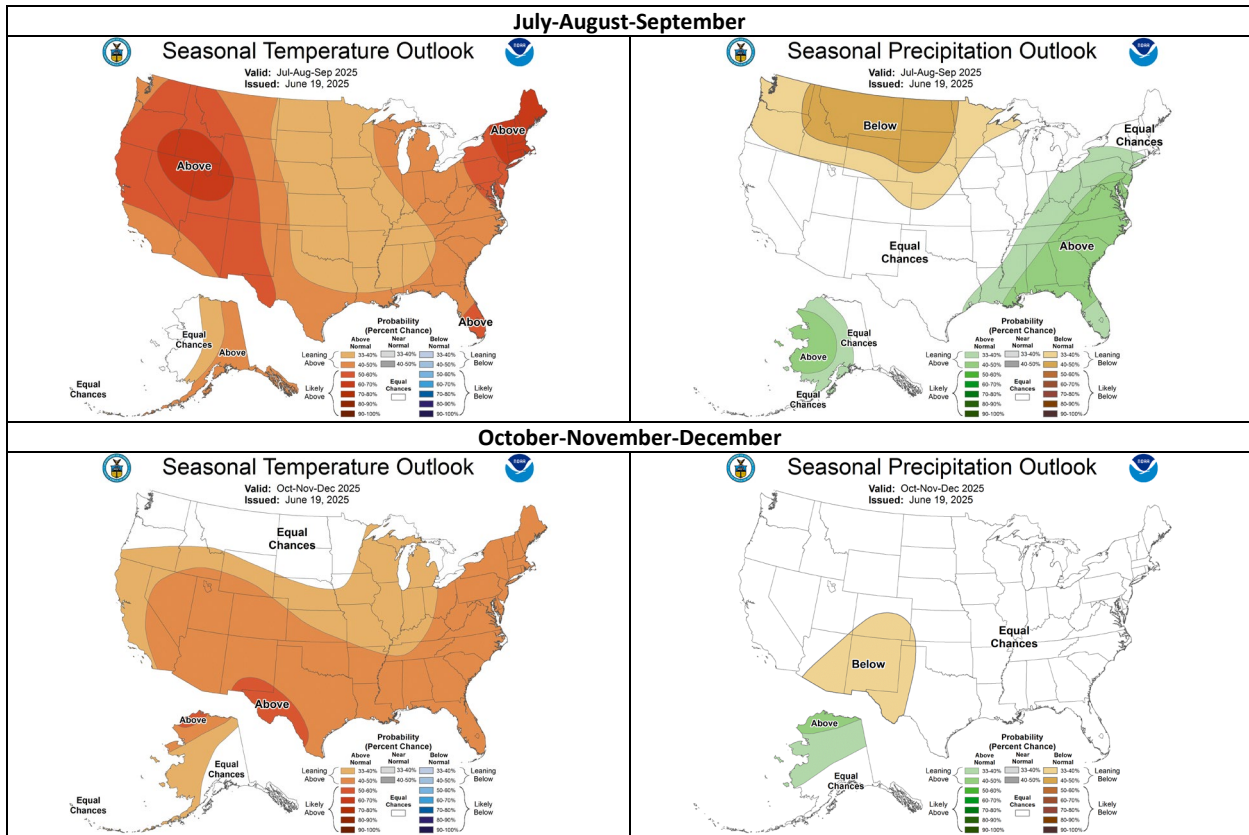


Figure 10. CPC Three-Month Temperature and Precipitation Outlooks

Summary

This forecast considers reach runoff, basin conditions, mountain snowpack, and temperature and precipitation outlooks. Given these factors we expect runoff during July for Fort Peck, Garrison, and Oahe to be below average. Runoff in the Fort Randall and Sioux City reaches are expected to be near normal and runoff in the Gavins Point reach is expected to be above normal due to current above-normal tributary flows. Runoff is expected to remain near or below normal for all the reaches except Gavins Point for the remainder of the year.

In summary, the 2025 calendar year runoff forecast is **19.1 MAF, 74% of average**.

Upper Missouri River Basin
August 2025 Calendar Year Runoff Forecast
August 4, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

July runoff was 2.0 MAF (62% of average) for the basin above Sioux City, 0.2 MAF lower than the forecasted volume. Runoff was well below average in the Fort Peck and Garrison reaches, about normal in the Oahe and Fort Randall reaches, and well above normal in the Gavins Point and Sioux City reaches.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **19.2 MAF, 75% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **17.1 MAF, 74% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next five months, expected inflow could range from the 17.9 MAF lower basic forecast to the 20.5 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for July 29 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows over 52% of the Basin is not experiencing abnormally dry or drought conditions. There is no D4 exceptional drought anywhere in the Basin, and only a small area of D3 extreme drought on the western edge of the Basin in Montana. Areas of D0 abnormally dry to D2 severe drought are still present in every state except Iowa and Missouri. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of October 2025, indicates drought conditions are expected to persist and slightly expand in Montana, Wyoming, North Dakota, South Dakota, Nebraska and Kansas.

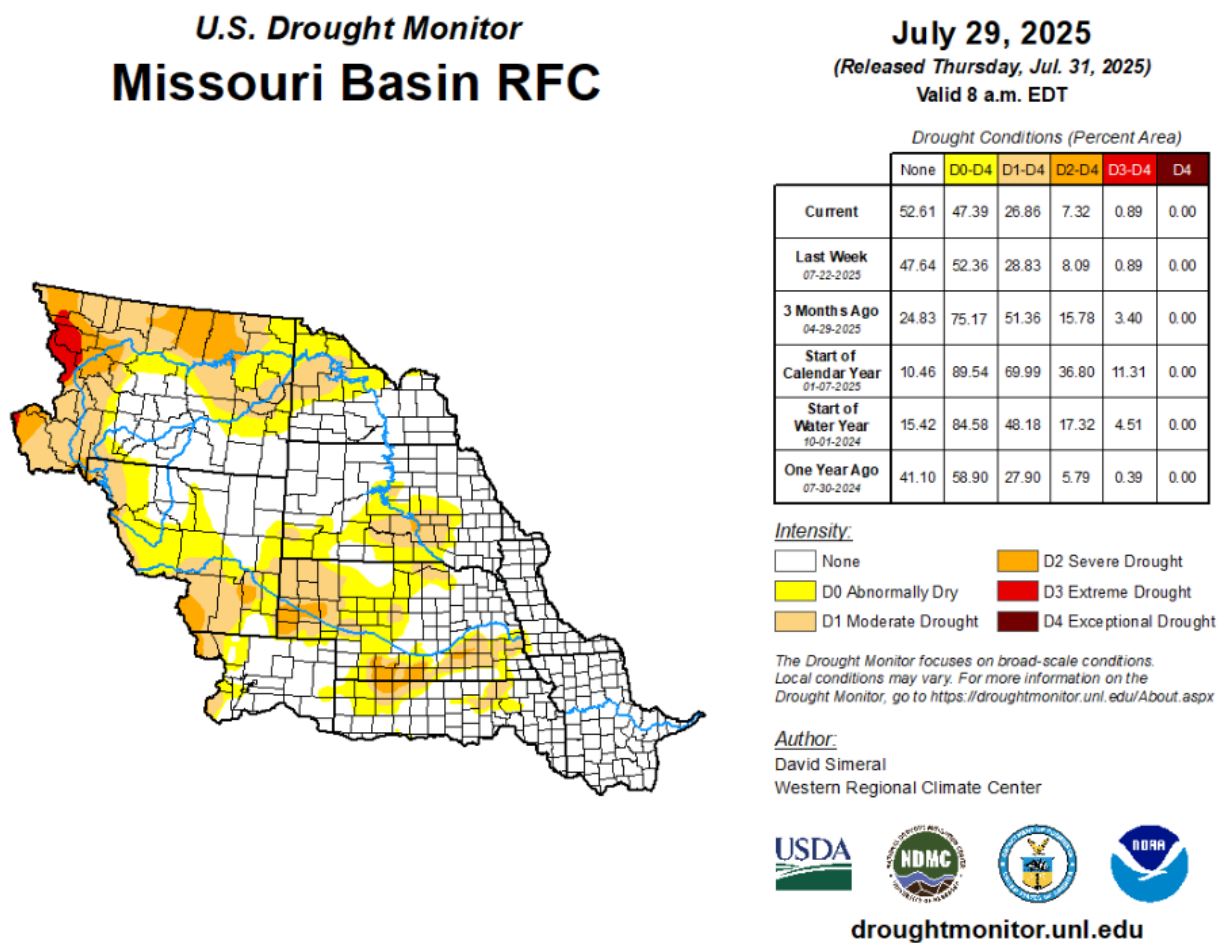


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for August 1 - October 31, 2025
Released July 31, 2025

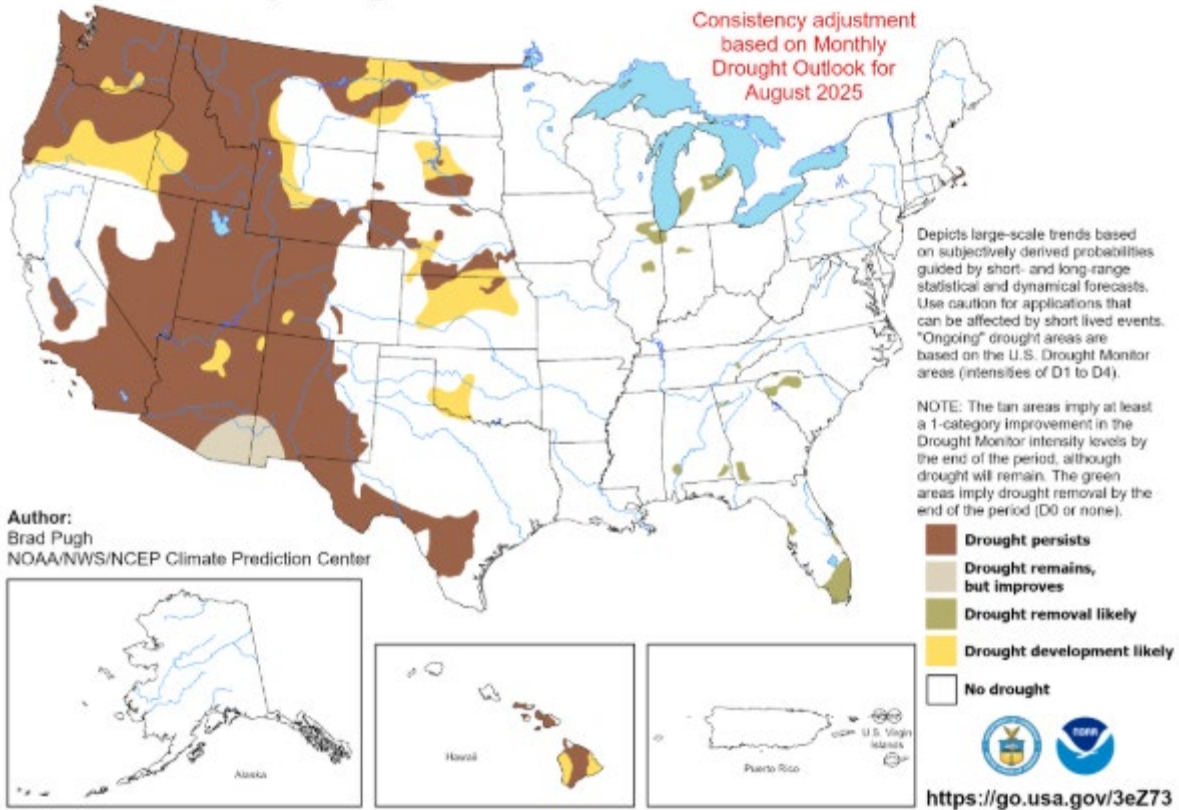


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The July precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Precipitation was mostly above normal for large areas in both the upper and lower Basin, with some areas experiencing over 300 percent of normal precipitation. Only areas along the western edge of the Basin in Montana, Wyoming, Colorado, Nebraska and Kansas saw below normal precipitation.

Precipitation as a percent of normal for the May-June-July period (**Figure 4**) was mixed, with areas of below- and above-normal precipitation occurring for every state in the Basin.

Percent of Normal Precipitation (%)
7/1/2025 – 7/31/2025

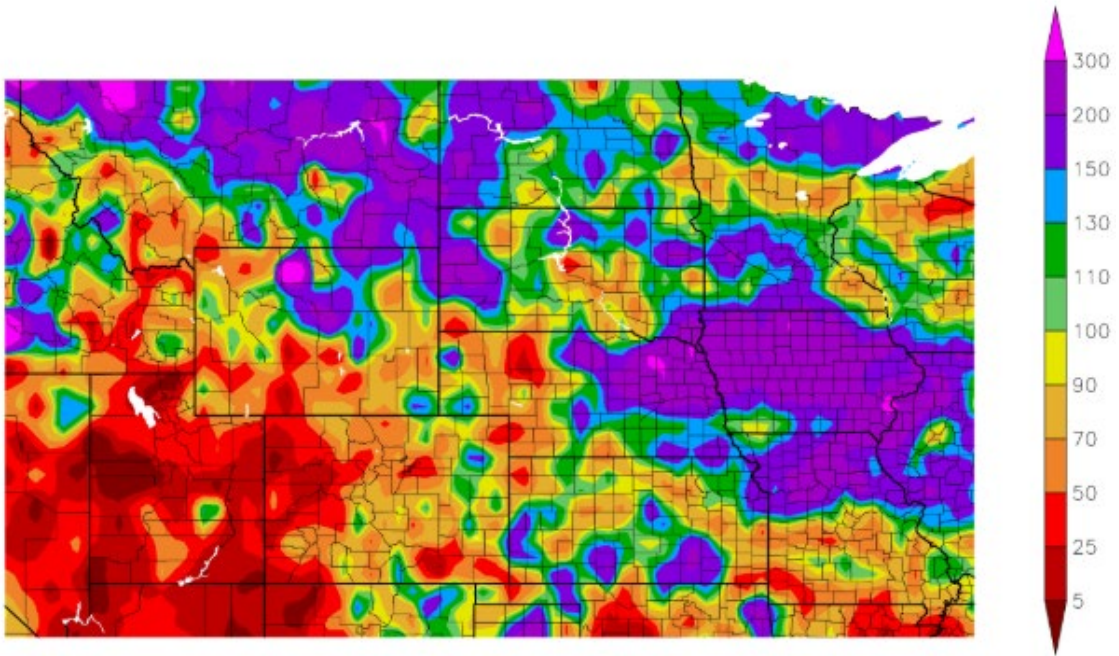


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
5/1/2025 – 7/31/2025

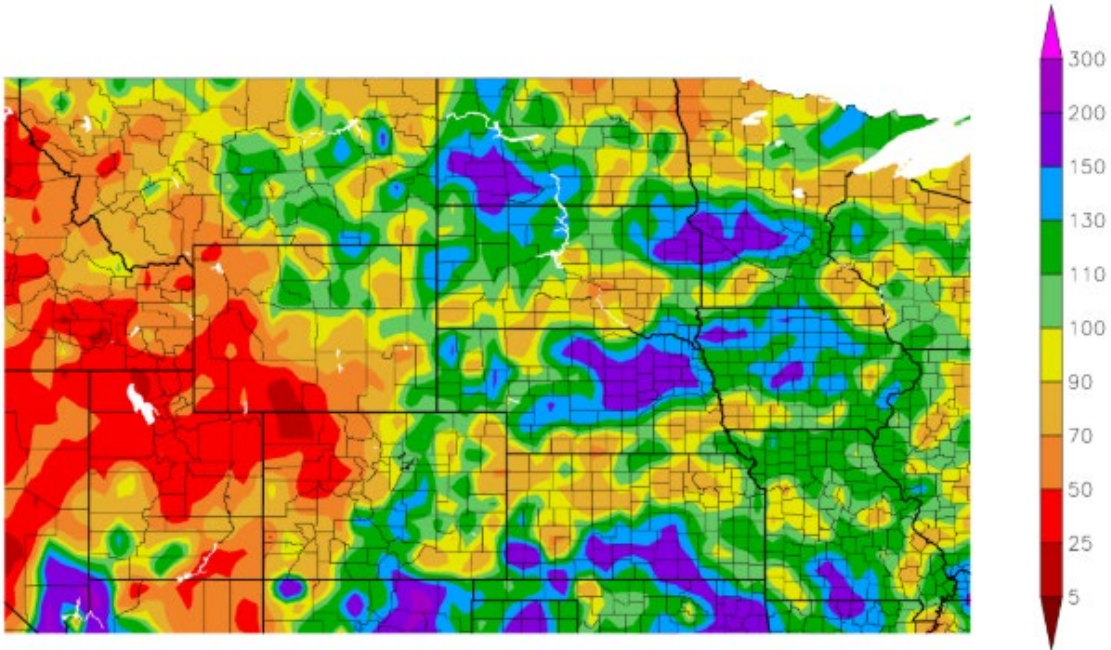


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

July temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were near normal for most of the Basin. May-June-July temperature departures are shown in **Figure 6**. The three-month average temperatures were slightly above normal for most of the Basin.

Departure from Normal Temperature (F) 7/1/2025 – 7/31/2025

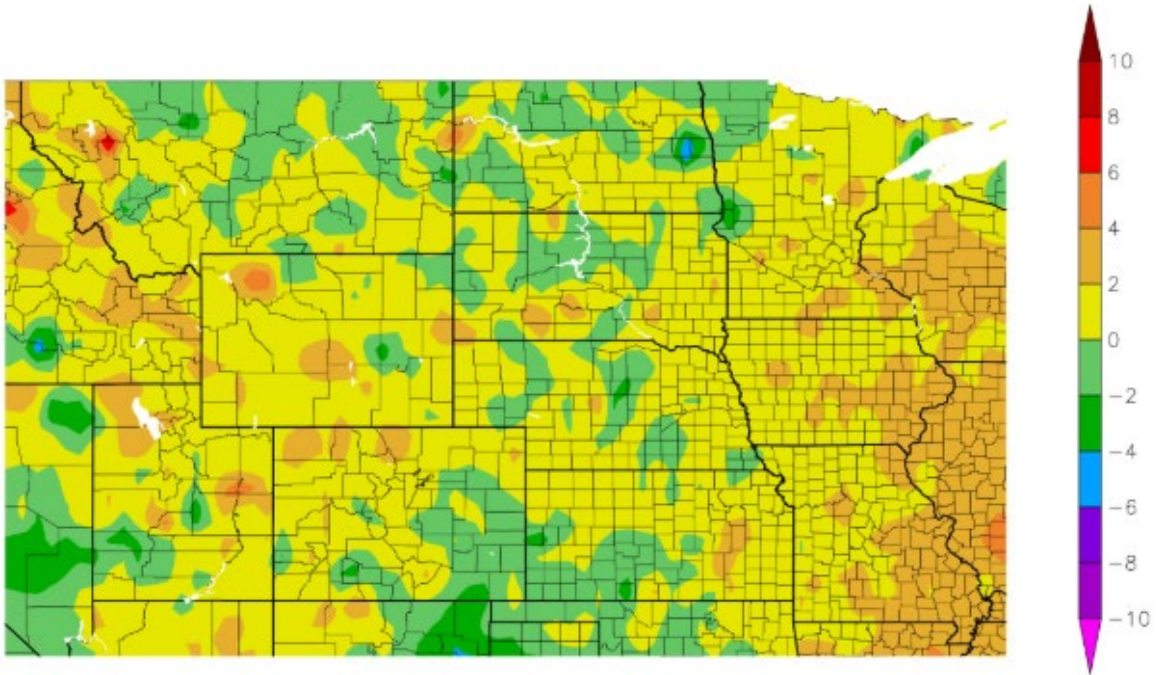


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 5/1/2025 – 7/31/2025

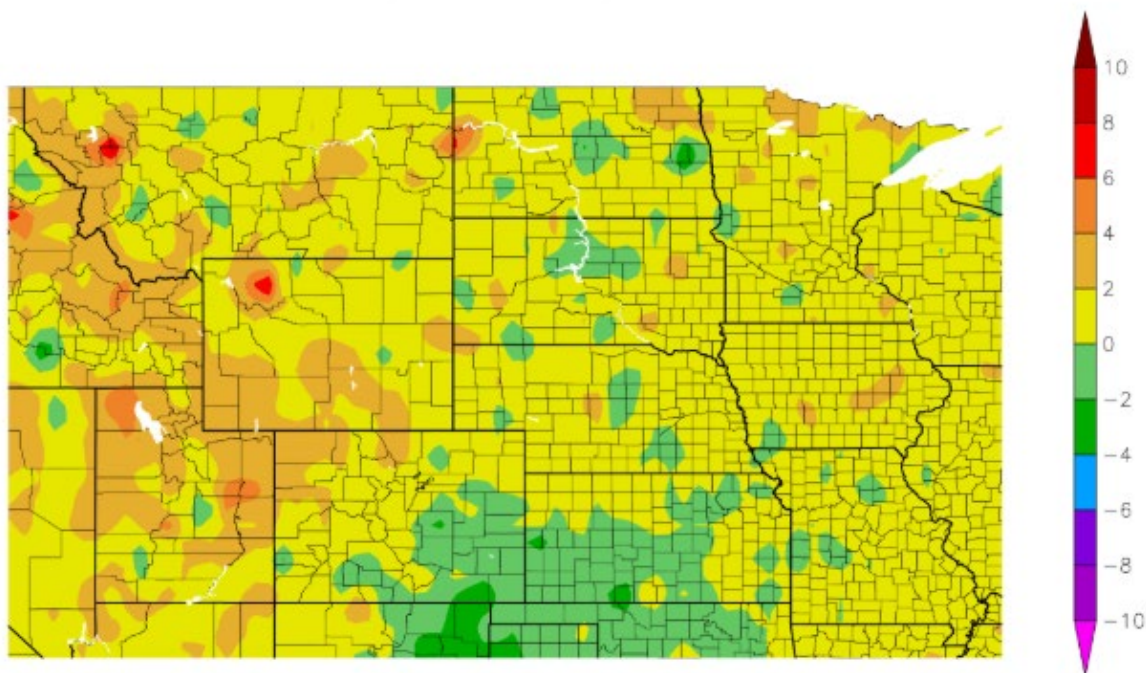


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of July 2025 are shown in **Figure 7**. Soil moisture is generally drier-than-normal along the western edges of the Basin, near normal in the middle, and wetter-than-normal along the eastern edges of the Basin. Soil moisture increased in most areas during the month of July.

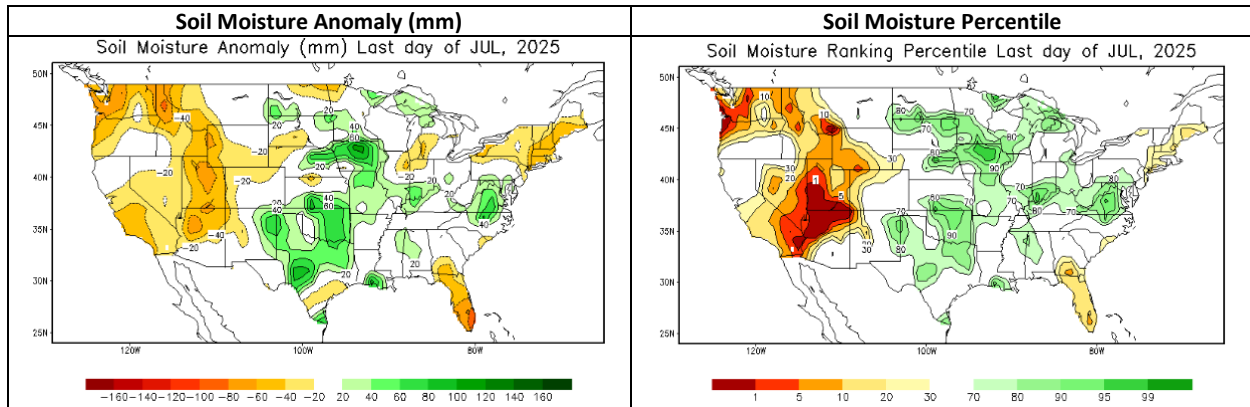


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) is not a factor in the August runoff forecast.

Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlations to mountain snowpack as the season reaches the date of peak accumulation, which typically occurs in mid-April. The best predictor of May-July runoff in the mountain reaches is the peak snow water equivalent (SWE) accumulation.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources Conservation Service SNOw TELEmetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content 2024-2025 with comparison plots from recent high and low years

25-Jun-2025

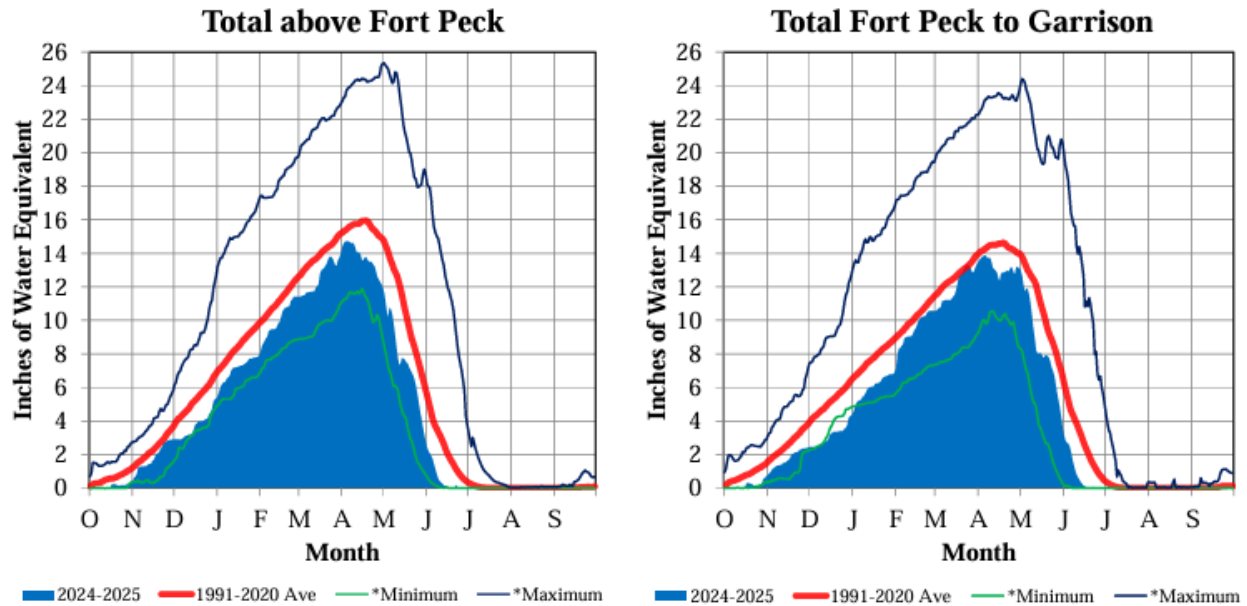


Figure 8. Mountain Snowpack Water Content

The Fort Peck reach peaked on April 5 at 14.7 inches of SWE and 92% of the average peak. The Garrison reach peaked on April 5 at 13.9 inches of SWE and 95% of the average peak. As of June 25, the snow in both reaches had completely melted.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is a sea surface temperature oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

ENSO-neutral conditions are currently present in the Basin. ENSO-neutral conditions are 56% likely to continue through October. Into the winter 2025-2026 there is about an equal chance of ENSO-neutral conditions and transitioning to La Niña conditions.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for August (**Figure 10**) show increased chances for warmer-than-normal temperatures in the mountains, Montana, and North Dakota. There are equal chances for above-normal, normal, and below-normal temperatures for the rest of the Basin in August. Most of the upper Basin shows equal chances for below-normal, normal, or above-normal precipitation. Southern Wyoming and Colorado show increased chances for below-normal precipitation.

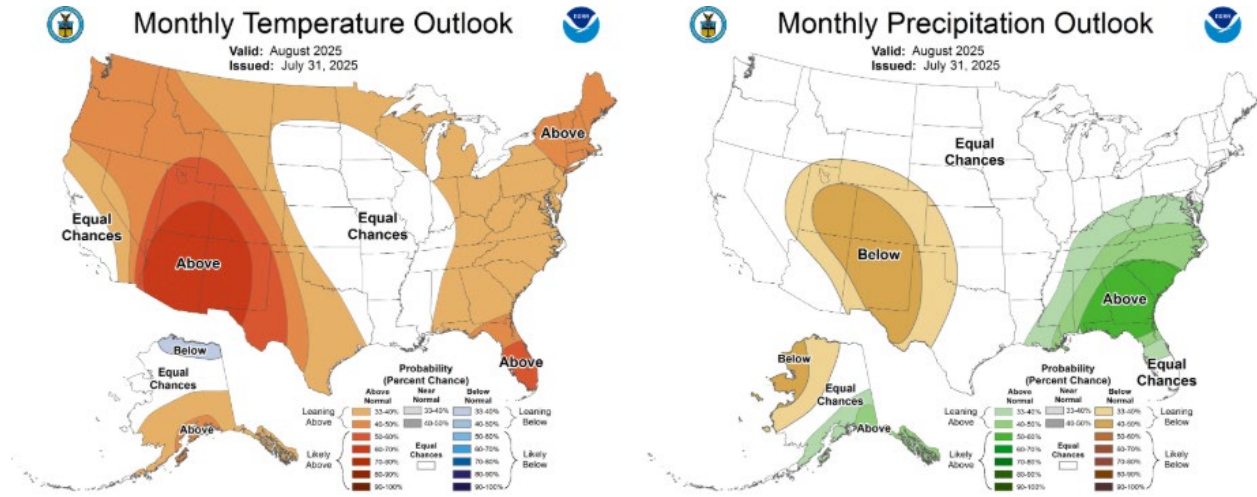


Figure 9. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases.

The three-month temperature outlook for September-October-November indicates increased chances for warmer-than-normal temperatures across the Basin. The precipitation outlook for the same period indicates increased chances for below-normal precipitation across most of the Basin.

The outlooks for December 2025-January 2026-February 2026 indicate equal chances for cooler-than-normal, normal, or warmer-than-normal temperatures across the Basin. The precipitation outlook for the same period shows equal chances for below-normal, normal, or above-normal precipitation across most of the Basin, with increased chances for above-normal precipitation in Montana, northern Wyoming, and western South Dakota.

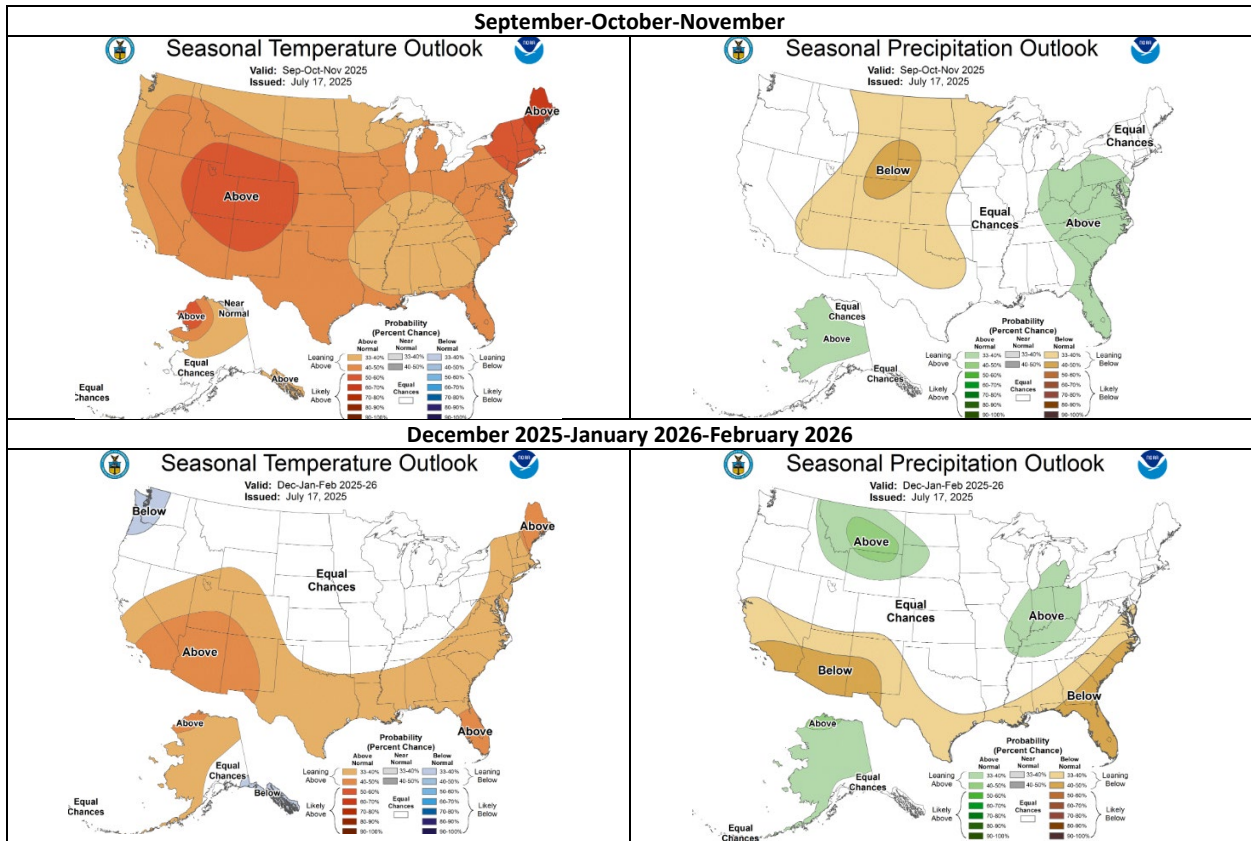


Figure 10. CPC Three-Month Temperature and Precipitation Outlooks

Summary

This forecast considers reach runoff, basin conditions, and temperature and precipitation outlooks. Given these factors we expect runoff during August for Fort Peck and Garrison to be below average. Runoff in the Fort Randall reach is expected to be near normal and runoff in the remaining reaches is expected to be above normal due to current above-normal tributary flows. Runoff is expected to trend back towards normal later in the year.

In summary, the 2025 calendar year runoff forecast is **19.2 MAF, 75% of average**.

Upper Missouri River Basin
September 2025 Calendar Year Runoff Forecast
September 4, 2025

US Army Corps of Engineers, Northwestern Division
Missouri River Basin Water Management
Omaha, NE

Calendar Year Runoff Forecast

Explanation and Purpose of Forecast

The long-range runoff forecast is presented as the Calendar Year Runoff Forecast. The Calendar Year Runoff Forecast for the Missouri River Basin above Sioux City, IA (upper Basin) is available [here](#). This forecast is developed shortly after the beginning of each calendar year and is updated at the beginning of each month to show the actual runoff for historic months of that year and the updated forecast for the remaining months of the year. This forecast presents monthly inflows in million acre-feet (MAF) from five incremental drainage areas, as defined by the individual System projects plus the incremental drainage area between Gavins Point Dam and Sioux City, IA. Due to their close proximity, the Big Bend and Fort Randall drainage areas are combined. Summations are provided for the total Missouri River reach above Gavins Point Dam and for the upper Basin. The Calendar Year Runoff Forecast is used in the Monthly Study simulation model to plan future system regulation in order to meet the authorized project purposes throughout the calendar year.

Observed Runoff

August runoff was 1.5 MAF (109% of average) for the basin above Sioux City, 0.3 MAF higher than the forecasted volume. Runoff was well below average in the Fort Peck and Garrison reaches and above normal for the remaining reaches.

Calendar Year Runoff Forecast Synopsis

The 2025 calendar year runoff forecast for the Missouri Basin above Sioux City, IA is **19.1 MAF, 74% of average**. The 2025 calendar year runoff forecast for the Missouri Basin above Gavins Point Dam is **16.8 MAF, 72% of average**.

Due to the variability in precipitation and other hydrologic factors that can occur over the next four months, expected inflow could range from the 18.3 MAF lower basic forecast to the 20.0 MAF upper basic forecast. The lower and upper basic forecasts are used in long-term regulation planning models to “bracket” the range of expected runoff given much wetter or drier conditions, respectively. The range of possible drier-than-expected (lower basic) and wetter-than-expected (upper basic) conditions is attributed to all six reaches. The result is a range or “bracket” for each reach, and thus, for the total runoff forecast.

Current Conditions

Drought Analysis

The National Drought Mitigation Center’s drought monitor for September 2 is shown in **Figure 1**. The drought monitor is available [here](#). The US Drought Monitor for the Missouri Basin (Basin) shows over 58% of the Basin is not experiencing abnormally dry or drought conditions. There is no exceptional drought anywhere in the Basin and extreme or severe drought only is modeled on the western edge of the Basin and one small area in the panhandle of Nebraska. Areas of abnormally dry or moderate drought conditions are still modeled in Missouri, western Nebraska, southwest South Dakota, and northeast Montana. The Seasonal Drought Outlook in **Figure 2**, which extends through the end of November 2025, indicates drought conditions are expected to persist or develop on the western side of the Basin.

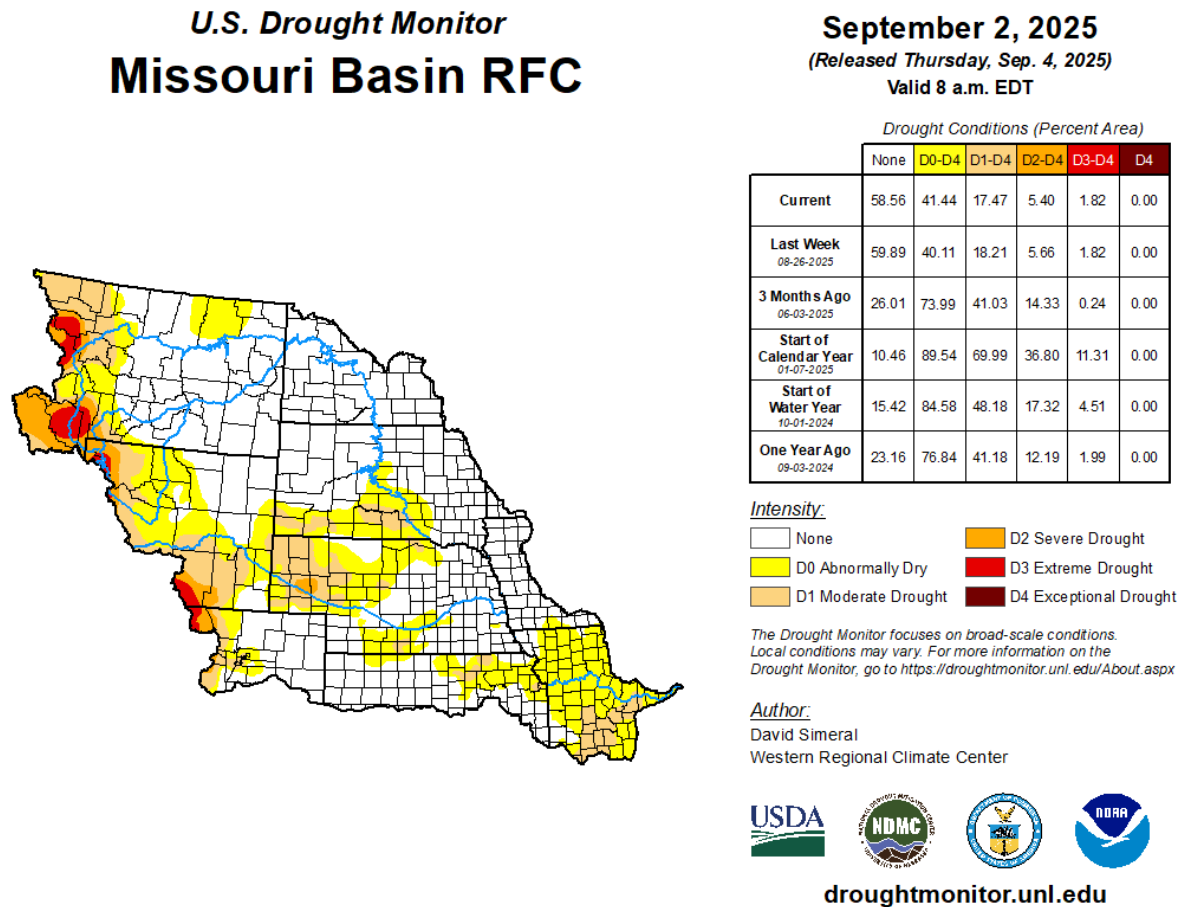


Figure 1. National Mitigation Center US Drought Monitor for the Missouri Basin

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for September 1 - November 30, 2025
Released August 31, 2025

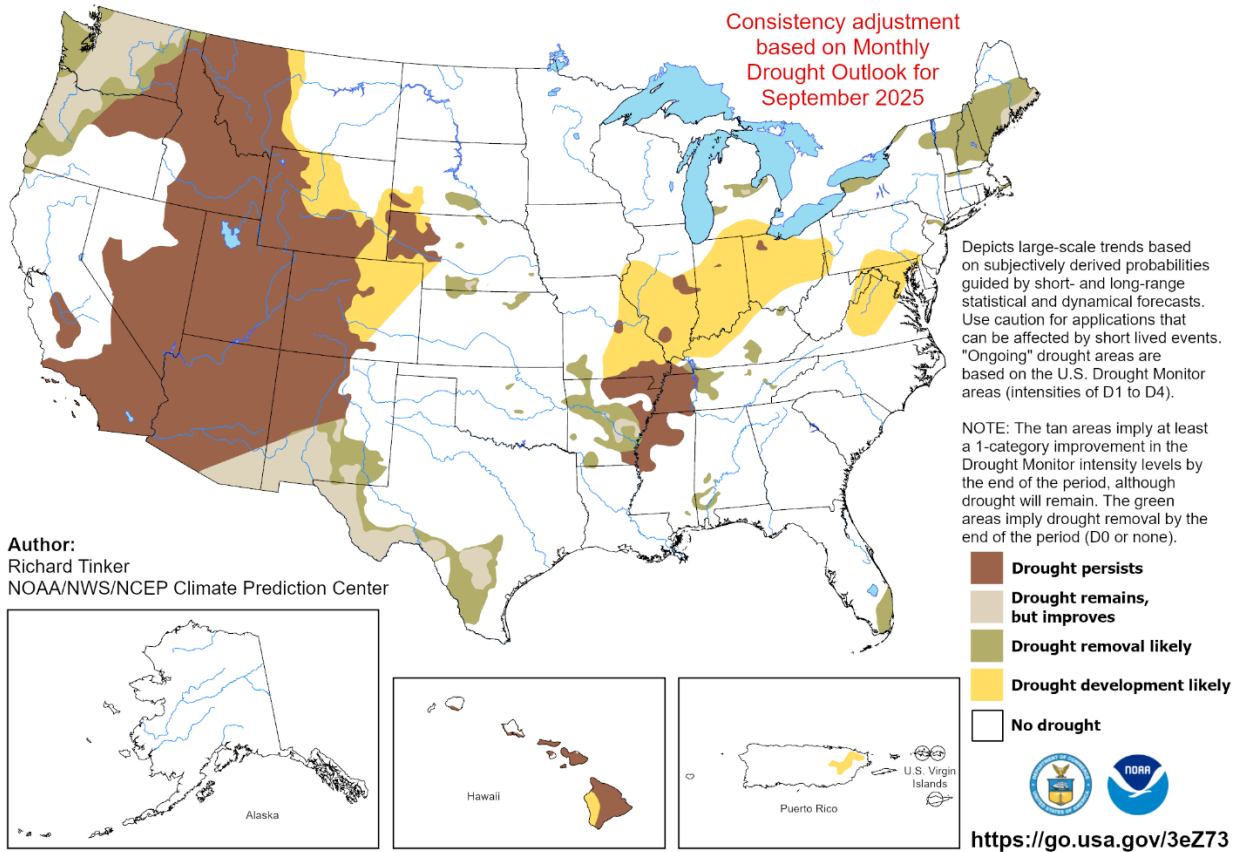


Figure 2. Climate Prediction Center US Seasonal Drought Outlook

Precipitation

Monthly precipitation accumulations are shown using the High Plains Regional Climate Center (HPRCC) images available [here](#). The August precipitation accumulations are shown in **Figure 3** as a percent of normal precipitation. Pockets of well above normal precipitation were observed in Montana, North Dakota, and South Dakota, with most other areas seeing near normal or slightly below normal precipitation in the basin. The exception to that was in Missouri, which saw mostly well below normal precipitation.

Precipitation as a percent of normal for the June-July-August period (**Figure 4**) was mixed, with every state seeing pockets of above-normal, normal, or below-normal precipitation.

Percent of Normal Precipitation (%)
8/1/2025 – 8/31/2025

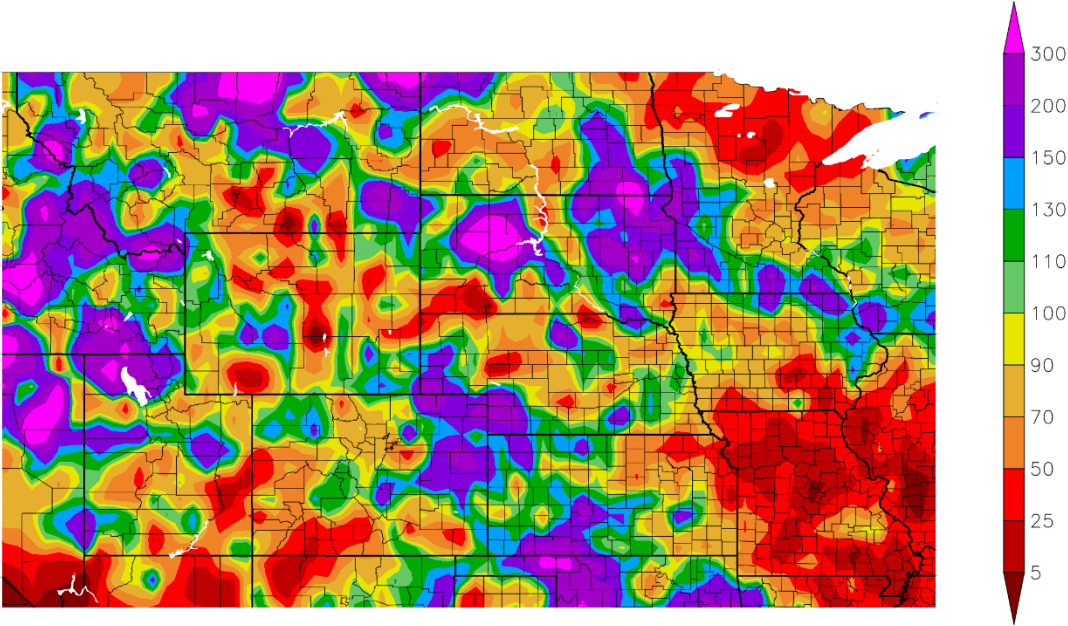


Figure 3. HPRCC Last Full-Month Percent of Normal Precipitation

Percent of Normal Precipitation (%)
6/1/2025 – 8/31/2025

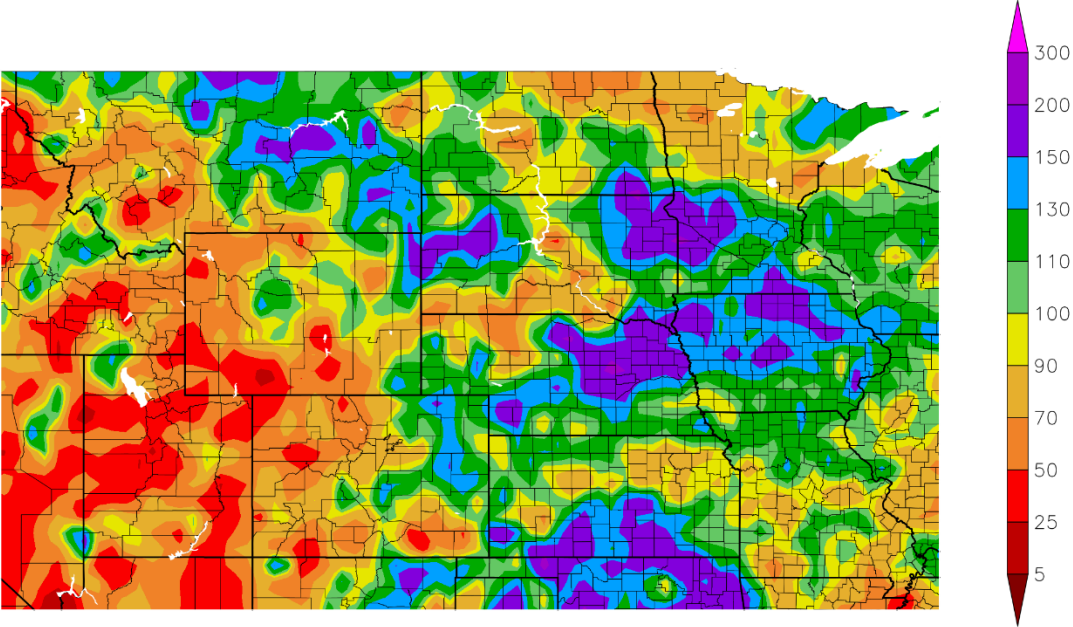


Figure 4. HPRCC Last 3-Month Percent of Normal Precipitation

Temperature

August temperature departures from normal in degrees Fahrenheit (deg F), shown in **Figure 5**, were near normal for most of the Basin except southwestern South Dakota and northwestern Nebraska, which saw temperatures 2-5 degrees above normal. June-July-August temperature departures are shown in **Figure 6**. The three-month average temperatures were near normal for the Basin.

Departure from Normal Temperature (F) 8/1/2025 – 8/31/2025

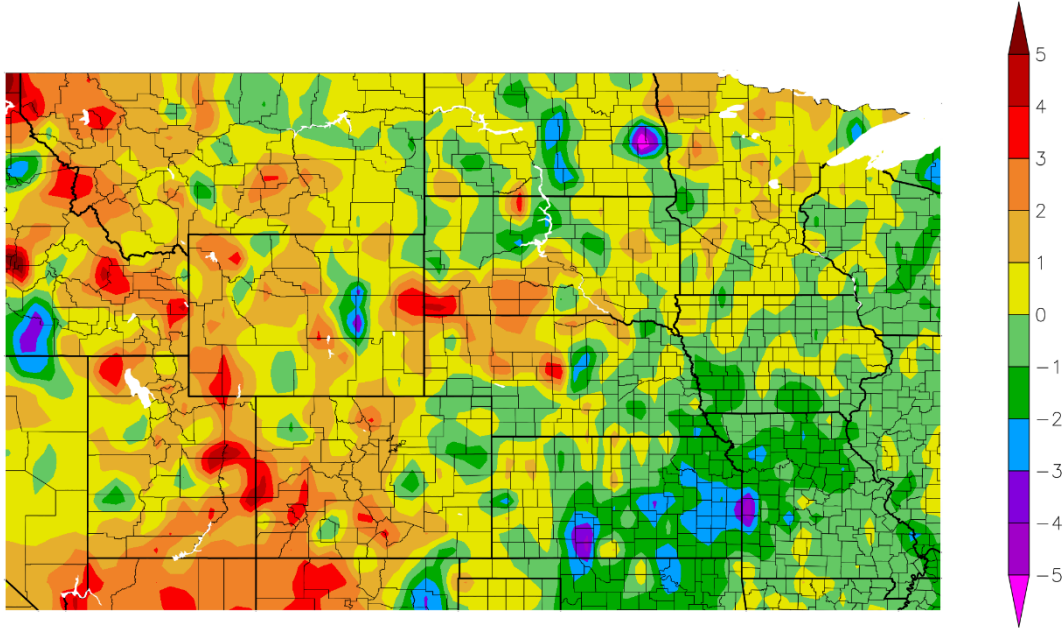


Figure 5. HPRCC Previous Month Departure from Normal Temperature

Departure from Normal Temperature (F) 6/1/2025 – 8/31/2025

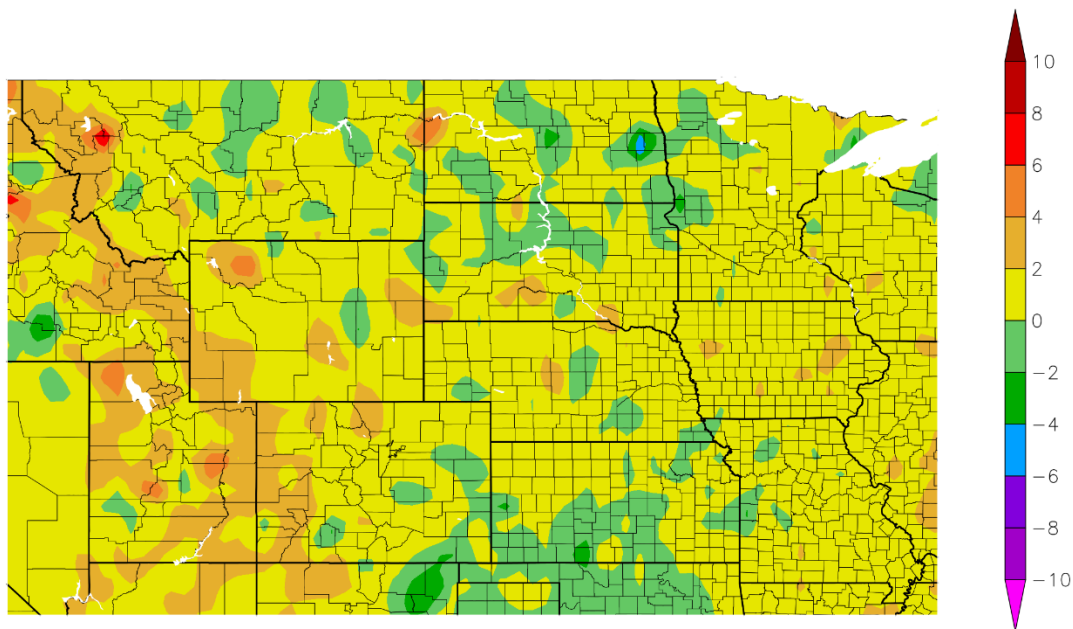


Figure 6. HPRCC Last 3-Month Departure from Normal Temperature

Soil Moisture

Soil moisture is factored into the forecast as an indicator of wet or dry hydrologic basin conditions. Typically, rainfall and snowmelt runoff are greater when soil moisture conditions are above normal than when soil moisture conditions are below normal. Not only is soil moisture a physical parameter that influences runoff, but it can also be used as an indicator of future runoff.

Soil moisture anomalies and soil moisture percentiles are shown using the Climate Prediction Center (CPC) images available [here](#). Soil moisture anomalies are defined as deviations from the 1991-2020 daily climatology while the percentiles are based on the comparison between the current soil moisture estimate to the 1895 to present period. Soil moisture anomaly and percentile at the end of August 2025 are shown in **Figure 7**. Soil moisture is generally drier than normal along the western side of the Basin and in northern North Dakota and Missouri. Pockets of wetter-than-normal soil are modeled along the ND-SD border, eastern Nebraska, and western Iowa.

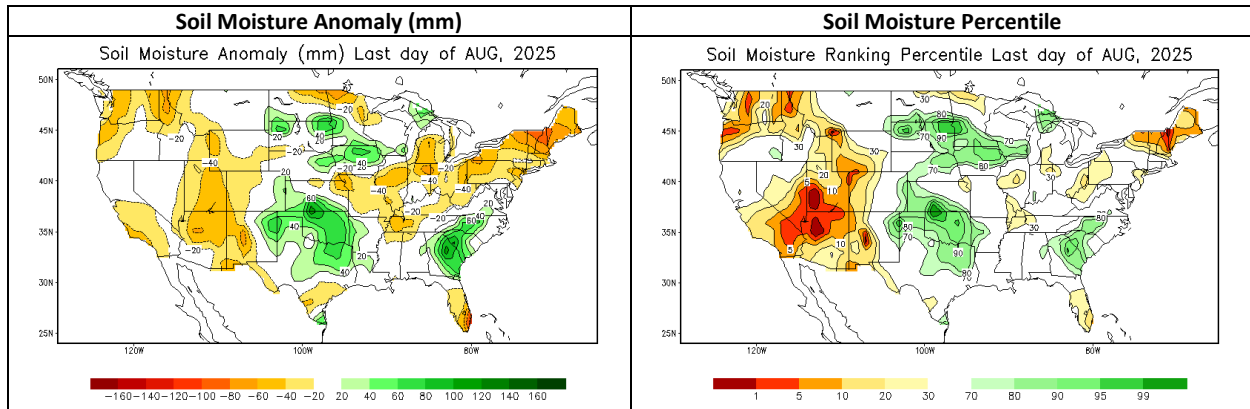


Figure 7. CPC Soil Moisture Anomaly and Soil Moisture Percentile

Plains Snowpack

Plains snowpack is an important parameter that influences the volume of runoff occurring in the Basin during the months of March and April. A common misperception is that the March-April runoff is a result only of plains snowmelt. Historically, about 25% of annual runoff occurs in March and April, during the time when plains snow is melting, due both to melting snowpack and rainfall runoff. Runoff occurs in March and April whether there is any plains snow to melt. Determining exact rainfall amounts and locations is nearly impossible to predict more than a week in advance. Thus, the March-April runoff forecast is formulated based on existing plains snowpack and existing Basin conditions and hydrologic forecasts.

The National Weather Service’s National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled snow assessment (available [here](#)) is not a factor in the August runoff forecast.

Mountain Snowpack

Mountain snowpack is the primary factor used to predict May-June-July runoff volumes in the Fort Peck and Fort Peck to Garrison mainstem reservoir reaches. May, June, and July runoff in the Fort Peck and Garrison reaches have increasing correlations to mountain snowpack as the season reaches the date of peak accumulation, which typically occurs in mid-April. The best predictor of May-July runoff in the mountain reaches is the peak snow water equivalent (SWE) accumulation.

Mountain snowpack for the Fort Peck and Fort Peck to Garrison reaches can be found [here](#). **Figure 9** includes time series plots of the average mountain SWE beginning on October 1 based on the Natural Resources Conservation Service SNOw TELelemetry (SNOTEL) data for the headwater basin above Fort Peck and the incremental basin from Fort Peck to Garrison. The current average SWE values (shaded blue area) are plotted against the 1991-2020 basin average SWE (bold red line), the historic low SWE between 1991-2020 (green line) and the historic high SWE between 1991-2020 (dark blue line).

Missouri River Basin – Mountain Snowpack Water Content

2024-2025 with comparison plots from recent high and low years

25-Jun-2025

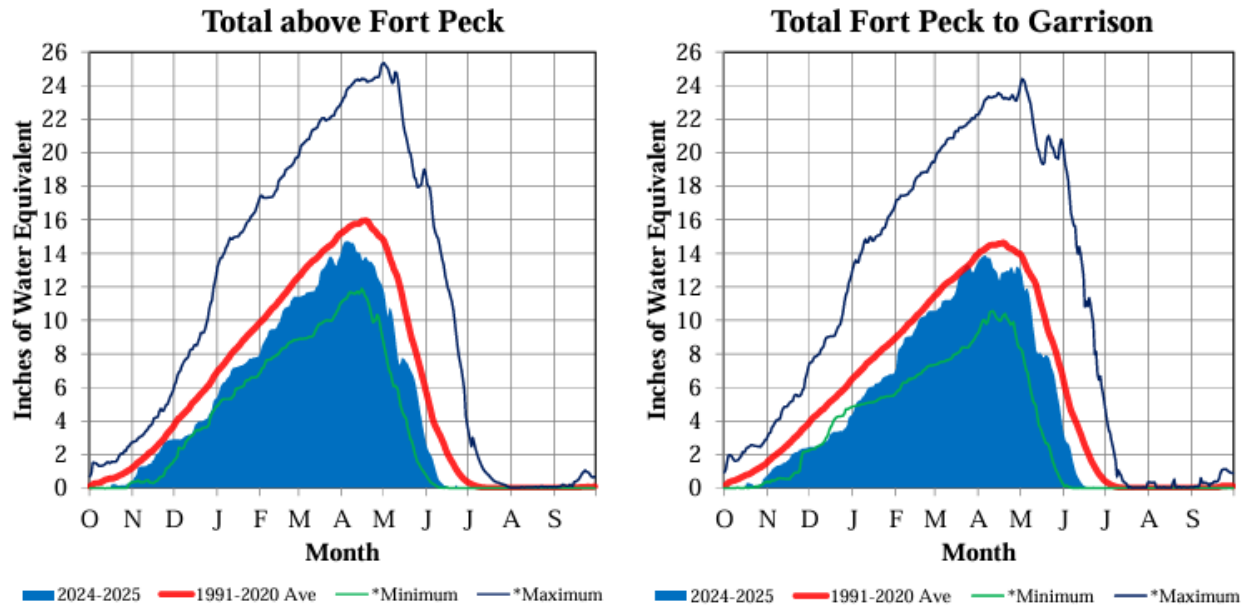


Figure 8. Mountain Snowpack Water Content

The Fort Peck reach peaked on April 5 at 14.7 inches of SWE and 92% of the average peak. The Garrison reach peaked on April 5 at 13.9 inches of SWE and 95% of the average peak. As of June 25, the snow in both reaches had completely melted.

Climate Outlook

The Missouri River Basin Water Management office participates in the monthly North Central US Climate/Drought Outlook Webinar coordinated through NOAA, the regional climate centers, and the American Association of State Climatologists. These webinars provide updates on near-term climate outlooks and impacts, including the El Niño Southern Oscillation (ENSO) climate pattern and its implications on winter temperature and precipitation patterns in the Missouri Basin.

El Niño Southern Oscillation (ENSO)

ENSO is a sea surface temperature oscillation that occurs in the tropical Pacific Ocean and fluctuates between warm episodes (El Niño), neutral conditions, and cold episodes (La Niña). During El Niño winters, the favored storm track is typically across Canada, resulting in warm temperatures and less snowfall in the Basin. During La Niña winters, the storm track typically favors northwest flow across the Basin, resulting in cooler temperatures and above-normal snowfall across the northern Rockies.

ENSO-neutral conditions are currently present in the Basin. ENSO-neutral conditions are 56% likely to continue through October. La Niña conditions are favored in the fall and early winter of 2025-2026.

Temperature and Precipitation Outlooks

The CPC outlooks provide the forecasted probability of occurrence of future weather conditions during periods ranging from 1 to 12 months into the future. The CPC outlooks are available [here](#).

The outlooks for September (**Figure 10**) show increased chances for warmer-than-normal temperatures in the Basin. The upper Basin shows equal chances for below normal, normal, or above normal precipitation while the lower Basin shows increased chances for above normal precipitation.

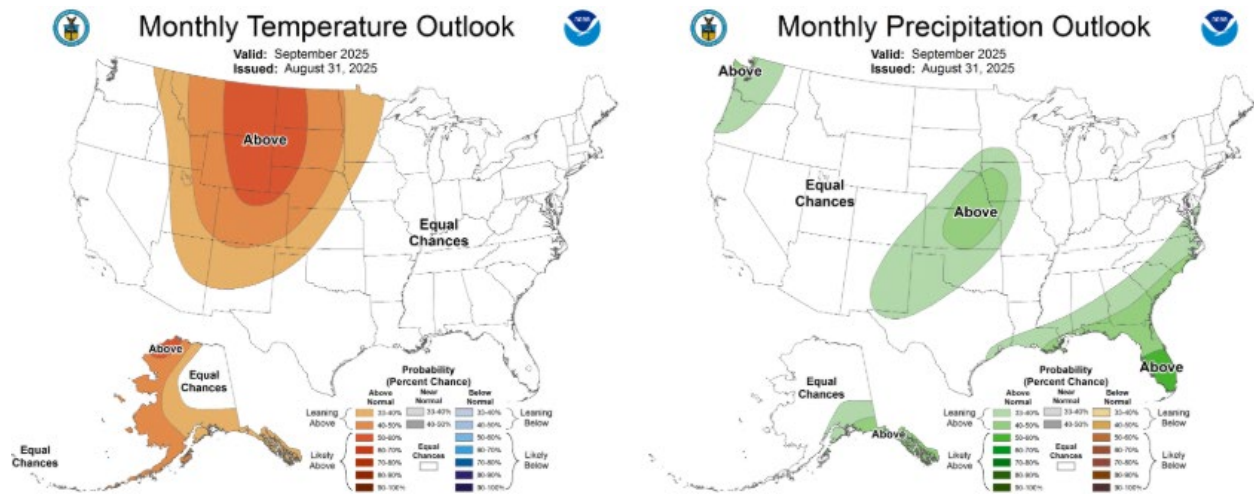


Figure 9. CPC Monthly Temperature and Precipitation Outlooks

Three-month temperature and precipitation outlooks for the remaining months of the year are shown in **Figure 11**. It is important to note that as the outlook period moves farther out into the year, the skill of these outlooks greatly decreases.

The three-month temperature outlook for September-October-November indicates increased chances for warmer-than-normal temperatures across the Basin, except for Montana and North Dakota, which show equal chances for above-, below-, or normal temperatures. The precipitation outlook for the same period indicates equal chances for above-, below-, or normal precipitation across the Basin.

The temperature outlook for December 2025-January 2026-February 2026 indicates equal chances for cooler-than-normal, normal, or warmer-than-normal temperatures across the Basin. The precipitation outlook for the same period shows increased chances for above-normal precipitation in Montana and Wyoming, and equal chances for above-, below-, or normal precipitation in the rest of the Basin.

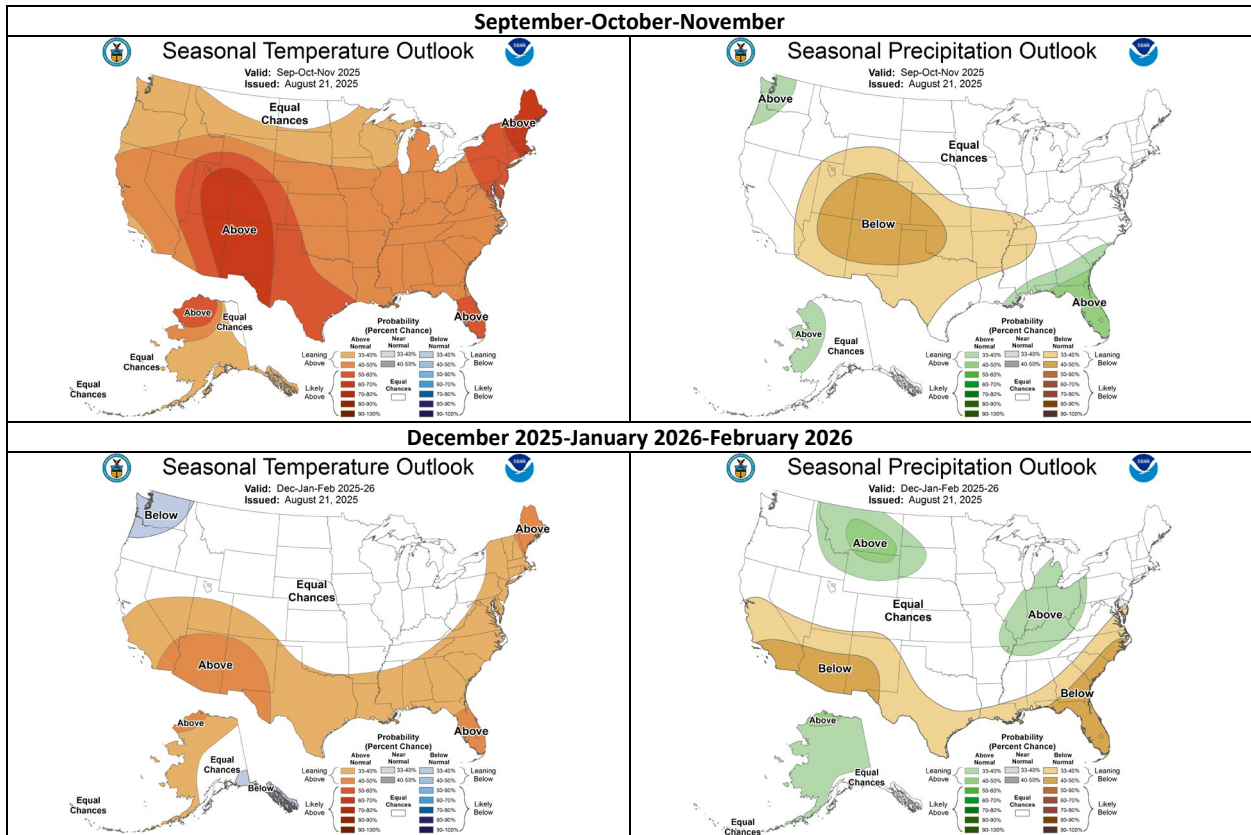


Figure 10. CPC Three-Month Temperature and Precipitation Outlooks

Summary

This forecast considers reach runoff, basin conditions, and temperature and precipitation outlooks. Given these factors we expect runoff during September for Fort Peck and Garrison to remain well below average. Runoff in the Oahe, Fort Randall, and Gavins Point reaches is expected to be near normal, and runoff in the Sioux City reach is expected to be above normal as that reach continues to see elevated flows due to above-normal August precipitation.

In summary, the 2025 calendar year runoff forecast is **19.1 MAF, 74% of average**.