

Montana Drought Forecast Report – Summer 2021



Ungerminated wheat field near Wolf Point, 2017

Prepared by DNRC on behalf of the Governor's Drought & Water Supply Advisory Committee

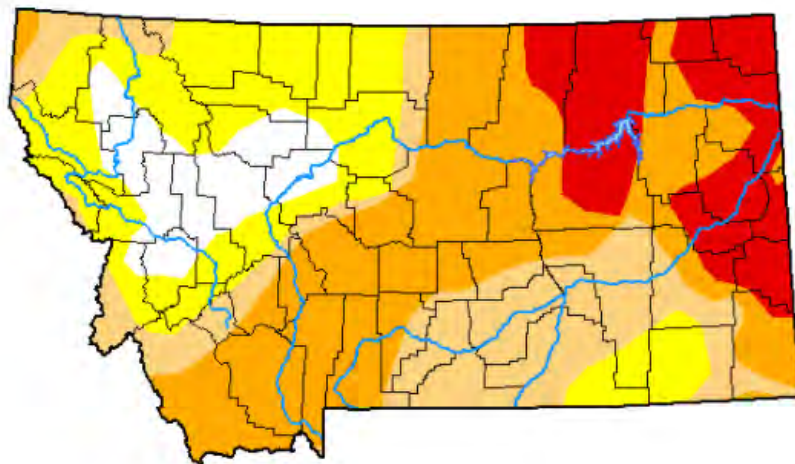


Summary of Antecedent and Current Conditions

The onset of current drought conditions across the Northern Great Plains began in the late summer and fall of 2020. The 2020 Water Year (October 2019 to September 2020) closed with higher than average temperatures and much below average precipitation in August and September. The fall precipitation that sprouts Montana's typical fall "green-up" and coincident improvements in soil moisture following the growing season failed to materialize. The warm and dry weather pattern carried into the first part of October with high temperatures setting some daily records across the state. So began a pattern of weather extremes that characterized conditions for the following eight months.

Heavy snowfall across much of the state and much colder than average temperatures in late October jump started snow accumulation in the mountains. However, much above average temperatures and below average precipitation in November, December and January made for a warm, dry and open winter in the low and mid-elevations. This trend changed sharply with the arrival of the Polar Vortex in February as temperatures plunged and most of the state received above normal precipitation. The uncharacteristically dry March and April, coupled with the warm and dry winter, resulted in abnormally dry to extreme drought conditions taking hold across much of Montana by the end of April. Despite above average to near average precipitation and cooler than normal temperatures in May, deficits from the previous eight months were too large to overcome the persistent dryness. Gains in May were quickly offset by record setting high temperatures and below normal precipitation in June.

U.S. Drought Monitor Montana



June 22, 2021
(Released Thursday, Jun. 24, 2021)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8.77	91.23	68.60	47.84	14.25	0.00
Last Week 06-15-2021	10.25	89.75	58.89	32.71	10.55	0.00
3 Months Ago 03-23-2021	19.97	80.03	37.21	17.16	0.44	0.00
Start of Calendar Year 12-29-2020	36.37	63.63	34.41	8.27	0.36	0.00
Start of Water Year 09-29-2020	11.86	88.14	40.59	4.22	0.02	0.00
One Year Ago 06-23-2020	47.74	52.26	14.51	1.74	0.00	0.00

Intensity:

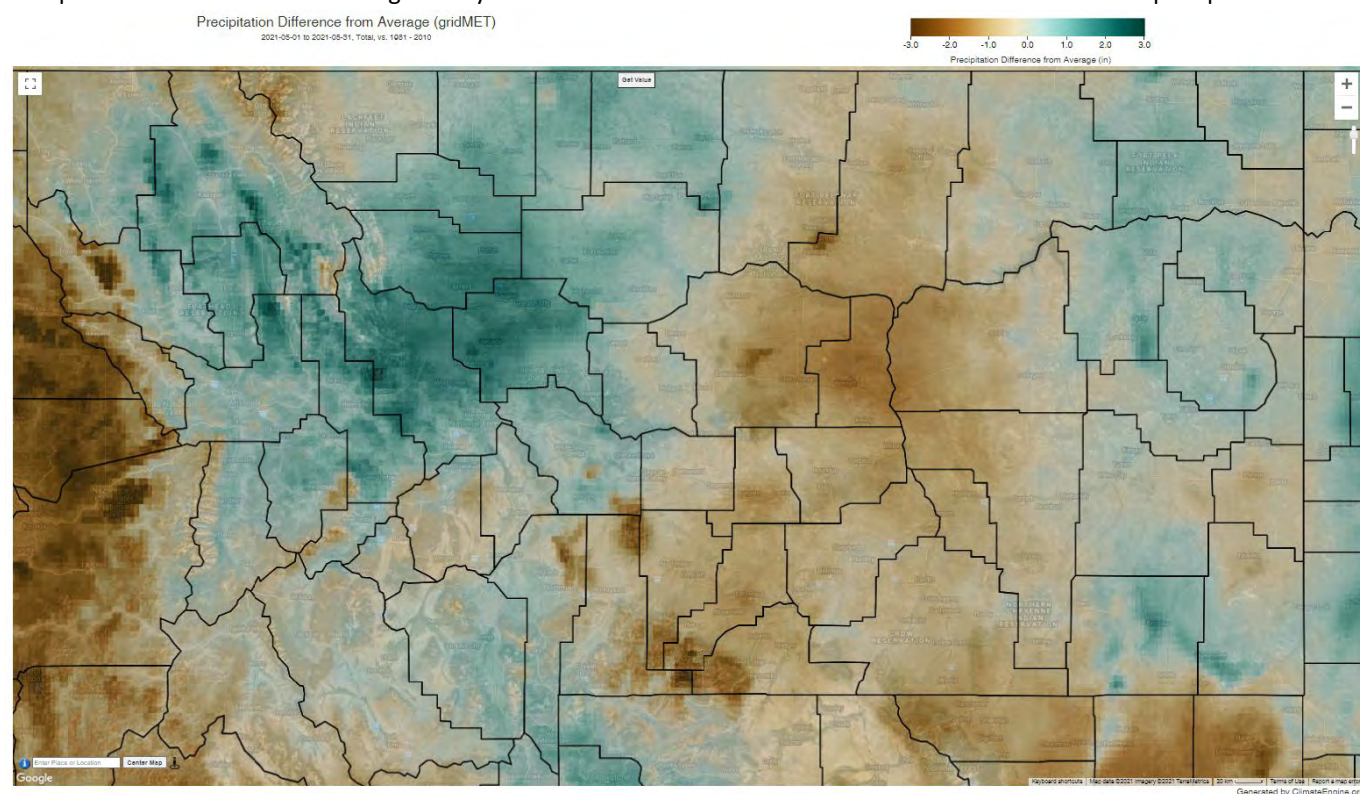
None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

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National Drought Mitigation Center

Precipitation difference from Average – May 2021 – Tan to Brown indicates areas with lower than normal precipitation



Seasonal Drought Forecast

The end of June marks the end of Montana’s high precipitation months and the onset of the typically hot and dry summer season. As of June 22nd, the US Drought Monitor indicated that approximately 91% of Montana is in D0 (abnormally dry) to D3 (extreme) drought classification. Approximately 14% is in D3, 34% is in D2 (severe drought) 21% is in D1 (moderate drought), and 23% is in D0. The potential for significant summer precipitation in the coming weeks is quickly waning, although regional summer precipitation can materialize as late as mid-July. After that, summer precipitation is mostly limited to thunderstorms which can be significant locally. NOAA’s Climate Prediction Center [one-month weather forecast](#) points to a 40% to 50% percent chance for above normal temperatures and below normal precipitation. The [three-month](#) outlook is similar.

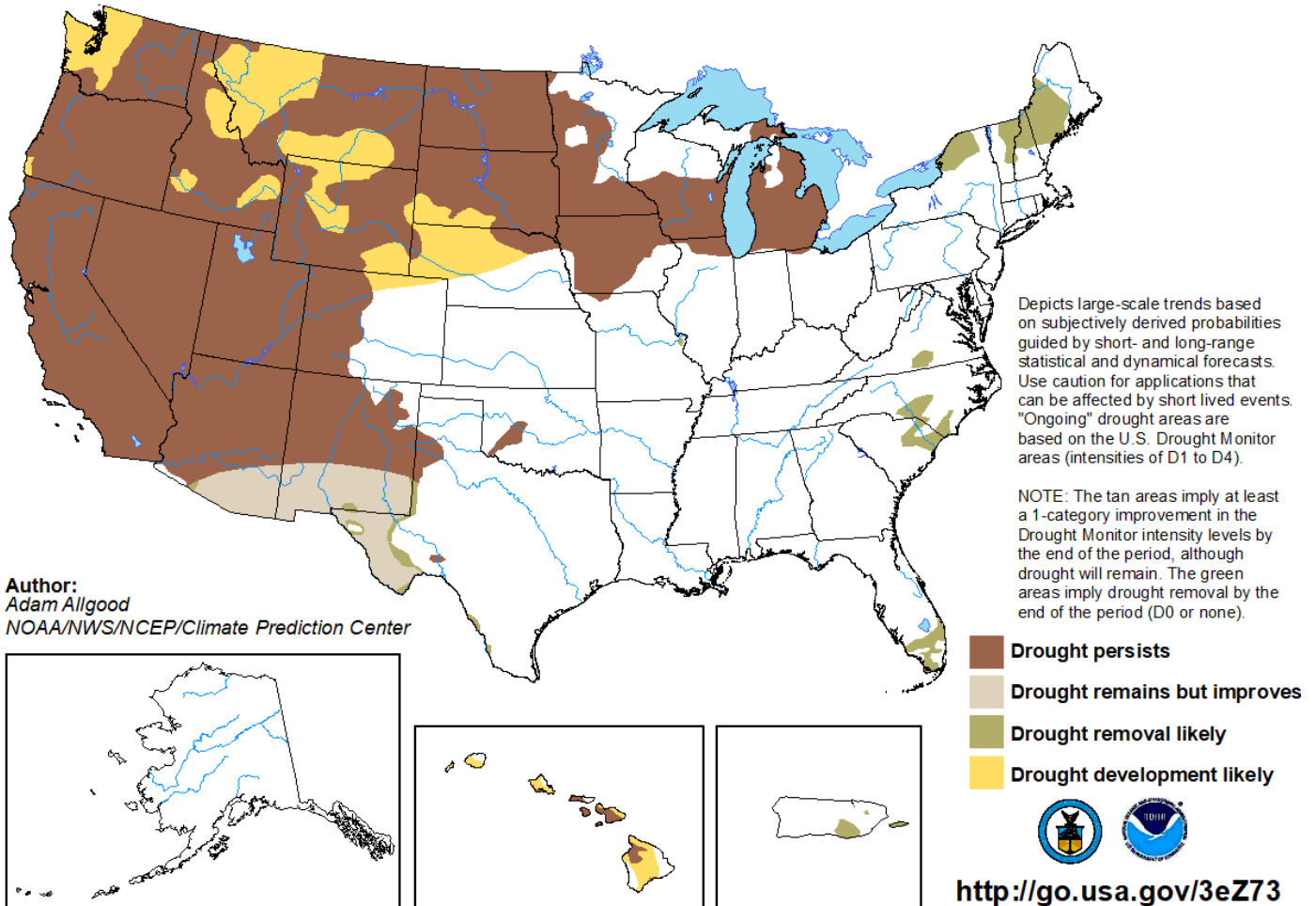
The USDA used the “Fast Track” Drought Disaster declaration process this spring to declare a drought disaster in multiple counties across Montana. The Fast-Track Declaration is triggered when a county, or contiguous county is classified in D2 drought (severe) for 8 or more weeks during the growing season or when an area is identified in D3 (extreme) or D4 (exceptional) drought. Currently, the USDA has identified the following counties as drought disaster areas: Big Horn, Carbon, Powder River, Fallon, Richland, Roosevelt, Sheridan, Wibaux, Phillips, Valley, Petroleum Garfield, McCone, Prairie, Rosebud, and Custer.

This summer’s seasonal drought outlook closely mirrors the current U.S. Drought Monitor Map (on page 1 above). Over the course of the next eight to ten weeks drought conditions will likely worsen across most, if not all, of Montana.

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for June 17 - September 30, 2021
Released June 17

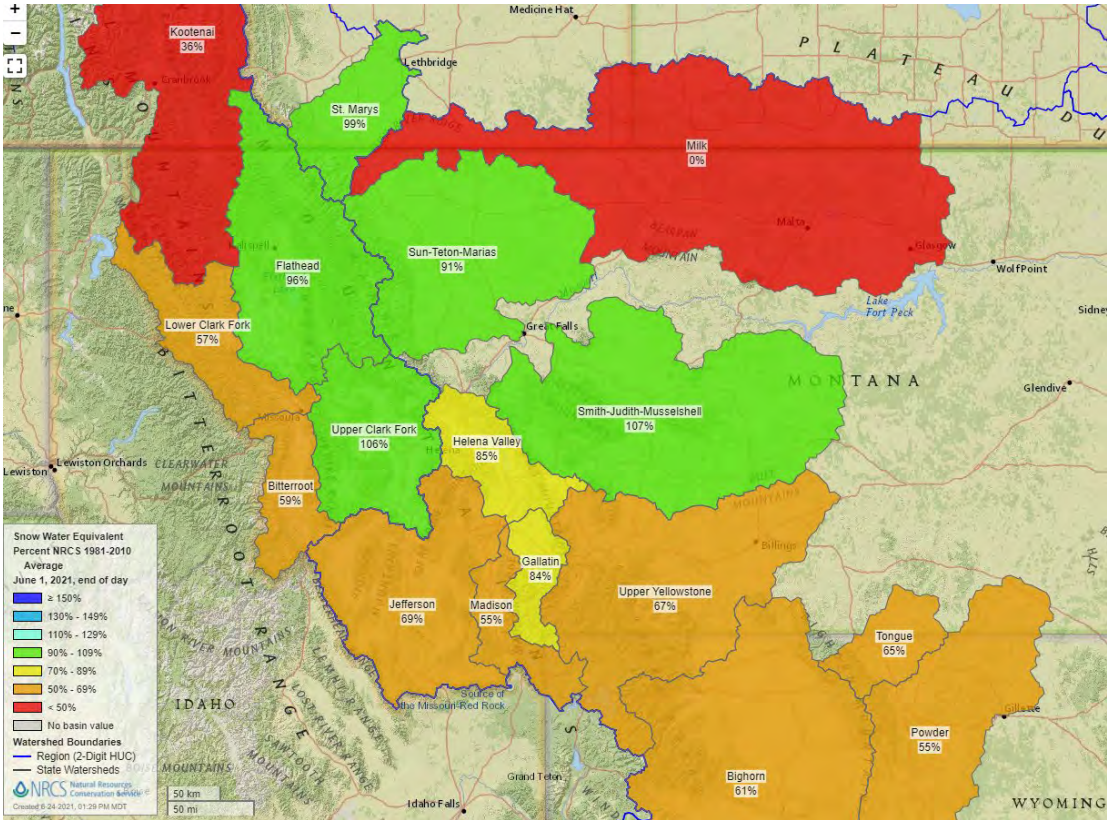


In evaluating weekly drought conditions, Montana's drought monitoring group relies on reports from the field to inform decision making. Producers, recreationists, land managers and others can provide site specific reports of conditions through the [Montana Drought Impact Reporter](#). Maps, links and other drought information specific to conditions in Montana are provided there also.

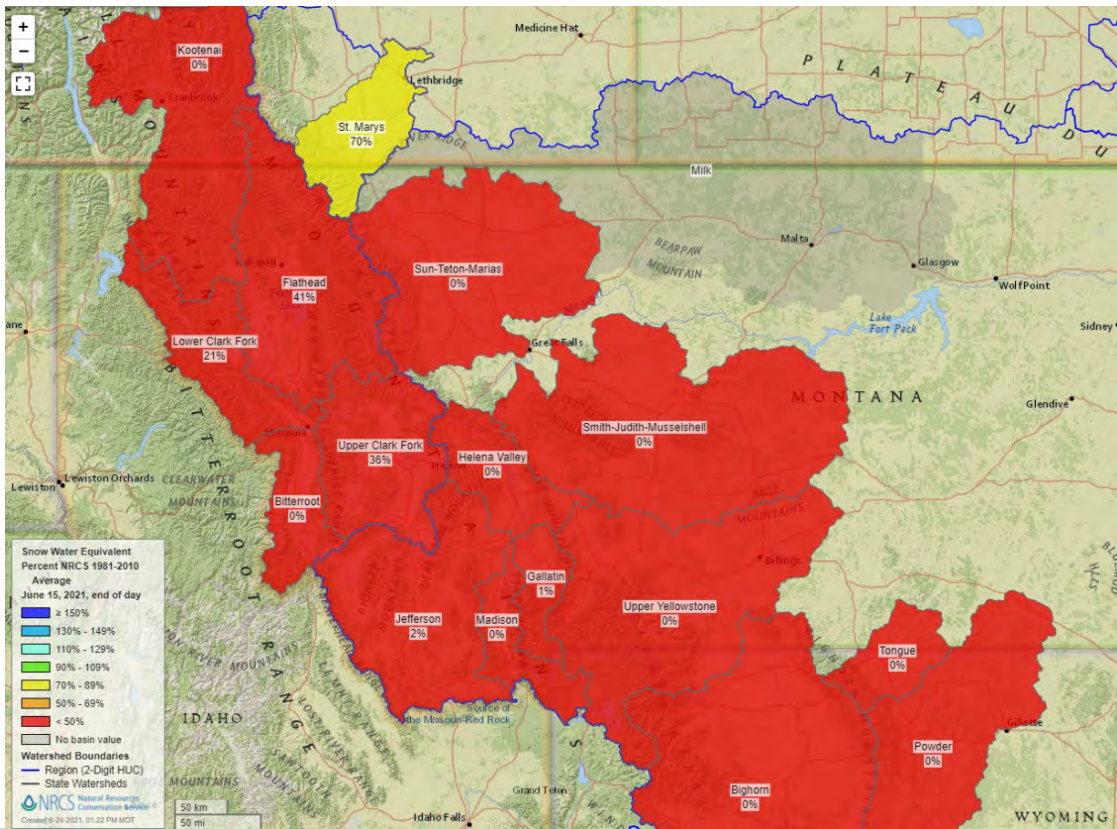
Snowpack – Overview:

Snow totals across the state on June 1st varied widely due mainly to weather patterns in April and May. Much of the low and mid-elevation snow melted in April; however, cooler temperatures preserved the high elevation snow. Throughout May, snowmelt occurred at all elevations. At the very end of May and in the first two weeks of June, snowmelt accelerated at a stunning rate, which moved a significant amount of snow water into rivers and streams. In western and southwest Montana, this early melt resulted in a snowpack that was well below normal on June 1st. By June 15th, virtually all the high-elevation snowpack had melted, with only the Clark Fork, Flathead and St. Mary's drainages retaining measurable snowpack.

Snow Water Equivalent as a percentage of average, June 1, 2021

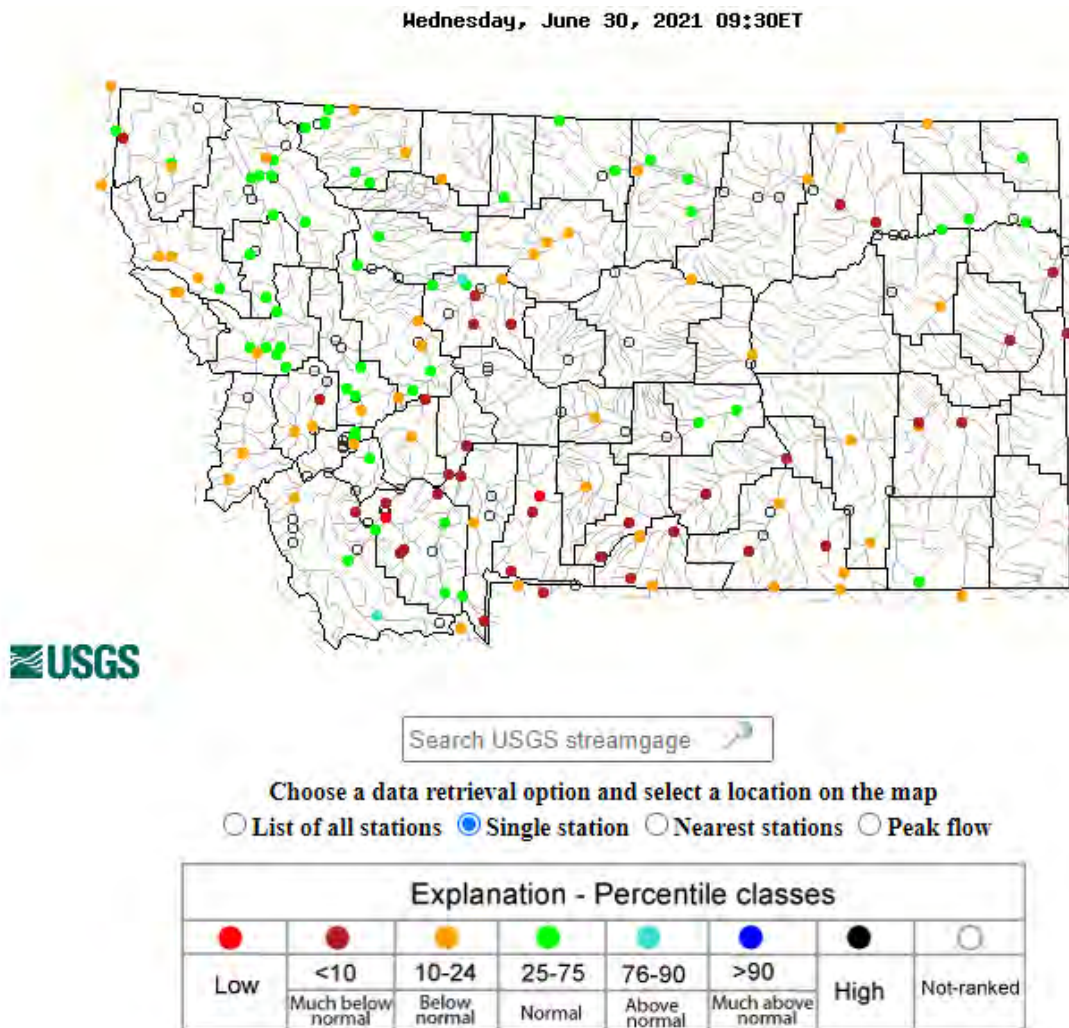


Snow Water Equivalent as a percentage of average, June 15, 2021



Streamflow: ([DNRC/USGS/MBMG Gaging Stations](#), [USGS Water Watch Dashboard](#), [Missouri Basin Forecast Center](#), [Northwest River Forecast Center](#))

The dry fall, compounded by mostly warm and dry conditions from December through April, below average snowpack, and record-breaking temperatures in early June, has resulted in much below and, in some cases, record low stream flows. The early pass-through of water on non-reservoir-controlled systems means that less water will be available when irrigation demand is highest later in the summer. Low stream flows and high temperatures will also have a negative impact on riparian species, habitat, and all forms of recreation associated with these areas. Diminished water tables could result in groundwater well depletion, affecting domestic and municipal resources, in addition to water for stock and wildlife.



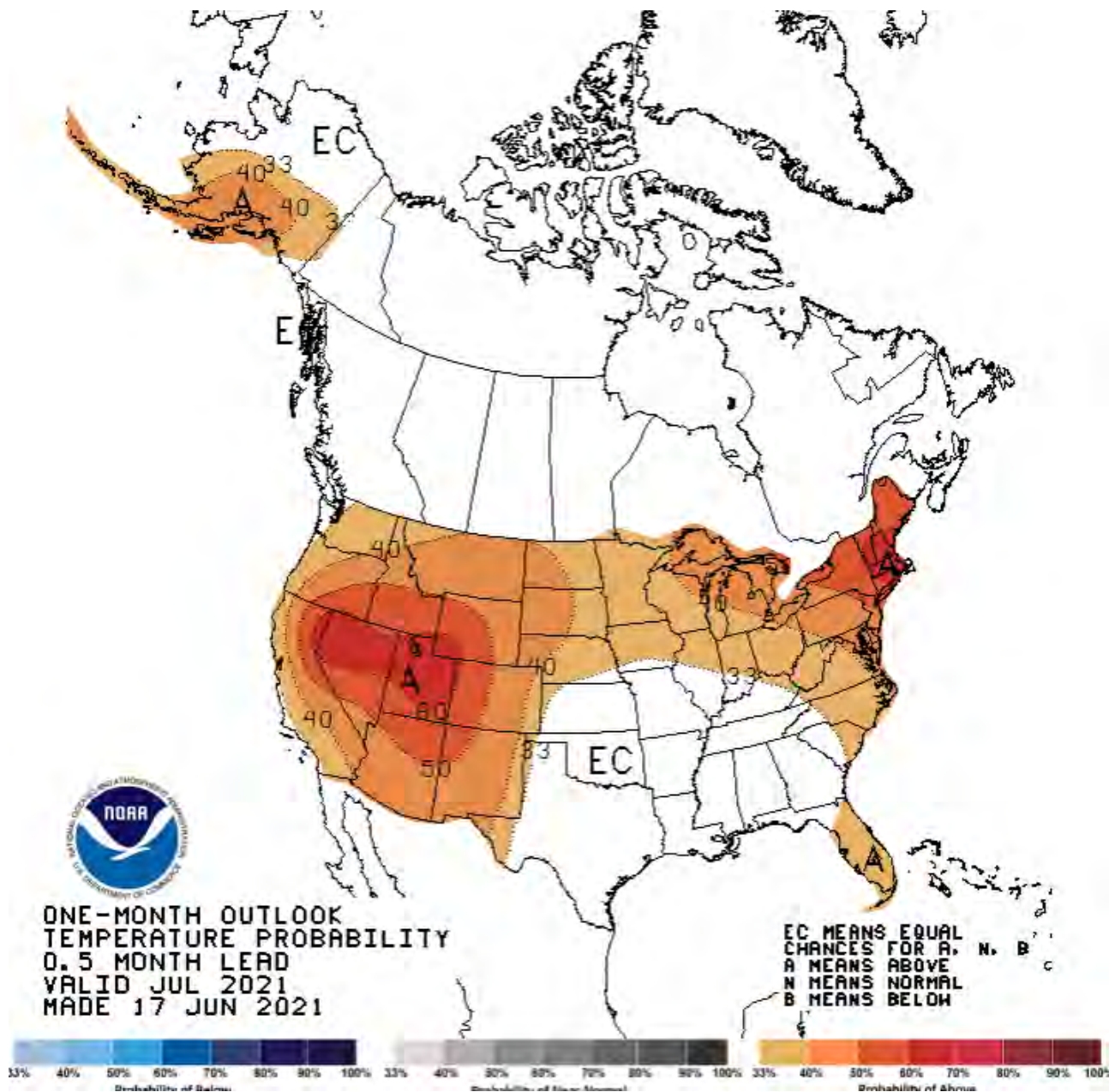
Reservoirs: ([Bureau of Reclamation Reservoirs](#), [State Reservoirs](#))

Water elevations at state-owned reservoirs across Montana were mostly normal to above normal as of June 1st. Conditions at the smaller irrigator-controlled reservoirs across the state are mixed and many small reservoirs in the eastern half of Montana are much below normal. Some of these areas are already facing challenges providing stock-water and some producers are taking steps to reduce herd numbers due to concerns over forage and stock water availability. Reservoir elevation status for July 1st was unavailable in time for this report.

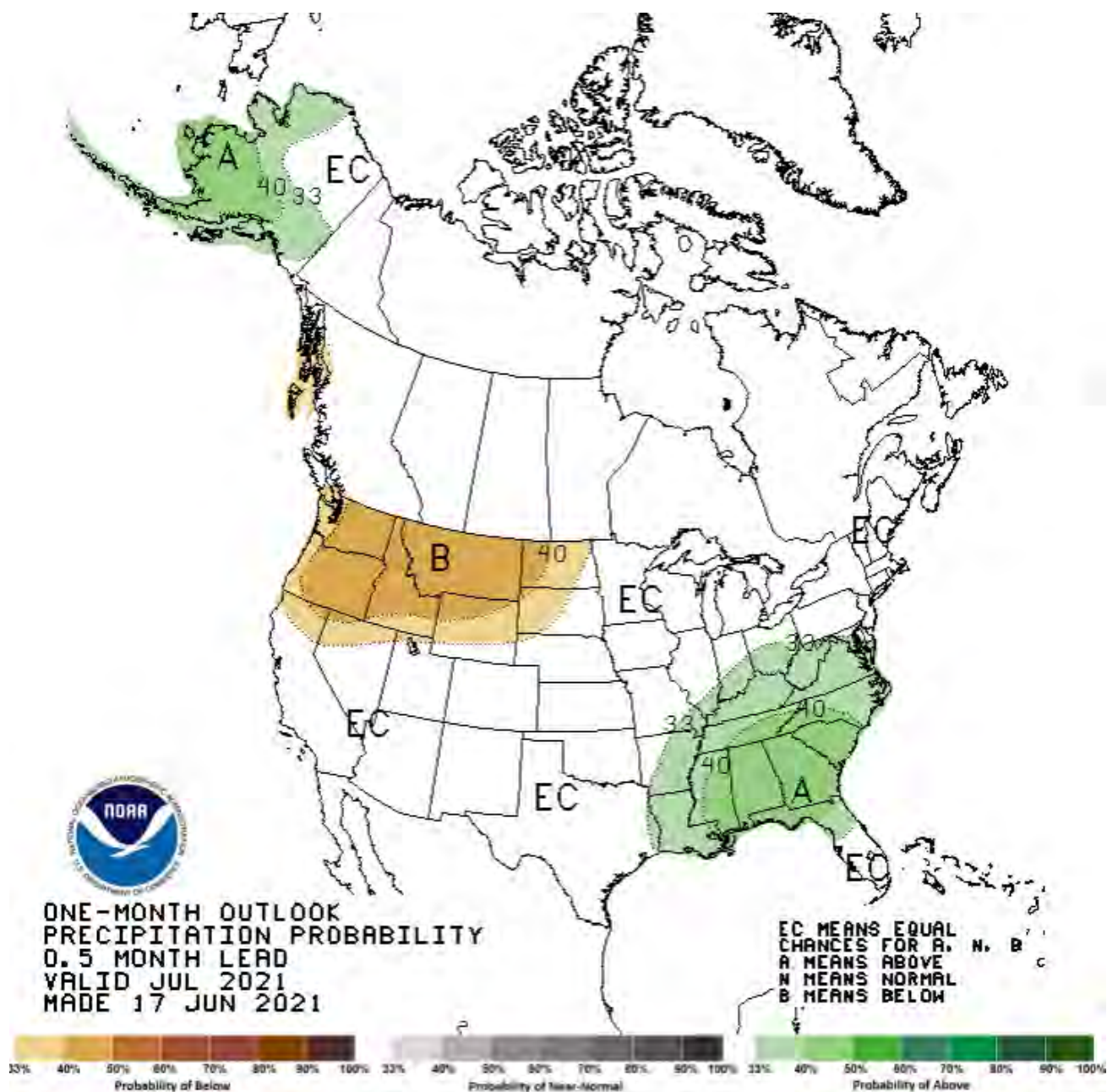
Long Term Weather Forecast:

The [Climate Prediction Center's](#) current temperature outlook for July calls for 40% to 50% chance of above normal temperatures across much of Montana. The precipitation outlook indicates a forecast for below normal precipitation across the state. The maps below show the 1-month forecast for both temperature and precipitation. The 3-month forecast is similar, although the longer timespan makes it much less reliable.

1 Month Temperature Forecast:

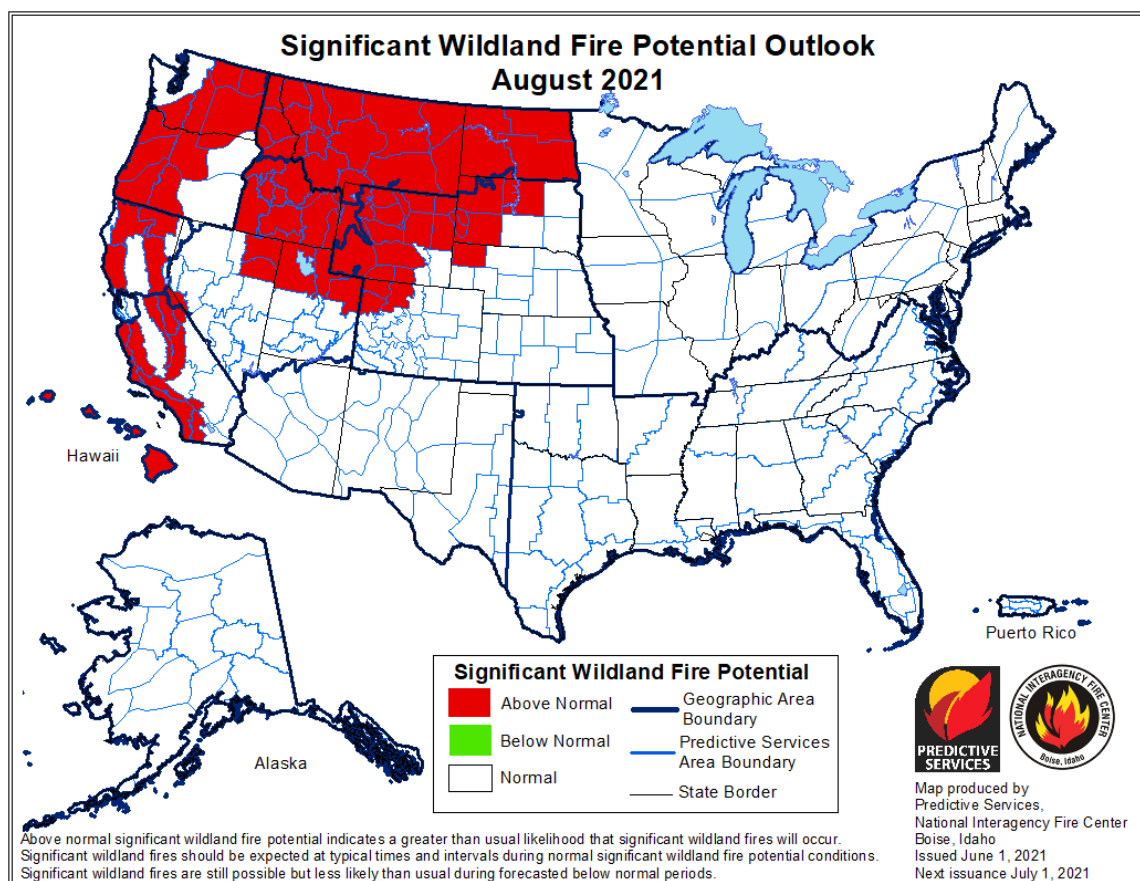
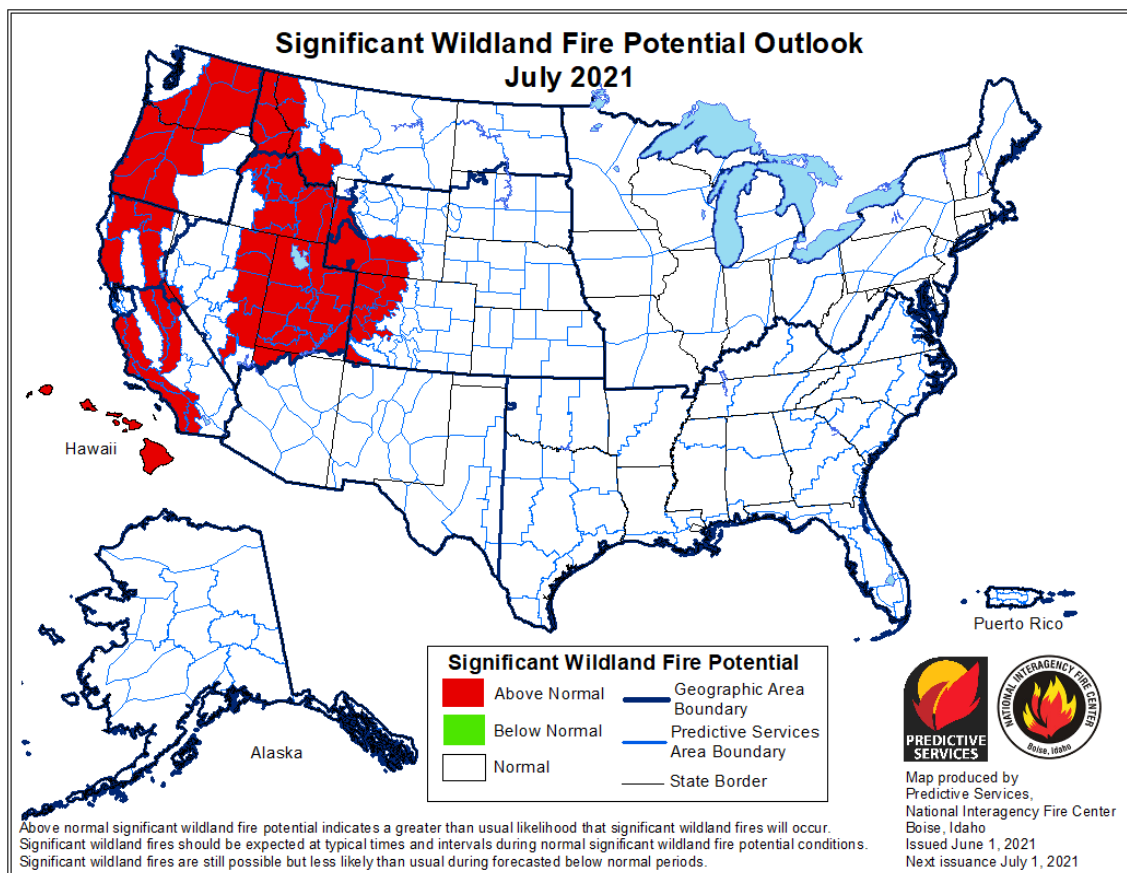


1 Month Precipitation Forecast:



Wildfire Outlook Summary ([excerpt from the North American Seasonal Fire Assessment 6/11/21](#)):

Drought now encompasses nearly 90% of the western US, with more than half of the region in the highest two categories of drought intensity. Fire activity increased across the US in May, with fuel dryness in the western US mostly two to four weeks ahead of schedule. Significant wildland fire potential for the Northern Rockies Geographical Area is expected to be normal in June and again in September. However, above normal significant fire potential will shift northward into the Intermountain West in July, with much of the Great Basin and northern and central Rockies forecast to have above normal significant fire potential by August.



Drought Evaluation Tools and Resources – The following resources provide useful tools that DNRC and their partners use to evaluate drought and water supply conditions on a weekly basis across Montana.

[Upper Missouri River Drought Indicators Dashboard](#)

Montana Drought Impacts Reporter - Submit a report: <https://nris.mt.gov/droughtsurvey>
View results: <https://nris.mt.gov/droughtimpacts>

[NRCS Interactive Precip Portal](#)

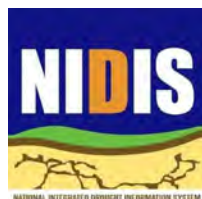
[USGS Water Watch Dashboard](#)

[Montana Mesonet Data Downloader](#)

In partnership with other state and federal agencies and Tribes, experts in climate science, snowpack, streamflow and weather information collect and evaluate drought and water supply data on a weekly basis throughout the year. This information is distilled into weekly recommendations to the U.S. Drought Monitor, which tracks drought conditions nationally.

Much of the information contained in this report comes from the [NRCS Water Supply Outlook Report](#), [U.S. Drought Monitor](#), [Climate Prediction Center](#), [National Integrated Drought Information System](#), [National Interagency Coordination Center](#) and others. Please don't hesitate to contact [Michael Downey](#), at DNRC (mdowney2@mt.gov) if you have any questions or feedback about any of the information contained in this report.

Working on behalf of the Governor's Drought and Water Supply Advisory Committee, DNRC has compiled this Summer Drought Forecast. This report provides a synopsis of statewide conditions gleaned from multiple sources and offers links to additional resources with more in-depth information. This report would not be possible without the ongoing participation and contributions of our local, university, state, tribal and federal partners, some of which are listed below:



This report was developed by DNRC on behalf of the Governor's Drought & Water Supply Advisory Committee pursuant to MCA 2-15-3308(5).