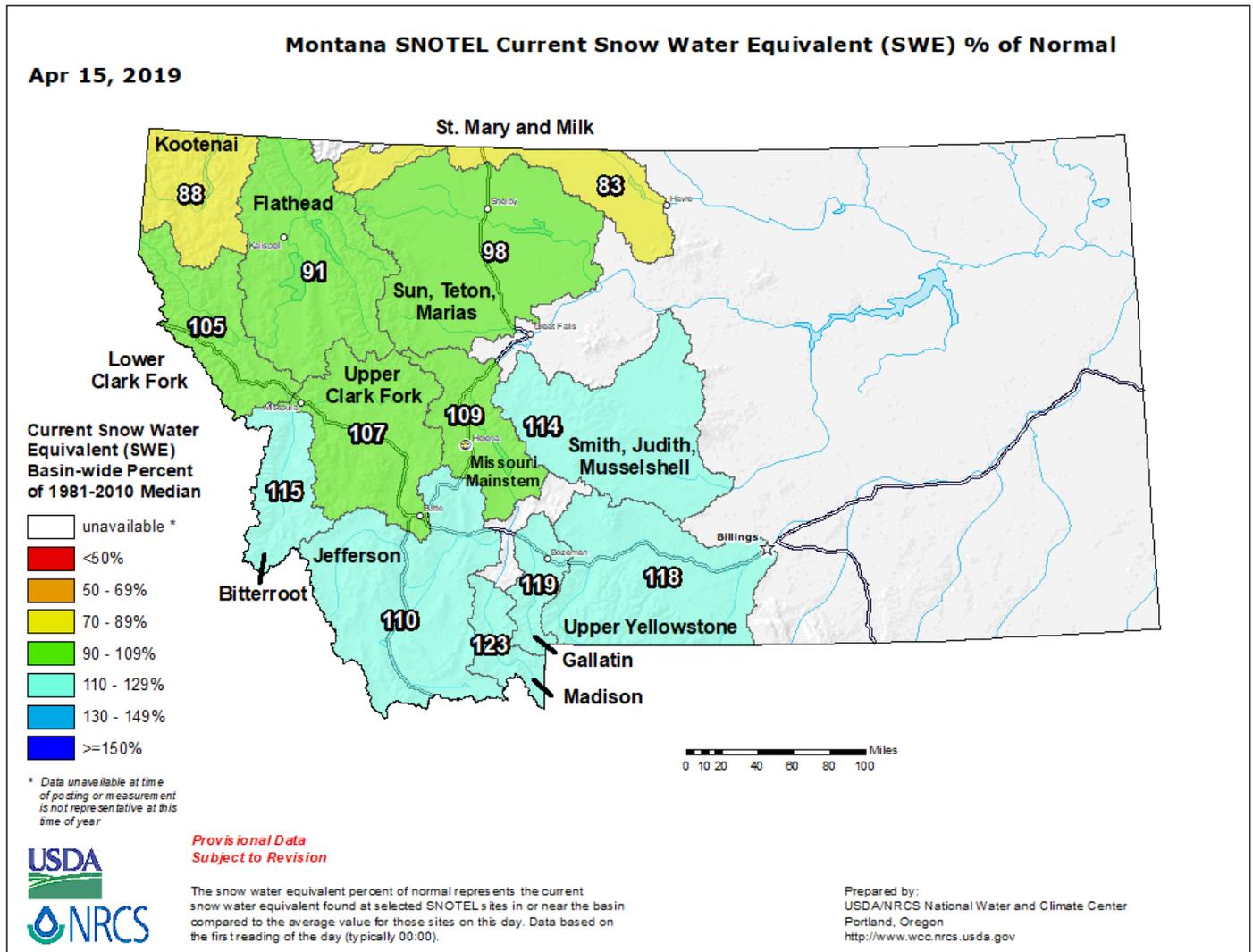




Montana Water Supply Outlook – Spring 2019

Water Supply Overview:

On behalf of the Governor's Drought and Water Supply Advisory Committee, DNRC Water Planners have compiled this Spring Water Supply Outlook. This report provides a synopsis of statewide conditions gleaned from multiple sources and offers additional resources with more in-depth information. In partnership with other state and federal agencies, DNRC staff gather this information from experts in climate science, snowpack, streamflow and other important drought and flooding indicators.

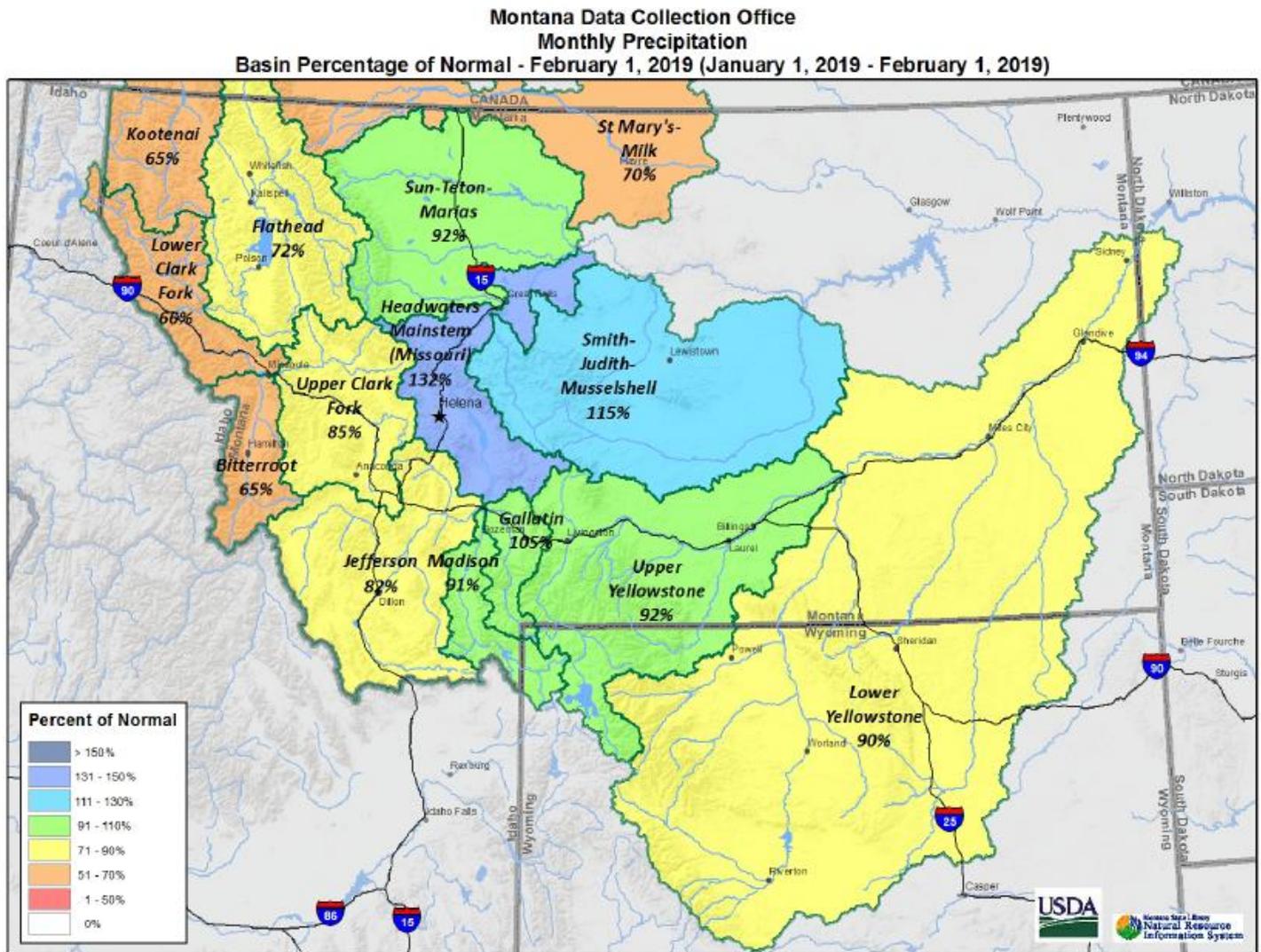


Precipitation:

Precipitation in January, February and March of 2019 offered a study in contrasts that varied from record lows to record highs for both precipitation and temperature across much of Montana. The 2018 – 2019 water year has continued with

the wide variability experienced during the previous year. Despite near record snowpack in 2018, the warm spring and dry summer left much of the western half of the state persistently dry with moderate drought conditions in the northwest hanging on through the end of 2018. As of this writing in mid-April, snowpack conditions are near normal across much of the state with above average conditions in southwest Montana but diminishing to below normal moving to the northwest as shown in the map on the previous page.

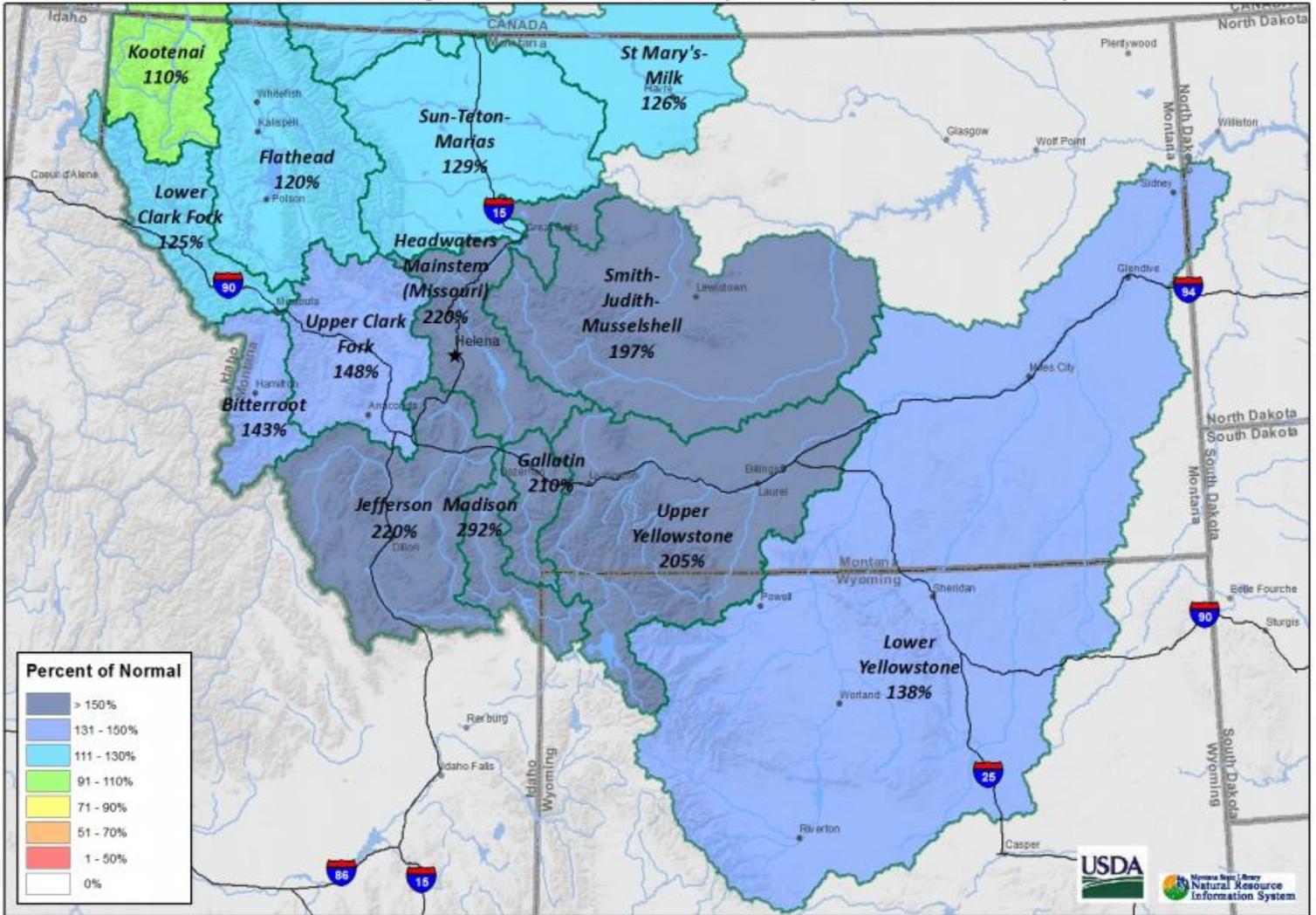
As of this January, most of the mountains and valleys across western Montana from north to south remained well below average for precipitation coupled with record high temperatures in some locations (see map below). With a drier and



warmer than normal forecast for the remainder of the winter (Helena saw a record 49 degrees on February 2), few anticipated the sudden onslaught of the Polar Vortex that caused temperatures to plunge along with a dramatic increase in precipitation for most of February. As much of the northwest shivered, Montana shuddered as it bore the brunt of the weather shift with temperatures dropping between 20 and 25 degrees below average resulting in the second coldest February on record. The collision of moisture laden air masses from the west and the south with the extreme cold front resulted in above average precipitation across Montana and much of the intermountain west.

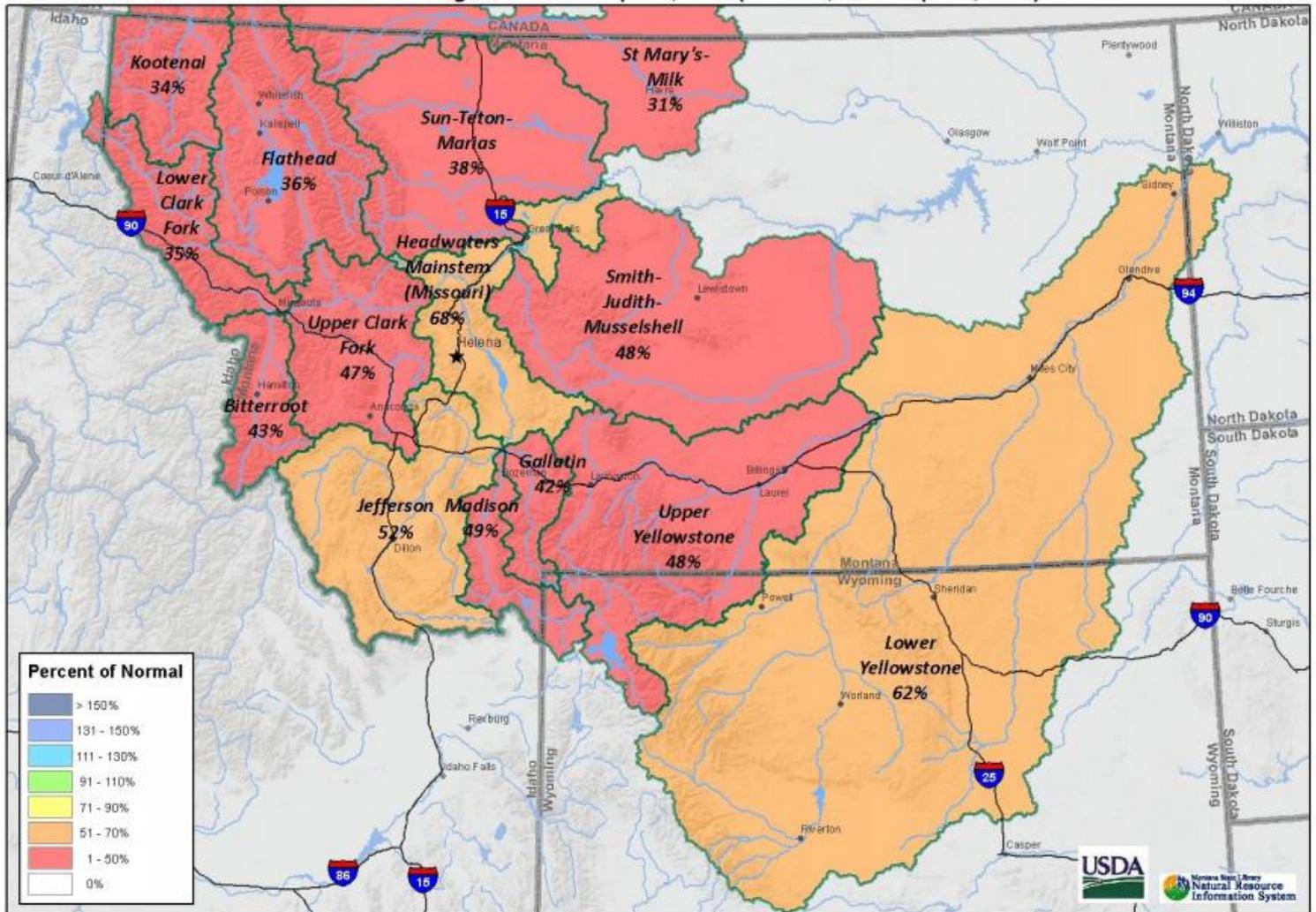
Several basins in southwest Montana experienced their snowiest February on record (see map below).

Montana Data Collection Office
Monthly Precipitation
Basin Percentage of Normal - March 1, 2019 (February 1, 2019 - March 1, 2019)



Following the record cold temperatures and snowfall in February, the extreme weather conditions retreated in March and snow accumulations in all of Montana’s river basins fell to well below normal for the month (see map below).

Montana Data Collection Office
 Monthly Precipitation
 Basin Percentage of Normal - April 1, 2019 (March 1, 2019 - April 1, 2019)



Fortunately, cooler temperatures prevailed through March and into early April. The cold temperatures in February and March prevented the common spring chinook events that typically melt off the low to mid-elevation snowpack by the middle of March. Much of southwest Montana still had snow on the ground in mid-April despite the dry conditions in the previous month. Later snowmelt has the potential to improve soil moisture and ephemeral storage in those areas with higher than normal low to mid-elevation snowpack. Areas with a northerly aspect could see the benefit of the late snowpack extend well into early summer. As we move through spring, eastern mountain basins are favored for more precipitation, with May and June typically some of the “wettest” months of the year. On the west side of the divide, precipitation generally tapers down as summer approaches. In some areas where snowpack contribution to spring and summer streamflows appears below average, particularly northwest and south-central Montana, strong precipitation and normal day and night-time temperatures through April, May and June will be particularly important for determining conditions through the remainder of the summer months.

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

It's getting to be that time of the year when water managers across Montana start to fill the irrigator controlled and federally managed reservoirs, and this year some federal water managers will have their hands full. Record flooding along the Missouri River in the Midwest means that water managers in Montana are trying to hold back water so that the problem isn't amplified. For example, on March 27 inflows to Fort Peck Reservoir were estimated to be 52,000 cfs, while outflows were only 6,700 cfs. It's always important to note that water management in Montana isn't only about our resources, but also those downstream of us. Due to the "Bomb Cyclone" that caused the downstream flooding in the Dakotas and Nebraska, federal water managers with the BOR and USACE will be closely watching weather patterns and streamflows in both Montana and other states downstream.

Smaller irrigator-controlled reservoirs in the State could also be impacted, but to a much lesser extent. Carryover storage from last year's ample runoff, combined with ample snowpack, looks to deliver full storage in many areas. However, some areas remain below normal for snowpack and water year precipitation and have storage that is below average for April 1, but only at isolated locations. Overall, reservoir storage is above average in the state of Montana for April 1.

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

Northern basins streamflow forecasts suggest below average seasonal runoff volumes this spring and summer. A particularly dry 2018 summer, combined with below normal snowpack and below average water year precipitation (Oct 1 – Current) has led to the low forecasts. Of course, unusually high spring and summer precipitation could offset these deficits, but water management plans shouldn't rely on it.

River forecasts improve moving from north to south across the State, with the highest streamflow percentages forecast for southwest and south-central Montana. At this point, central and southern basins should receive average to above average seasonal volumes, but flows will depend largely on the weather during the next three months. The snowpack component in these regions is near to above normal, but spring precipitation is critical, especially east of the Divide. In the high elevation basins of southern Montana, the May 1 forecast should provide better insight into the long-term water supply, as snowpack typically approaches peak by that time.

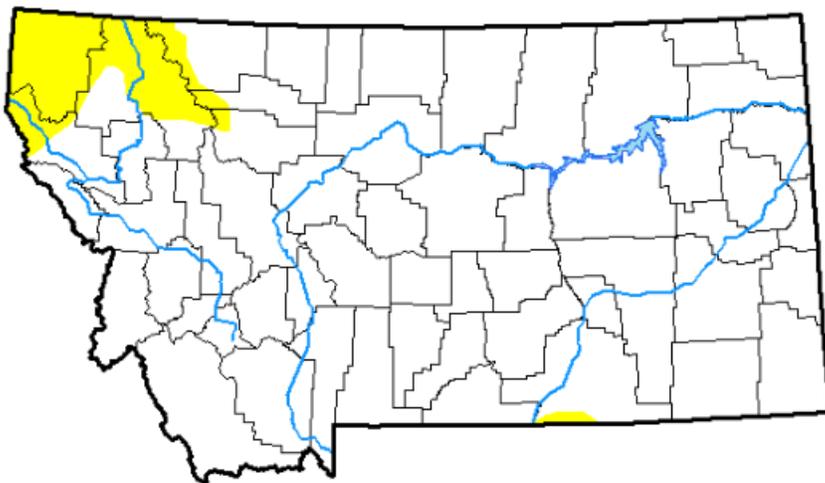
This winter's snowpack should provide adequate runoff for most of the state this spring and summer, however, water users should continue to keep a close eye on day-to-day and week-to-week weather patterns. A prolonged period of high pressure with abundant sunshine, high daily temperatures, and nights of above freezing could accelerate our spring run-off. Despite a much larger snowpack in 2018, the early run-off, below average summer precipitation and above average temperatures resulted in drought conditions across much of northwestern and north central Montana in 2018.

Drought Watch: ([Montana Drought Information and Montana Drought Impacts Reporter](#))

As we move into late spring, none of Montana is in a drought status for the first time since early April of 2017 and that condition only lasted until early June with the onset of the flash drought that summer. While there is still time to turn things around, persistent dryness in northwest Montana is likely to result in at least moderate drought conditions (D-1) in the coming months. A small area in southcentral Montana north of Sheridan, WY, around the community of Lodge Grass is showing abnormally dry conditions but adequate summer precipitation and average or below average temperatures could easily prevent the onset of drought in that area. Generally, current conditions in the state are better than we have seen for some time. It is important to keep in mind that the development of drought is typically driven as much by temperature as it is precipitation. Despite the strong snowpack in 2017, the absence of any precipitation after July 1 along with considerably higher than normal temperatures resulted in that summer’s extreme drought. The next 8 to 10 weeks will tell much of the tale, so stay tuned. Below is the most recent map from the [U.S. Drought Monitor](#). Additional information on drought, weather and climate is also available from the [National Integrated Drought Information System](#) (NIDIS)

**U.S. Drought Monitor
Montana**

April 9, 2019
(Released Thursday, Apr. 11, 2019)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	93.58	6.42	0.00	0.00	0.00	0.00
Last Week <i>04-02-2019</i>	93.79	6.21	0.00	0.00	0.00	0.00
3 Months Ago <i>01-08-2019</i>	93.69	6.31	0.92	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	93.69	6.31	0.92	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	46.28	53.72	13.18	2.74	0.00	0.00
One Year Ago <i>04-10-2018</i>	88.33	11.67	5.79	2.11	0.00	0.00

Intensity:

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

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

Author:

Deborah Bathke
National Drought Mitigation Center

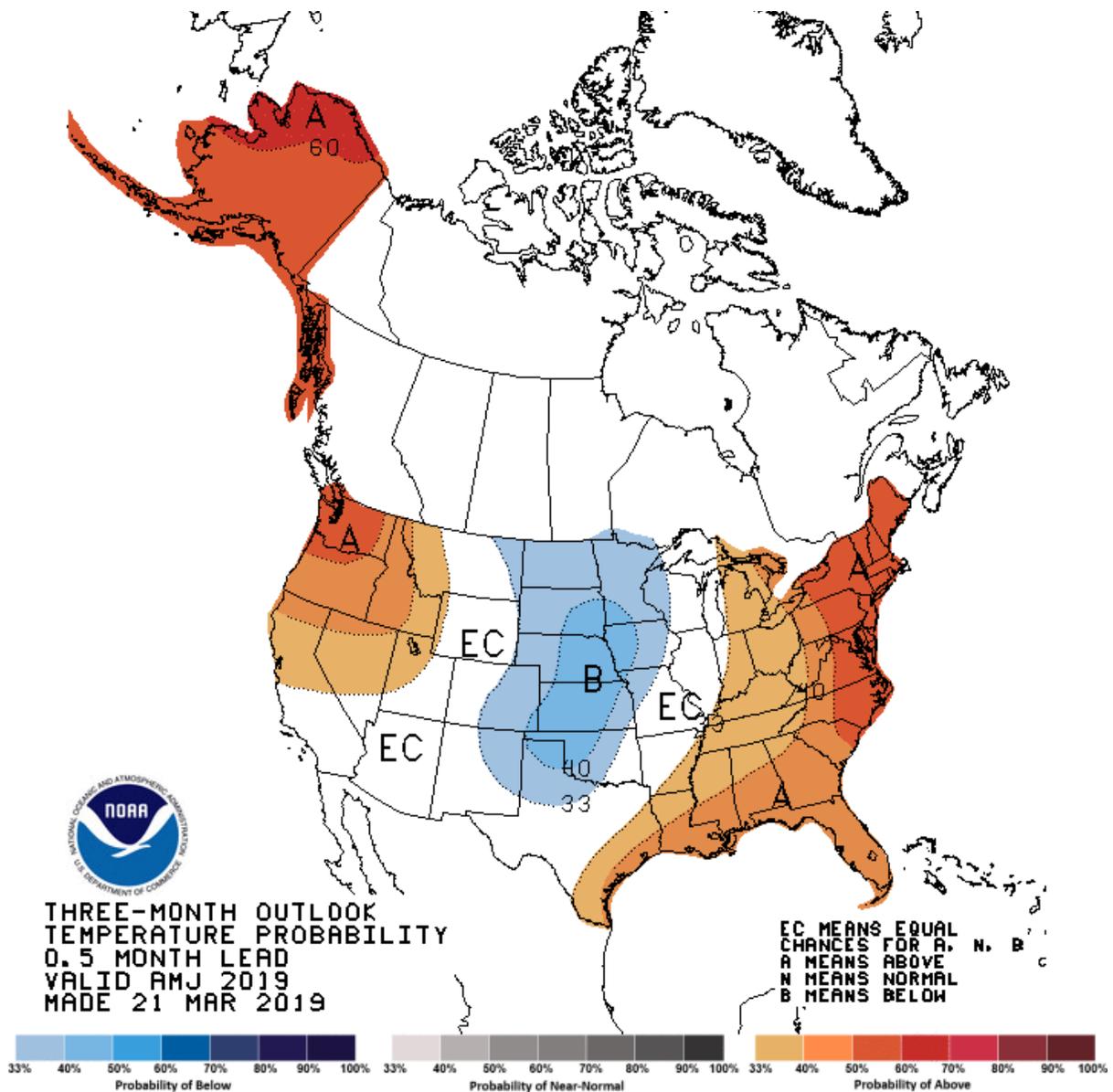


<http://droughtmonitor.unl.edu/>

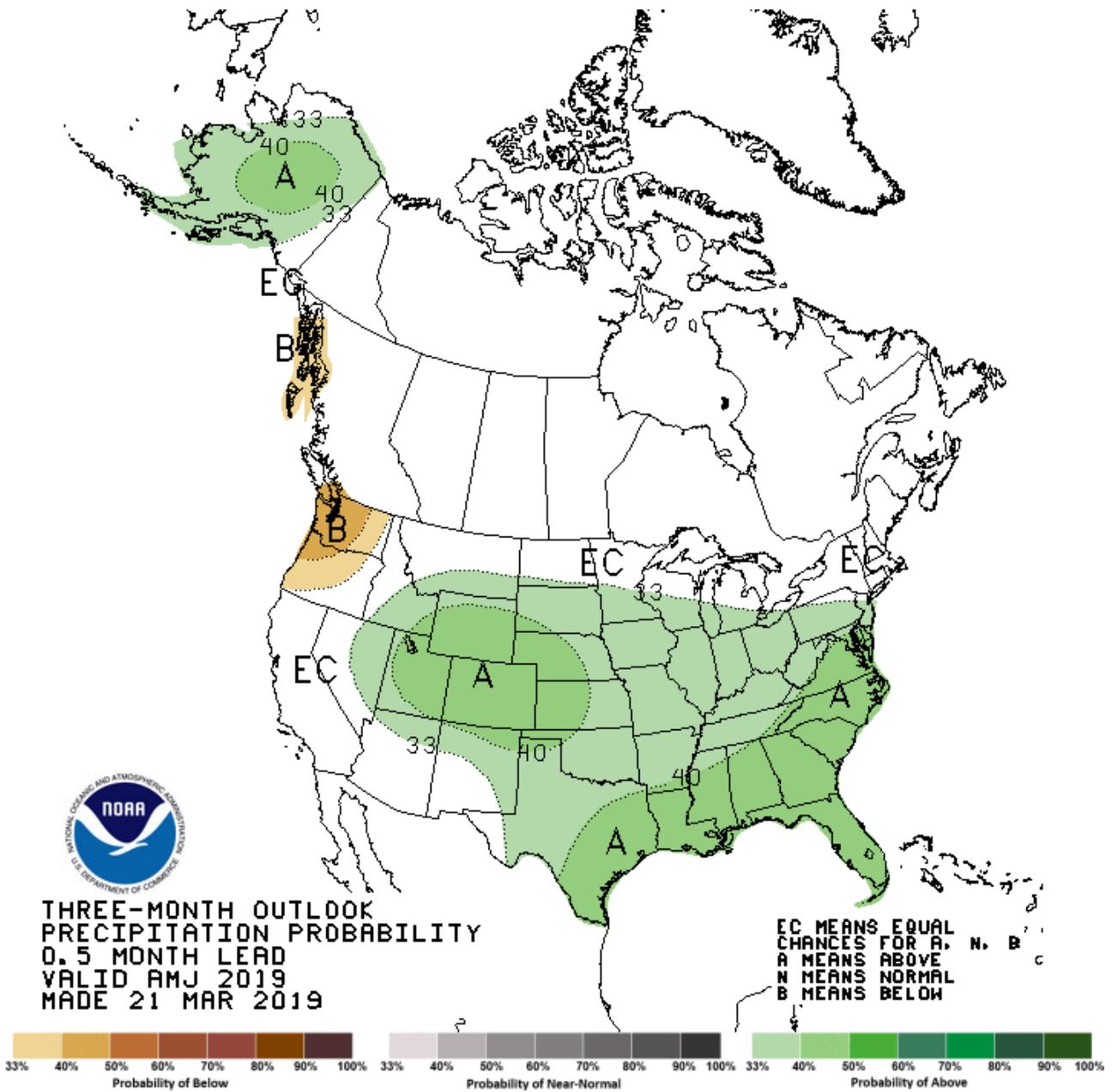
Long Term Forecast:

The [Climate Prediction Center](#), a division of the National Weather Service, provides long-term forecasts for the contiguous United States, Alaska and Hawaii. The current temperature outlook for April, May, and June calls for 30% to 40% chance of above normal temperatures in northwest Montana and an equal chance of average, below normal or above normal temperatures in the remainder of the state. That means that the northwest is likely to see warmer than normal temperatures in the next three months and there are not any clear signals on the horizon that indicate the likelihood of one scenario over another in the rest of Montana. A similar situation applies to the precipitation outlook with south central Montana favoring above normal precipitation and the rest of the state not showing a clear indication in one direction or the other. The maps below show the 3-month forecast for both temperature and precipitation.

3 Month Temperature Forecast:



3 Month Precipitation Forecast:



These combined indicators tell the current water supply story in Montana. As always, the ending may differ radically depending upon Mother Nature’s particular mood over the next few months. DNRC can help answer questions about water resources in your area or provide information about water management tools like stream gages, near you. DNRC also provides planning assistance and technical support for local water supply planning for your community and in your watershed.

Please don't hesitate to get in touch if you have any questions or feedback, and keep an eye out for the next update in late June. Contact the DNRC staff listed below for assistance or additional information.

Lower Missouri Basin

Water Planner - [Michael Downey](#)
State Drought Monitoring

Yellowstone River Basin

Water Planner - [Sara Meloy](#)

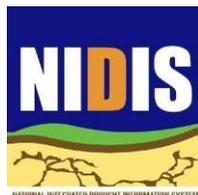
Upper Missouri River Basin

Water Planner - [Ann Schwend](#)

Clark Fork & Kootenai River Basins

Water Planner – Vacant

Much of the information in this report comes from the [NRCS Water Supply Outlook Report](#), U.S. Drought Monitor, Climate Prediction Center, National Integrated Drought Information System and others. 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 the MT DNRC on behalf of the Governor’s Drought & Water Supply Advisory Committee pursuant to MCA 2-15-3308(5).