NRCS Natural Resources Conservation Service

USDA

Montana
Water Supply Outlook Report
June 1st, 2020

Shown above is the West Fork of the Madison River during the last weekend of May. The unseasonably warm temperatures, which set new records on May 30th and 31st at many mountain SNOTEL sites, released a significant amount of the remaining snow water from the snowpack into rivers and streams across the state. Some minor flooding occurred on June 1st along some rivers. Due to this accelerated melt, some river basins in southwest Montana now have snowpack, which is well below normal for this date. This rapid decrease means that less water will be available later in summer when demand is the highest. Streamflow forecasts for the summer vary widely from above average in northwest river basins, to well below average in some southwest river basins. Water users are encouraged to read the individual basin narratives and streamflow forecasts for their region to gauge the impact this rapid melt might have on their late-summer water availably. (Photo: Tom Beers – USDA NRCS Montana Snow Survey)

For more water supply and resource management information, contact:

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Montana Water Supply Outlook Report as of June 1st, 2020

How Forecasts Are Made

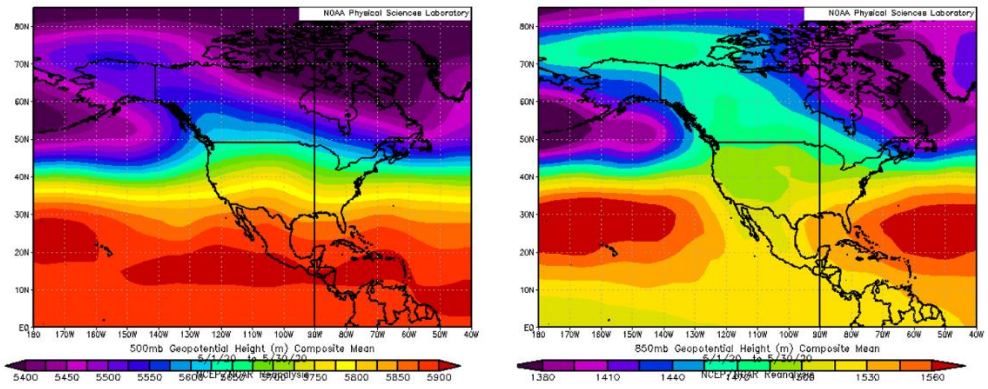
Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

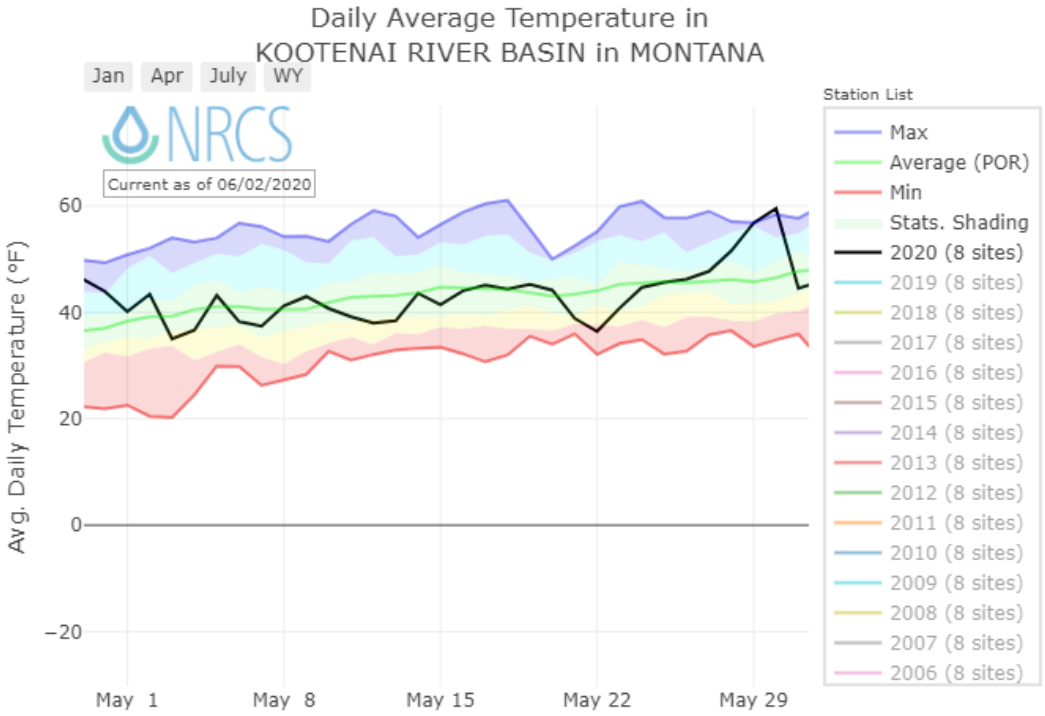
Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

Monthly Weather – General Summary

The first two weeks of May yielded near to slightly below average daily temperatures at mountain locations across the state, with moist western flow delivering cool air to most areas and above-normal precipitation in river basins west of the Divide in western Montana. Below, the composite monthly flow for the May 1st – May 31st period shows this pattern, which persisted until the fourth week of the month, when a significant pattern change would take place.



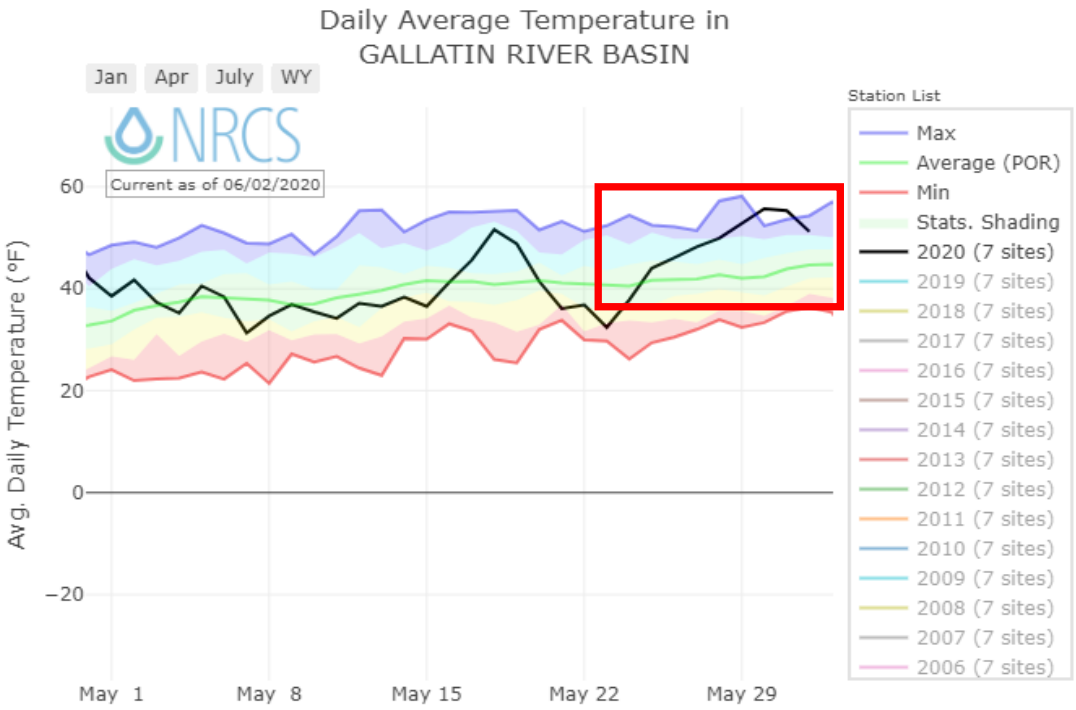
500mb and 850mb Analysis for May 1st, 2020 to May 31st, 2020.



During the first three weeks of May, mountain temperatures in northwest Montana were near to slightly below average, prolonging snowmelt in many locations and even adding snow water to the mountain "reservoir" with both rain and snow falling at mountain locations.

This was a welcome return to this zonal western flow, which yielded significant precipitation from late December through the end of February, boosting the mountain snowpack.

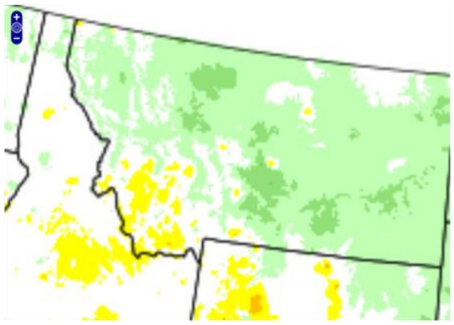
The last week of May would mark a major pattern change across the state, one that would set new high daily average temperatures at many mountain and valley locations. The jet stream would move north into Canada, allowing warm and dry air to spill into the state from the southwest. This pattern would remain in place through the end of May and into the first few days of June.



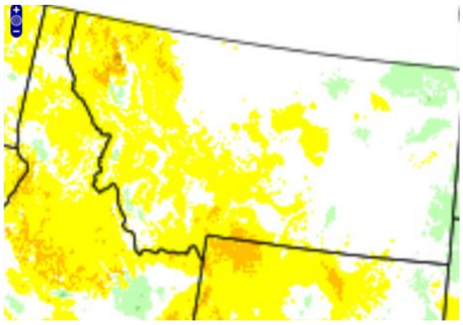
Air temperatures at all mountain locations during the last week of May gradually increased toward the end of the month, with many records being set at mountain SNOTEL sites for the highest daily average temperature on record for May 30th and May 31st. Some valley locations would also set new records.

Looking at the monthly average temperatures, the cool weather during the first two weeks of the month would help to balance out the overall monthly totals for daily average temperature and daily high temperatures in all locations except southwest Montana. However, monthly average daily minimum temperatures would remain above average for the western half of the state. This is important, especially at mountain locations where below-freezing temperatures typically slow down the daily melt/freeze cycle, which releases water into rivers and streams. Additional details on the impact of the anomalously warm temperatures during the last week on snowmelt and runoff will be covered in the snowpack and streamflow sections of this report.

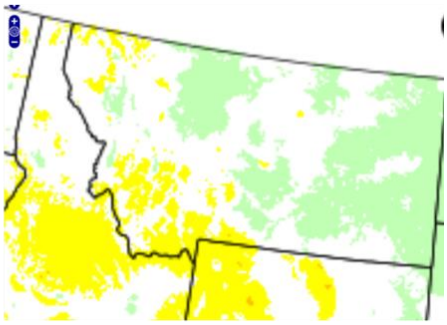
May 2020 – Monthly Average



Max Temperature Anomaly



Min Temperature Anomaly



Mean Temperature Anomaly

Snowpack – Overview

Snow totals across the state on June 1st vary widely due to the weather patterns in May. Most river basins experienced a peak snowpack in late April this year that was near to slightly above normal, and most river basins were in good shape at the beginning of the month. Throughout this month, the melt has been occurring at all elevations, and during the first two weeks of the month, it was happening at a controlled (or more typical) rate. However, melt rapidly accelerated across the state during the last week of the month, which has moved a significant amount of snow water into rivers and streams. In the Madison, Jefferson, and Bitterroot River basins, this has resulted in a snowpack that is well below normal. Elsewhere in the state, snowpack remains near to slightly above normal.

Rapid snowmelt at the end of the month and the beginning of June will decrease the long-term availability of snow water to river systems later this summer. 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, making irrigators more reliant on summer precipitation, which typically declines through the summer months. Water users along reservoir-controlled river systems may not feel the same impact, as reservoirs have been able to store much of this runoff.

Precipitation - Overview

Monthly precipitation varied widely across the state during the month of May. River basins west of the Divide received consistent precipitation during the first three weeks of the month, with mountain and valley locations receiving above-average totals for May. Elsewhere, precipitation was more hit or miss. East of the Divide, only the Little Belt Mountains and areas north towards Great Falls would receive above-average precipitation. Other regions would receive near to below normal precipitation. One area of concern east of the Divide, with regards to spring precipitation, is the mountains and valleys of southwestern Montana within the Jefferson, Madison, and Gallatin River basins. Monthly totals in this region were well below average for both April and May, resulting in crop-year precipitation totals (April 1st – Current, coinciding with growing season), which are in the bottom 10th percentile of all years on record. Many stations set new record lows for April – May precipitation. This will be an area to keep an eye on later in the summer, should June fail to deliver rainfall.

Reservoirs - Overview

At this time, most reservoirs are above average for storage on June 1st, and the remaining snowmelt should help to fill most reservoirs. Currently, reservoir managers across the state have their hands full, due to the accelerated snowmelt at the end of the month and are balancing managing the increased volumes of runoff with being able to provide water resources later in the summer. This is not an easy task, so hats off to our water managers across the state.

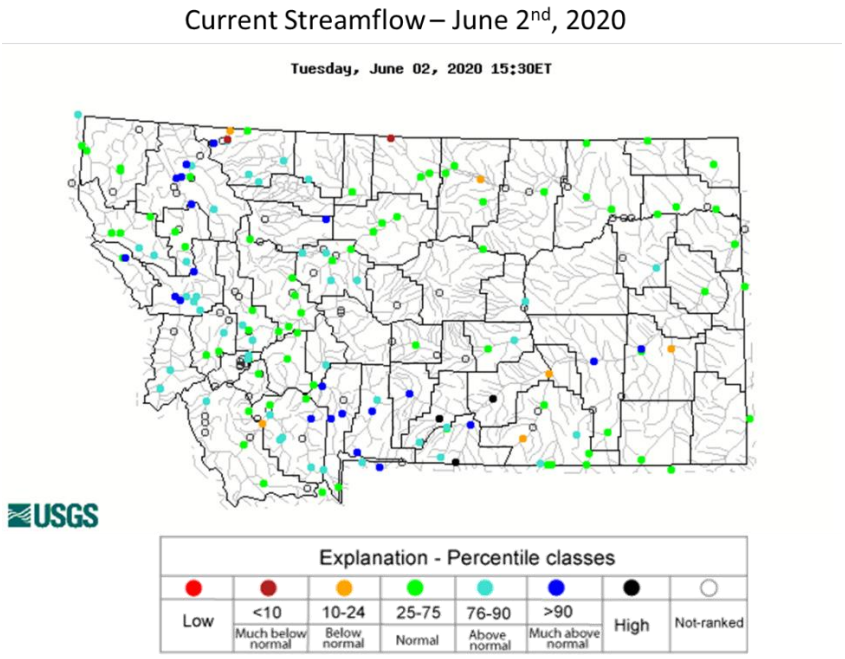
Streamflow Forecasts

After what started as a tame start to runoff this year during the first two weeks of May, things made a dramatic change towards the latter half of the month. Weather patterns during the last week of May caused rivers and streams across the state to rise significantly, with abundant sunshine and well above average to record-setting temperatures causing rapid snowmelt at even the highest of elevations. As of June 1st, several of the major rivers have hit the minor flood stage, but continued increases will be a function of available snowpack left to melt and the upcoming weather patterns (rain). In many cases, these early June peaks could be the snowmelt driven peaks for the water year. However, future high flows could occur if a significant precipitation event accompanies snowmelt.

This rapid runoff, fueled by the abnormal weather during the last week of June, will decrease the overall volumes in our rivers from June 1st through September 30th. Think of the mountain snowpack as a vast reservoir; this year, we are letting the water out a lot faster than we'd, and before we really need it. This early melt could be of concern on non-

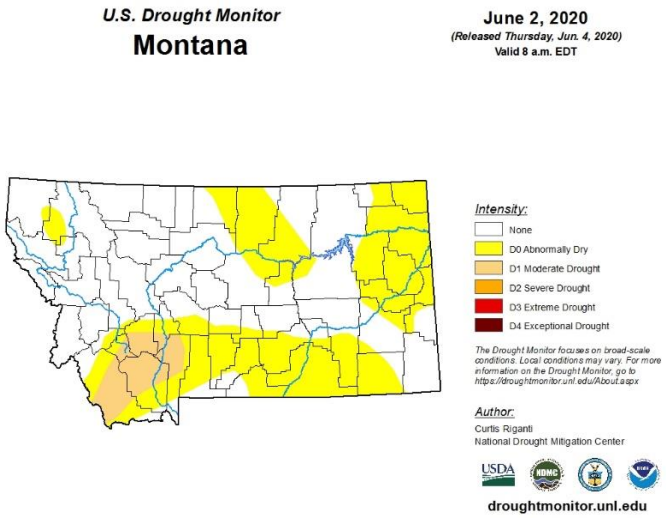
reservoir-controlled river systems later in the summer when demand on water is highest. If the long-range weather forecasts verify, and June and coming months remain warm and dry, it could further accelerate melt at the remaining snowcovered elevations.

Streamflow forecasts issued on June 1st for the June 1st – September 30th period range widely this year, so water users are encouraged to view the individual basin narratives for forecasts in their region. While some areas might still anticipate near to above-normal water yield in northern and central Montana, some areas in southwest Montana look to experience below-average volumes due to the rapid melt during May.



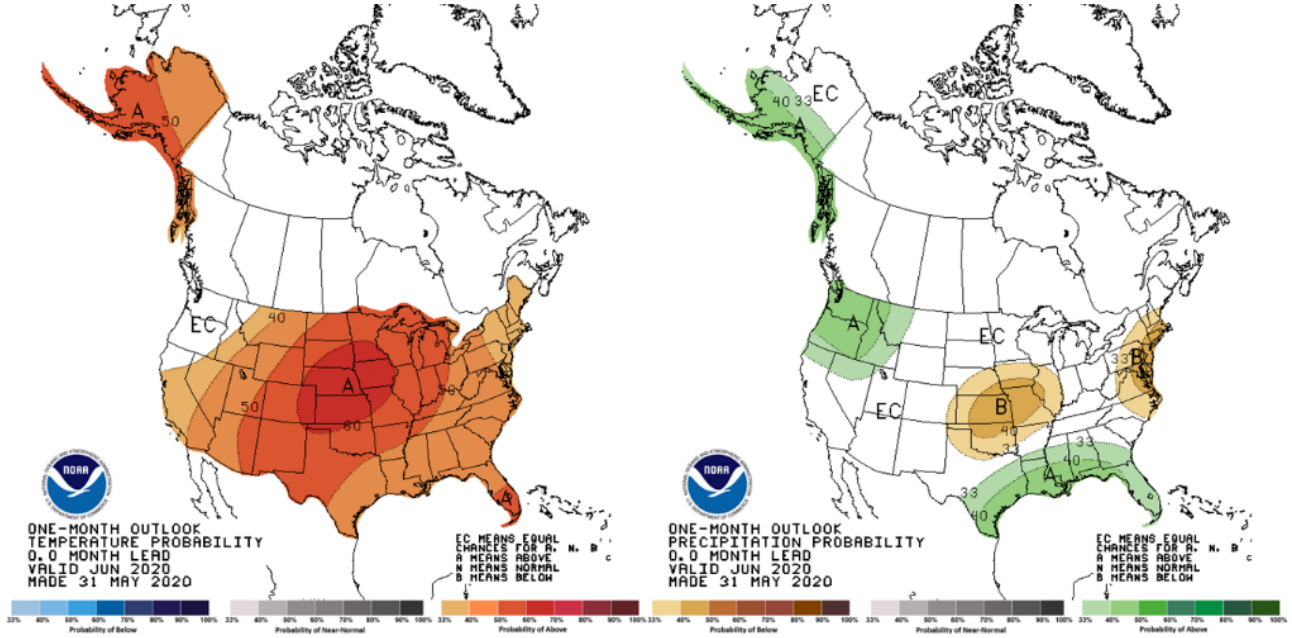
Drought

The most recent National Drought Monitor map, released on June 4th, 2020, shows some areas of D0 and D1 across Montana. While it might seem counterintuitive to have some rivers across the state approaching flood stage while drought is present, it should be known that these determinations are not strictly made using surface water as a proxy for drought. Precipitation plays a crucial role in both water demand and soil moisture. In many of these areas, there are deficits in either precipitation or soil moisture when looking at the 30, 60, and 90-day timescales.

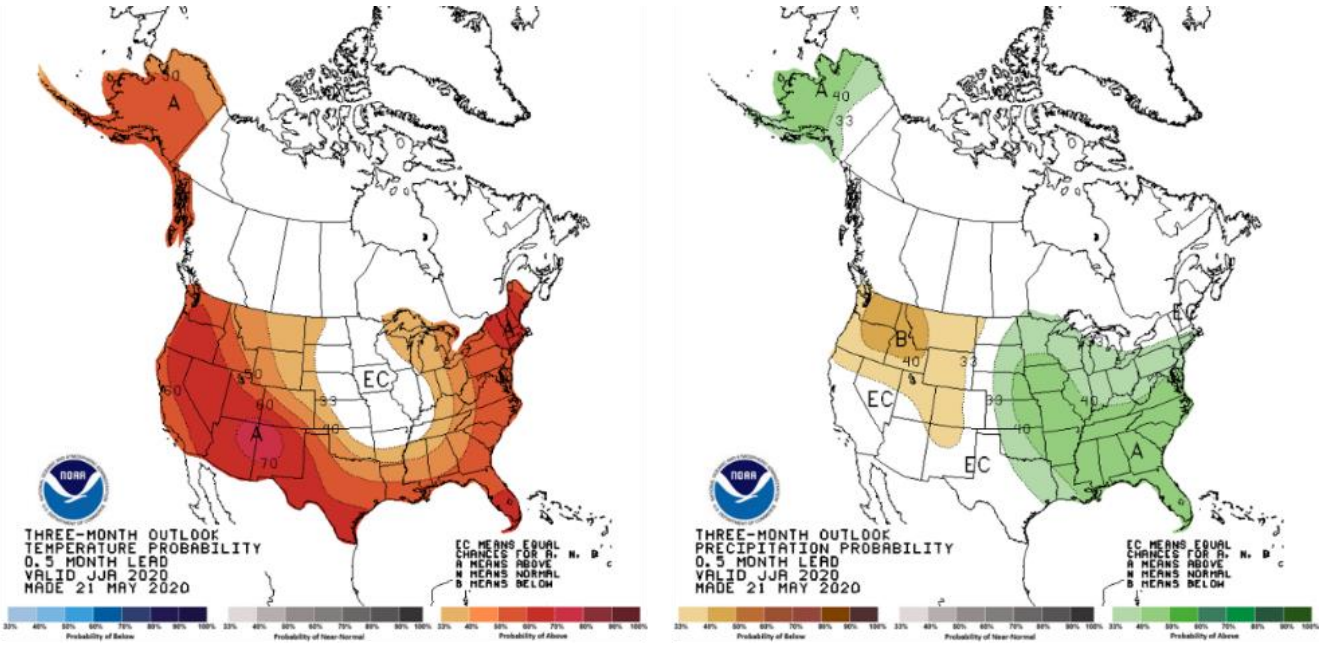


Looking Ahead

Long-range forecasts issued by NOAA's Climate Prediction Center do not look favorable for a return to more seasonal temperatures during the next one to three months. Both the one-month outlook for June, and three-month outlook for June – August, indicate above normal chances of above-average temperatures through those periods. Precipitation wise, the one month forecast for June suggests that western Montana has slightly above normal chances of precipitation during June, however the long-range outlook for June – August indicates better than normal chances for below-average precipitation across the entire state.



One month outlook – Issued May 31st, 2020



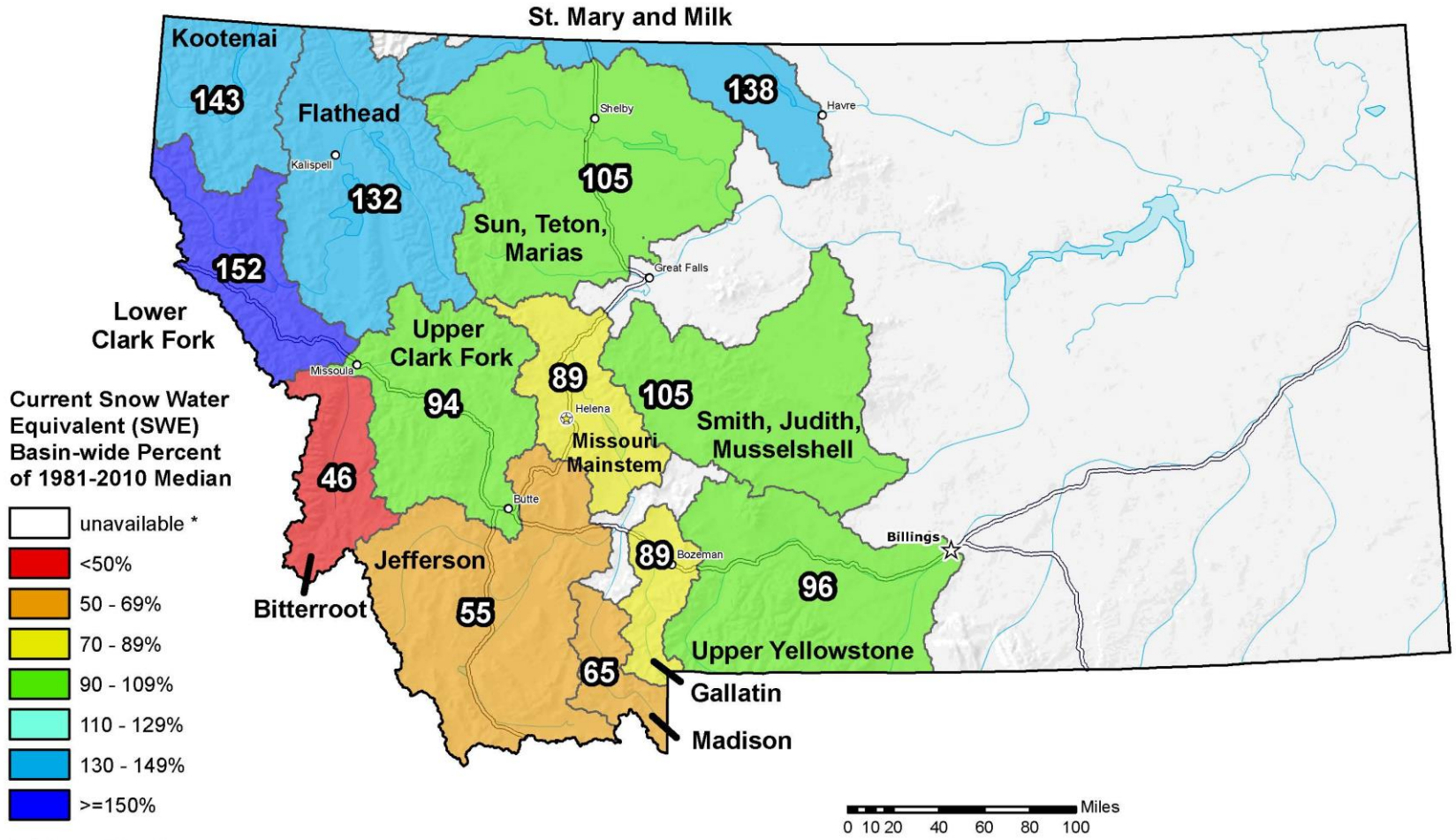
Three month outlook – Issued May 21st, 2020

Data Table – Basin-Wide Values

6/1/2020	Snow Water Equivalent	Precipitation		Reservoir Storage	
	% Normal	*Monthly % Avg*	*Water Year % Avg*	*% Average*	*% Capacity*
Columbia River Basin	113	127	95	108	79
Kootnenai in Montana	140	143	94	111	72
Flathead in Montana	129	135	101	105	86
Upper Clark Fork	93	120	94	110	94
Bitterroot	46	136	95	111	109
Lower Clark Fork	151	124	92	102	99
Missouri River Basin	75	86	92	116	83
Jefferson	55	78	89	110	68
Madison	65	71	85	104	92
Gallatin	89	75	98	121	102
Headwaters Mainstem	33	83	92	119	84
Smith-Judith-Musselshell	105	120	101	147	103
Sun-Teton-Marias	105	89	96	111	70
St. Mary-Milk	138	87	101	132	74
Yellowstone River Basin	89	69	90	100	63
Upper Yellowstone	96	91	99	110	67
Bighorn	84	69	94	96	60
Tongue	71	49	81	154	102
Powder	4	61	87		
Montana State-Wide	98	102	94	113	81
Color Scale	<50%	51 to 70%	71 to 90%	91% to 110%	>110%

Montana SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Jun 01, 2020



Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

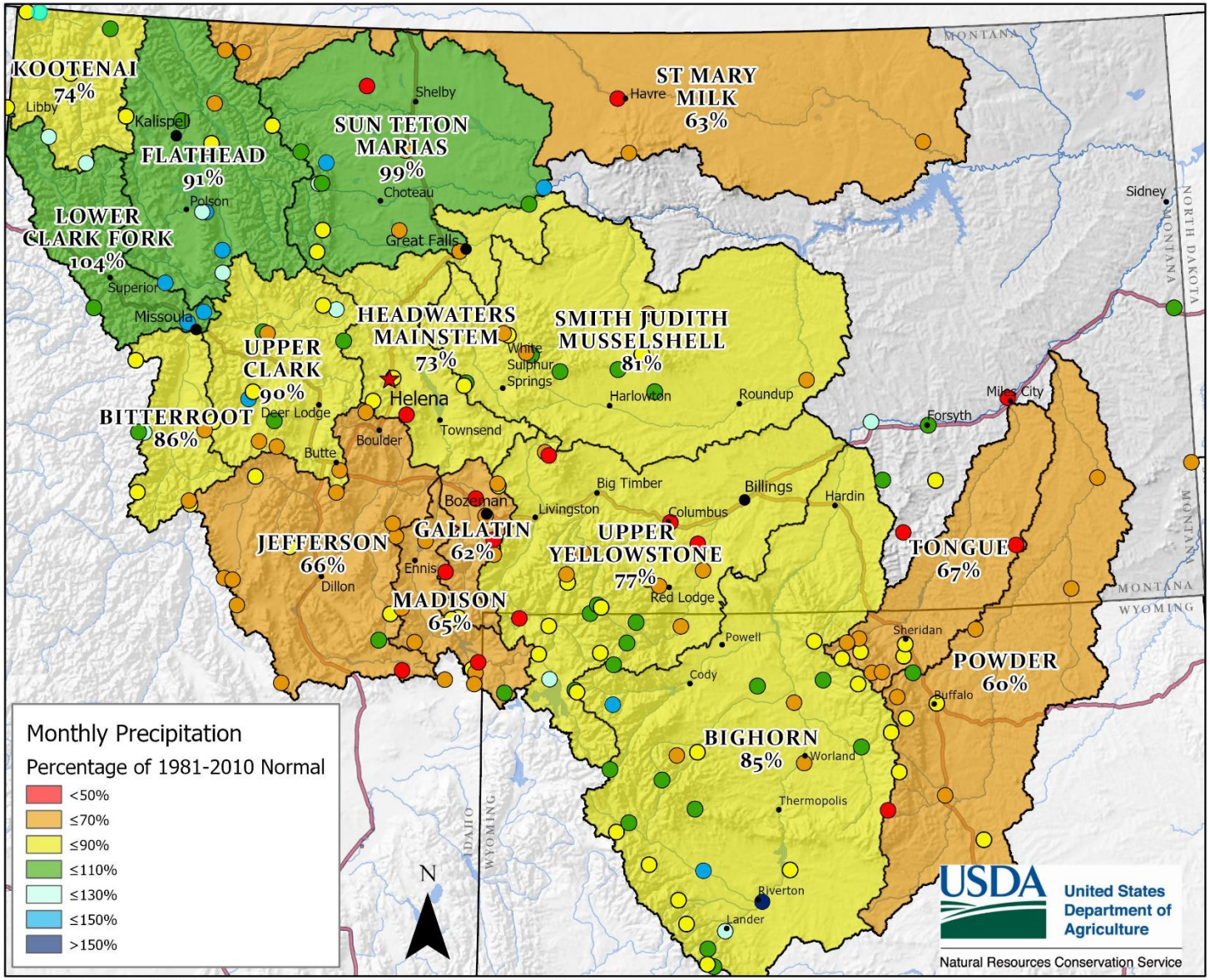
* *Data unavailable at time of posting or measurement is not representative at this time of year*

Provisional Data Subject to Revision

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

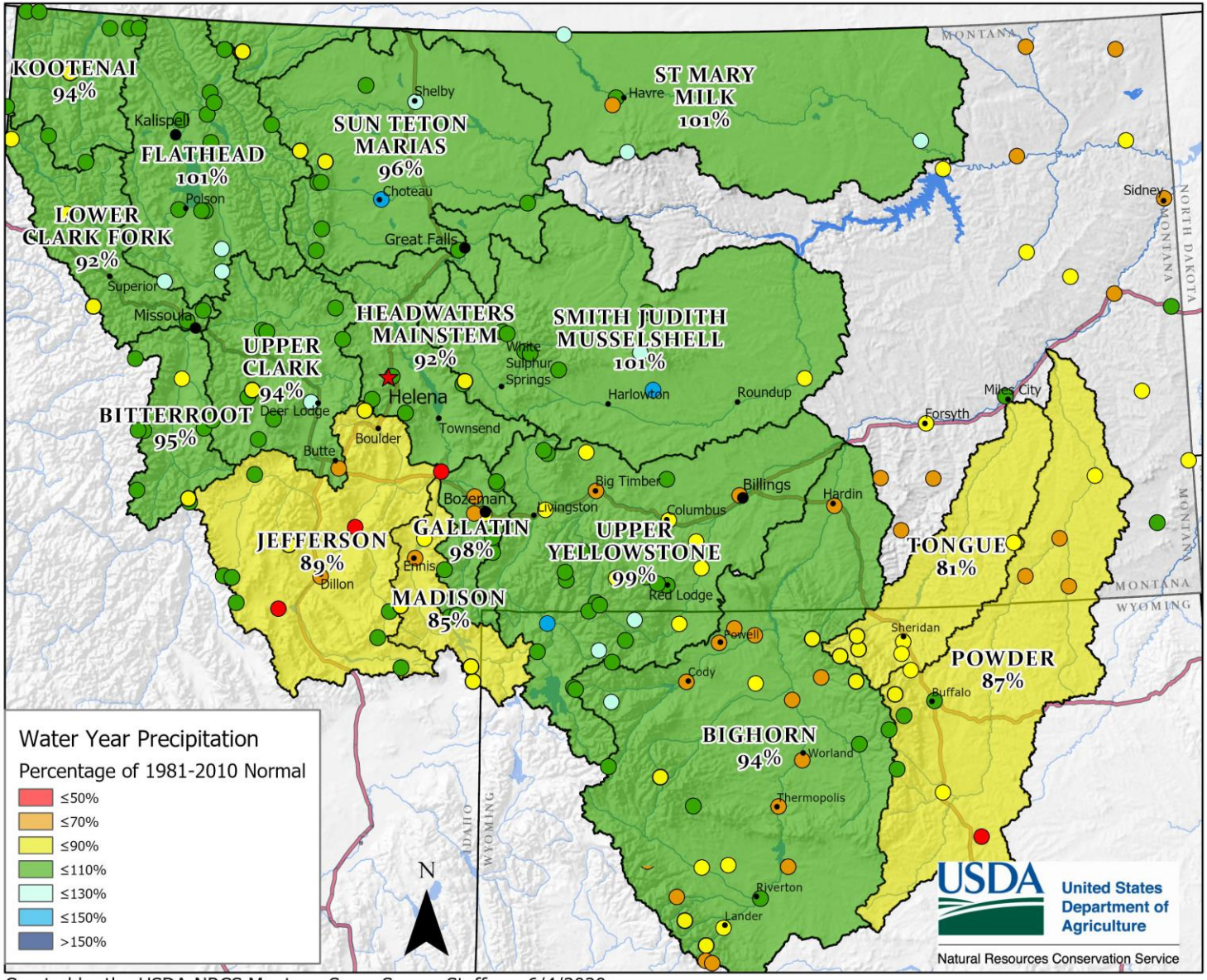
Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

Monthly Precipitation - Percentage of 1981-2010 Normal
April1st, 2020 - April 30th, 2020



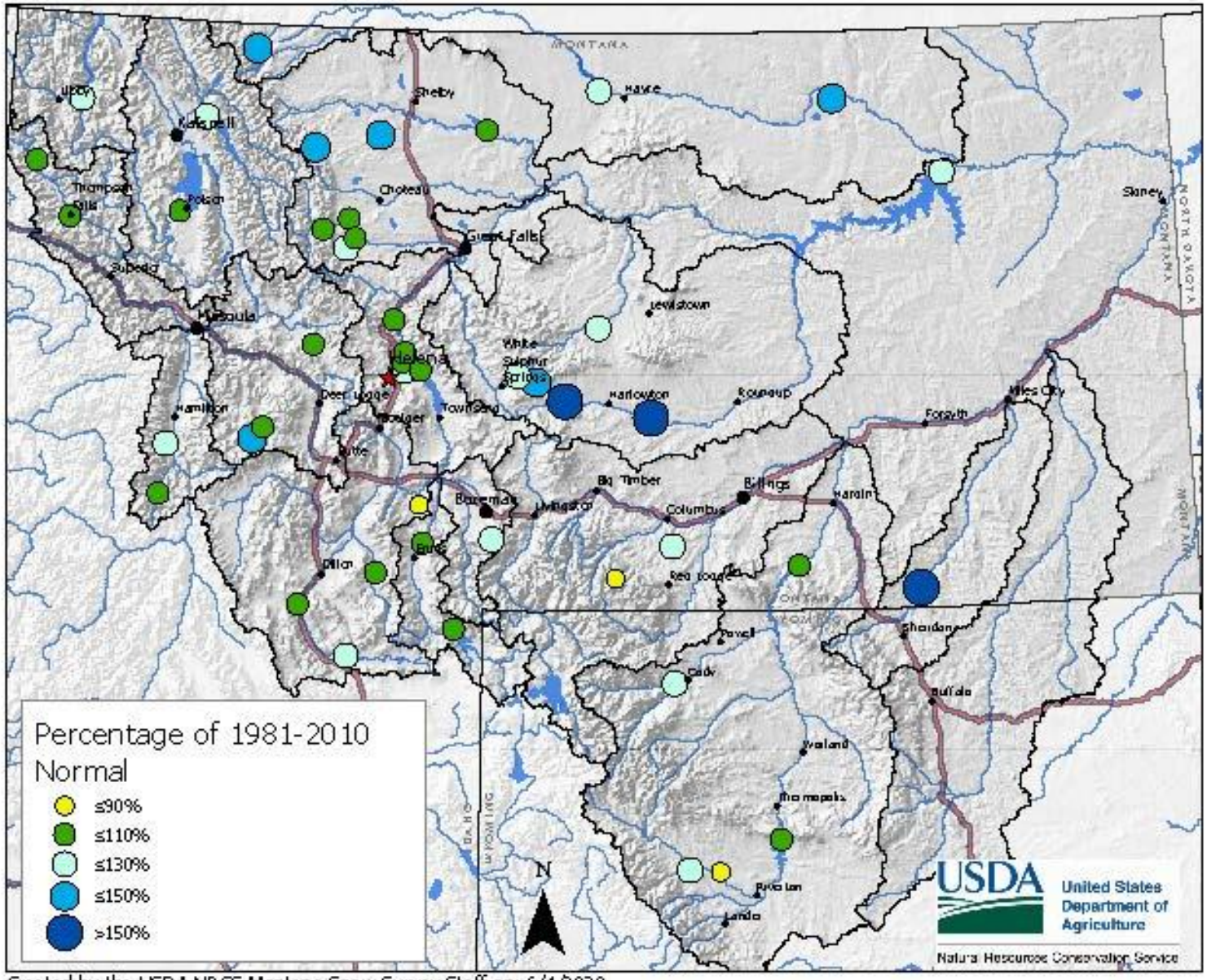
Created by the USDA-NRCS Montana Snow Survey Staff on: 5/6/2020

Water Year Precipitation - Percentage of 1981-2010 Normal
June 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 6/4/2020

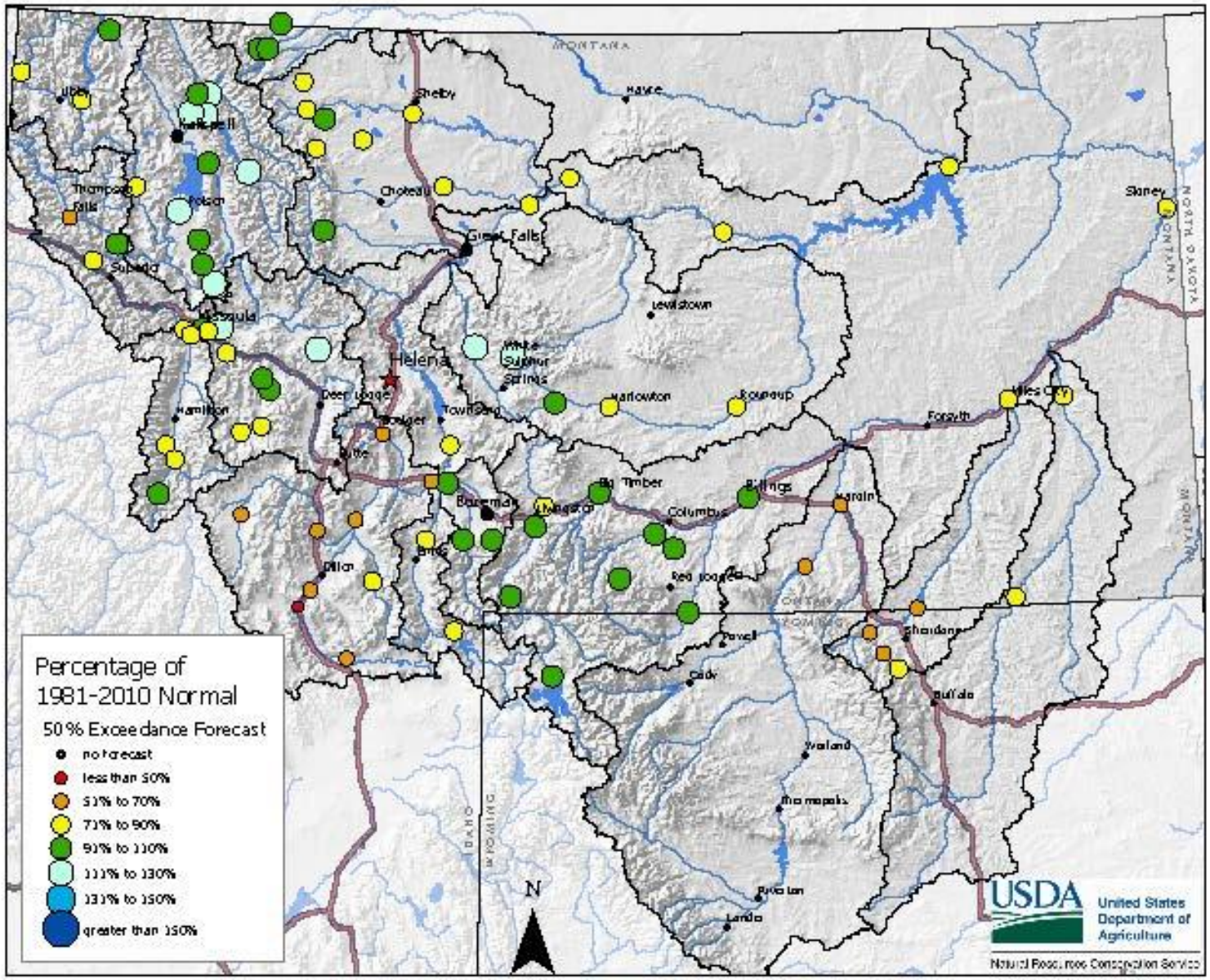
Reservoir Contents - Percentage of 1981-2010 Normal
June 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 6/4/2020

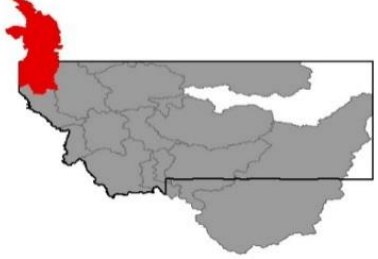
Streamflow Forecasts (June 1st - Sept. 30th) - Percentage of 1981-2010 Normal

June 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 6/5/2020

Kootenai River Basin



The Kootenai Basin received above-normal precipitation throughout May, with snowstorms accumulating at high elevations. Seasonal temps prevailed throughout the month until the last few days when new record high daily average temps were set. Mild temperatures for the majority of the month helped sites to hold onto snowpack, slowing melt rates until the very end of May. Snowmelt has now accelerated, and meltwater surges are entering tributaries. The Fisher River near Libby peaked on June 1st, and flows are slowly receding. Snowpack to the north in Canada melted at much the same rate, with only the northernmost reaches of the Kootenai still holding above-normal snowpack. Reservoir storage in Lake Koocanusa is above normal for this time of year and continuing to fill with 73 kcfs inflow. Forecasted streamflow for June 1st – September 30th for the mainstem Kootenai is near normal with this runoff, but recent warm temperatures and early runoff have decreased volumetric forecasts for the Yaak and Tobacco drainages. For specific tributaries, please reference the table below.

Kootenai River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
KOOTENAY in CANADA	129%	81%
KOOTENAI MAINSTEM	200%	48%
TOBACCO	134%	58%
FISHER	%	%
YAAK	16%	0%
KOOTENAI RIVER BASIN in MONTANA	140%	43%
KOOTENAI ab BONNERS FERRY	126%	68%
Basin-Wide Snowpack	**140%**	**43%**

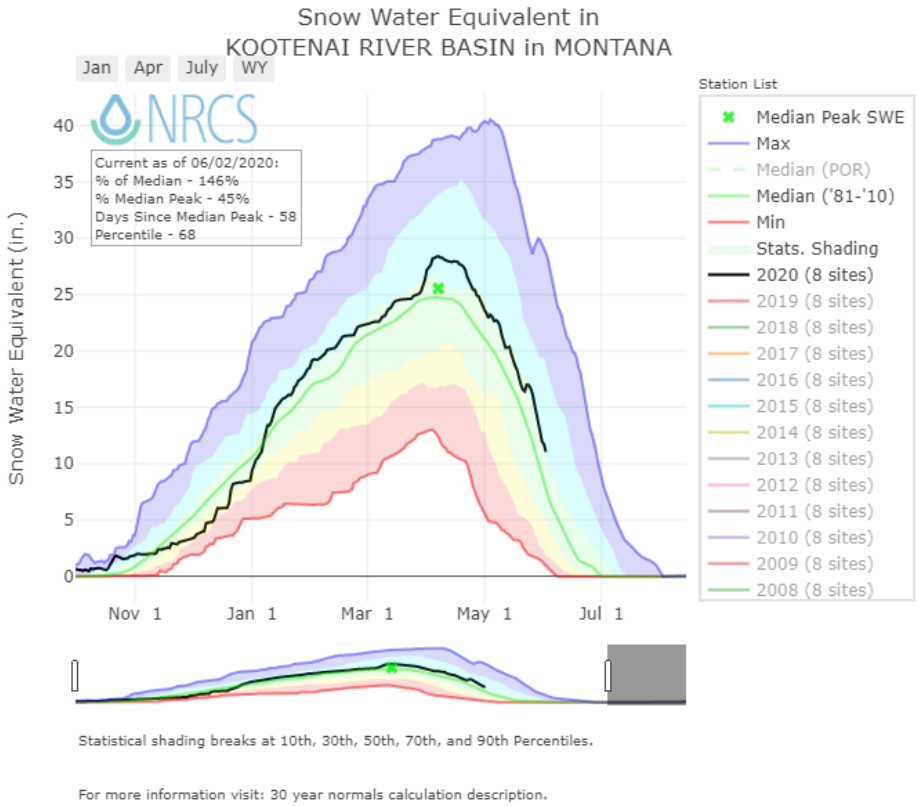
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	143%	94%	77%
Valley Precipitation	140%	91%	88%
Basin-Wide Precipitation	**143%**	**94%**	**77%**

**WYTD Precipitation is October 1st- Current*

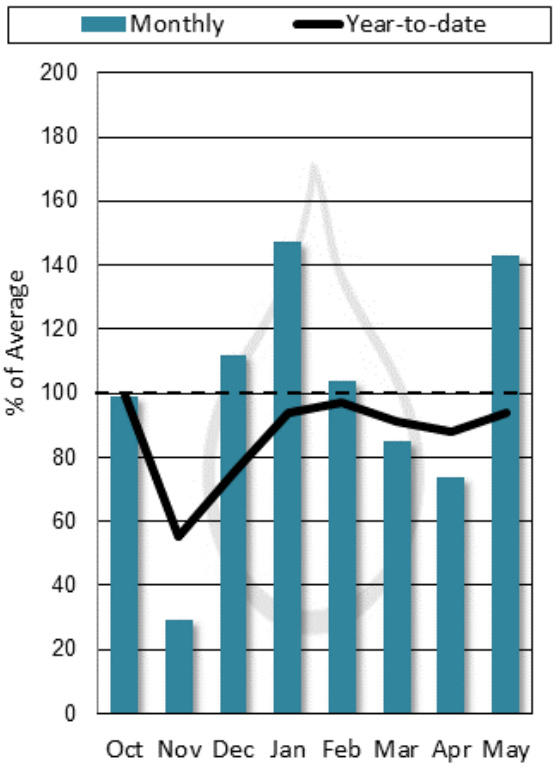
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Reservoir Storage	**111%**	**72%**	**106%**

**See Reservoir Storage Table for storage in individual reservoirs*

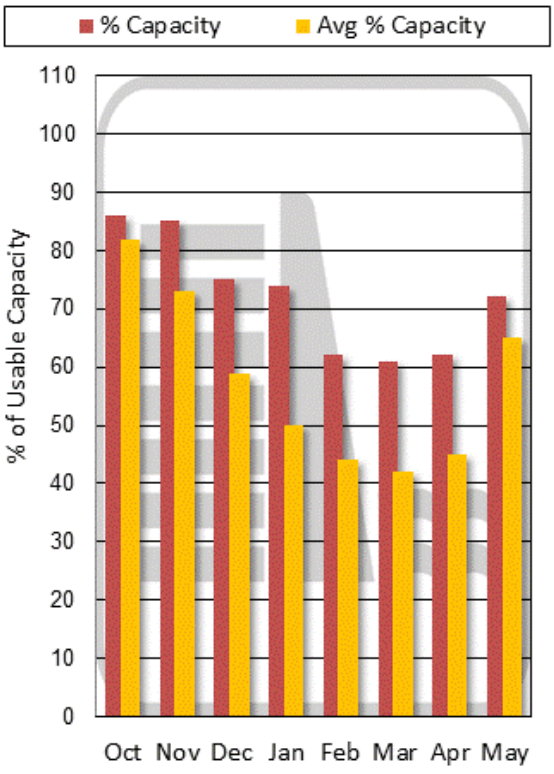
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

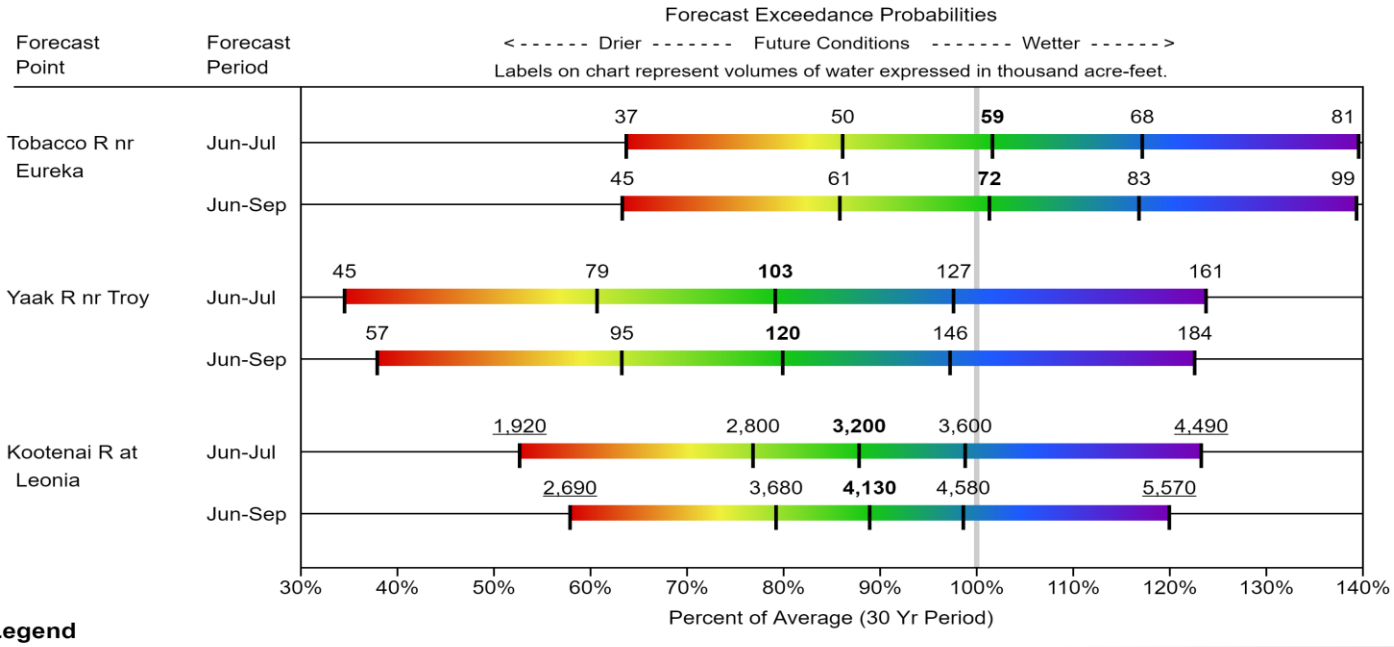


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

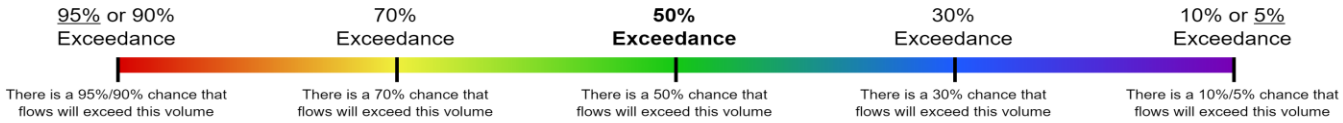
KOOTENAI RIVER BASIN in MONTANA

Water Supply Forecasts

June 1, 2020



Legend



When selected, the following historic streamflow values and statistics will be shown.

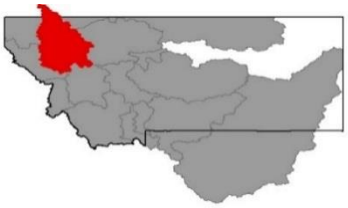
Period of Record Minimum Streamflow KAF (Year)

1981-2010 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.



Flathead River Basin

The Flathead Basin received above-normal precipitation during May, which prolonged mountain snowpack through the first three weeks, then weather patterns transitioned to daytime highs reaching 70 degrees Fahrenheit above 6000 ft. With overnight lows that remained above freezing, rapid snowmelt entered the streams and rivers, leading to a minor flood stage on the Flathead by June 1st. This snow-water pulse may be the snowmelt driven peak flow for this year on the Flathead, sparing a significant rain event. Inflow on the South Fork into Hungry Horse Reservoir has also had a peak, and storage is above normal for June 1st. The Mission and Swan Ranges received well above normal May precipitation, and the Swan River is forecasted to swell into a minor flood stage by June 9th. Ashley Lake Divide and the Salish Mountains continued to make gains in water year to date precipitation throughout May, which has helped to alleviate the lack of low elevation snow this year. Forecasted June 1st – September 30th flows reflect this rapid runoff and are decreased from May 1st forecasts, but remain near to above average for the summer.

Flathead River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
NF FLATHEAD in CANADA	%	%
NF FLATHEAD in MONTANA	146%	68%
MIDDLE FORK FLATHEAD	124%	68%
SOUTH FORK FLATHEAD	130%	58%
STILLWATER-WHITEFISH	128%	86%
SWAN	130%	71%
MISSION VALLEY	119%	78%
LITTLE BITTERROOT-ASHLEY	%	%
JOCKO	144%	80%
FLATHEAD in MONTANA	129%	70%
Basin-Wide Snowpack	***129%***	***70%***

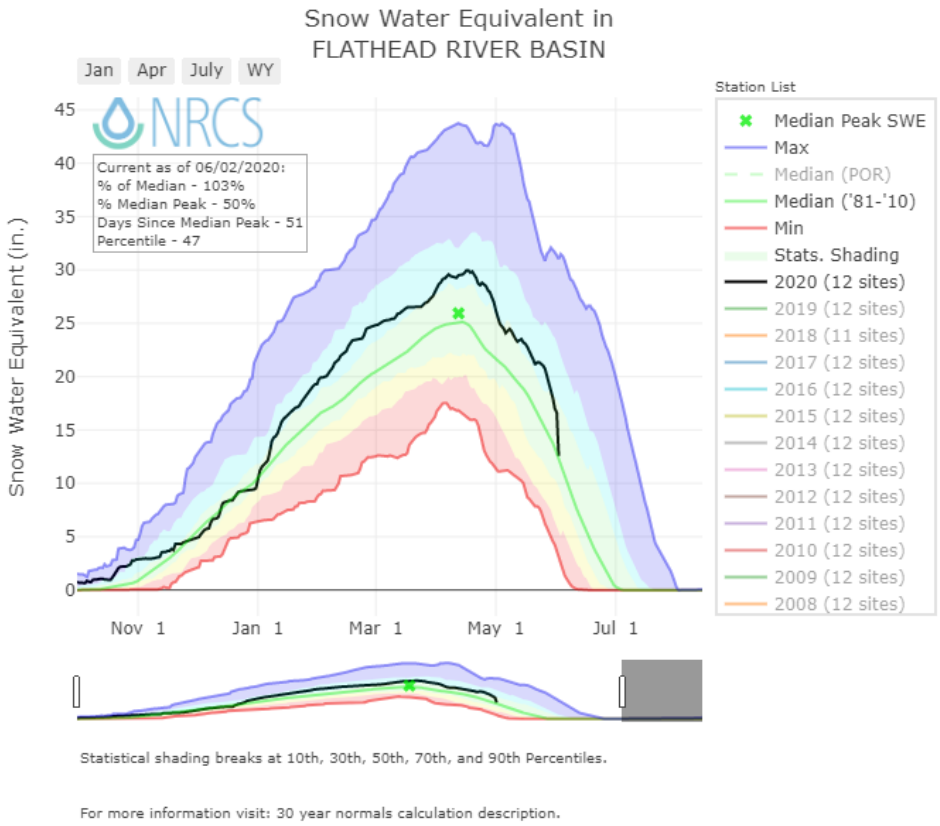
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	134%	101%	88%
Valley Precipitation	155%	94%	104%
Basin-Wide Precipitation	**135%**	**101%**	**88%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

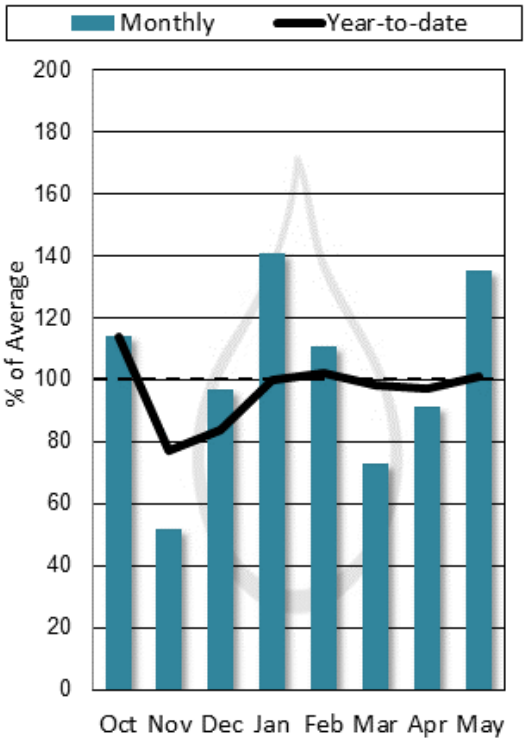
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Reservoir Storage	105%	86%	109%

**See Reservoir Storage Table for storage in individual reservoirs*

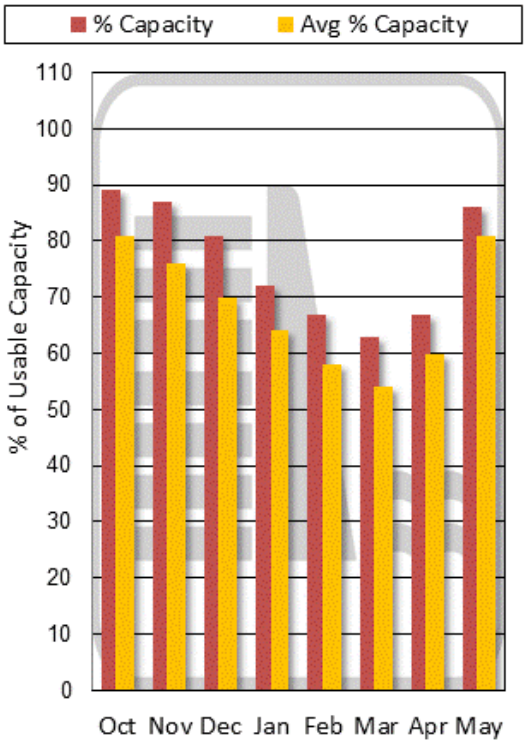
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

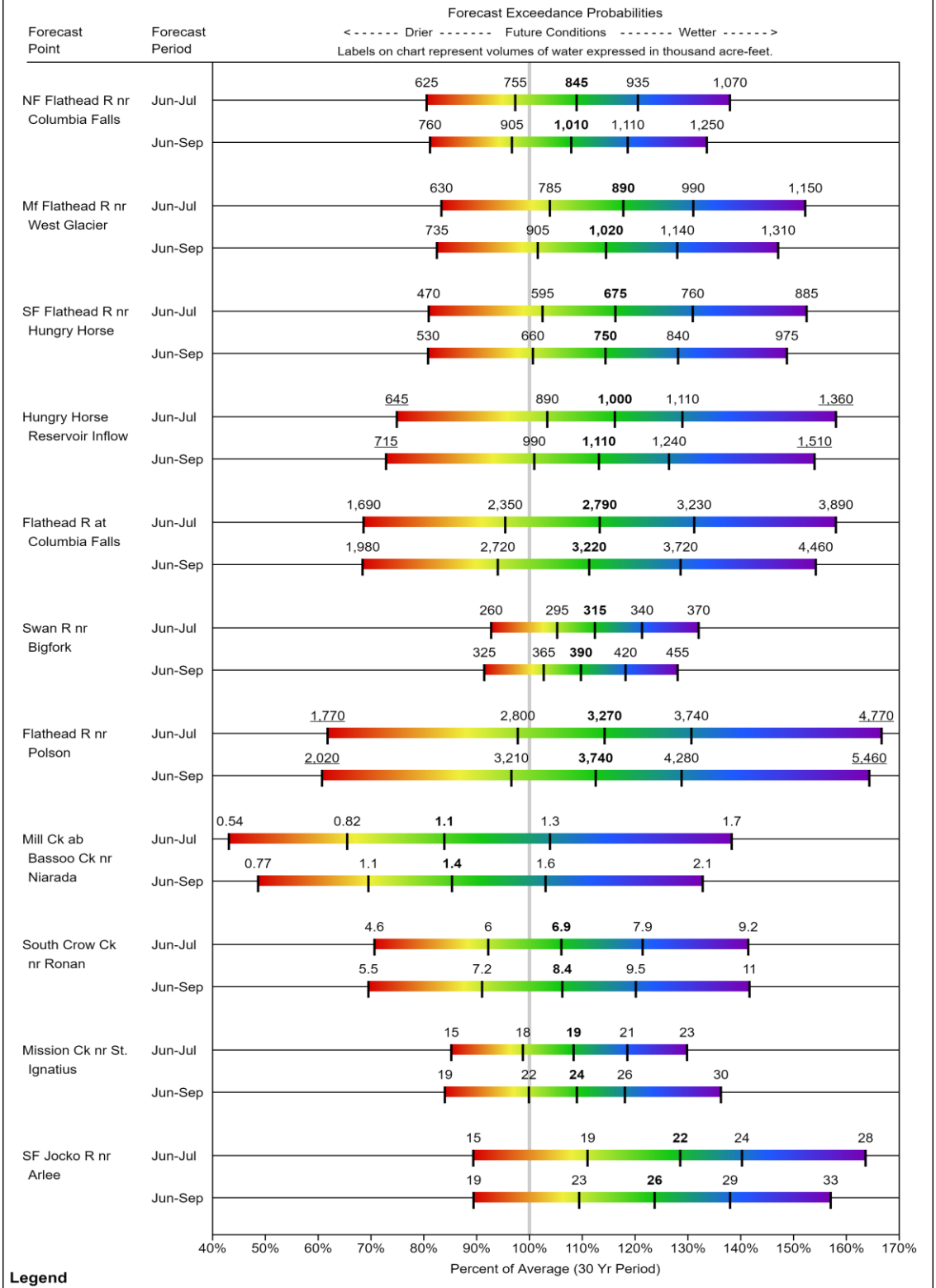


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

FLATHEAD RIVER BASIN

Water Supply Forecasts

June 1, 2020



Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Upper Clark Fork River Basin

The Upper Clark Fork spring runoff has started with a bang this year, flowing at 21 kcfs on May 22nd (~9 days earlier than the median peak), and swelling to a minor flood stage near Missoula. Record-setting high temperatures at the end of the month, coupled with overnight lows remaining near 50 degrees Fahrenheit at 8000 ft, have led to accelerated melt of snowpack in our mountains. Near-average precipitation fell during May, stacking on top of this runoff. Reservoir storage is above normal for this time of year, and most are at capacity or will fill to near capacity. Even with these stores, the Upper Clark Fork will depend on late spring and summer precipitation to sustain flows for water users throughout the irrigation season. Streamflow forecasts have decreased in most areas since the May 1st report with record temps and rapid snowmelt, sparing the Blackfoot River. Please reference the table below for conditions in your area of interest.

Upper Clark Fork River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
CLARK FORK ab FLINT CREEK	69%	114%
FLINT CREEK	0%	107%
ROCK CREEK	0%	46%
CLARK FORK ab BLACKFOOT	55%	102%
BLACKFOOT	136%	83%
Basin-Wide Snowpack	**93%**	**93%**

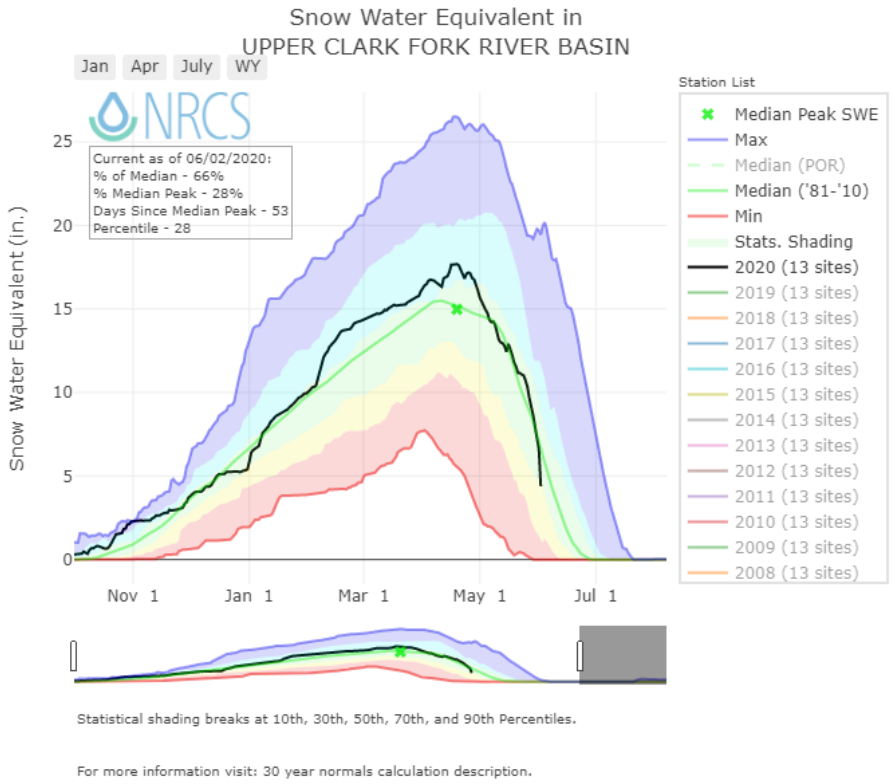
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	122%	95%	98%
Valley Precipitation	68%	55%	116%
Basin-Wide Precipitation	**120%**	**94%**	**99%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

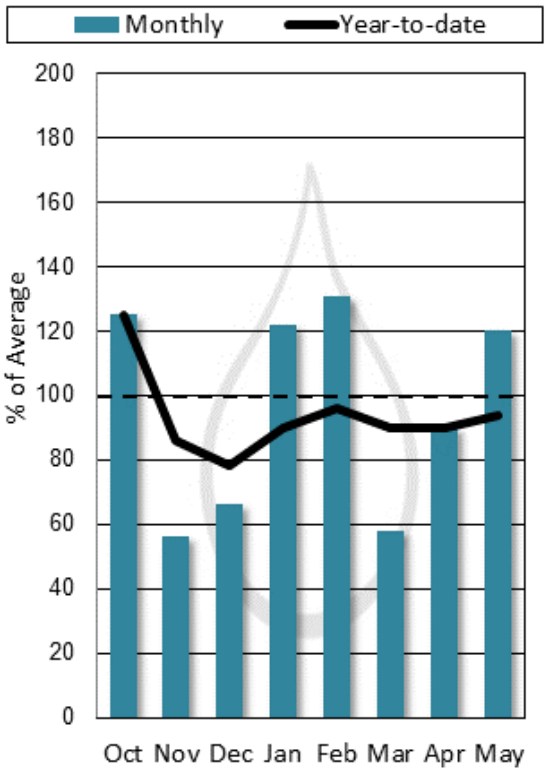
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**110%**	**94%**	**108%**

**See Reservoir Storage Table for storage in individual reservoirs*

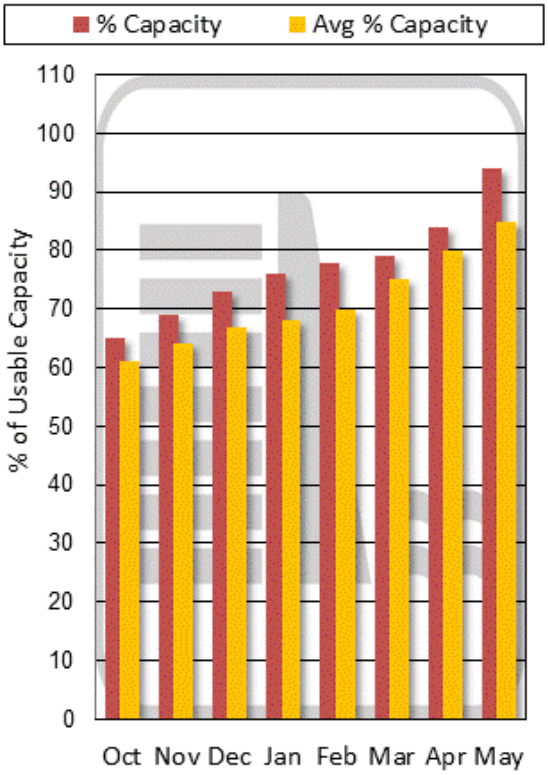
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

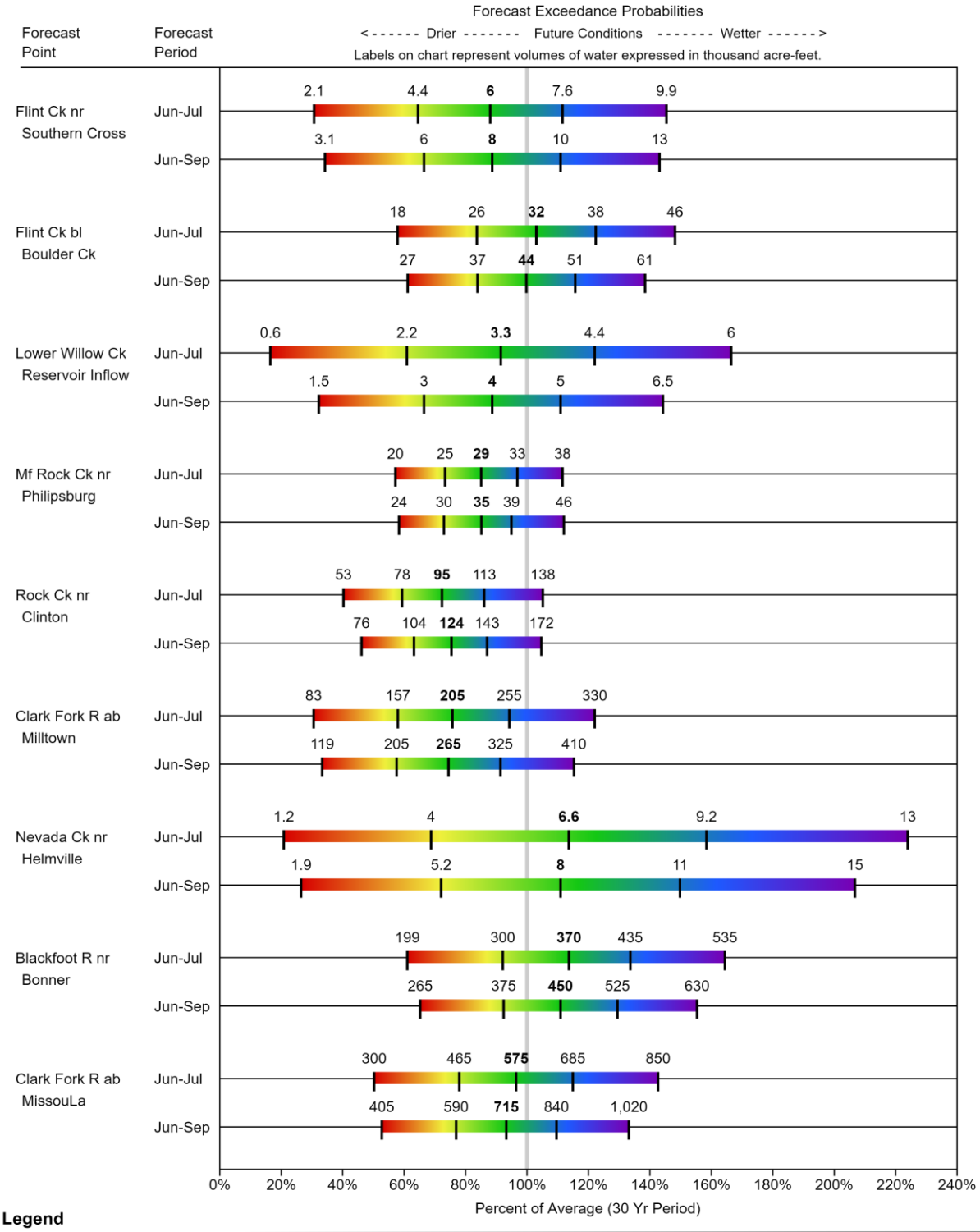


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

UPPER CLARK FORK RIVER BASIN

Water Supply Forecasts

June 1, 2020



Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Bitterroot River Basin

Warm temperatures during later May, combined with rain-on-snow events, have accelerated the melt of snowpack, leading to a minor flood stage on the Bitterroot River near Missoula. Well below-average snowpack remains in the mountains yet to melt, but the good news is that near-normal precipitation fell during May. Additionally, reservoir storage is above normal for this time of year, as reservoir managers are holding back summer stores in Painted Rocks and Lake Como to bolster summer flows. While these flows will help to mitigate the effects of this early runoff, without continued spring and summer precipitation water users could experience shortages in supply through the summer months. Streamflow volumetric forecasts for the June 1st – September 30th period have decreased because of this rapid runoff. Please reference the table below for streamflow forecasts in your specific area of interest.

Bitterroot River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
WEST FORK BITTERROOT	75%	102%
EAST SIDE BITTERROOT	44%	82%
WEST SIDE BITTERROOT	48%	64%
Basin-Wide Snowpack	**46%**	**74%**

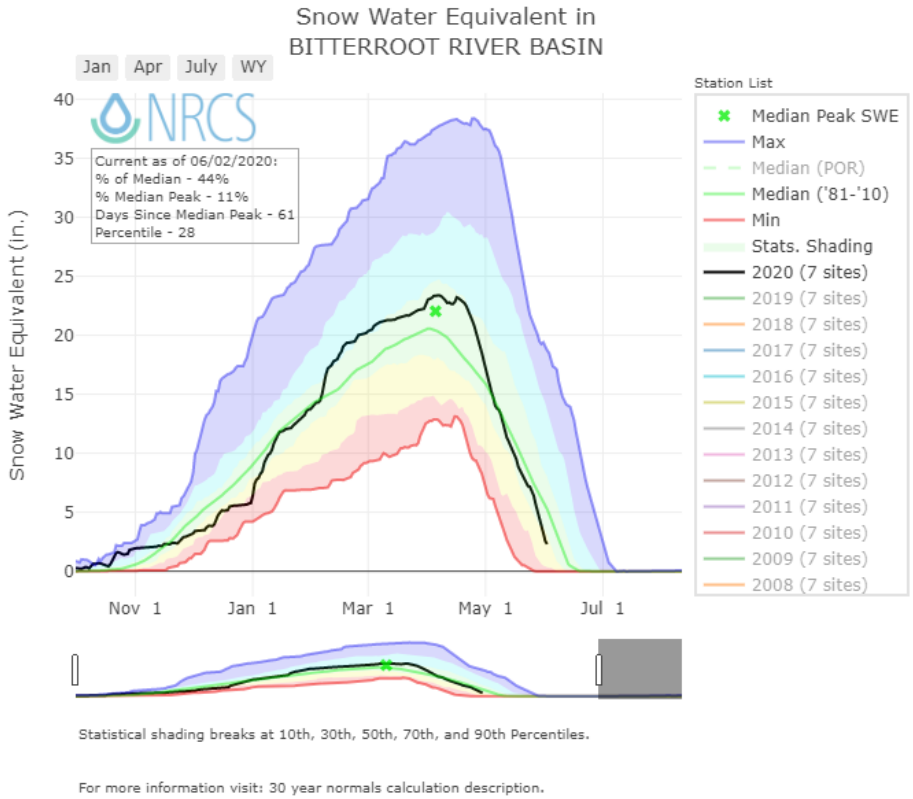
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	133%	95%	100%
Valley Precipitation	190%	79%	66%
Basin-Wide Precipitation	**136%**	**95%**	**99%**

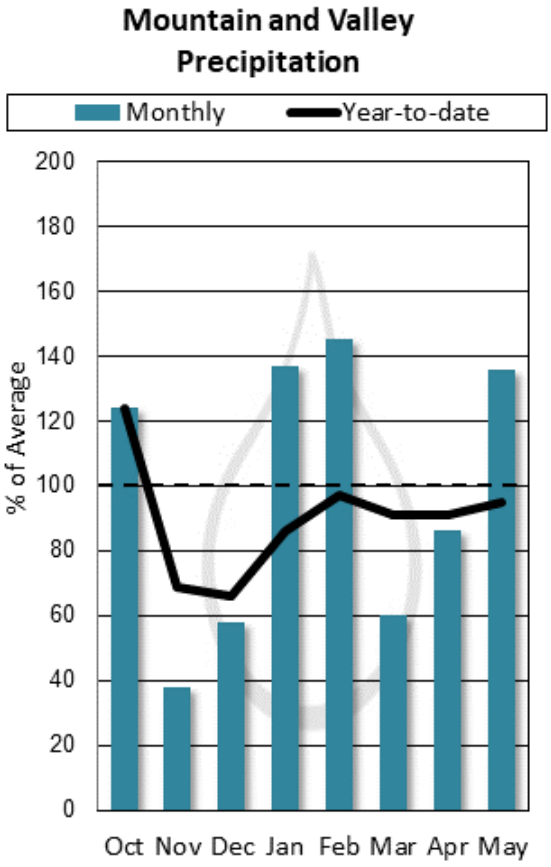
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

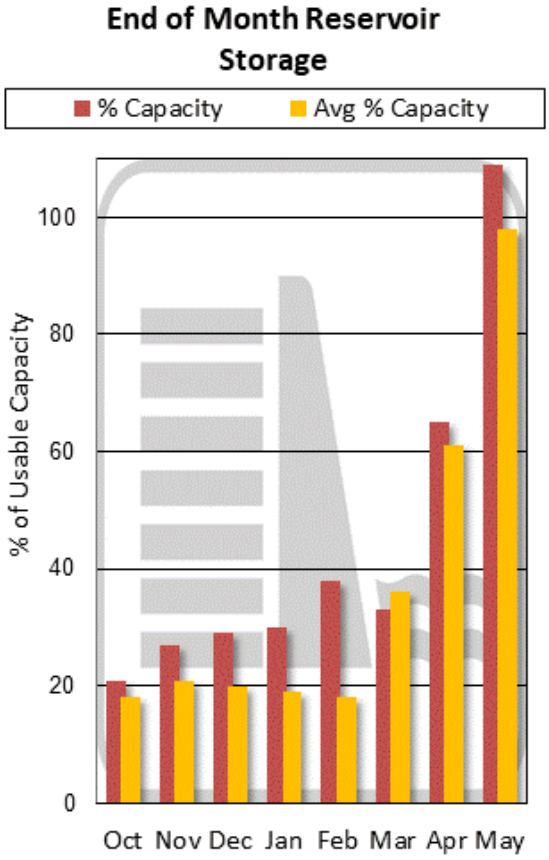
	Percentage of Average	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**111%**	**109%**	**108%**

**See Reservoir Storage Table for storage in individual reservoirs*

(click to navigate to online version with additional features)





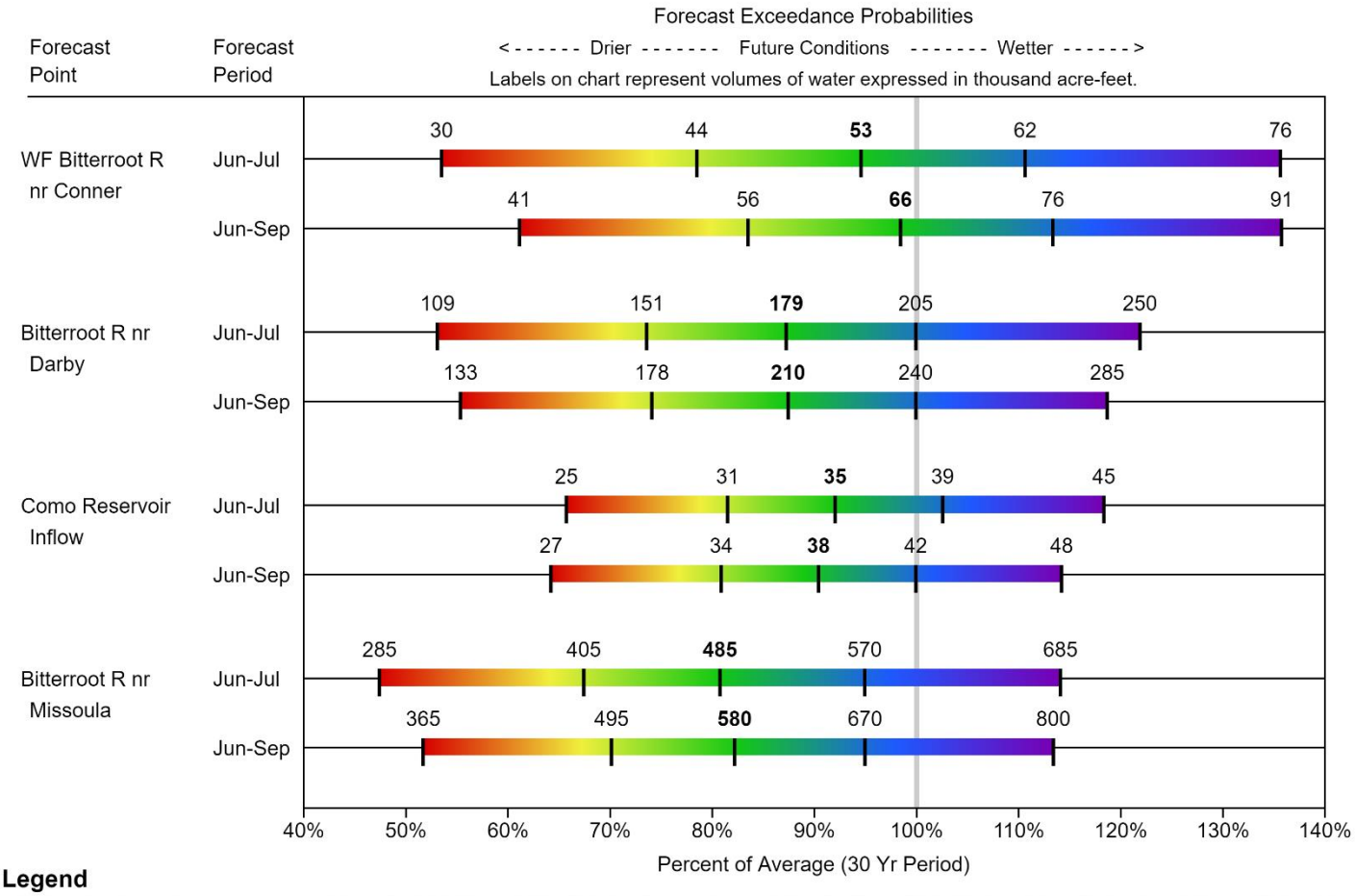


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

BITTERROOT RIVER BASIN

Water Supply Forecasts

June 1, 2020



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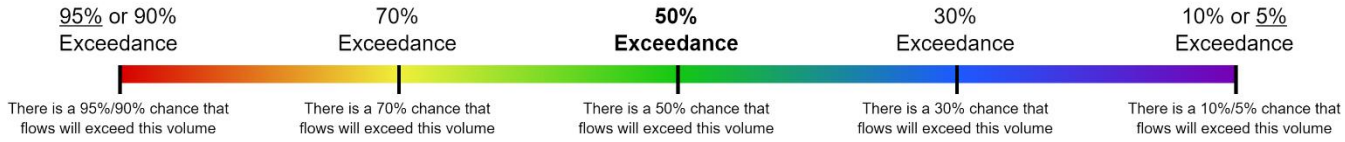


When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)

1981-2010 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Lower Clark Fork River Basin

The Lower Clark Fork as of June 1st still holds the most snow water equivalent by percent of normal in the state. This is in large part thanks to above-normal April and May storms that built on early season totals. Only high elevation snowpack remains, with Stuart Mountain and Hoodoo Basin SNOTELs holding on to ~60% of this year's peak snowpack. These high elevations will continue to melt off throughout June and could accelerate at a rate observed in basins upstream of the Lower Clark Fork. The Flathead, Bitterroot, and Upper Clark Fork Rivers have already reached minor flood stages as of June 1st, due to record high daily average temperatures and above freezing overnight lows at the end of May. Needless to say, Thompson Falls Reservoir storage is above normal, and Noxon Rapids is ramping up outflow. With early runoff upstream, and above normal snowpack still in the mountains above the Lower Clark Fork, it's best to look at your area of interest below for streamflow forecasts over the June 1st- September 30th period.

Lower Clark For River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
LOWER CLARK FORK RIVER BASIN	151%	92%
Basin-Wide	**151%**	**92%**

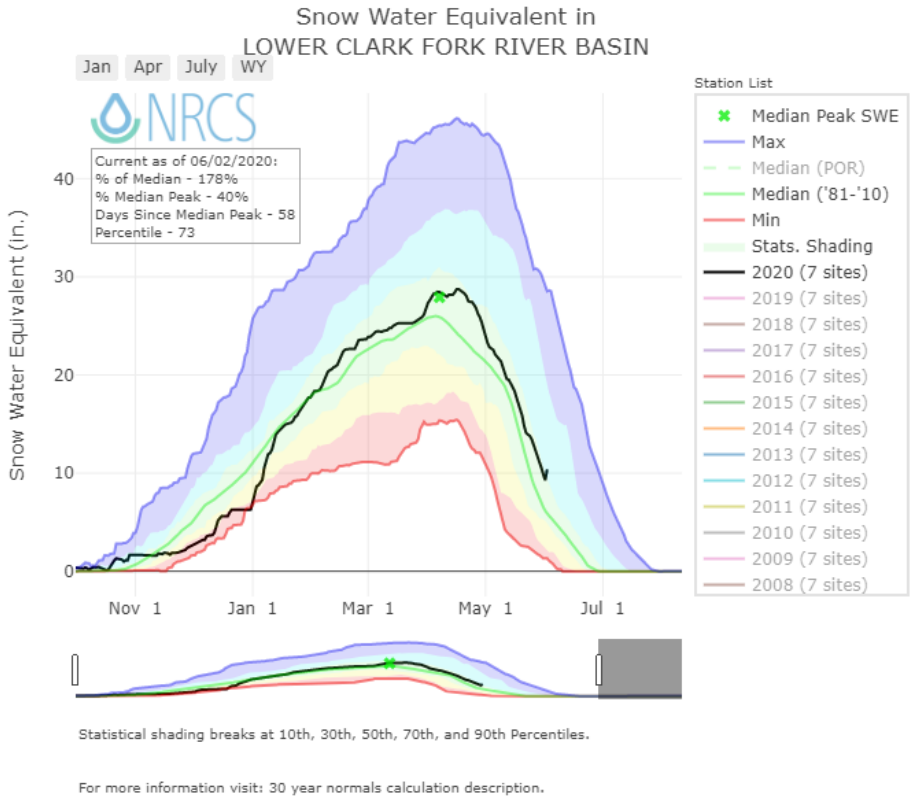
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	121%	94%	90%
Valley Precipitation	141%	82%	102%
Basin-Wide Precipitation	**124%**	**92%**	**91%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

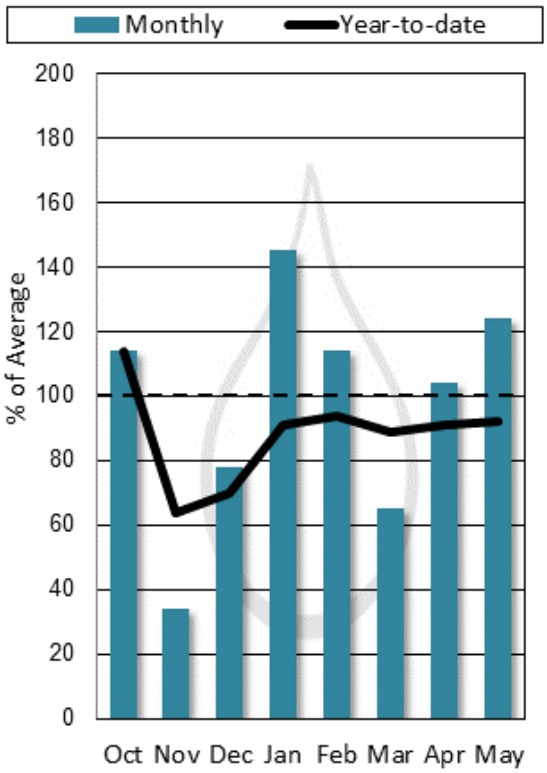
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**102%**	**99%**	**102%**

**See Reservoir Storage Table for storage in individual reservoirs*

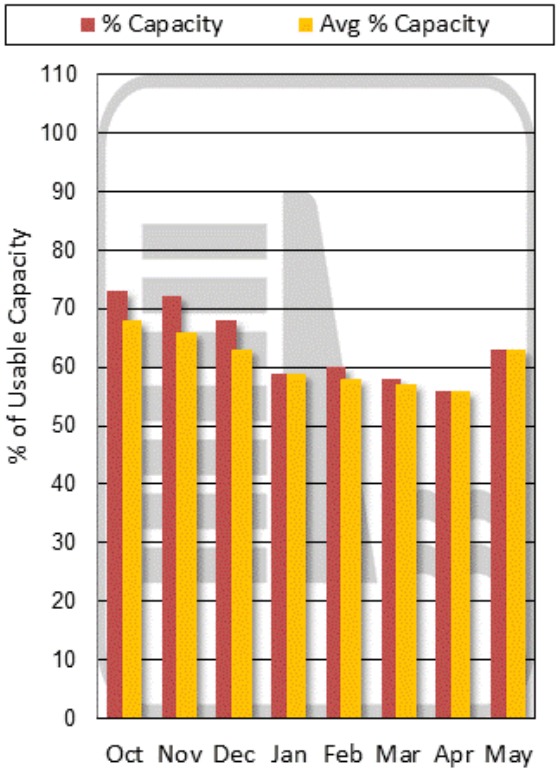
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

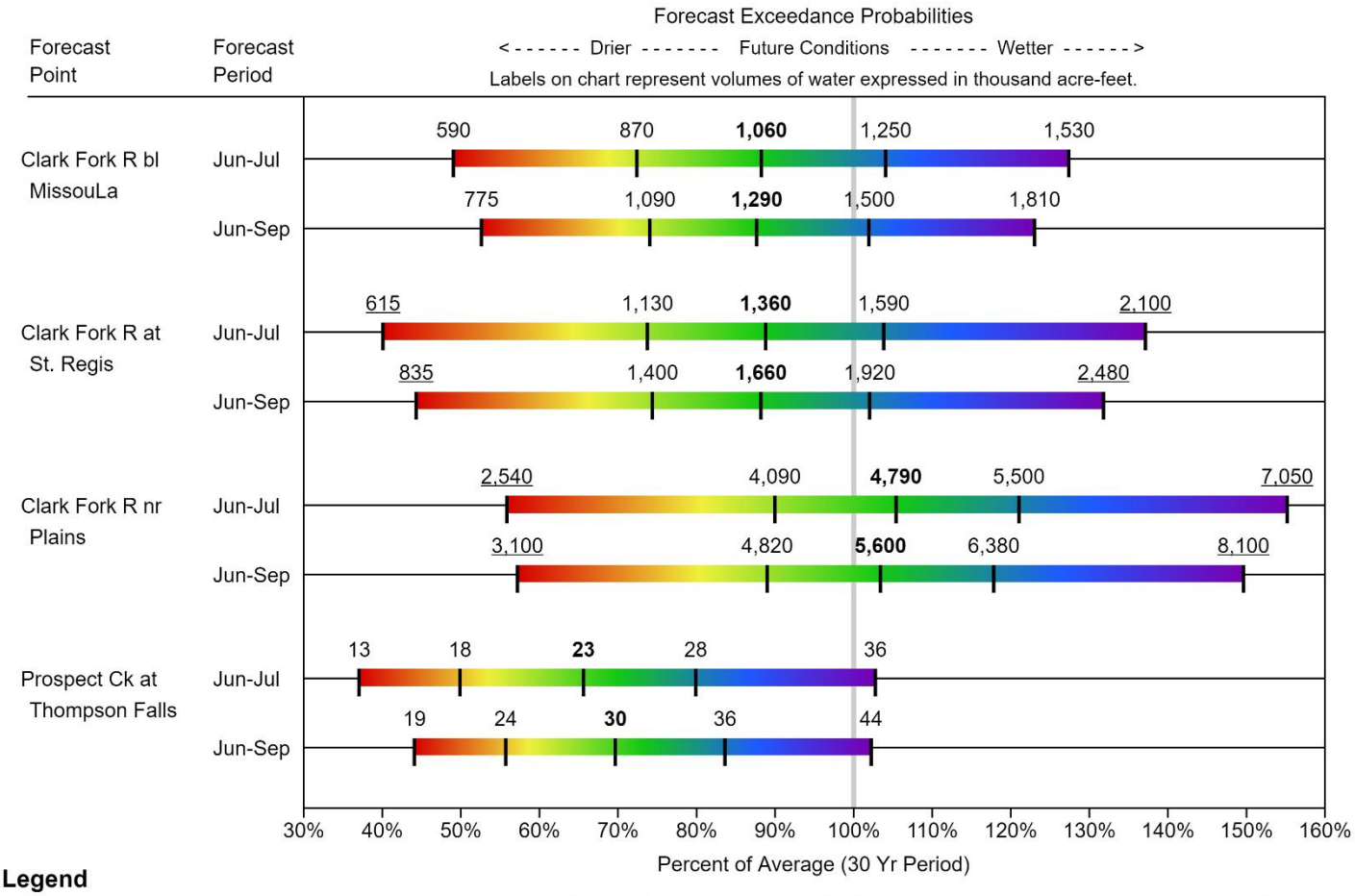


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

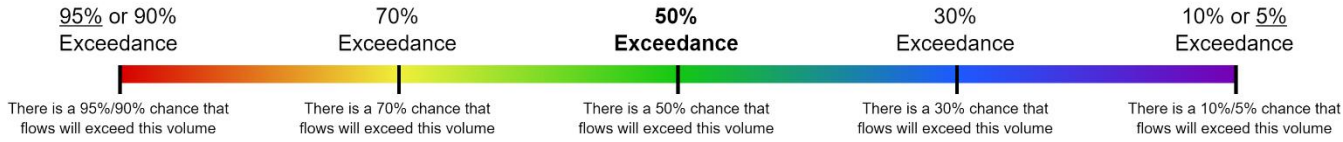
LOWER CLARK FORK RIVER BASIN

Water Supply Forecasts

June 1, 2020



Legend



When selected, the following historic streamflow values and statistics will be shown.

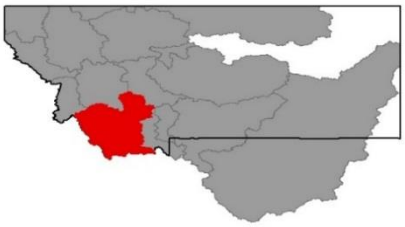
Period of Record Minimum Streamflow KAF (Year)

1981-2010 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.



Jefferson River Basin

May precipitation varied widely within the Jefferson River basin. While the Big Hole received near to above-average precipitation at mountain locations, other areas to the east were left high and dry through most of the month. Valleys have been unusually dry during April and May, receiving only 8 to 34 percent of the average between April 1st and May 31st. Early snowmelt, especially at low and mid-elevations, left some SNOTEL sites snow-free early in May. The Lakeview Ridge SNOTEL sites, located in the Upper Red Rock River basin, was snow-free as of May 5th, nearly 15 days early. Other sites within the basin have been melting through the month with snowmelt accelerating rapidly during the last week of May. The ahead of schedule melt and a big slug of snowmelt at the end of the month will result in lower than normal flows later in the summer on non-reservoir-controlled rivers, especially if the long-range weather forecasts prove accurate. Volumetric streamflow forecasts have dropped to below average for the June 1st – September 30th for most rivers within the Jefferson River basin, so water users are encouraged to look at individual streamflow forecasts below to gauge the impact on their river of interest.

Jefferson River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
BEAVERHEAD	63%	119%
RUBY	39%	128%
BIGHOLE	72%	101%
BOULDER	39%	116%
Basin-Wide Snowpack	**55%**	**120%**

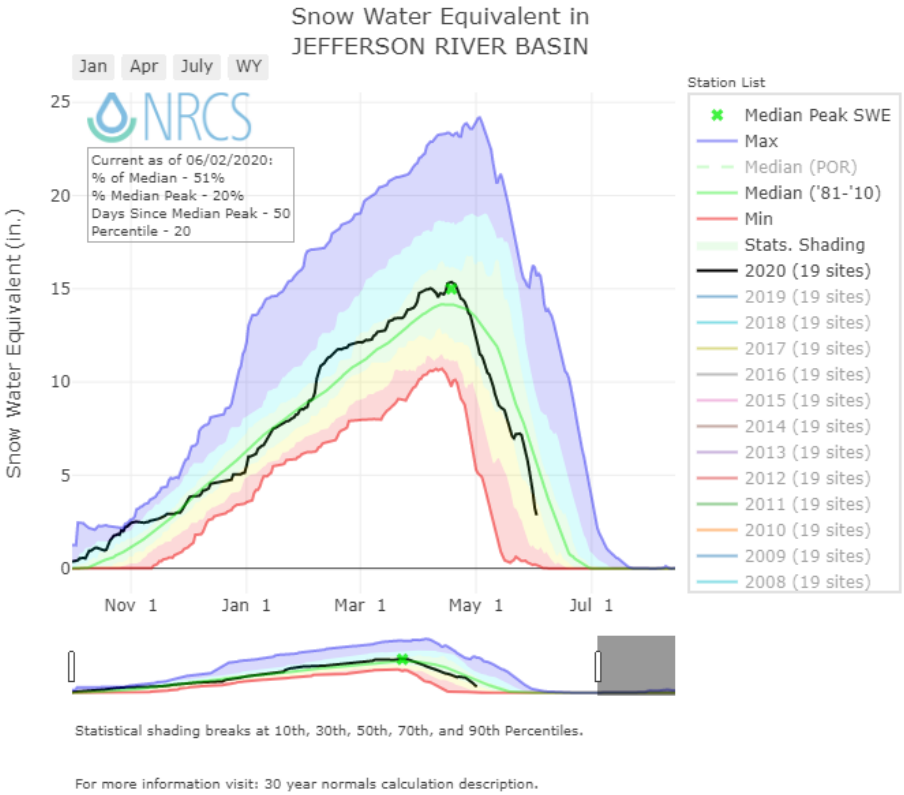
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	78%	89%	101%
Valley Precipitation	%	%	%
Basin-Wide Precipitation	**78%**	**89%**	**101%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

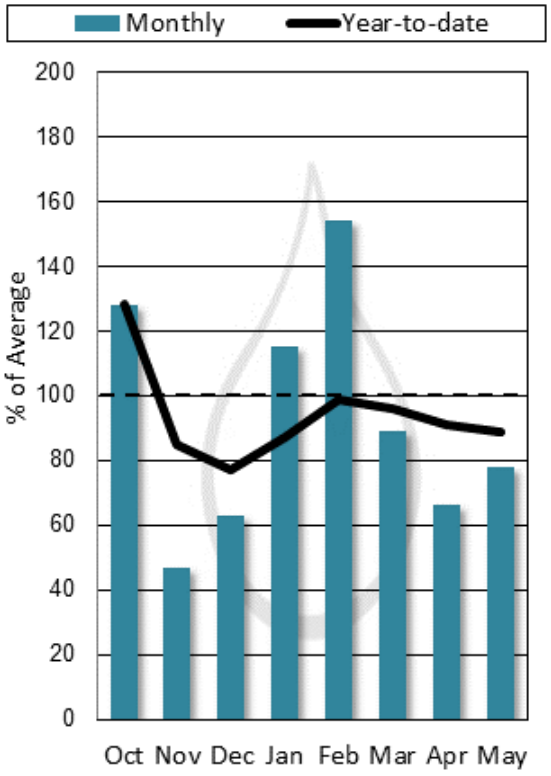
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**110%**	**68%**	**116%**

**See Reservoir Storage Table for storage in individual reservoirs*

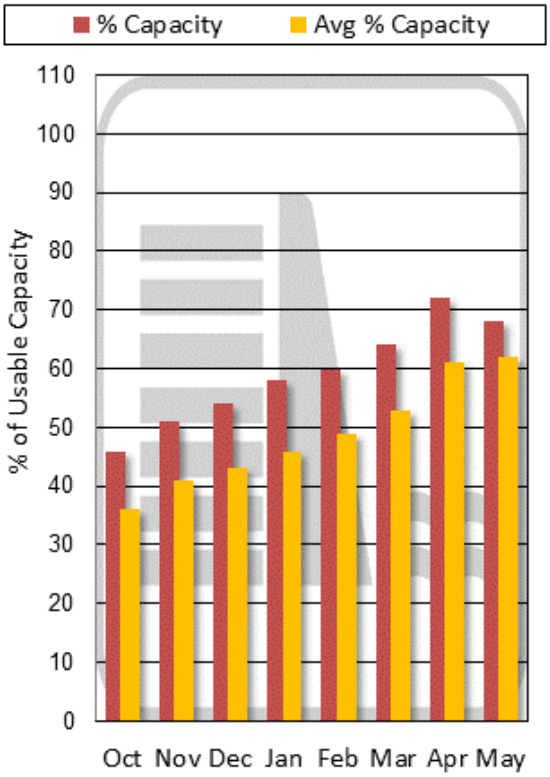
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

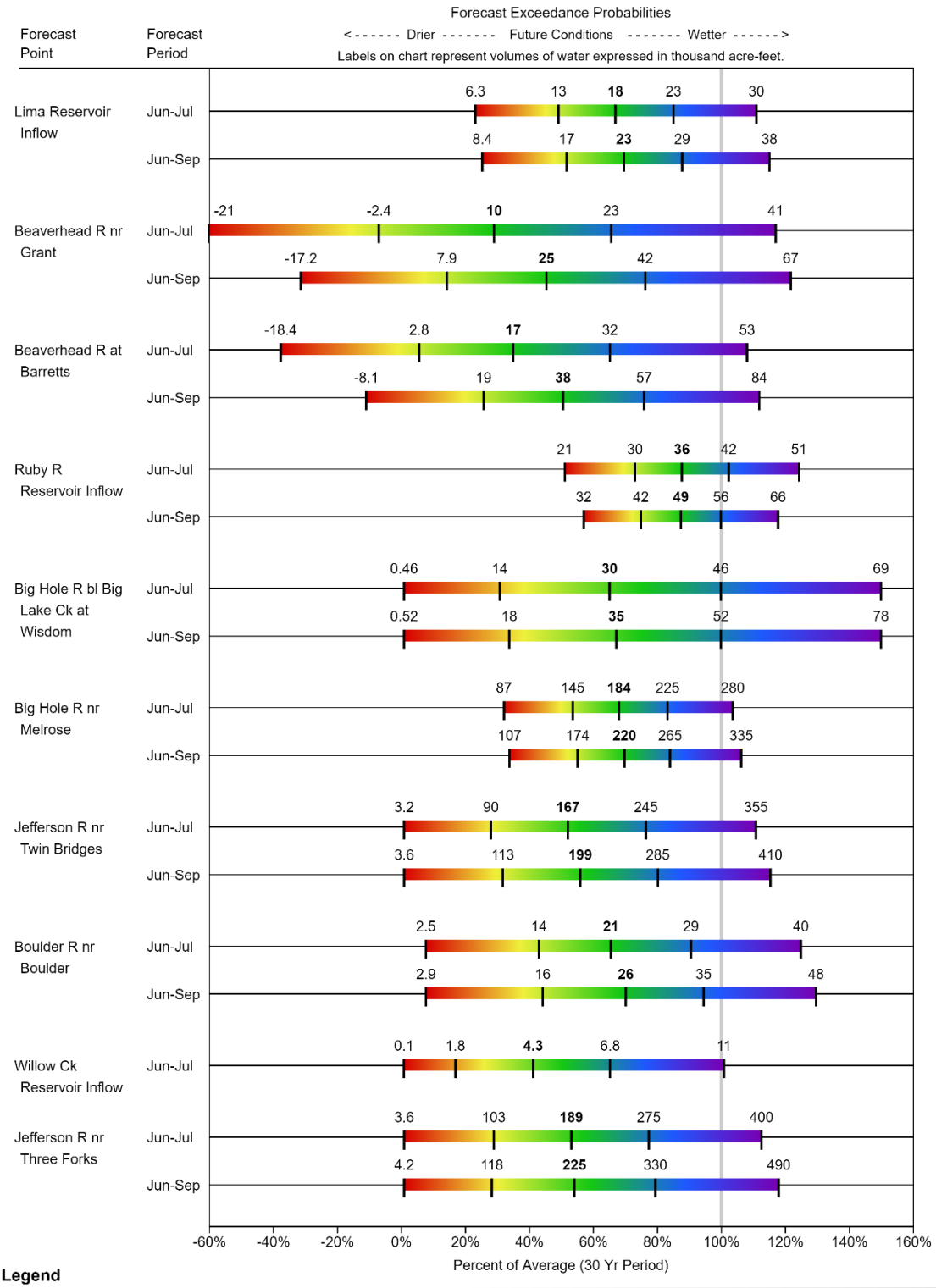


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

JEFFERSON RIVER BASIN

Water Supply Forecasts

June 1, 2020



Legend

95% or 90% Exceedance — There is a 95%/90% chance that flows will exceed this volume

70% Exceedance — There is a 70% chance that flows will exceed this volume

50% Exceedance — There is a 50% chance that flows will exceed this volume

30% Exceedance — There is a 30% chance that flows will exceed this volume

10% or 5% Exceedance — There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)

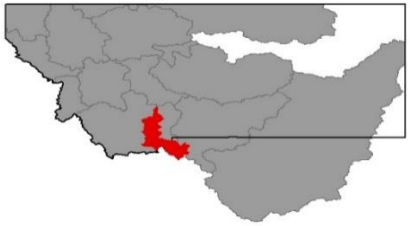
1981-2010 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Madison River Basin



After a dry April, there was hope that May would turn the tide in the Madison River basin; unfortunately, it wasn't the turnaround we were hoping for. The southern end of the Madison River basin received below-average precipitation at lower elevations, but near normal precipitation at higher elevations. Further north, precipitation in the Madison River Valley near Ennis, and the Tobacco Root Mountains was well below average to record-setting low for the month. Snowmelt in the Madison River basin has been ongoing throughout the month, but it quickly accelerated during the last week of May. The rapid rises in snowmelt at the end of the month resulted in significant increases in fin water being released from both Hebgen and Ennis Lakes to make room for the large volume of water coming in. Streamflow forecasts for the June 1st – September 30th period have dropped since last month due to the large amount of snow water that has moved through the river system. Forecasts for both Hebgen and Ennis Lake inflows are below average; however, stored water should offset the lower than normal flows when demand is highest later this summer.

Madison River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
MADISON abv HEBGEN LAKE	76%	173%
MADISON blw HEBGEN LAKE	60%	124%
Basin-Wide Snowpack	**65%**	**138%**

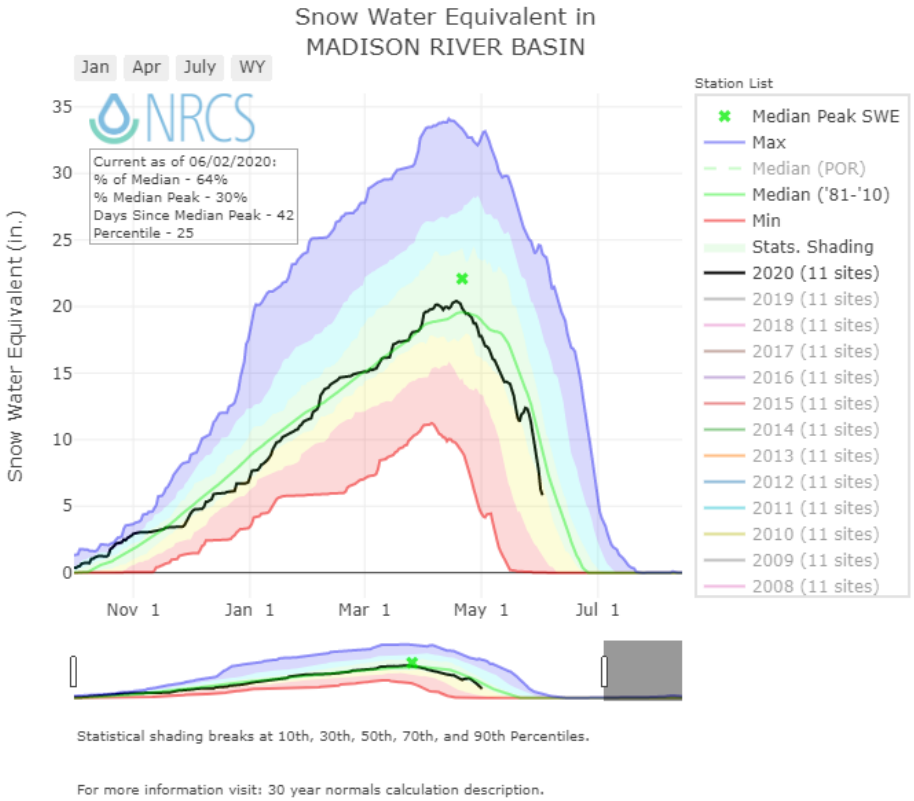
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	75%	86%	108%
Valley Precipitation	32%	71%	162%
Basin-Wide Precipitation	**71%**	**85%**	**111%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**104%**	**92%**	**95%**

**See Reservoir Storage Table for storage in individual reservoirs*

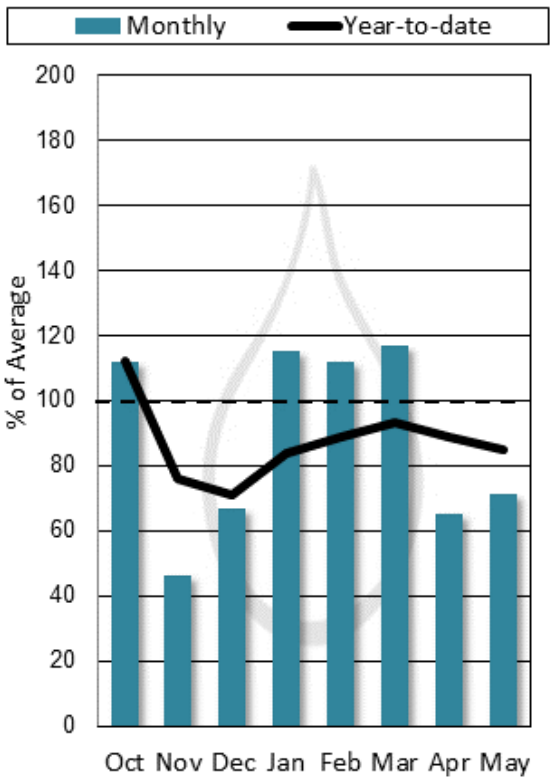
(click to navigate to online version with additional features)



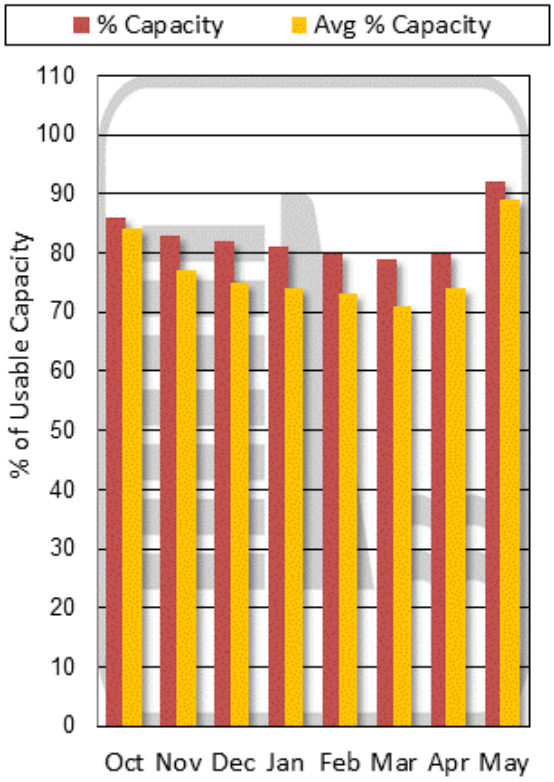
Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.

For more information visit: 30 year normals calculation description.

Mountain and Valley Precipitation



End of Month Reservoir Storage

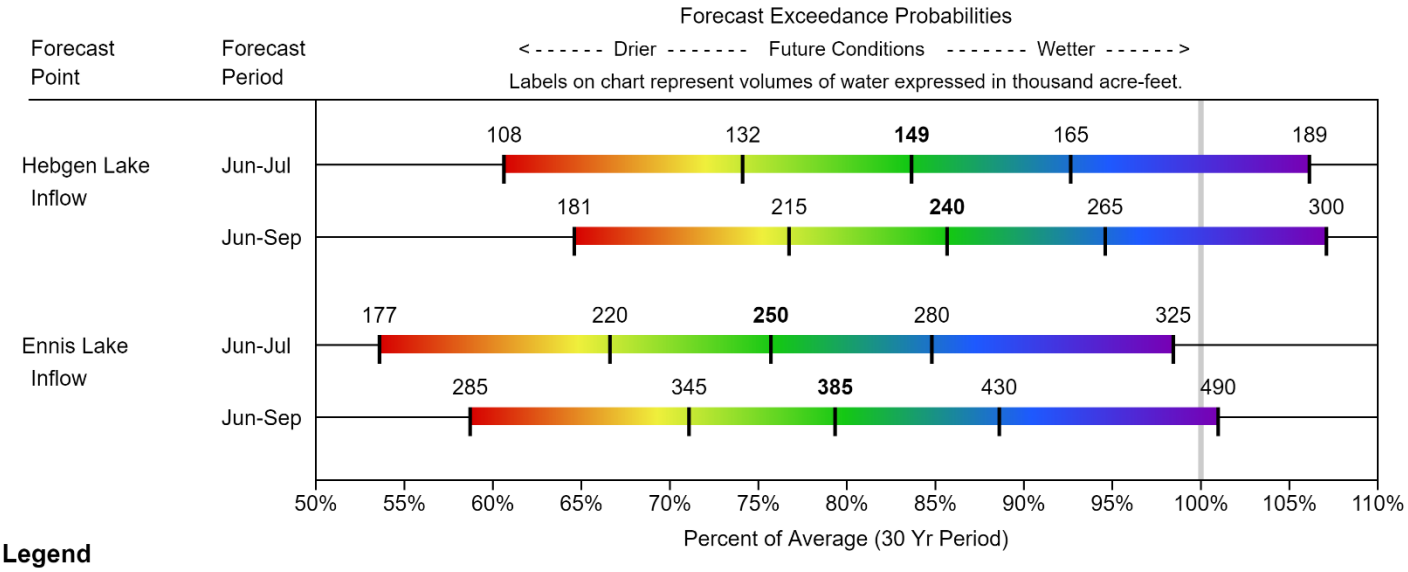


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

MADISON RIVER BASIN

Water Supply Forecasts

June 1, 2020



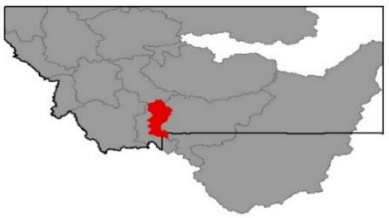
Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.



Gallatin River Basin

Monthly precipitation in the Gallatin Valley was a paltry 27 to 56 percent of average for May, so if it seemed like it was a dry month, that's because it was. Mountain locations fared better during the month, receiving 78 to 104 percent of normal precipitation. Looking further back at two-month precipitation totals for April and May, the dry pattern continues, but it becomes evident how dry it has been in both mountain and valley locations this spring. Three SNOTEL sites set new records for lowest April – May precipitation, and three valley stations were second lowest on record. Fortunately, snowpack peaked near to above normal at many mountain locations this year before snowmelt commenced. However, a significant amount of the snowpack has melted during the last week of May due to the abnormally warm temperatures, which gradually increased to near record-setting at mountain locations on May 30th and 31st. As a result, there were quick rises in local rivers with the Gallatin River at Gateway approaching 7,000 cubic feet per second on June 1st, nearly double the average peak flow. This rapid loss of snow water was enough to reduce the remaining snowpack from 109 percent of normal on May 29th to 73 percent of normal on June 4th. This rapid loss of snowpack is concerning, as it reduces the water available later in the summer when demand is highest. Due to the accelerated melt this year, and lack of April and May precipitation, streamflow forecasts have dipped for the June 1st – September 30th period to slightly below average. Individual forecasts can be seen in the forecast table below.

Gallatin River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
UPPER GALLATIN	*84%*	*126%*
HYALITE	*115%*	*118%*
BRIDGER	*13%*	*432%*
Basin-Wide Snowpack	**89%**	**140%**

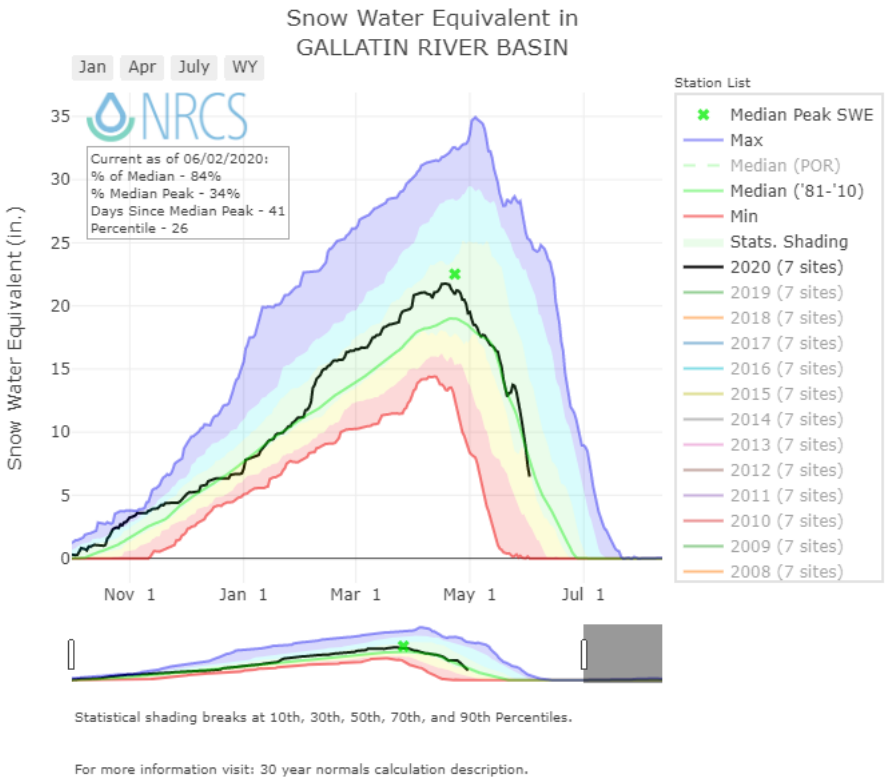
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	80%	101%	113%
Valley Precipitation	47%	69%	111%
Basin-Wide Precipitation	**75%**	**98%**	**113%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

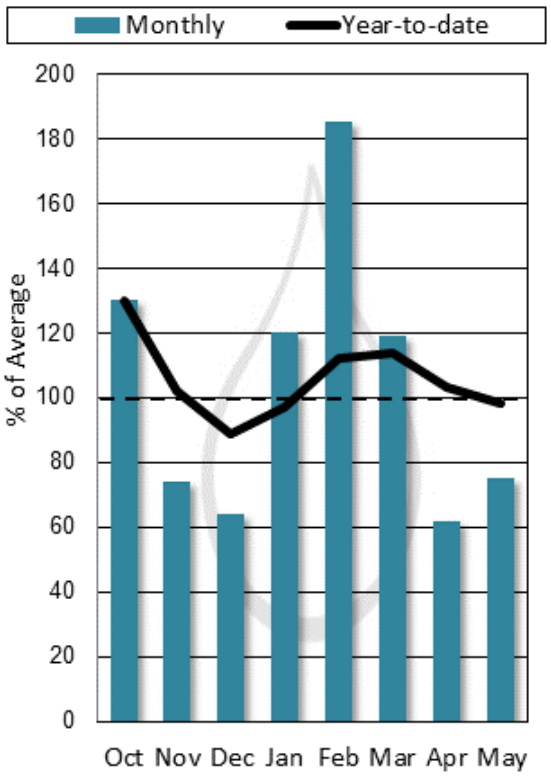
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**121%**	**102%**	**120%**

**See Reservoir Storage Table for storage in individual reservoirs*

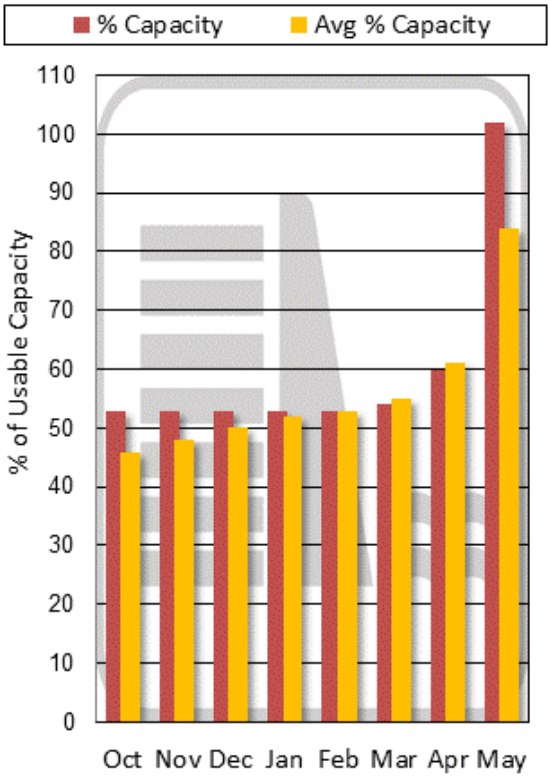
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

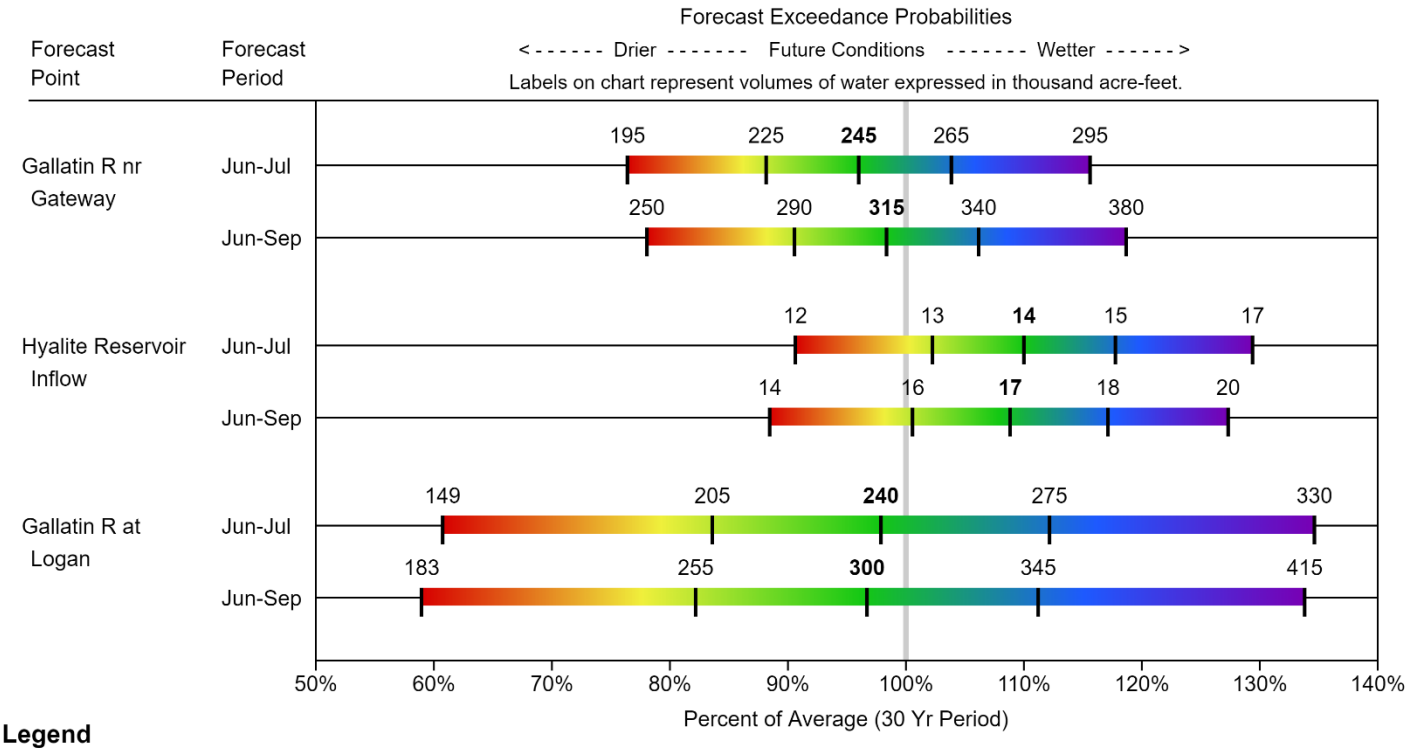


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

GALLATIN RIVER BASIN

Water Supply Forecasts

June 1, 2020



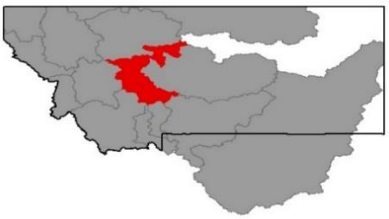
Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.



Headwaters Mainstem (Missouri) River Basin

May precipitation in the Headwaters Mainstem basin was well below average. This includes Tizer Basin SNOTEL, which had its second-lowest May on record. With that said, water year precipitation is only slightly below average, and the snowpack this year peaked at near-normal conditions in mid-April. Since then, the overall snowmelt rate has been much higher than normal. If it weren't for the relatively cold temperatures and precipitation during the first couple weeks of May, all SNOTEL sites would likely be melted out in the basin. During this time, high elevation SNOTEL sites received small snow accumulations. During the last couple of days of the month, high elevation temperatures reached 60-70 degrees, and snowmelt drastically increased. Overall, above average snowmelt occurred during May reducing streamflow forecasts from the May 1st estimates. Currently, June-September streamflow is forecasted to be below average in the Headwaters Mainstem basin.

Headwaters Missouri Mainstem River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
HEADWATERS MAINSTEM	33%	122%
Basin-Wide Snowpack	**33%**	**122%**

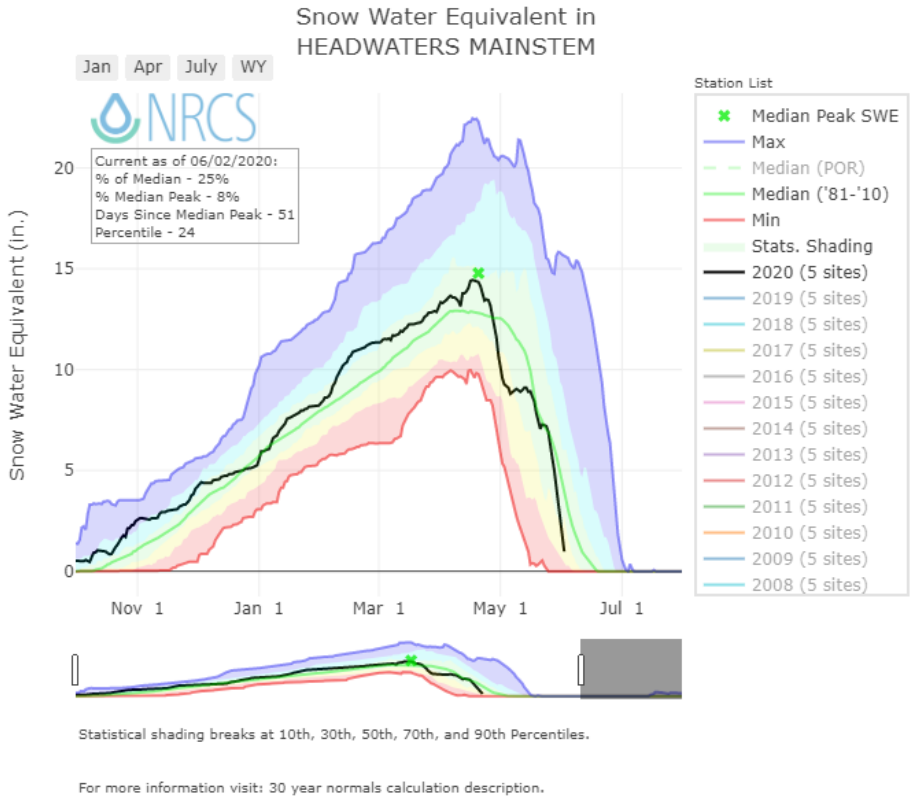
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	83%	92%	107%
Valley Precipitation	84%	95%	148%
Basin-Wide Precipitation	**83%**	**92%**	**109%**

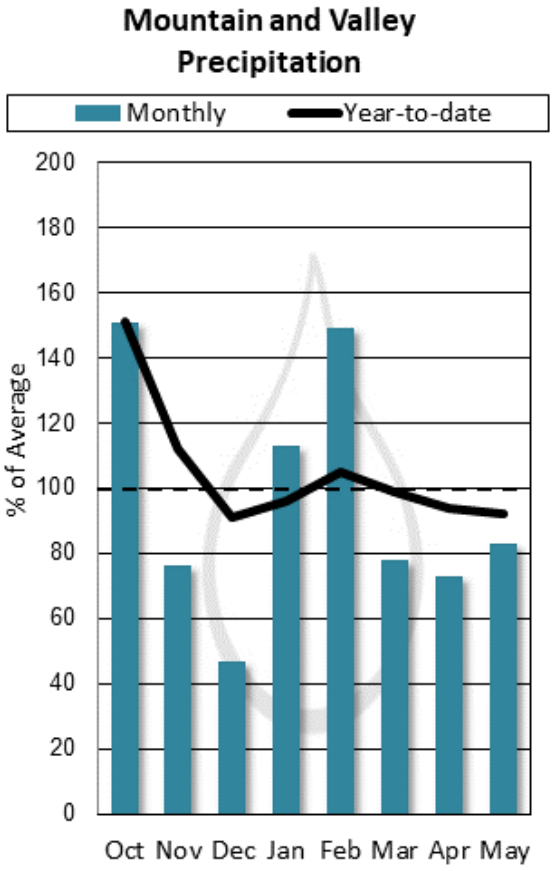
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

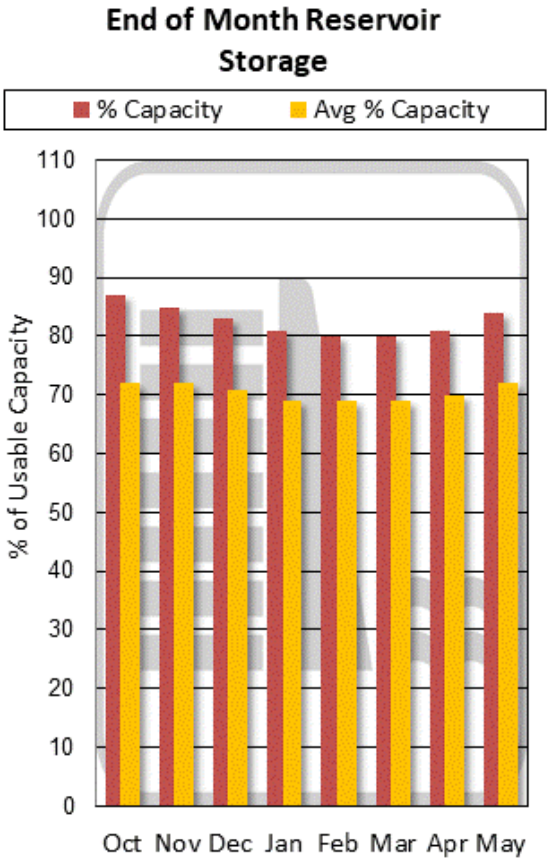
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**116%**	**84%**	**125%**

**See Reservoir Storage Table for storage in individual reservoirs*

(click to navigate to online version with additional features)





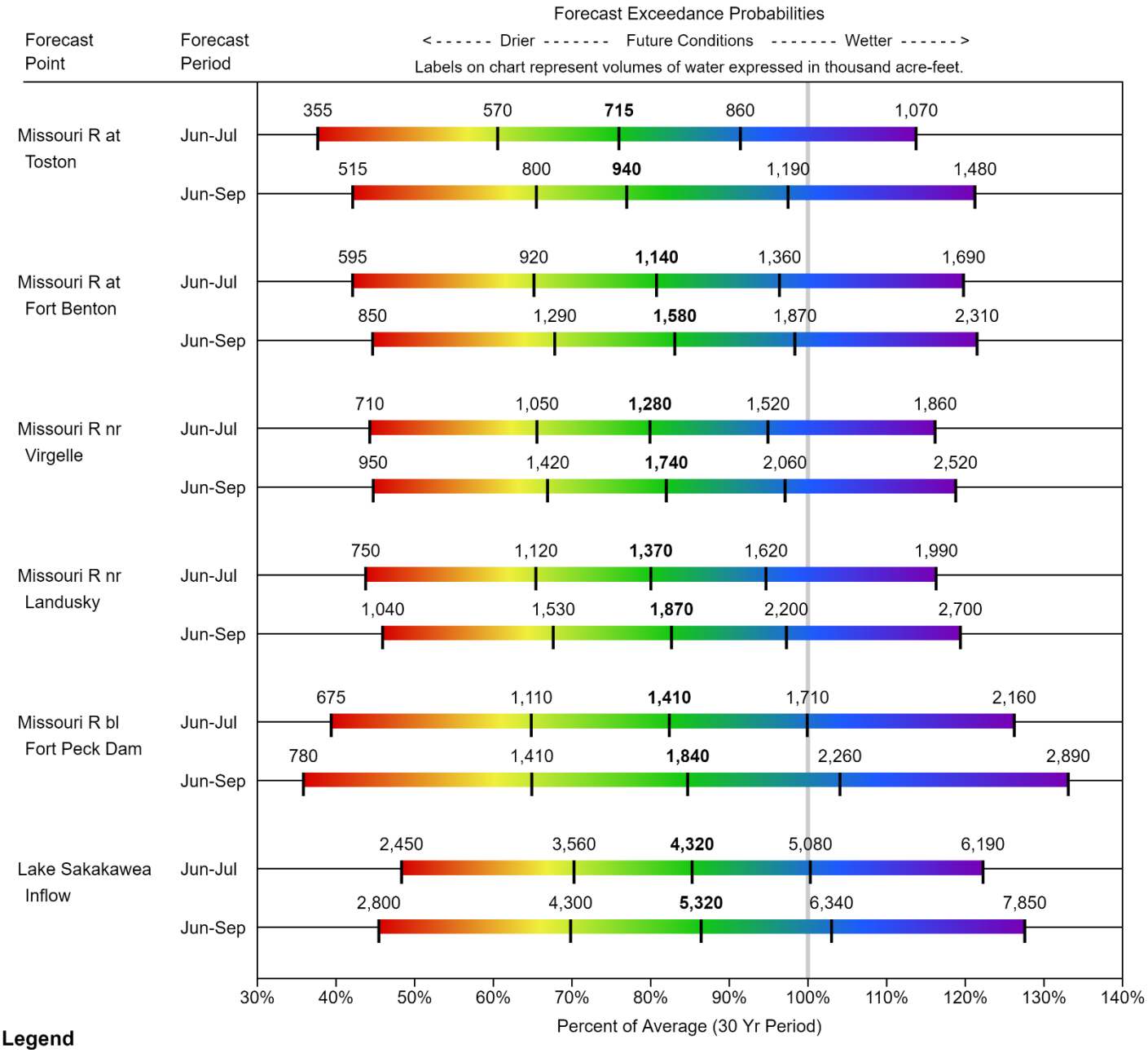


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

MISSOURI MAINSTEM BASIN

Water Supply Forecasts

June 1, 2020



Legend

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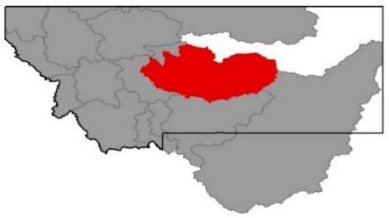
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.



Smith-Judith-Musselshell River Basin

Precipitation was well above average in the Smith-Judith-Musselshell River basin during May. Most of the precipitation occurred during the colder first half of the month. Water year precipitation has been slightly above average, and snow remains at upper elevations only. The basin-wide snowpack peaked at near-normal conditions in mid-April. Currently, with 14 inches of snow (5.8 inches snow water), Onion Park SNOTEL has over double it's normal June 1st snowpack. Spur Park SNOTEL currently has about 40 inches of snow. Due to near-record high temperatures, significant snowmelt occurred at the end of April and end of May, which pushed streamflows soaring to near-record high stages. As a result of the above-average snowmelt, streamflow forecasts have decreased slightly since May 1st. Currently, June-September streamflow forecasts range from the near-to-below average in the Smith-Judith-Musselshell River basin.

Smith Judith Musselshell River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
SMITH	102%	134%
HIGHWOOD	%	%
JUDITH	128%	166%
MUSSELSHELL	%	%
Basin-Wide Snowpack	**105%**	**157%**

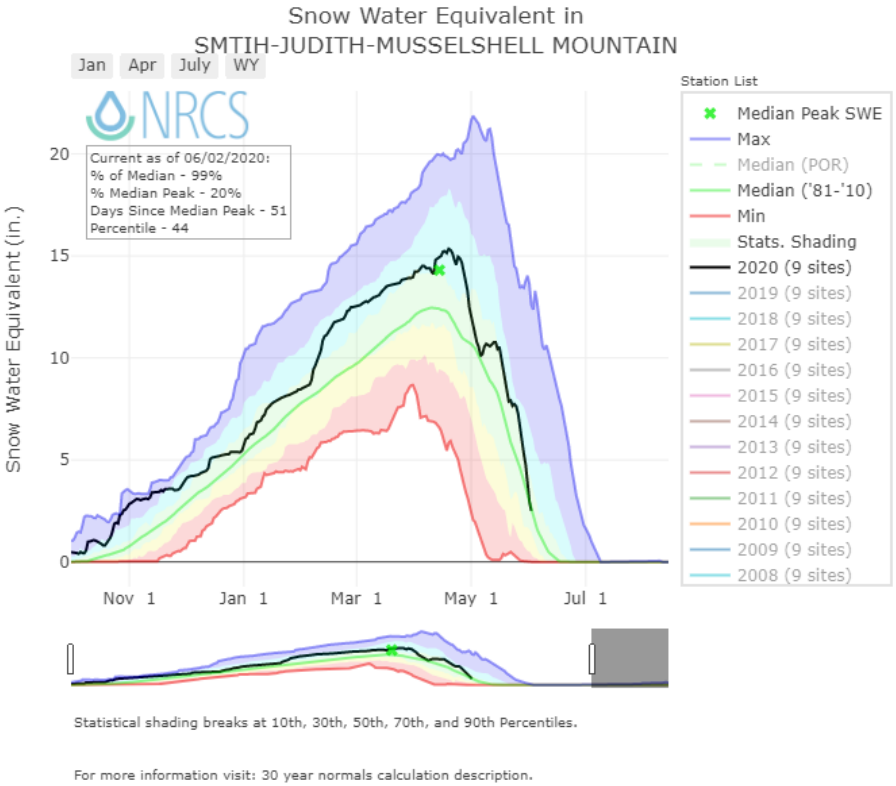
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	115%	100%	102%
Valley Precipitation	158%	114%	120%
Basin-Wide Precipitation	**120%**	**101%**	**104%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

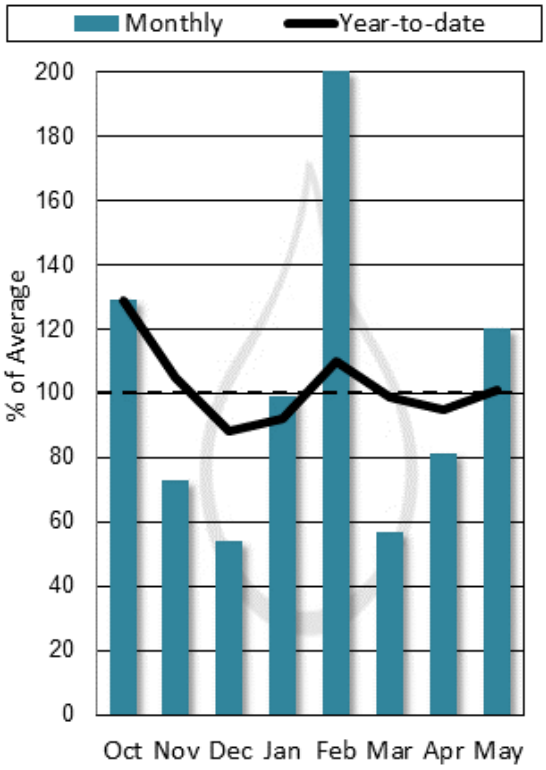
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**147%**	**103%**	**149%**

**See Reservoir Storage Table for storage in individual reservoirs*

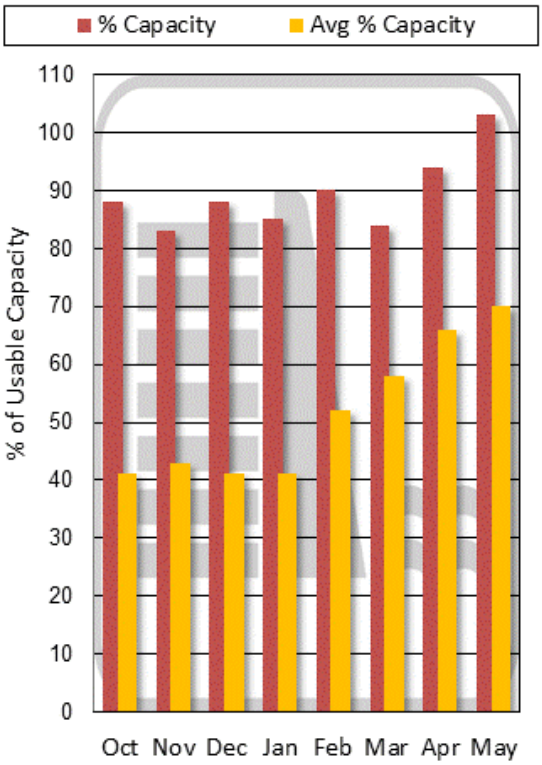
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

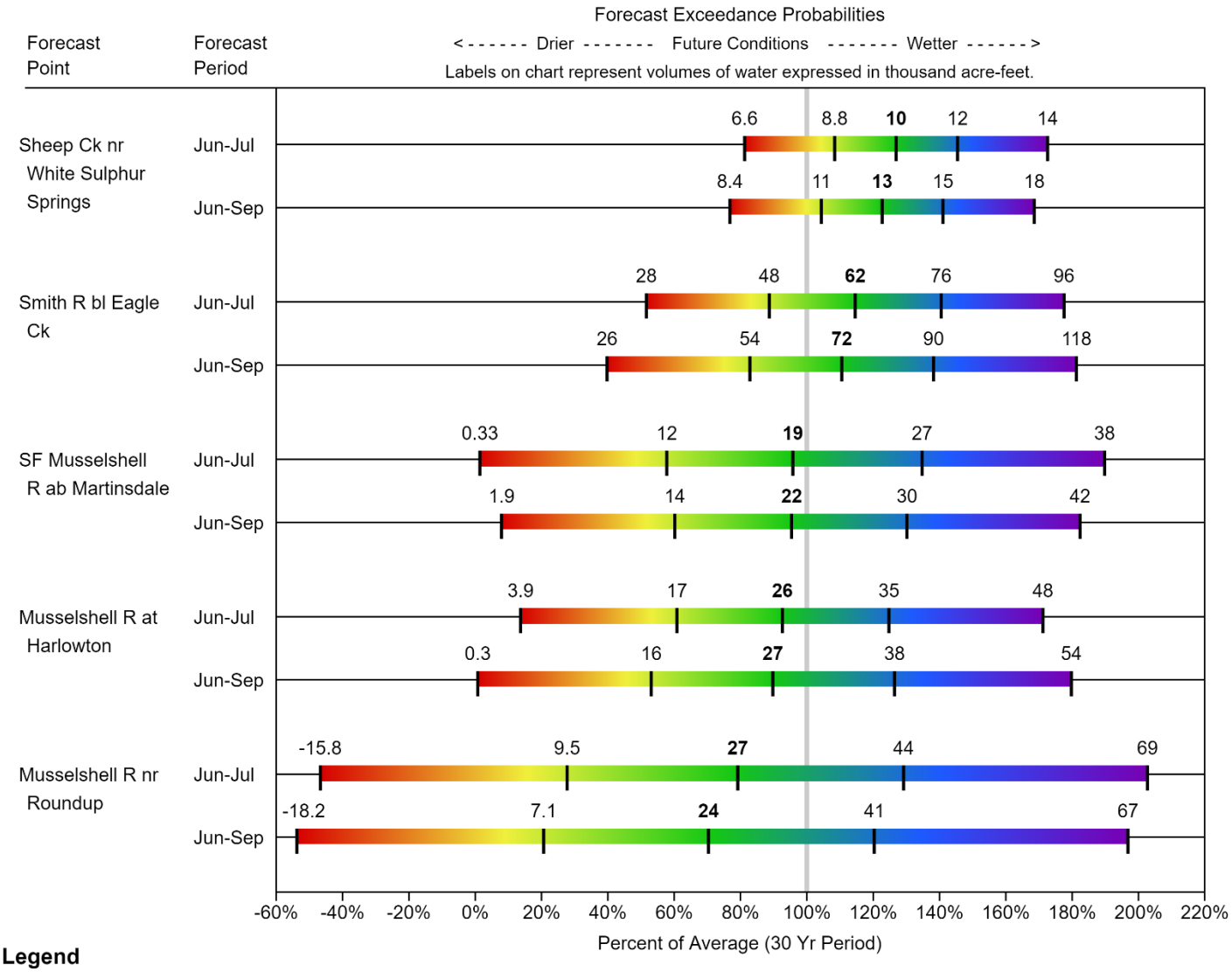


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

SMITH-JUDITH-MUSSELSHELL

Water Supply Forecasts

June 1, 2020



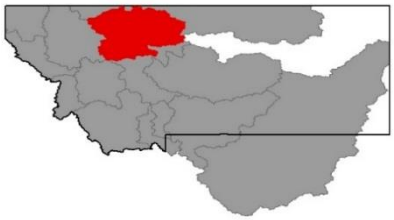
Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.



Sun-Teton-Marias River Basin

Precipitation was below average in the Sun-Teton-Marias River Basin during May. Fortunately, water year precipitation has been near average. The snowpack peaked at well above normal conditions in mid-April and, in general, has been melting faster than normal. Over the last month and a half, the basin-wide snowpack has gone from well above normal to near normal. This was primarily due to near-record high temperatures in late April and late May. The exception to the above-average melt occurred during the first half of May when temperatures were cooler. High elevations received some snowfall during this period. During this time, Badger Pass SNOTEL received about 6 inches of snow. Due to the above-average melt rates over the last month and a half, streamflow forecasts have decreased slightly since May 1st. Currently, June-September streamflow is forecasted to be below average in the Sun-Teton-Marias River basin.

Sun-Teton-Marias River Basin Data Summary

Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
SUN	131%	171%
TETON	131%	171%
MARIAS	98%	59%
Basin-Wide Snowpack	**105%**	**82%**

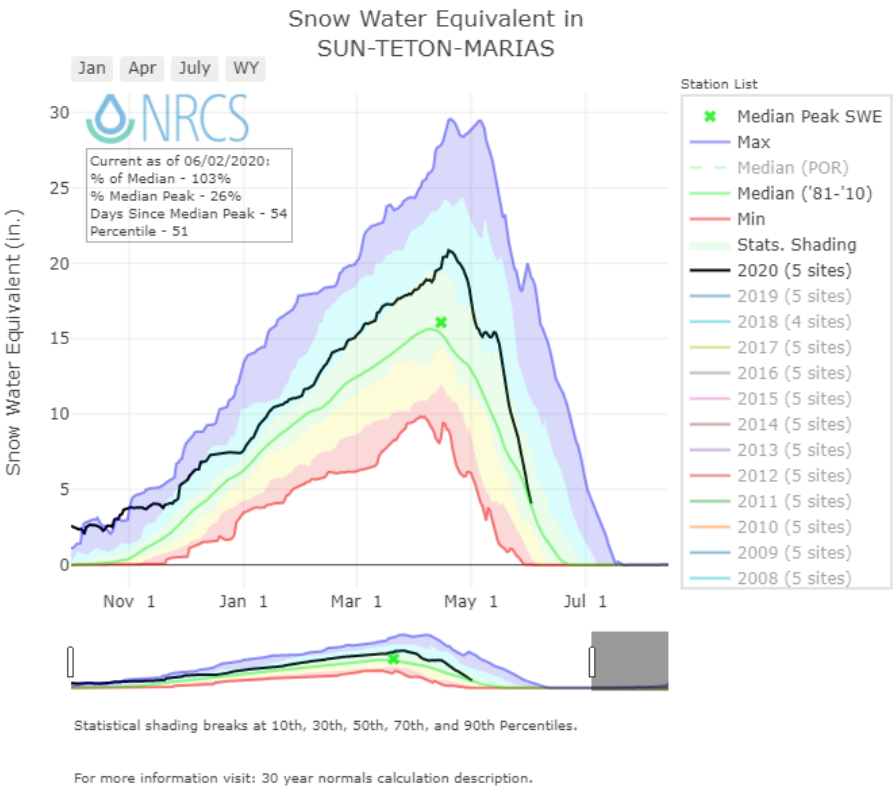
Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	88%	95%	98%
Valley Precipitation	92%	108%	174%
Basin-Wide Precipitation	**89%**	**96%**	**106%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

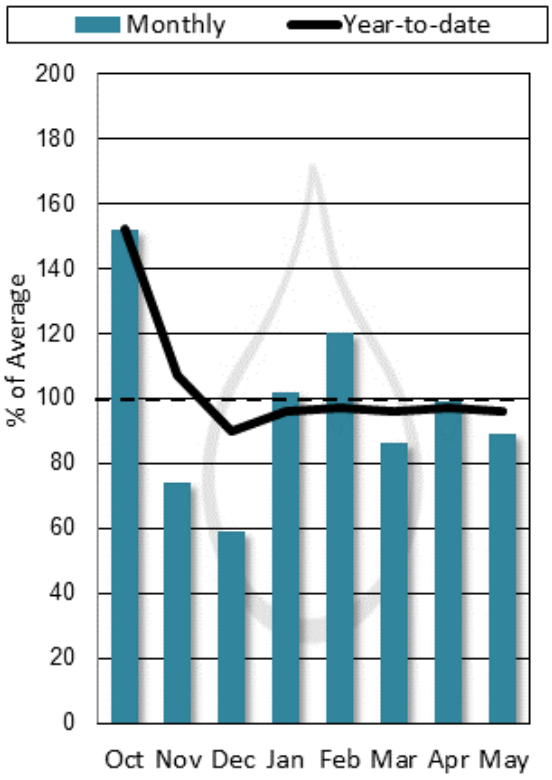
Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**111%**	**70%**	**121%**

**See Reservoir Storage Table for storage in individual reservoirs*

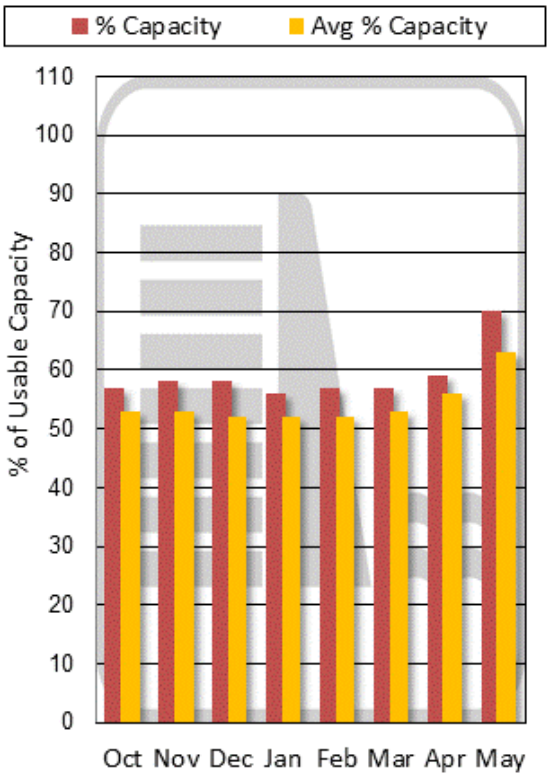
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

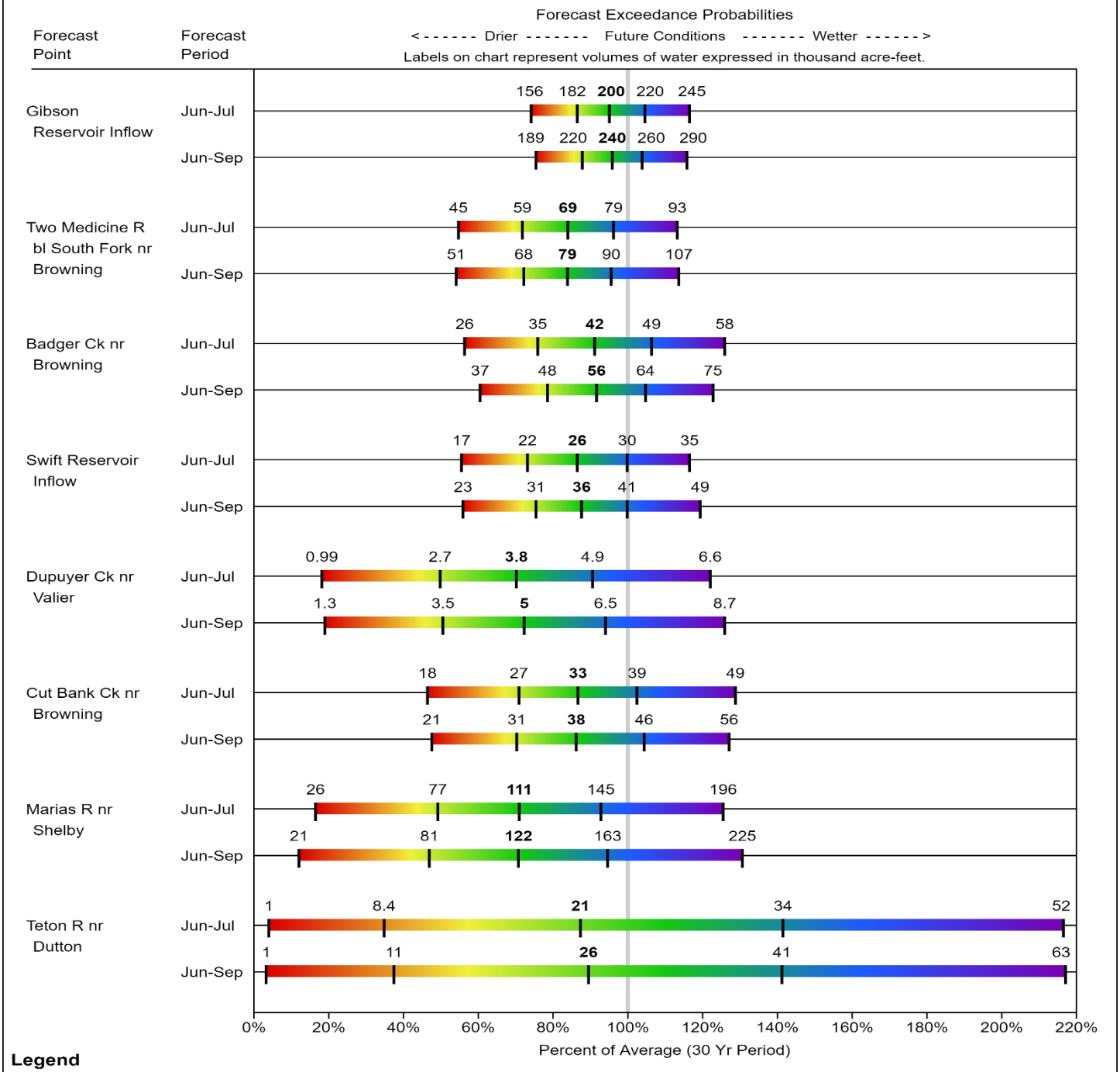


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

SUN-TETON-MARIAS

Water Supply Forecasts

June 1, 2020



Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

St. Mary-Milk River Basin

The upper elevations of Glacier National Park received near-average precipitation during May, however basin-wide monthly precipitation was below average in the Saint-Mary Milk River basin. The basin-wide snowpack peaked at well above normal conditions in mid-April and has been on the move since. Significant melt in late April slowed down in early May due to cooler temperatures and precipitation, which brought snow to high elevations. The 2nd half of May brought near average temperatures and melt continued as normal until the last several days of the month when temperatures reached record highs state-wide. During this time, snowmelt increased to well above normal rates, and river levels rose significantly. Currently, June-September streamflow is forecasted to be slightly above average in the Saint-Mary Milk River basin.

St. Mary-Milk River Basin Data Summary

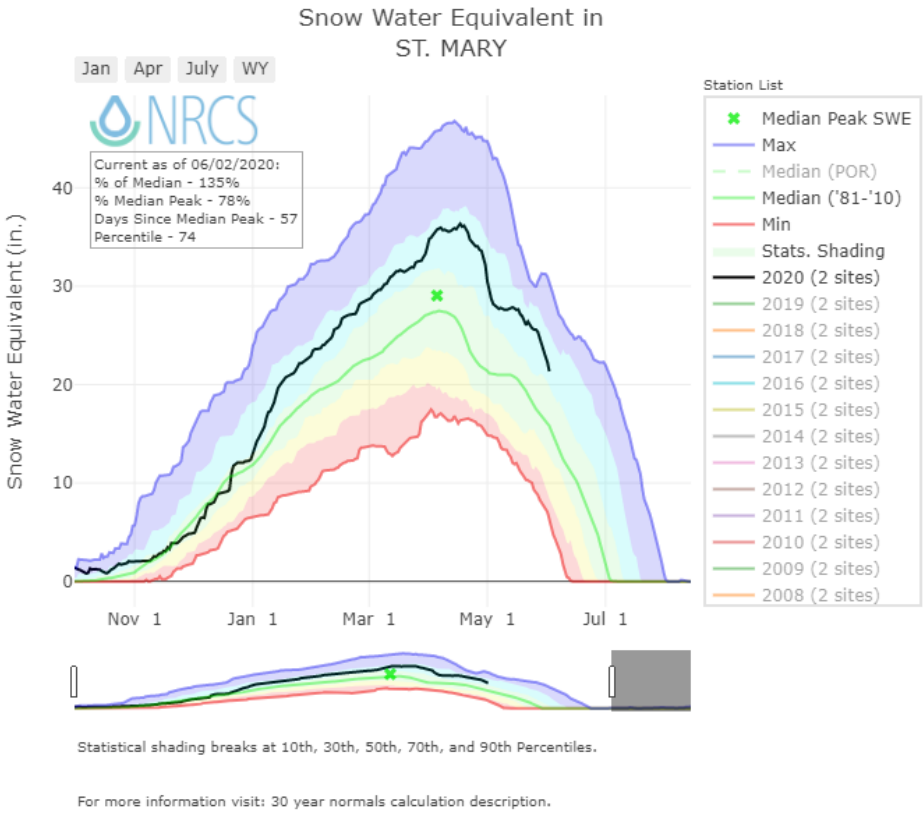
Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
ST. MARY	138%	73%
BEARPAW MOUNTAINS	%	%
MILK RIVER BASIN	%	%
Basin-Wide	**138%**	**73%**

Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation (St. Mary)	87%	100%	81%
Mountain Precipitation (Bearpaw Mtns)	62%	111%	91%
Valley Precipitation	105%	97%	100%
Basin-Wide Precipitation	**87%**	**101%**	**85%**

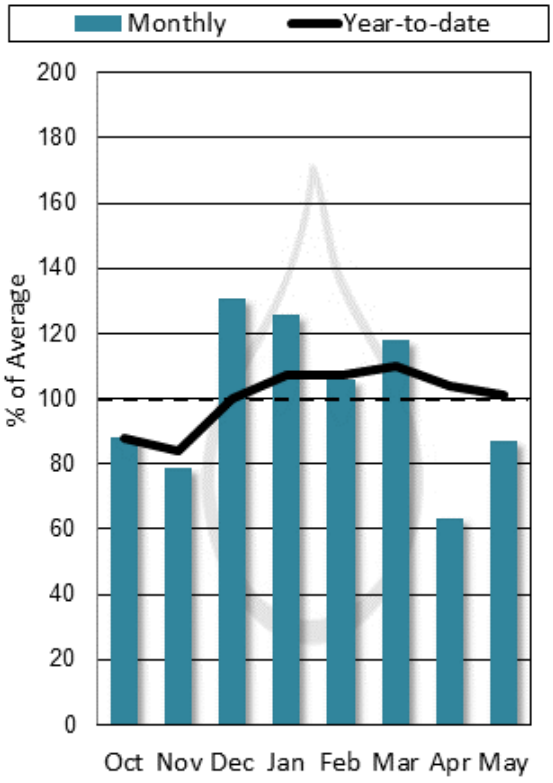
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**132%**	**74%**	**133%**

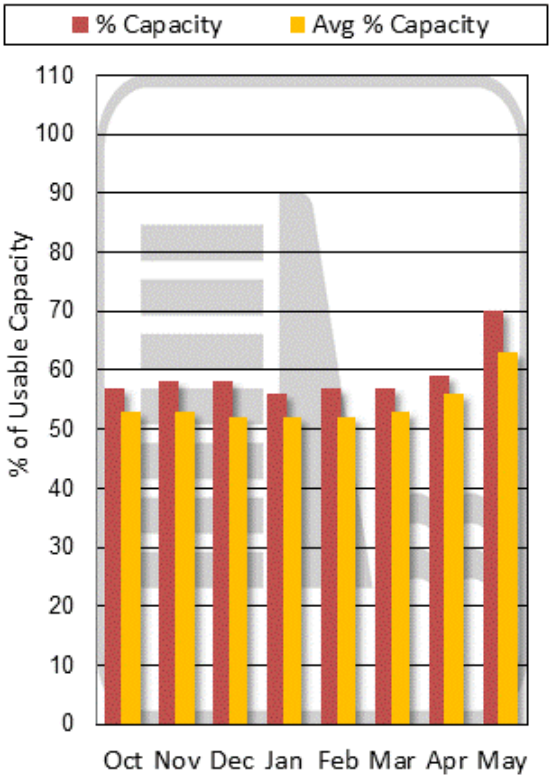
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

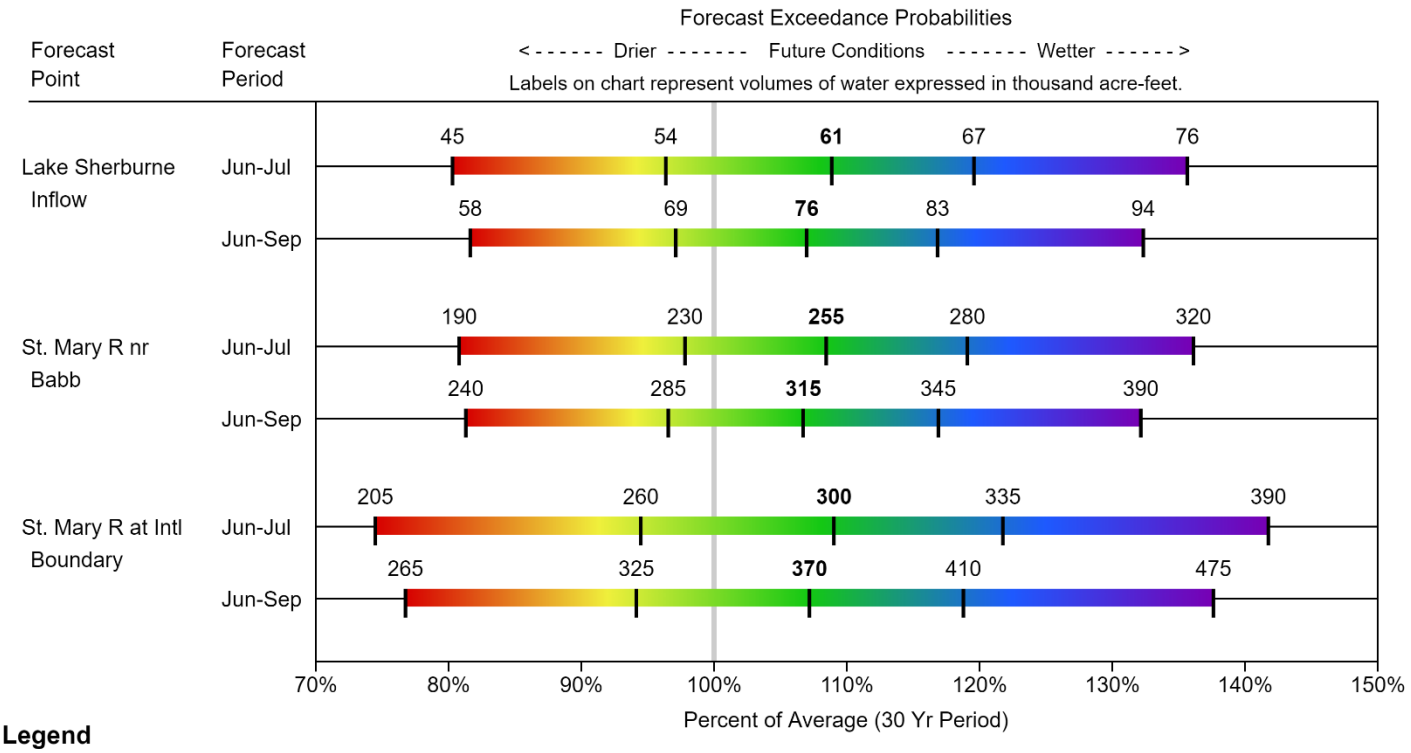


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

ST. MARY & MILK BASINS

Water Supply Forecasts

June 1, 2020



Legend

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When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Upper Yellowstone River Basin

Unlike many of the other river basins in southern Montana, the Upper Yellowstone received more reliable precipitation during May. Mountain stations reported slightly below normal to near normal precipitation for the month; however, valley precipitation during the month was below average. Crop year precipitation, which begins on April 1st is well below normal in some valley locations, with Billings and Livingston reporting a 2" or higher deficit in precipitation, which is in the bottom 10th percentile of all years on record. Snowmelt during the month was gradual through the first three weeks of May. However, it quickly accelerated during the last week of the month when mountain temperatures approached 70 degrees Fahrenheit at high elevation stations in the Beartooth and Absaroka Mountains, and overnight lows remained above freezing. This would cause rapid increases to flows in the Yellowstone, Boulder, and Clarks Fork of the Yellowstone Rivers. On June 1st, the Clarks Fork would reach minor flood stage at 13,000 cfs, before receding slightly. The Yellowstone River near Livingston would reach 30,000 cfs on the same date and approached the minor flood stage. This big push in the rivers was mostly snowmelt driven, as little rain fell during that time. The accelerated melt moved a significant amount of snow water through the river systems, resulting in decreased forecasts for the June 1st – September 30th period. Forecasts remain near average for many rivers within the basin, but water users should consult the forecast graphic below for rivers of interest, as some have forecasted volumes that are below normal.

Upper Yellowstone River Basin Data Summary

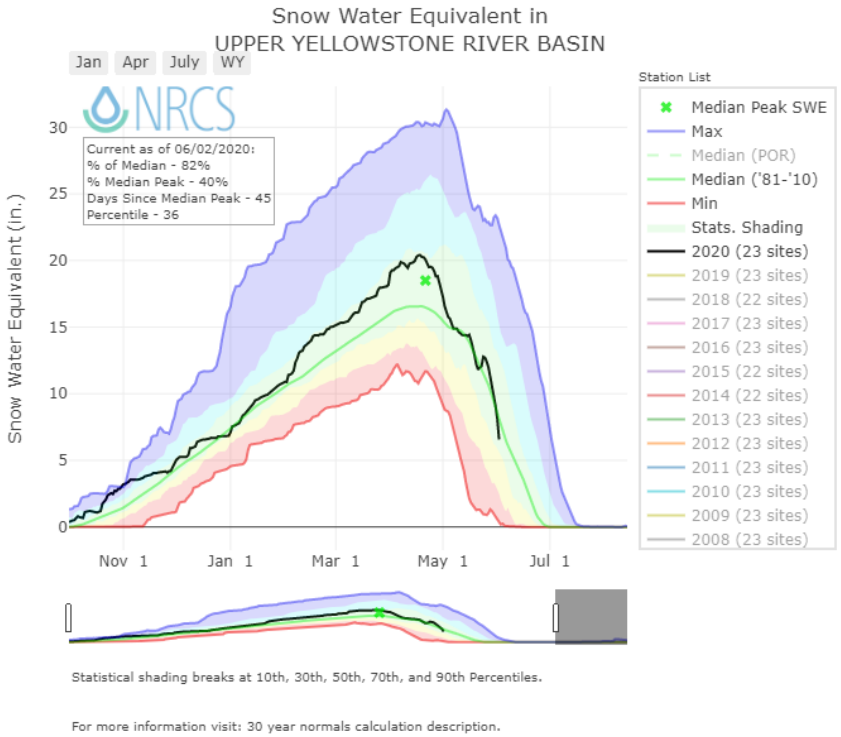
Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
YELLOWSTONE ab LIVINGSTON	104%	125%
SHIELDS	3%	174%
BOULDER-STILLWATER	73%	110%
RED LODGE-ROCK CREEK	133%	211%
CLARK'S FORK	110%	136%
Basin-Wide Snowpack	**96%**	**131%**

Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	91%	101%	108%
Valley Precipitation	91%	84%	133%
Basin-Wide Precipitation	**91%**	**99%**	**111%**

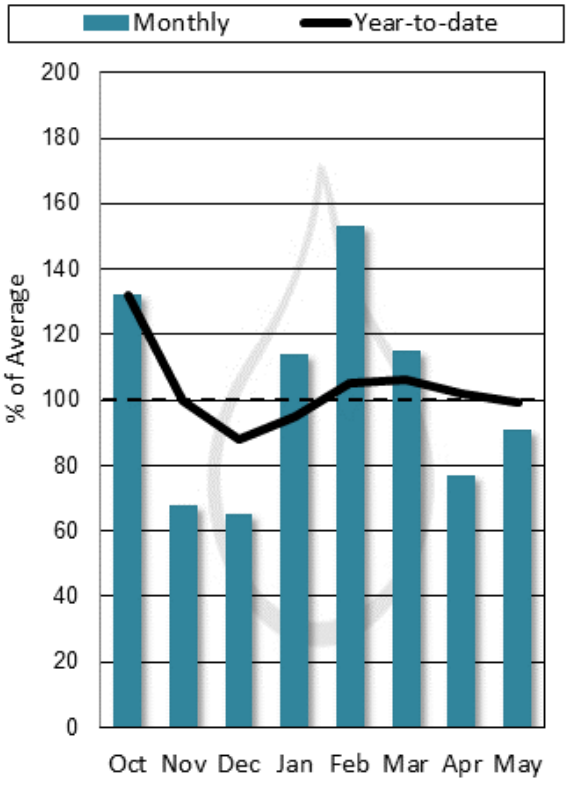
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**110%**	**67%**	**102%**

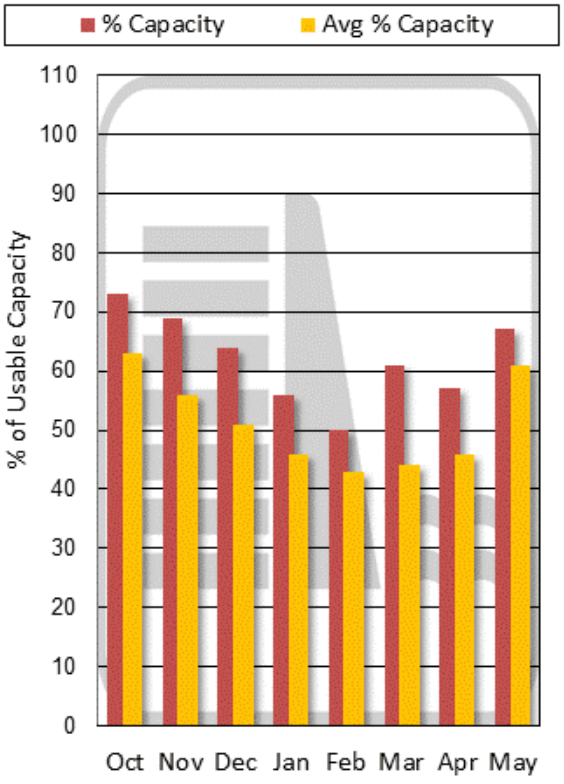
(click to navigate to online version with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage

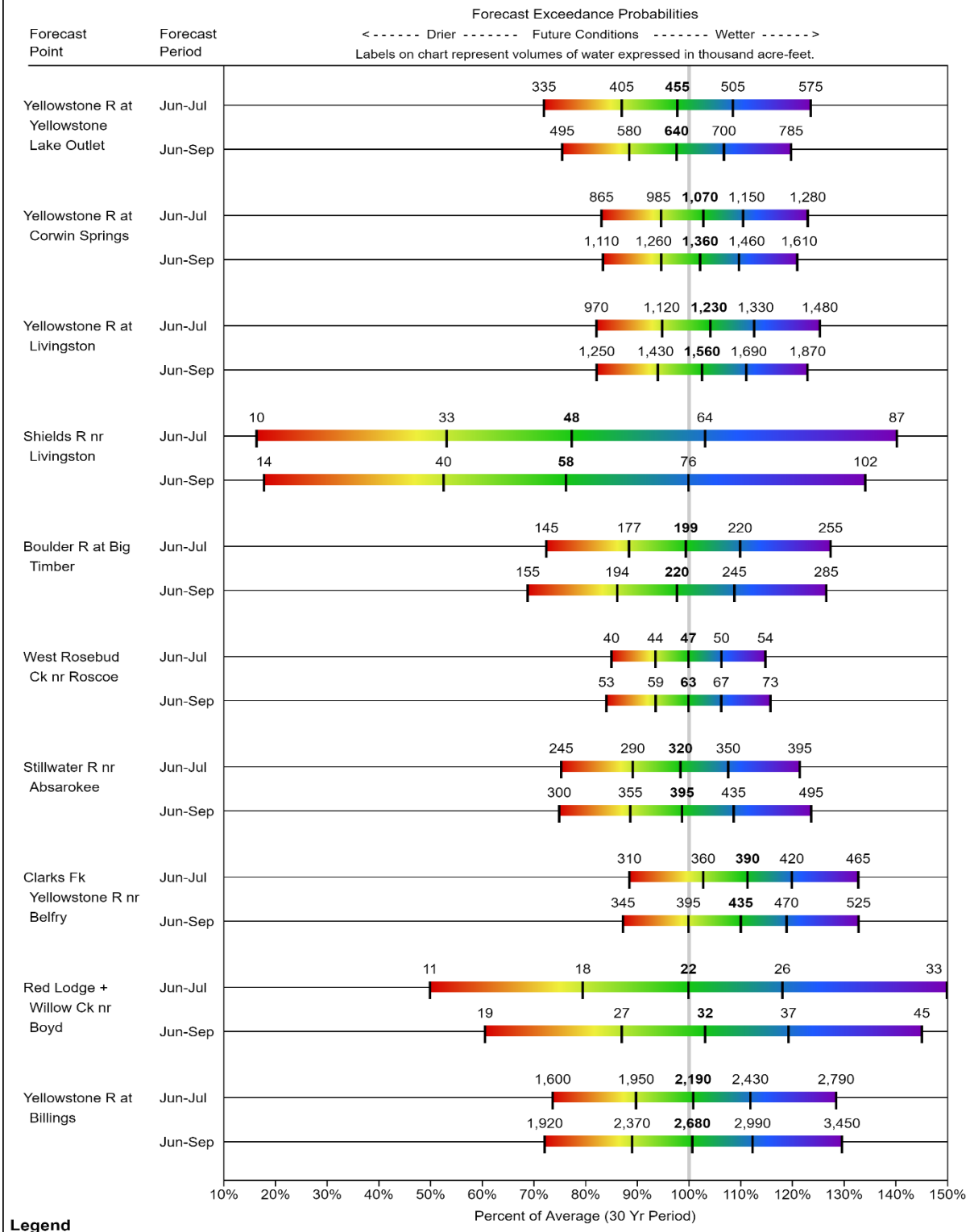


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

UPPER YELLOWSTONE RIVER BASIN

Water Supply Forecasts

June 1, 2020



Legend

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When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year) | *1981-2010 Normal Streamflow KAF* | *Observed Streamflow KAF* | *Period of Record Maximum Streamflow KAF (Year)*

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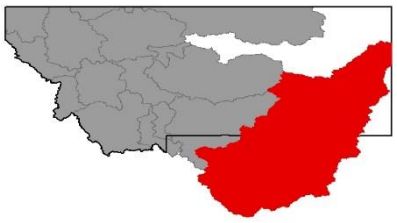


Lower Yellowstone River Basin

Precipitation, this water year in the Lower Yellowstone River basin, has been slightly below average, and May was no exception. During May, several SNOTEL sites in the Big Horn Mountains neared their lowest May precipitation total on record, including Grave Springs, which had its lowest in 28 years. Fortunately, the snowpack across the entire basin peaked at near-to-above normal conditions this year. The peak occurred in mid-April, and the snow has since been melting at a well-above-average rate. Late April brought near-record high temperatures, and so did the last couple days in May. During the last two days of May, maximum temperatures reached the mid-80s at Tie Creek SNOTEL. Due to the above-average melt in May, streamflow forecasts have decreased from last month. Currently, June-September streamflow is forecasted to be below average in the Lower Yellowstone River basin.

Lower Yellowstone River Basin Data Summary

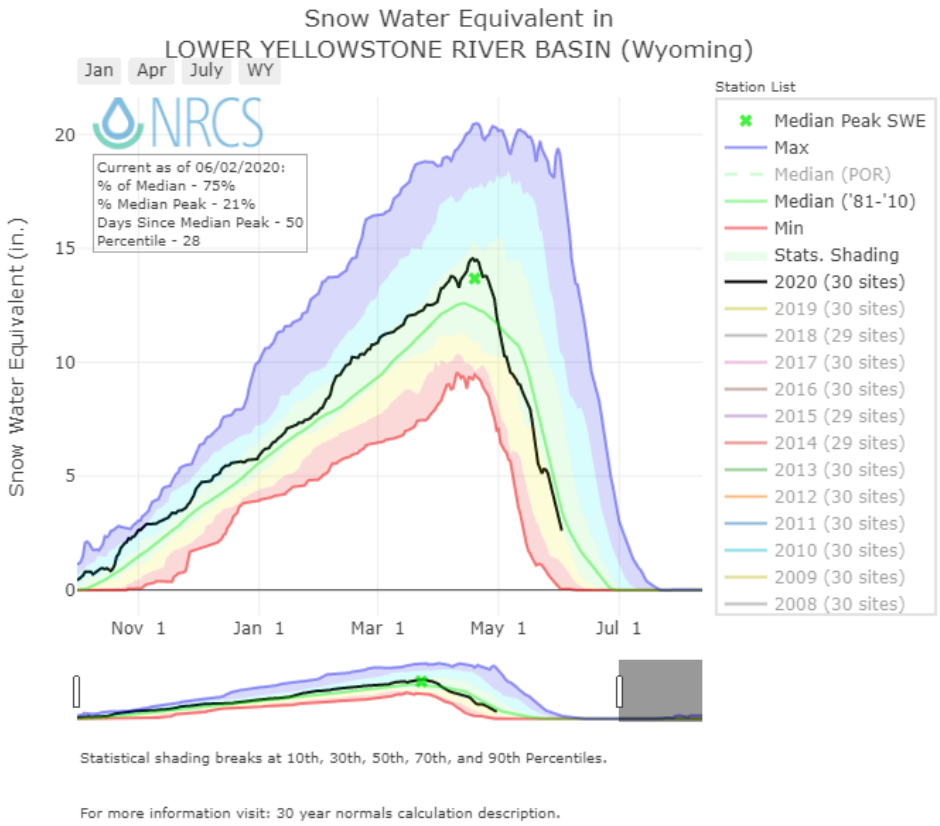
Snowpack	**Percent of 1981-2010 Normal (Median)**	**Last Year Percentage of Normal (Median)**
WIND RIVER BASIN	62%	272%
SHOSHONE RIVER BASIN	88%	141%
BIGHORN RIVER BASIN	84%	174%
LITTLE BIGHORN BASIN	96%	202%
TONGUE RIVER BASIN	71%	368%
POWDER RIVER BASIN	4%	449%
Basin-Wide Snowpack	**77%**	**247%**

Precipitation	**Monthly Percentage of Average**	**WYTD Percentage of 1981-2010 Average***	**WYTD Last Year Percentage of Average**
Mountain Precipitation	60%	87%	106%
Valley Precipitation	57%	79%	135%
Basin-Wide Precipitation	**59%**	**84%**	**114%**

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	**Percentage of Average**	**Percentage of Capacity (Total)**	**Last Year Percentage of Average**
Basin-Wide Storage	**100%**	**63%**	**108%**

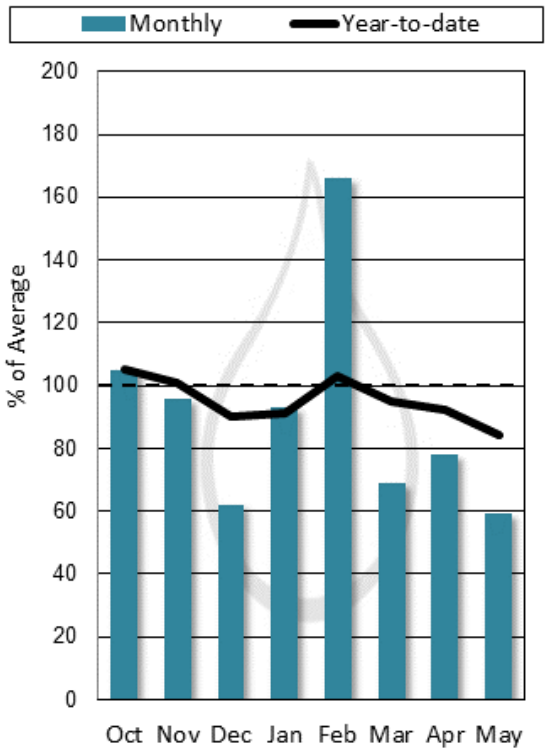
(click to navigate to online version with additional features)



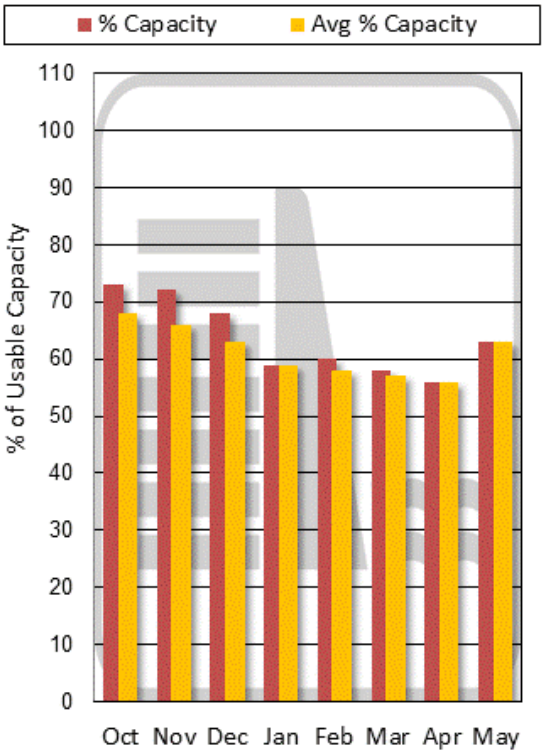
Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.

For more information visit: 30 year normals calculation description.

Mountain and Valley Precipitation



End of Month Reservoir Storage

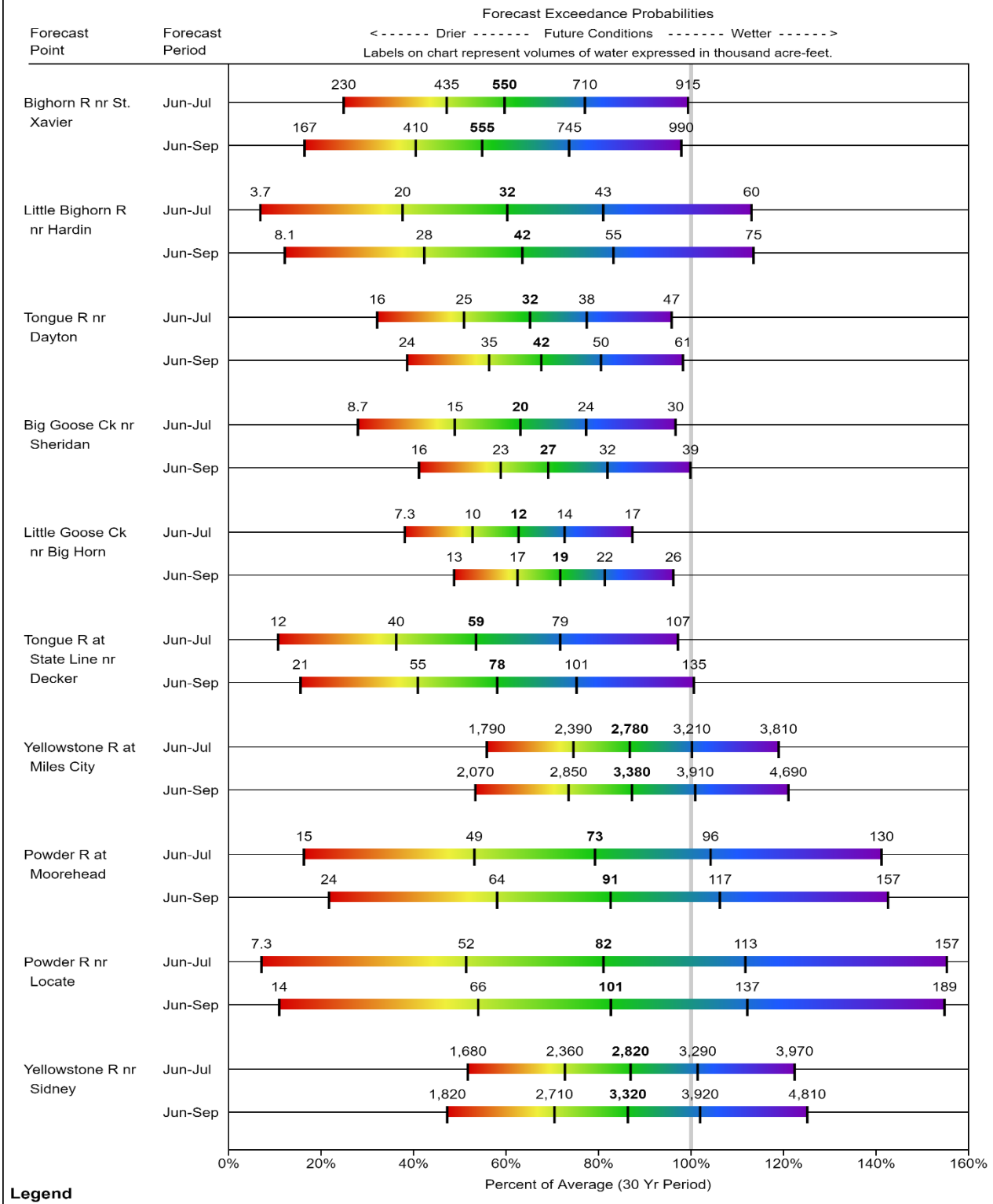


Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

LOWER YELLOWSTONE RIVER BASIN (Wyoming)

Water Supply Forecasts

June 1, 2020



Legend

95% or 90% Exceedance	70% Exceedance	**50% Exceedance**	30% Exceedance	10% or 5% Exceedance
There is a 95%/90% chance that flows will exceed this volume	There is a 70% chance that flows will exceed this volume	There is a 50% chance that flows will exceed this volume	There is a 30% chance that flows will exceed this volume	There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

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Montana Water Supply Outlook Report

Natural Resources Conservation Service