

Utah Water Supply Outlook Report

April 1, 2023



Tall Poles snow course, near Parowan

Photo by Jason Bradshaw (NRCS-Utah)

STATE OF UTAH GENERAL OUTLOOK

April 1, 2023

SUMMARY

A winter to remember! This has been the kind of snow season that folks will talk about for decades. And for good reason- as of March 24th, Utah's statewide snow water equivalent (SWE) measured at our SNOTEL weather stations broke the 1983 record, making this the snowiest winter since the SNOTEL network was installed in 1980. Prior to 1980, Utah NRCS evaluated SWE based on manual, monthly measurements called "snow courses", starting around 1930. Using these historical data, the winter of 1952 was the record holder for the most SWE for April 1st (when Utah's snowpack typically peaks) until the winter of 2022-2023 came along. No more! **As of April 4th, this winter has officially broken the 1952 record as well, making this year's snowpack the deepest ever measured in Utah!**¹ And it just keeps on snowing!

Here is a quick overview of some of our **snowpack** records and noteworthy items, as of April 4th:

- 9 of Utah's 16 major basins have record-high SWE: Duchesne (191% of normal), Northeastern Uintas (172% of normal), Weber-Ogden (208% of normal), Provo-Utah Lake-Jordan (216% of normal), Tooele Valley-Vernon Creek (237% of normal), Southeastern Utah (282% of normal), Price-San Rafael (205% of normal), Lower Sevier (280% of normal), and Beaver (202% of normal). While not a record-high, Southwestern Utah is at a whopping 331% of normal SWE!
- 41 of Utah's 138 SNOTEL sites were reporting an all-time record high amount of SWE, and 16 more were second-highest.
- A few noteworthy SNOTEL sites are: Ben Lomond Peak, in 1st place for Utah with 81.8" SWE. Wow! In 2nd and 3rd place are the two sites in Little Cottonwood Canyon: Atwater (71.9" SWE) and Snowbird (68.8" SWE). The Farmington site and nearby SNOTEL stations are also reporting tremendously high SWE values (e.g. 66.0" SWE at Farmington, 55.1" at Parrish Creek). In the Logan River headwaters, the Tony Grove Lake site has 56.6" SWE. In Southwestern Utah, the Midway Valley and Kolob sites also have extremely high amounts of SWE (50.0" and 50.1", respectively). The Mt. Baldy SNOTEL on the Wasatch Plateau is doing best for that region with 40.7" SWE. In the Lasal Mountains near Moab, the new Gold Basin site has 34.1" SWE, which is 8.9" higher than the value for the Lasal Mountain SNOTEL where the current value is at a record high. Also record-breaking is the 22.4" SWE at the East Willow Creek SNOTEL site on top of the Book Cliffs northeast of Crescent Junction. Every part of the state is setting records!
- 32 SNOTEL sites have at least double the amount of SWE that they would have at their typical (median) peak. 4 of those sites have more than triple their typical peak SWE!
- 45 of Utah's SNOTEL sites have more than 100" of snow depth. 7 of those are deeper than 150". 126 sites are reporting the deepest snow depths ever measured at those locations!

Statewide, the snow water equivalent (SWE) measured at our SNOTEL sites was 200% of normal as of April 1st, compared with 75% of normal at this time last year. What an improvement! All of our major basins except the Raft were above 160% of normal. As detailed above, our statewide SWE has broken all previous snowpack records, including 1952, 1983, and others. Take some pictures! This has truly been a memorable snow season.

March **precipitation** in Utah was WAY above normal at 254%, which is even more impressive when you consider that March is typically one of our wettest months. This brings the water-year-to-date

¹ Using the same 47 snow course locations measured in 1952, on April 4th, 2023, our average SWE was 30.1", compared with 29.9" measured on April 1st in 1952. Note that these snow courses have since been converted to SNOTEL weather stations, so this analysis compares SWE measured manually at snow courses in 1952 with SWE measured automatically using a snow pillow at our SNOTEL sites in 2023. The snow courses were only measured once per month, so no information is available outside of the April 1st reading from 1952, which makes it a conservative estimate. Lacking any other data beyond the monthly readings, however, we can officially state that the 1952 record for statewide SWE has now been broken.

precipitation to 158% of normal. As of April 4th, all of Utah’s major watersheds were above 130% of normal precipitation for the 2023 water year, with 4 at record-high levels (Provo-Utah Lake-Jordan, Tooele Valley-Vernon Creek, Beaver, and Lower Sevier).

Given that this year’s historic snowpack comes on the heels of several years of equally historic drought, we are often asked how much the current water year precipitation has helped Utah’s ongoing drought. While there is no perfect way to answer this question, one approach is to consider the cumulative precipitation deficit that each of Utah’s major basins have accrued over the last few years, and then to see how much this water year will cut into those deficits. These results are provided in the table below. Impressively, our current water year is projected to cut the ongoing precipitation deficits by roughly 75-90%, depending on the basin. For several watersheds (Duchesne, NE Uintas, Deep Creek, Provo-Utah Lake-Jordan, SE Utah, and SW Utah) we are actually forecasting a precipitation surplus based on this analysis. A few others (Dirty Devil, Escalante, San Pitch, and Raft) had very large precipitation deficits and will likely take another above-normal precipitation year to climb out of the hole from the last few seasons.

Precipitation deficits for Water Years 2020-2023

units = inches

	Precipitation deficits							
	WY20	WY21	WY22	WY23 *	Normal	WY20-22 deficit	WY20-23 deficit	% change in deficit
Bear	27.7	25.1	30.1	41.3	31.3	11	1.0	-91%
Beaver	21.1	26.3	27.9	42.1	30.1	15	3.0	-80%
Deep Creek	15.3	20	20.8	32.4	20.8	6.3	-5.3	surplus
Dirty Devil	17.6	19.8	21.5	29.5	23.1	10.4	4.0	-62%
Duchesne	20.5	24.3	28.4	35.6	26.9	7.5	-1.2	surplus
Escalante	17.1	19.7	20.9	28.4	23.4	12.5	7.5	-40%
Lower Sevier	16.1	20.4	22.4	41.3	26.1	19.4	4.2	-78%
NE Uintas	21.5	24.6	27.5	30.5	25.8	3.8	-0.9	surplus
Price-San Rafael	19.9	20.6	27	34.6	25.8	9.9	1.1	-89%
Provo-Utah Lake-Jordan	27.3	28.9	33.2	49.8	34.2	13.2	-2.4	surplus
Raft	32	24.8	33.9	42.8	36.7	19.4	13.3	-31%
San Pitch	21.1	20.7	26.9	34.8	27.1	12.6	4.9	-61%
SE Utah	19.9	22.4	24.8	36.8	25.5	9.4	-1.9	surplus
SW Utah	20.1	21.3	25.4	40.4	24.2	5.8	-10.4	surplus
Tooele-Vernon Creek	24.1	25	29	46.4	32.3	18.8	4.7	-75%
Upper Sevier	19.3	21.3	23.4	34.9	25.8	13.4	4.3	-68%
Weber-Ogden	28.2	27.3	32.8	49.8	35.3	17.6	3.1	-82%
Statewide	23.6	24.2	28.3	40.1	29.3	11.8	1.0	-92%

* projected, based on April 4, 2023 data

Table 1: Shown in the left three columns are the water year (October to September) totals for precipitation for each watershed, as well as the statewide total at the bottom (units are inches). These can be compared with each basin’s normal amount of precipitation (based on median values from 1991-2020, 5th column). This gives the cumulative precipitation deficit going back to 2020 (6th column). These cumulative deficits per basin provide an estimate of the drought magnitude per region coming into this water year. Next, we used projection curves to predict what the precipitation totals might be like for each basin by the end of September 2023. While there are a range of possible projections, we used the 50% exceedance probability projection based on April 4 values for precipitation to obtain WY23 total. While we don’t know how much precipitation will be received this year, the 50% projection is the most statistically likely and provides a middle value. These estimated 2023 water year totals are given in the 4th column and then are used to reevaluate the cumulative precipitation deficits per region (column 7). Finally, the right-most column shows the percent change in these deficits, once 2023 projections are included. See text above for additional explanation.

Utah’s SNOTEL sites have **soil moisture** sensors at 2”, 8”, and 20” depths. Combined together, statewide soil moisture is slightly below normal at 58% of saturation, compared with 68% at this time last year. This difference can be attributed to the fact that very few of Utah’s SNOTEL sites are currently losing SWE because temperatures have remained cool and we have continued to add more snow. Normally, a significant proportion of Utah’s sites would have started melting out their snowpacks by now, and that snowmelt wets up subsurface soils. This pattern has been shifted later in

time compared with previous years. While soil moisture conditions vary significantly between sites within a given basin due to local topographic influences, generally-speaking the current values for the degree of saturation of Utah's mountain soils decrease modestly with increasing elevation.

Utah's **reservoir storage** is currently at 54% of capacity, down 2% from this time last year. While Utah's small to medium-size reservoirs will likely fill, some of Utah's largest (e.g. Bear Lake) most likely will not, and of course the water levels in both Lake Powell and the Great Salt Lake remain critically low. Utahns will need to continue to conserve water to help make progress replenishing our storage systems.

As noted in previous reports, NRCS **streamflow forecasts** for April to July snowmelt runoff volume are based mainly on observed SWE and precipitation at Utah's SNOTEL sites. While we share others' concerns about the potential for flooding this spring, the NRCS runoff forecasts are volumetric and do not provide guidance on peak discharge magnitude at stream gage locations. Flood forecast estimates can be obtained from the National Weather Service [here](#). Please also check out the new [Forecast Comparison Page](#), showing forecasts from both the NRCS and the Colorado Basin River Forecast Center (NOAA). This is intended to be a one-stop landing page for water managers to find snowmelt runoff forecasts from both agencies for any location in Utah and compare the values.

April 1 forecasts are very high, with >200% of median flow forecast for 61 stream gage locations out of 82 total, and (incredibly) >400% of median flow predicted for 15 of Utah's sites. Even if we compare with the entire period of record (instead of just 1991-2020) and use average instead of median as our measure of central tendency, 46 sites are forecast to produce >200% of normal flow, with 2 sites forecast at >400% of normal runoff.

The snowmelt runoff may break previous records this spring. Listed here are forecast points where the previous record would rank at the 30th percentile exceedance probability or higher. Shown for each are the April 1st forecast volumes (50th percentile, expressed as KAF) for 2023, the previous record-high volume of flow (KAF), and the year of the previous record.

Forecast location	April 1st forecast volume (50th percentile, KAF)	Previous record-high volume of flow (KAF)	Year of the previous record
Pineview Reservoir Inflow	280	300	2011
S. Willow Creek near Grantsville	7.1	7.4	1984
Currant Creek below Currant Creek Dam	46	50	2011
American Fork above Upper Powerplant	64	66	2005
Little Cottonwood Creek near SLC *	68	63	1983
Big Cottonwood Creek near SLC *	70	61	1983
Mill Creek near SLC *	15	15	1984
Parleys Creek near SLC *	42	42	1983
Fish Ck above reservoir near Scofield	67	72	1952
White River below Tabbyune Creek *	42	40	1983
Mill Creek at Sheley Tunnel near Moab	9.9	11	1993

Table 2: Potential record-setting runoff locations in Utah. Use of the 30th percentile forecasts suggests that there is only a 30% chance that April to July snowmelt runoff will exceed those values. These were selected to include both the most probable flow magnitude (50th percentile) along with the potential for flows to be a bit higher than that. Certainly the possibility exists that runoff will exceed the April 1 30th percentile values, but this provides a reasonable cutoff based on likelihood. See text for additional explanation.

* The April 1 forecast 50th percentile value exceeds the previous record-high for these locations. This suggests that it is more likely than not that flows will break the previous maximums for these gage sites.

Surface Water Supply Indices (SWSI) for Utah basins combine our current reservoir levels with the additional volume of water anticipated for each watershed based on these April 1 streamflow forecasts. While a couple areas of the state with significant ground to make up (due to large amounts

of depleted reservoir storage) continue to have low SWSI values (e.g. Bear and Provo watersheds), most watersheds in Utah have much higher SWSI values. All but three of Utah's basins have SWSI values well above the 50th percentile, suggesting that those basins will have favorable amounts of surface water supplies compared with previous observations. Several basins are above the 90th percentile, suggesting that surface water supplies for these areas should be in outstanding shape this summer. Please refer to the SWSI table provided in this report for further details. Table 3 below compares the April 1 SWSI values with those from last year. What a difference a year makes!

Basin or region	Current SWSI percentile (April 1, 2023)	Previous SWSI percentile (April 1, 2022)	% change
Bear River	34	35	-1
Woodruff Narrows	79	14	65
Little Bear	94	29	65
Ogden River	93	9	84
Weber River	89	12	77
Provo River	47	10	37
Western Uinta	84	40	44
Eastern Uinta	84	19	65
Blacks Fork	78	28	50
Smiths Fork	85	32	53
Price River	91	30	61
Joe's Valley	82	9	73
Ferron Creek	86	19	67
Moab	95	56	39
Upper Sevier	91	5	86
San Pitch	50	5	45
Lower Sevier	82	5	77
Beaver River	93	7	86
Virgin River	94	16	78

Table 3: Surface Water Supply Indices (SWSI) for Utah basins, showing April 1 values for water years 2023 and 2022. The right-most column shows the percent increase from last year.

The U.S. **Drought** Monitor page was last updated on March 30th. As of that date, 93% of Utah was still in drought, but only 20% of the state is in D2 (severe drought) with no D3 (extreme drought) or D4 (exceptional drought) remaining. By comparison, one year ago 98% of the state was considered D2 or worse!

A final thought: awhile back, former Snow Survey Supervisor Randy Julander and I were talking about the ongoing drought and, perhaps wishfully, reflected that you never know when Utah might be due for another 1983. Well, we blew 1983 away! While our climate has unquestionably warmed, our state's precipitation has varied tremendously over the last decade or more. Winters like this one, while perhaps less likely than they used to be (that turns out to be a challenging research question), are still possible anytime. We can all be thankful for the tremendous amount of water Mother Nature has delivered to our state this snowpack season. And we can hope for another above-normal snowpack next year...

-Jordan Clayton

This report combines efforts from Utah Snow Survey staff members (Troy Brosten, Doug Neff, Dave Eiriksson, and Logan Jamison) and field partners (John Wells, Joel Burley, Kent Sutcliffe, Jason Bradshaw, Dakota Bowers, and others), as well as Gus Goodbody and Lexi Landers (National Water and Climate Center) who provide our streamflow forecasts.

Shown in the following pages are a handful of pictures from our SNOTEL sites and snow courses showing the historic snowpack conditions in Utah.



(left) Troy Brosten, Assistant Snow Survey Supervisor, at the Atwater SNOTEL site near Alta, trying to dig his way down to the instrument shelter to check readings. Snow depth at this site hit a new historic maximum this winter, for a period of record dating back to 1984 at the Alta Central snow course. Photo by Doug Neff.

(below) The Atwater SNOTEL site about a week later. The shelter and precipitation can are completely buried at that point. Since this photo was taken, the snow depth sensor shown below has also become buried. Photo by John Wells.





Doug Neff, Electronics Technician for the Utah Snow Survey, at the Fish Lake snow course obtaining manual readings of snow water equivalent (SWE) and snow depth for this year's April 1 report. Eight inches of SWE were measured at the site, which is not nearly the highest on record for April 1st (22.4" were measured in 1984). It's fascinating how our snowpack is setting records in many places but isn't particularly noteworthy in other spots. This snow course has been continuously measured since 1931. Photo by Joel Burley.



Tony Grove RS SNOTEL site, with the historic snow course in the distance. Data from this location date all the way back to 1924, making this the longest continuously measured snow measurement site in Utah. Manual readings of snow water equivalent (SWE) and snow depth were compared with automated values from the SNOTEL site for this year's April 1 report. Nineteen inches of SWE were measured at the site's snow course this year, which is the 4th highest on record, surpassed only by 1936, 2011, and 1952. Photo by Jordan Clayton.



Trial Lake SNOTEL site. Data from the corresponding snow course at this location date back to 1931. The current April 1st snowpack at Trial Lake is the 6th deepest on record. Photo by Jordan Clayton.



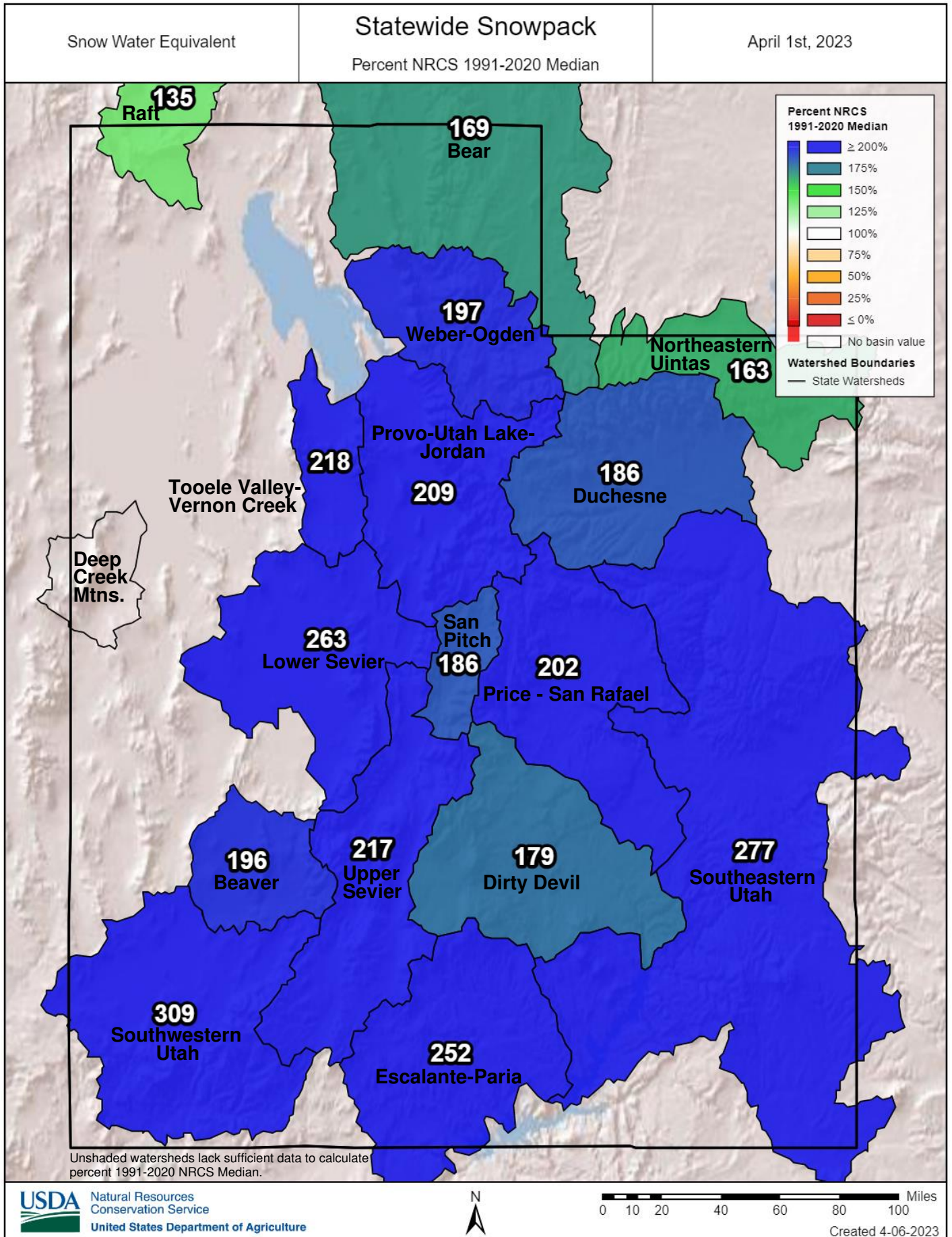
Timpanogos Divide SNOTEL site. The snow depth was 132" deep at the time this photo was taken, which almost reached the top of the precipitation can. The instrument shelter is the lump of snow on the left side of the image above. Shown below is Dave Eiriksson looking up from the instrument shelter after digging down to it to access the fluid manometer readings. A snow course preceded the existing SNOTEL site at this location and was measured from 1935 until the SNOTEL site was installed in 1978. This year's snowpack is the deepest ever recorded at this location on April 1, by a significant margin. Photos by Kent Sutcliffe.



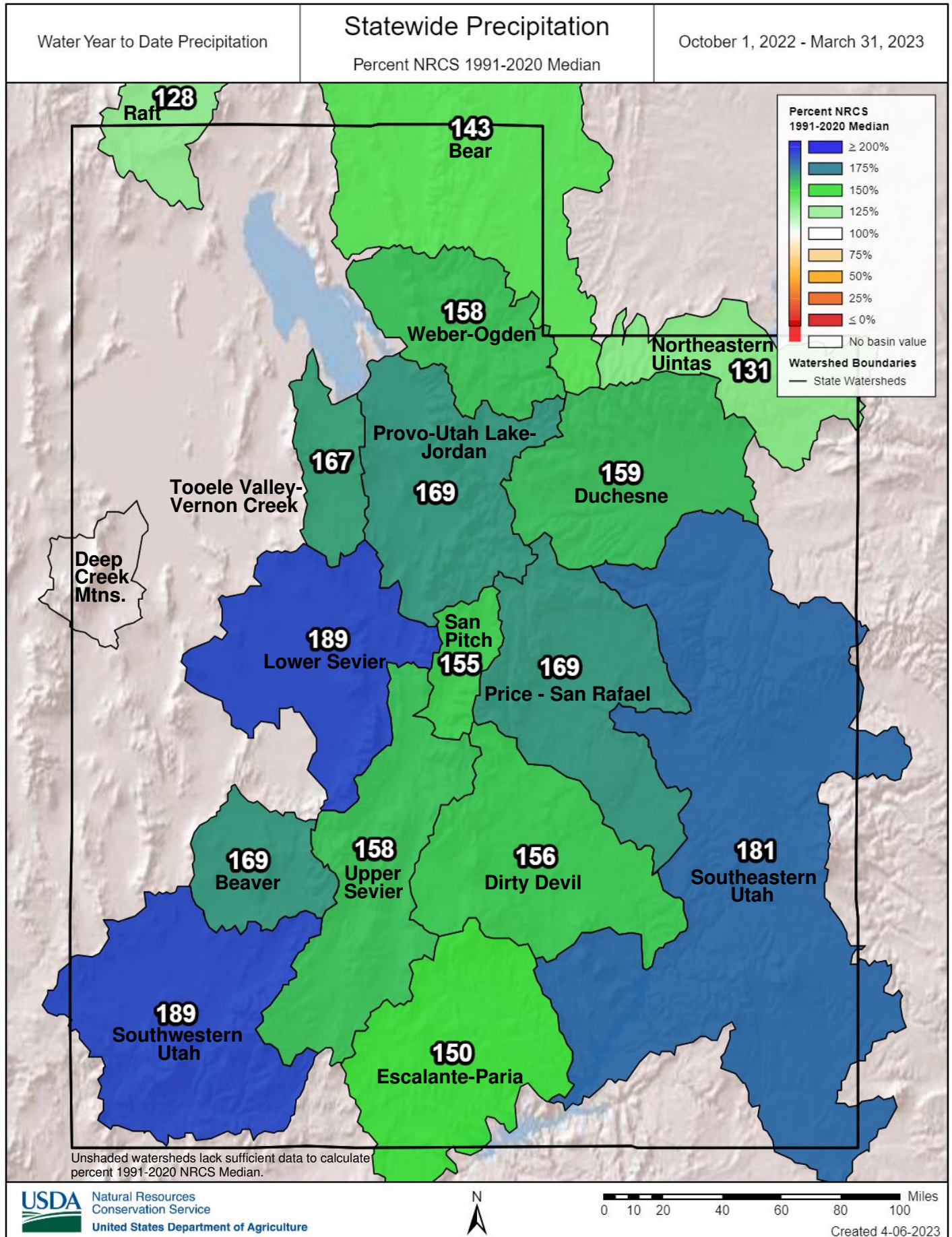


Huntington Horseshoe SNOTEL site on Skyline Drive near Fairview. The instrument shelter is completely buried and no longer visible. The snow course at this location dated back to 1930 and was replaced by the current SNOTEL site, which was installed in 2012. This year's April 1 snowpack was the third-highest ever measured at this site since 1930 (surpassed only by 1952 and 1983). Photo by Joel Burley.

Utah (statewide) Snowpack



Utah (statewide) Precipitation



April 1, 2023 | Surface Water Supply Index (SWSI)

Basin or Region	Reservoir Storage ¹ (KAF) ²	Apr-July Forecast (KAF) ²	Forecast + Storage (KAF) ²	SWSI ³	Percentile ⁴ (%)	Similar Years
Bear	443.5	162.0	605.5	-1.33	34	[2007, 2016]
Woodruff Narrows	16.3	198.0	214.3	2.46	79	[1993, 2017]
Little Bear	9.9	99.0	108.9	3.65	94	[1998, 2011]
Ogden	42.3	280.0	322.3	3.6	93	[1986, 1998]
Weber	257.6	625.0	882.6	3.22	89	[1982, 1984]
Provo	817.6	436.4	1254.0	-0.28	47	[2001, 2019]
Western Uintas	173.1	90.0	263.1	2.84	84	[1986, 1999]
Eastern Uintas	28.9	194.0	222.9	2.84	84	[1999, 2011]
Blacks Fork	11.4	110.0	121.4	2.34	78	[1999, 2005]
Smiths Fork	6.7	36.0	42.7	2.95	85	[1986, 1999]
Price	18.3	95.0	113.3	3.41	91	[1985, 1986]
Joes Valley	30.4	90.0	120.4	2.65	82	[1986, 2006]
Ferron Creek	9.0	57.0	66.0	3.03	86	[2017, 2019]
Moab	1.8	9.9	11.7	3.72	95	[1993, 2005]
Upper Sevier	57.0	203.0	260.0	3.41	91	[1995, 2011]
San Pitch	1.1	26.0	27.1	0.0	50	[1994, 2007]
Lower Sevier	58.0	275.0	333.0	2.65	82	[1995, 1997]
Beaver River	8.7	60.0	68.7	3.6	93	[1984, 1998]
Virgin River	38.7	195.0	233.7	3.65	94	[1993, 2005]

¹ End of Month Reservoir Storage; ² KAF, Thousand Acre-Feet; ³ SWSI, Surface Water Supply Index; ⁴ Threshold for coloring: >75% Green, <25% Red

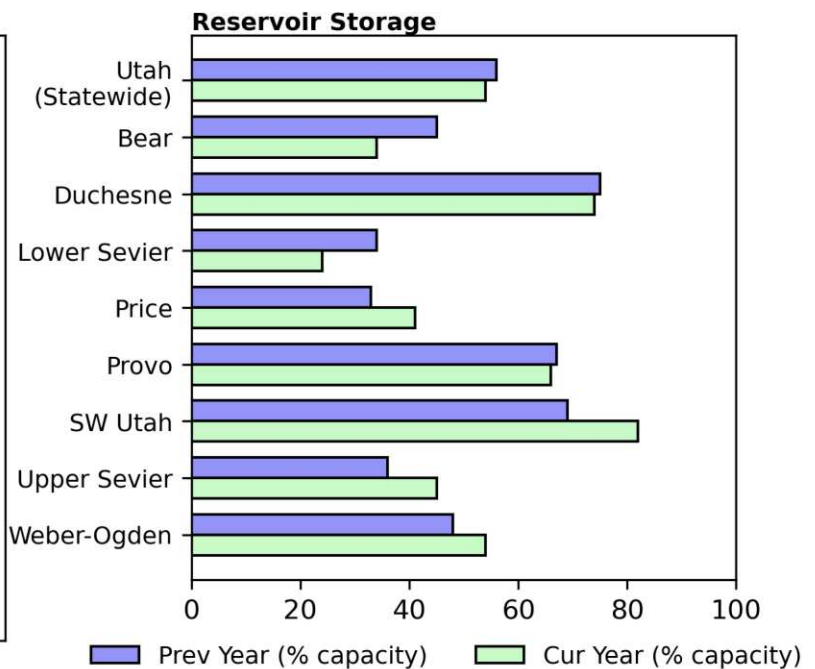
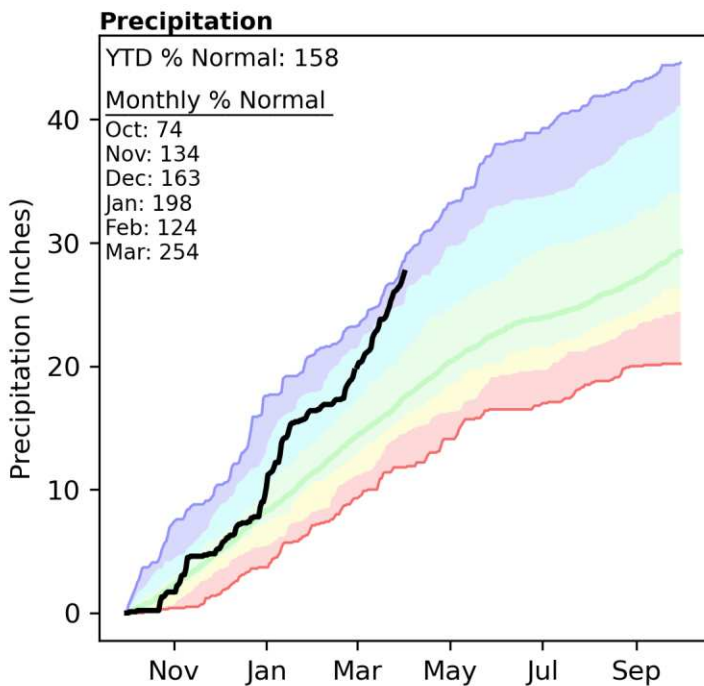
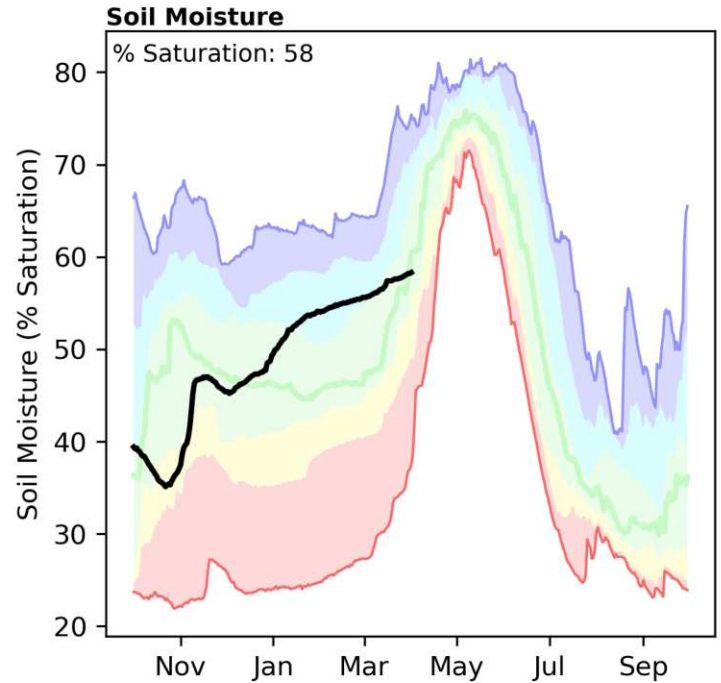
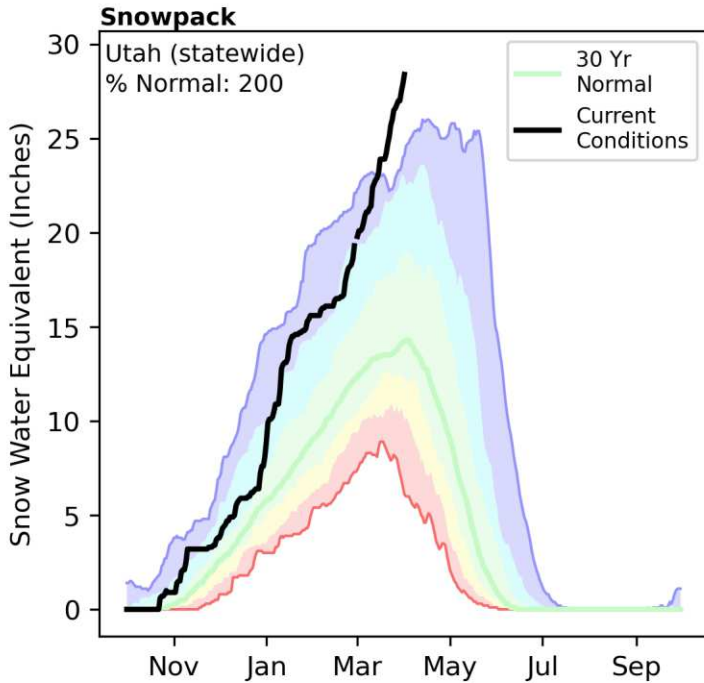
What is a Surface Water Supply Index?

The Surface Water Supply Index (SWSI) is a predictive indicator of total surface water availability within a watershed for the spring and summer water use seasons. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow which are based on current snowpack and other hydrologic variables. SWSI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry) with a value of zero (0) indicating median water supply as compared to historical analysis. SWSI's are calculated in this fashion to be consistent with other hydroclimatic indicators such as the Palmer Drought Index and the Precipitation index. See Appendix A for details on forecast points and reservoirs used in SWSI calculations.

The Utah Snow Survey has also chosen to display the SWSI value as well as a PERCENT CHANCE OF NON-EXCEEDANCE. While this is a cumbersome name, it has a simple application. It can be best thought of as a scale of 1 to 99 with 1 being the drought of record (driest possible conditions) and 99 being the flood of record (wettest possible conditions) and a value of 50 representing average conditions. This rating scale is a percentile rating as well, for example a SWSI of 75% means that this years water supply is greater than 75% of all historical events and that only 25% of the time has it been exceeded. Conversely a SWSI of 10% means that 90% of historical events have been greater than this one and that only 10% have had less total water supply. This scale is comparable between basins: a SWSI of 50% means the same relative ranking on watershed A as it does on watershed B, which may not be strictly true of the +4 to -4 scale.

Utah (statewide) | April 1, 2023

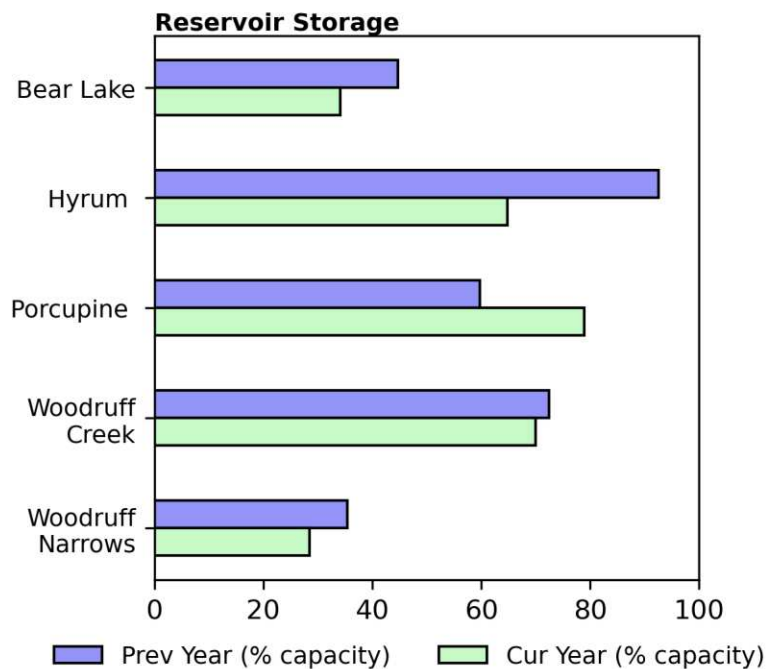
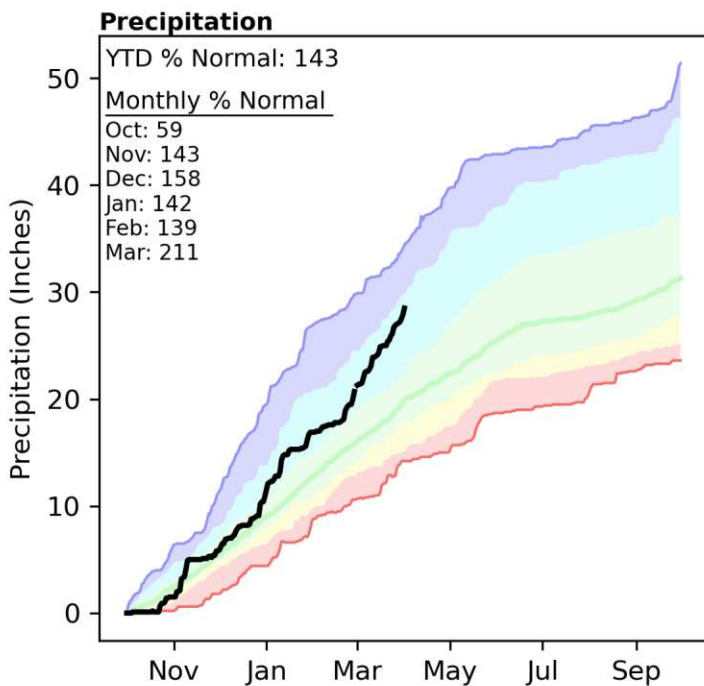
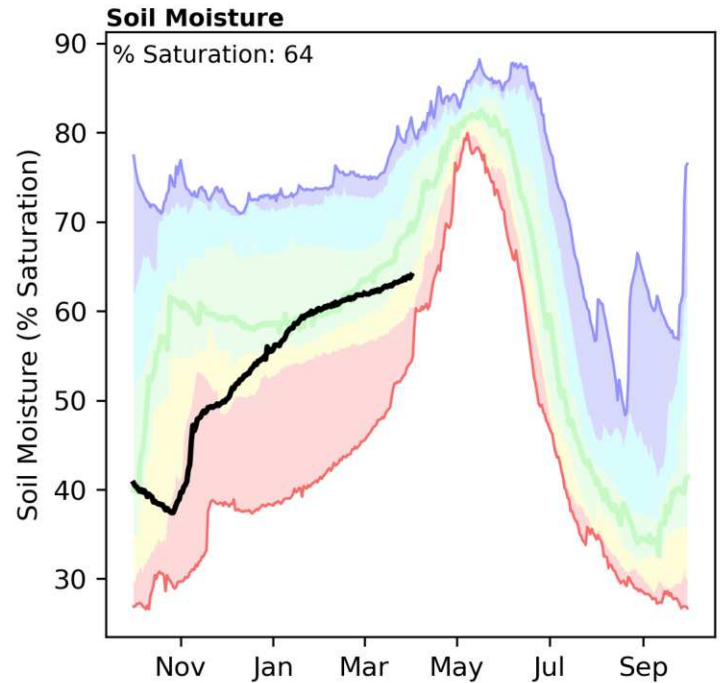
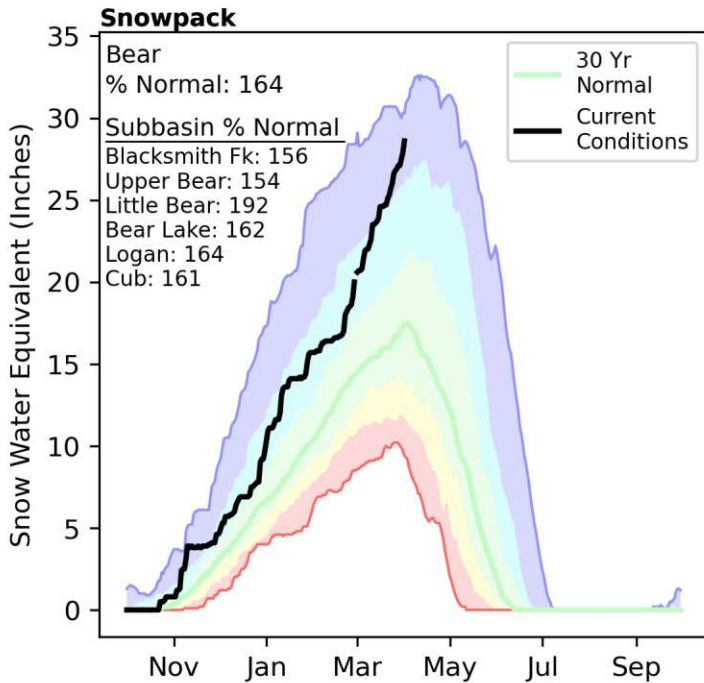
Snowpack in Utah (statewide) is well above normal at 200% of median, compared to 75% at this time last year. Precipitation in March was well above normal at 254%, which brings the seasonal accumulation (October-March) to 158% of median. Soil moisture is at 58% saturation compared to 68% saturation last year. Statewide, reservoir storage is 54% of capacity, compared to 56% last year¹. Forecast streamflow volumes (50% exceedence, April-July) range from 112% to 1020% of normal.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

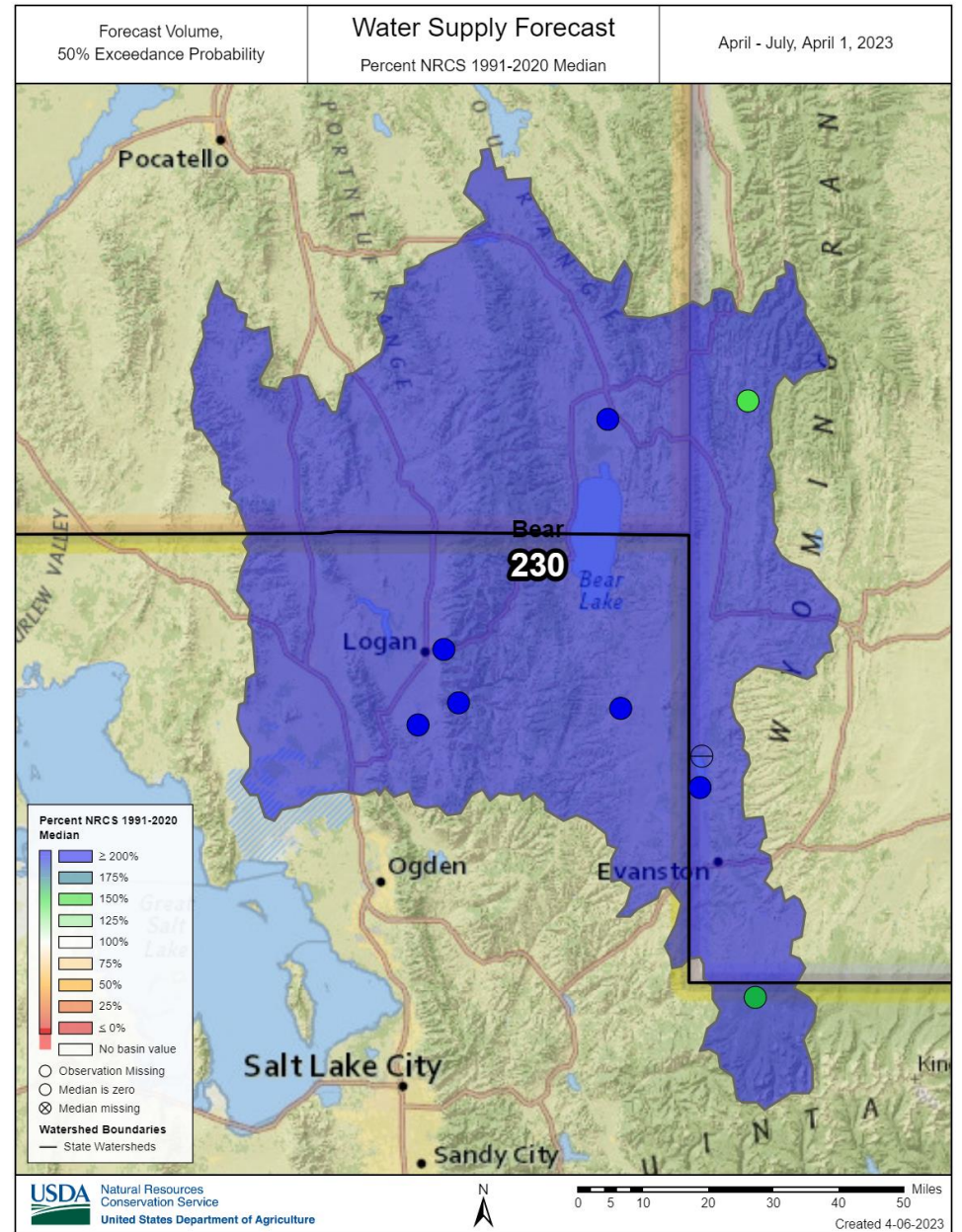
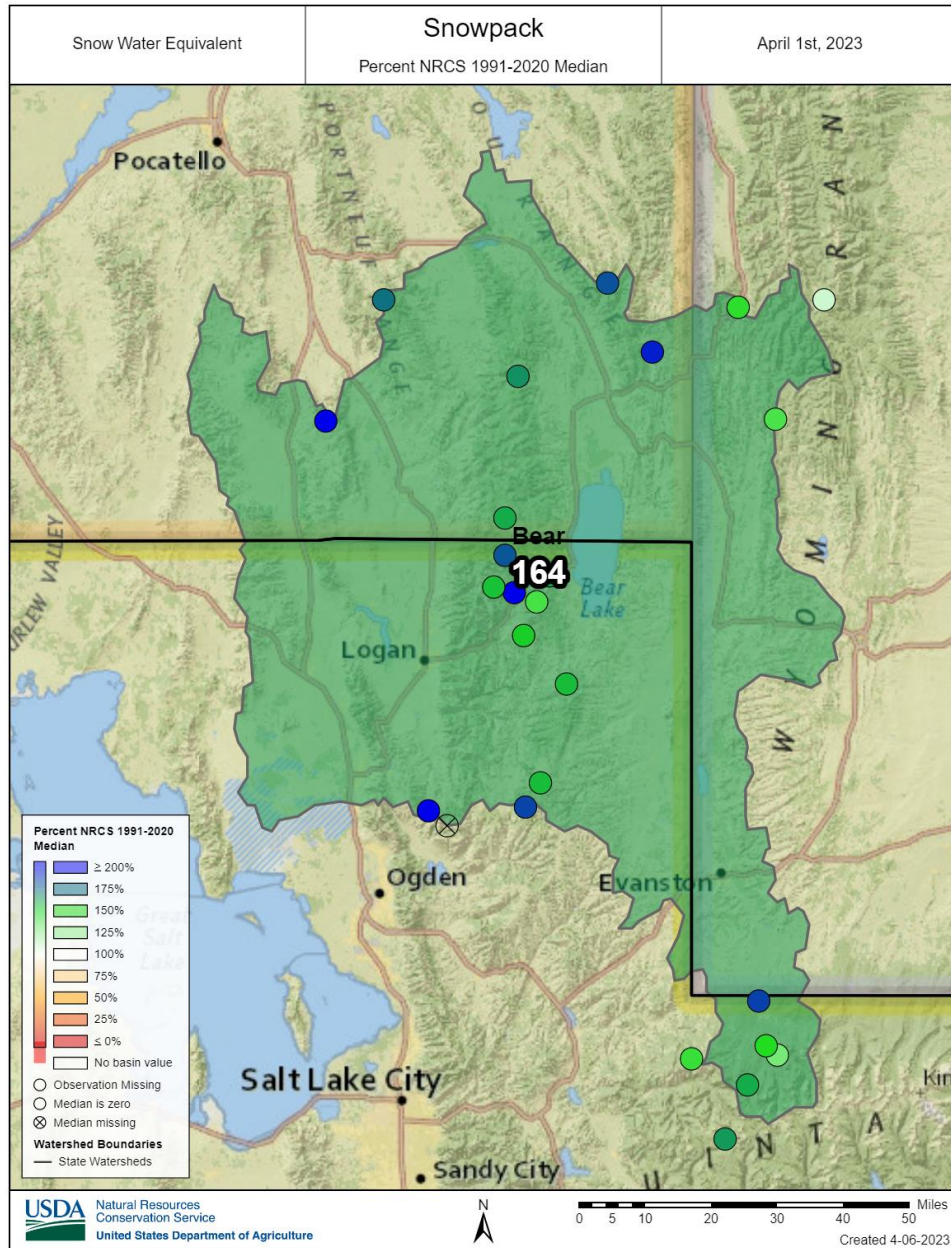
¹Statewide reservoir percentages exclude Lake Powell and Flaming Gorge Reservoirs.

Snowpack in the Bear River Basin is well above normal at 164% of median, compared to 68% at this time last year. Precipitation in March was well above normal at 211%, which brings the seasonal accumulation (October-March) to 143% of median. Soil moisture is at 64% saturation compared to 73% saturation last year. Reservoir storage is 34% of capacity, compared to 45% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 140% to 354% of normal. The Surface Water Supply Index percentiles are 34% for the Bear, 94% for the Little Bear, and 79% for Woodruff Narrows.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: [30 year normal calculation description](#)

Bear



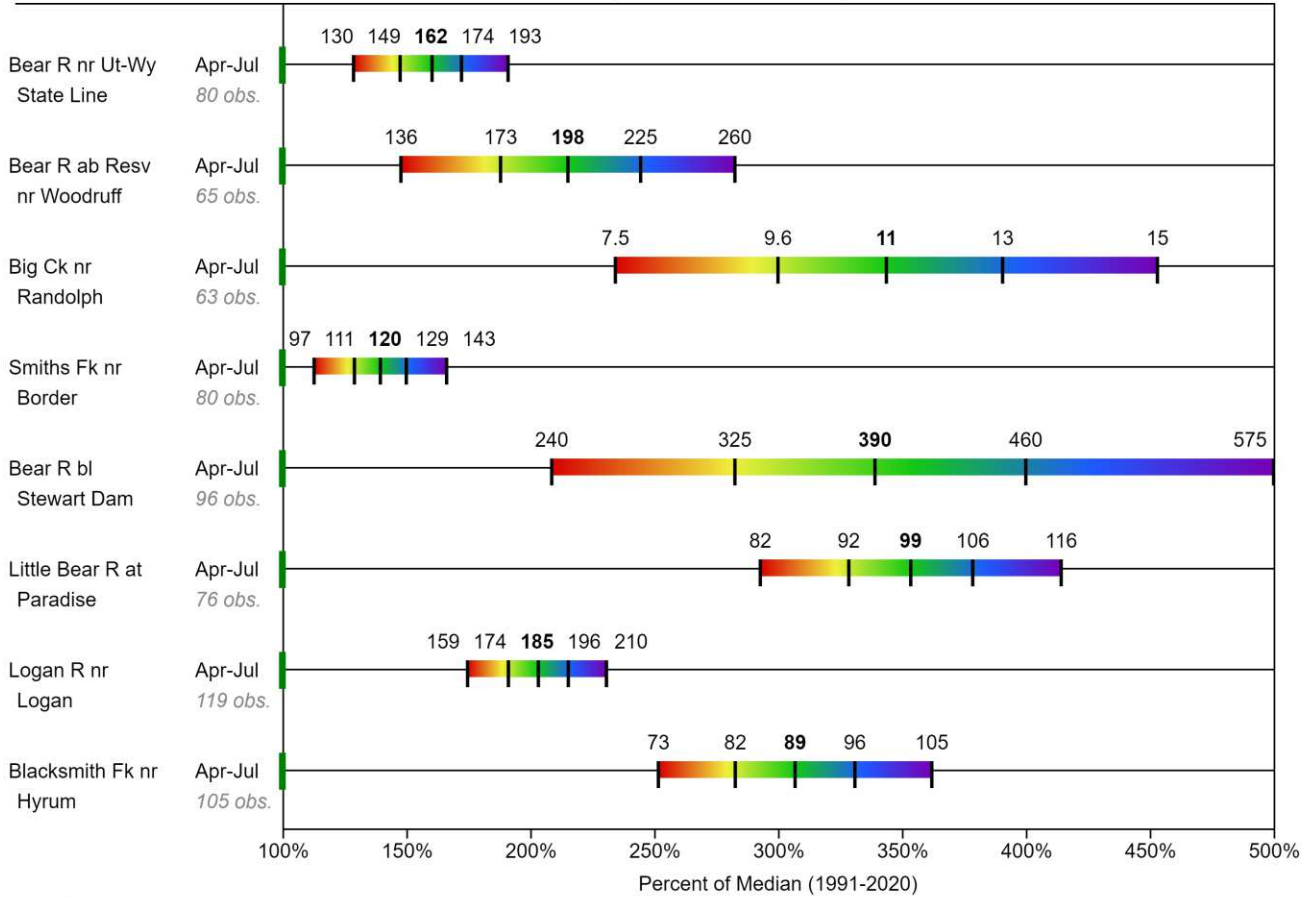
Bear

BEAR Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->

Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend

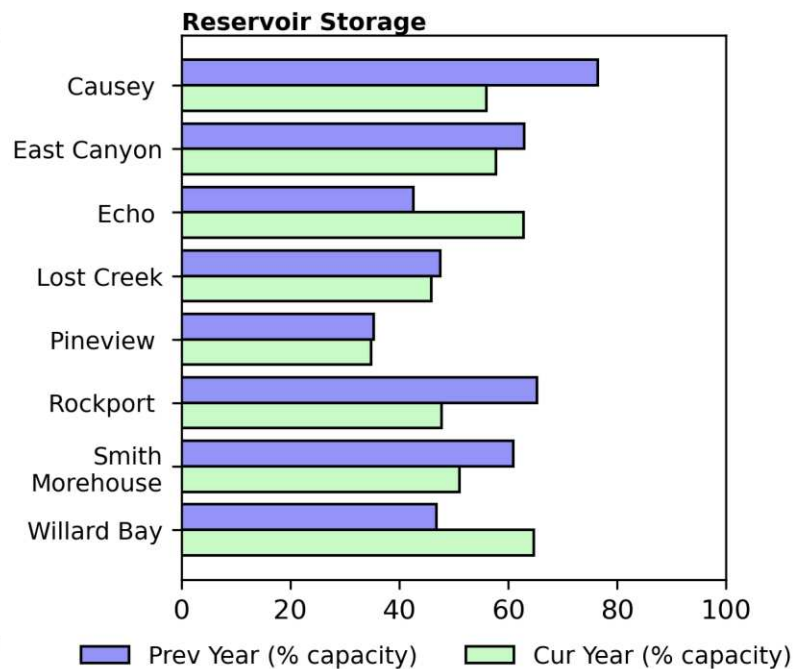
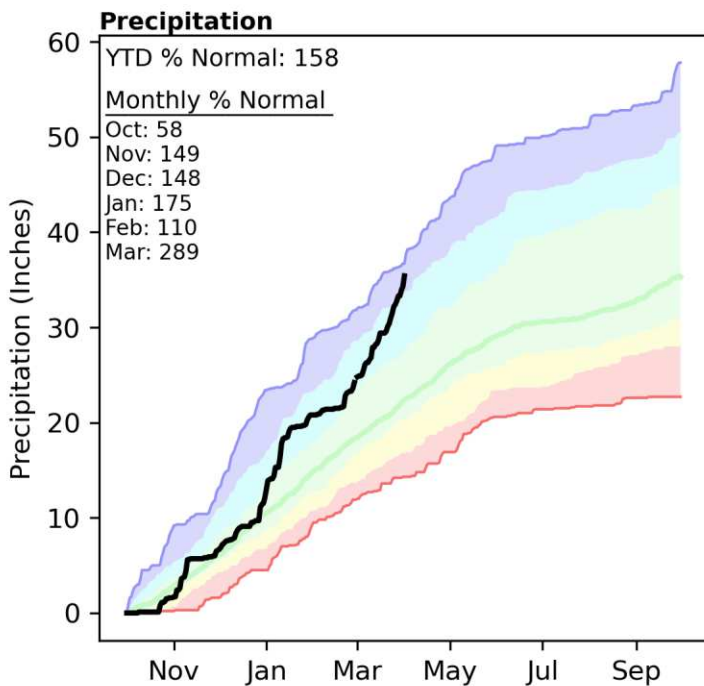
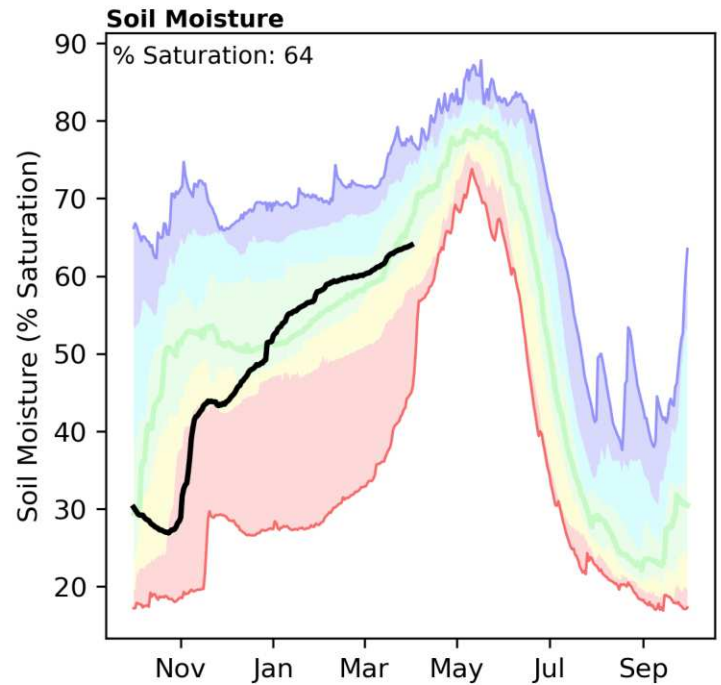
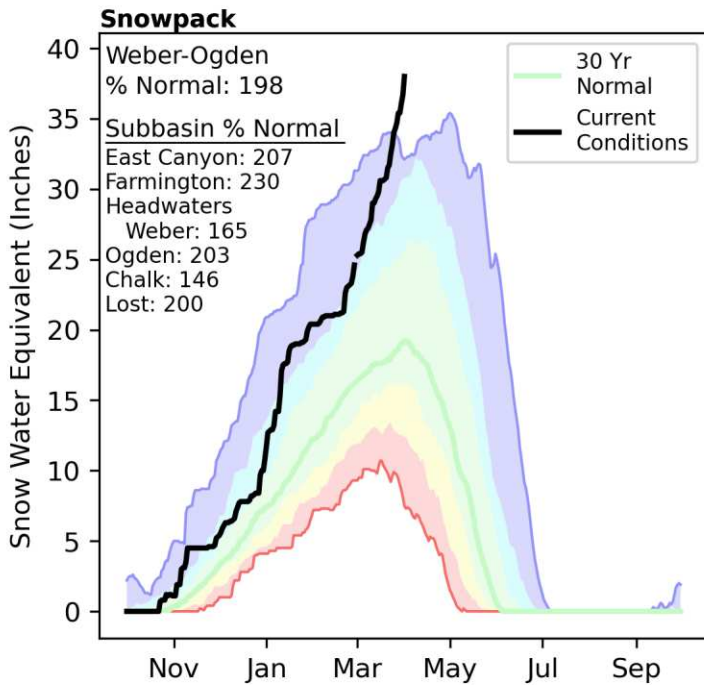


When selected, the following historic streamflow values and statistics will be shown.



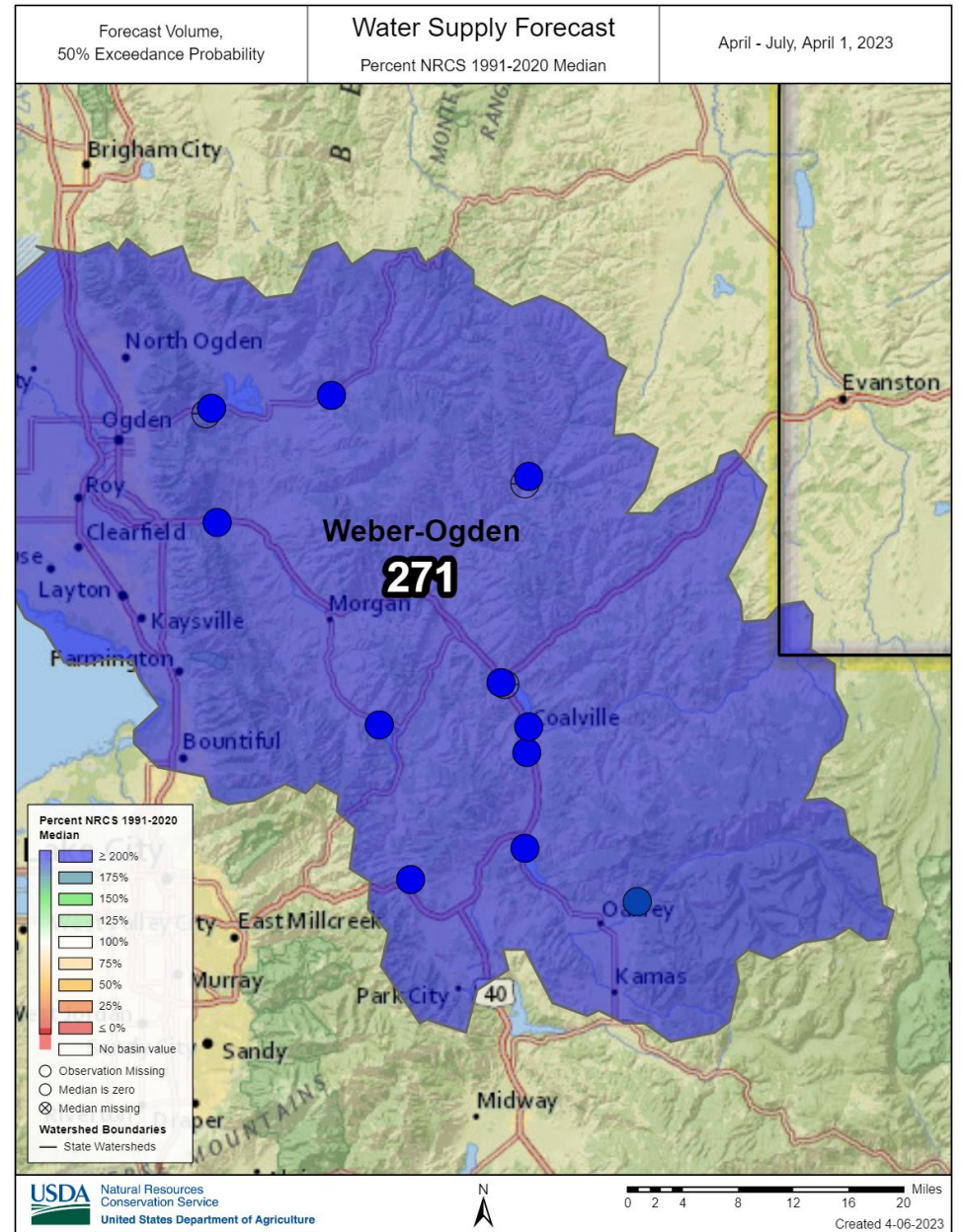
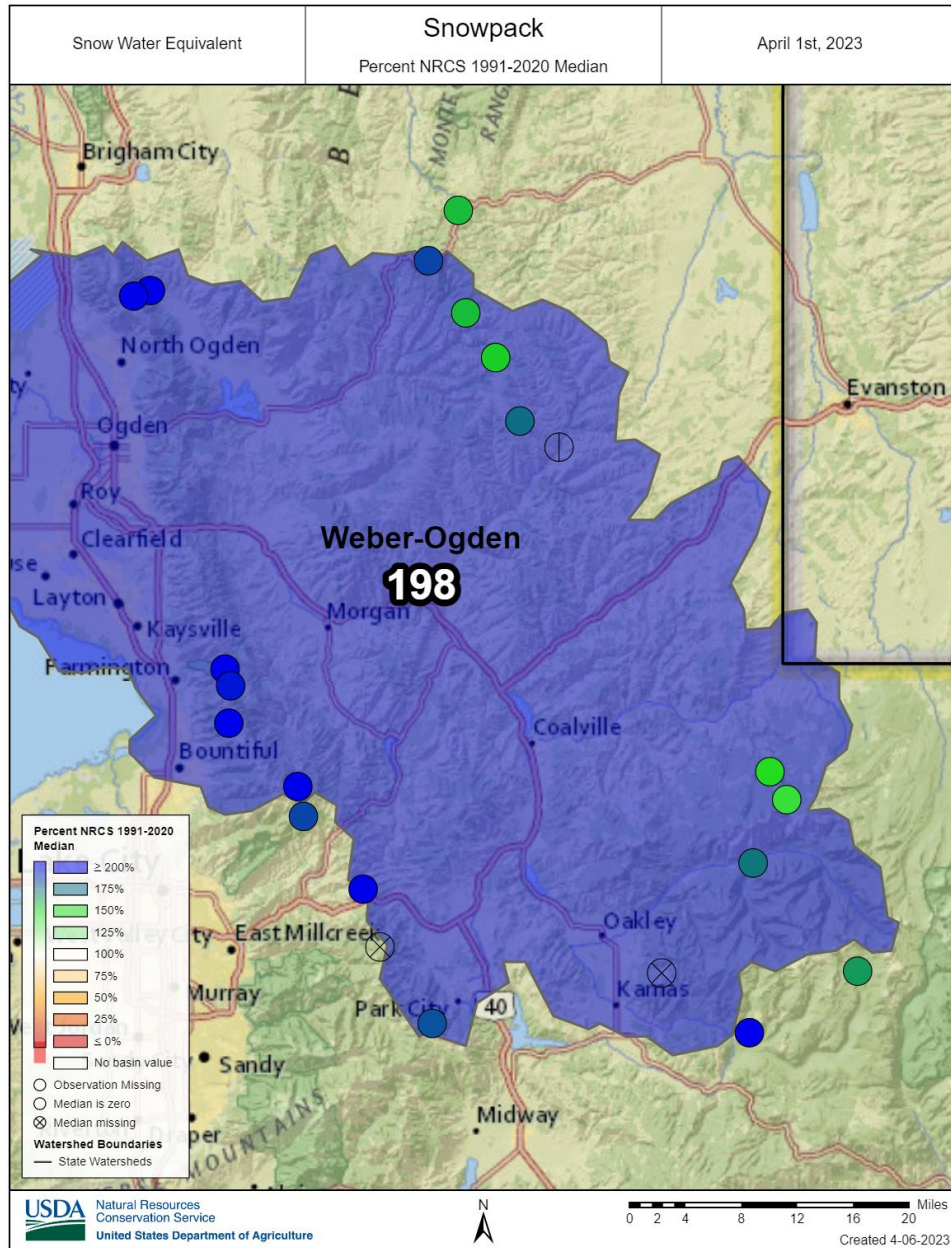
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Snowpack in the Weber and Ogden River Basins is well above normal at 198% of median, compared to 65% at this time last year. Precipitation in March was well above normal at 289%, which brings the seasonal accumulation (October-March) to 158% of median. Soil moisture is at 64% saturation compared to 73% saturation last year. Reservoir storage is 54% of capacity, compared to 48% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 185% to 389% of normal. The Surface Water Supply Index percentiles are 89% for the Weber, and 93% for the Ogden.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: [30 year normal calculation description](#)

Weber-Ogden

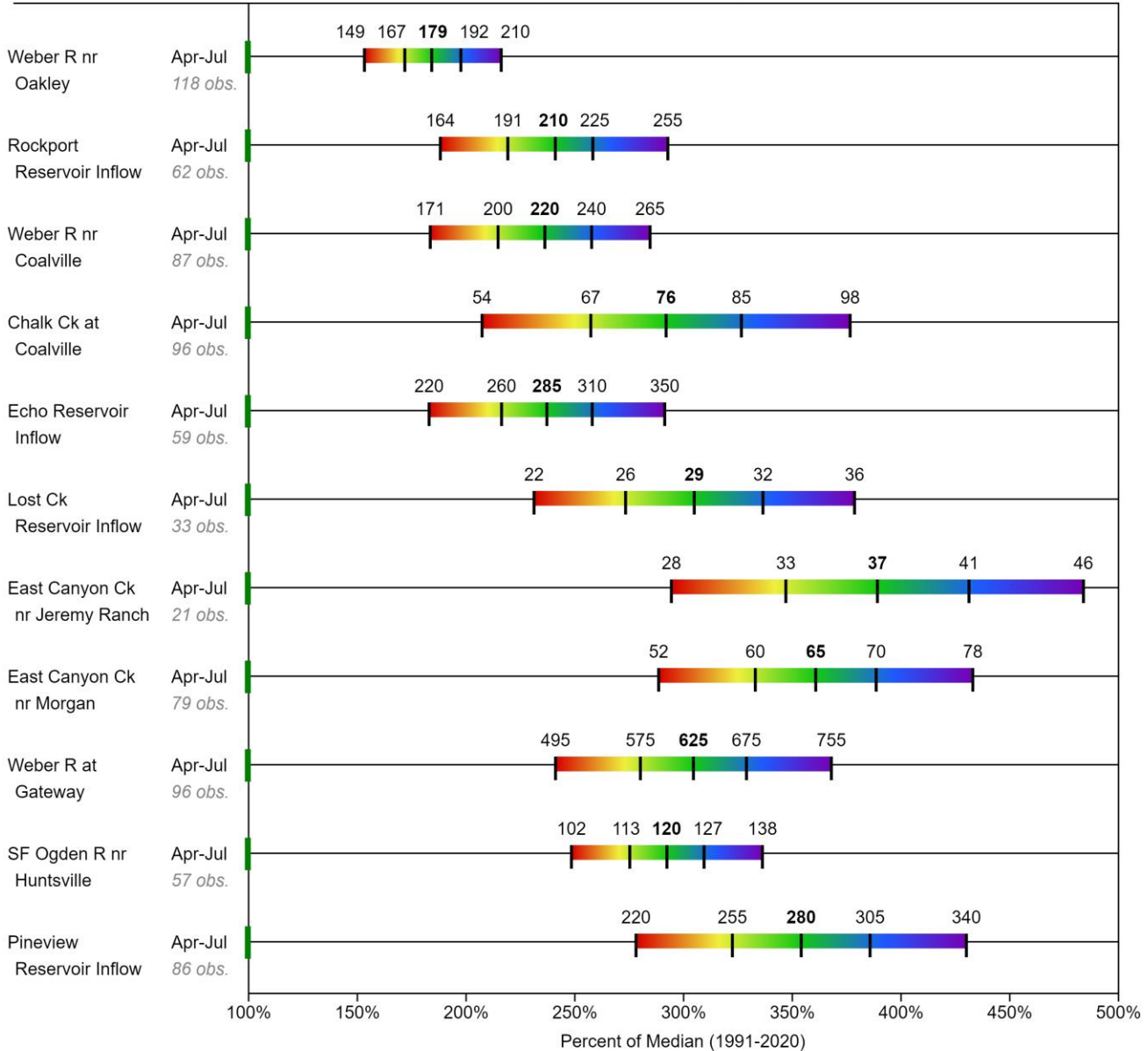


Weber-Ogden

WEBER-OGDEN Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->
Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



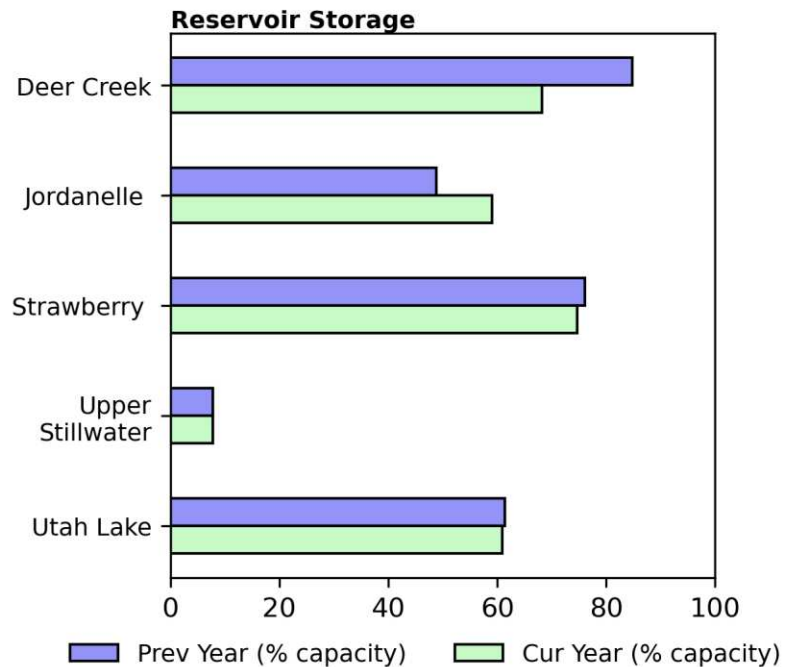
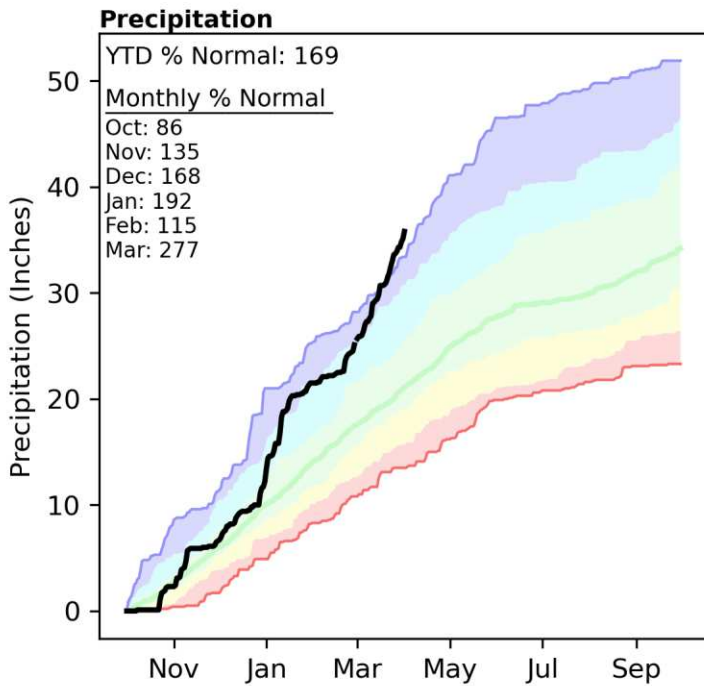
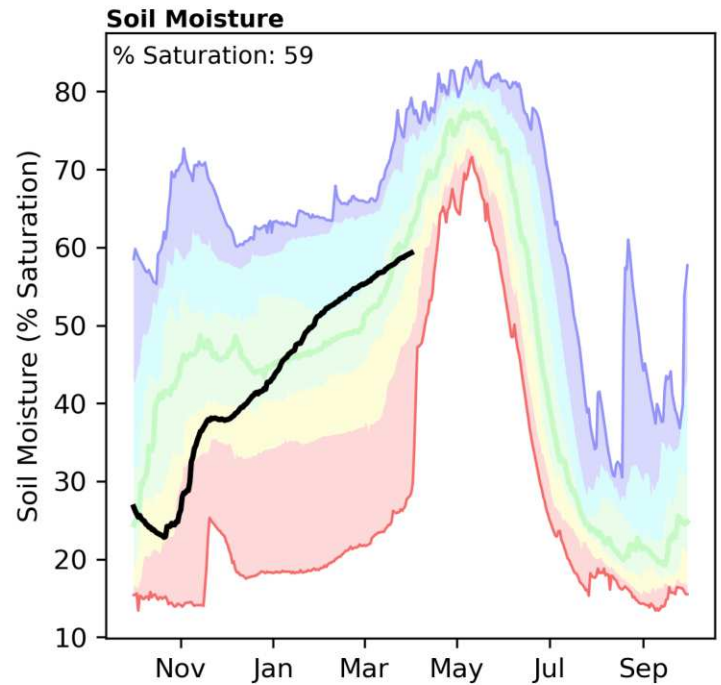
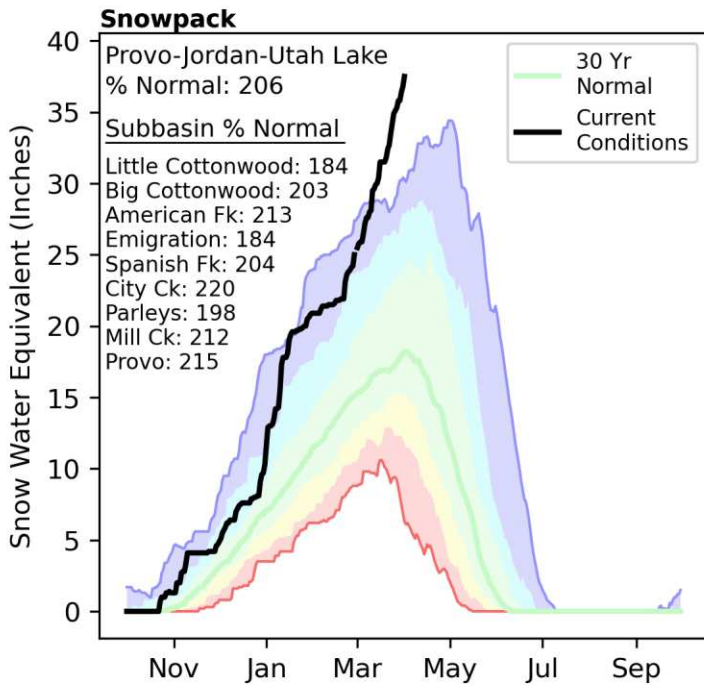
When selected, the following historic streamflow values and statistics will be shown.

■ *Period of Record Minimum Streamflow KAF (Year)*
 ■ *1991-2020 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.

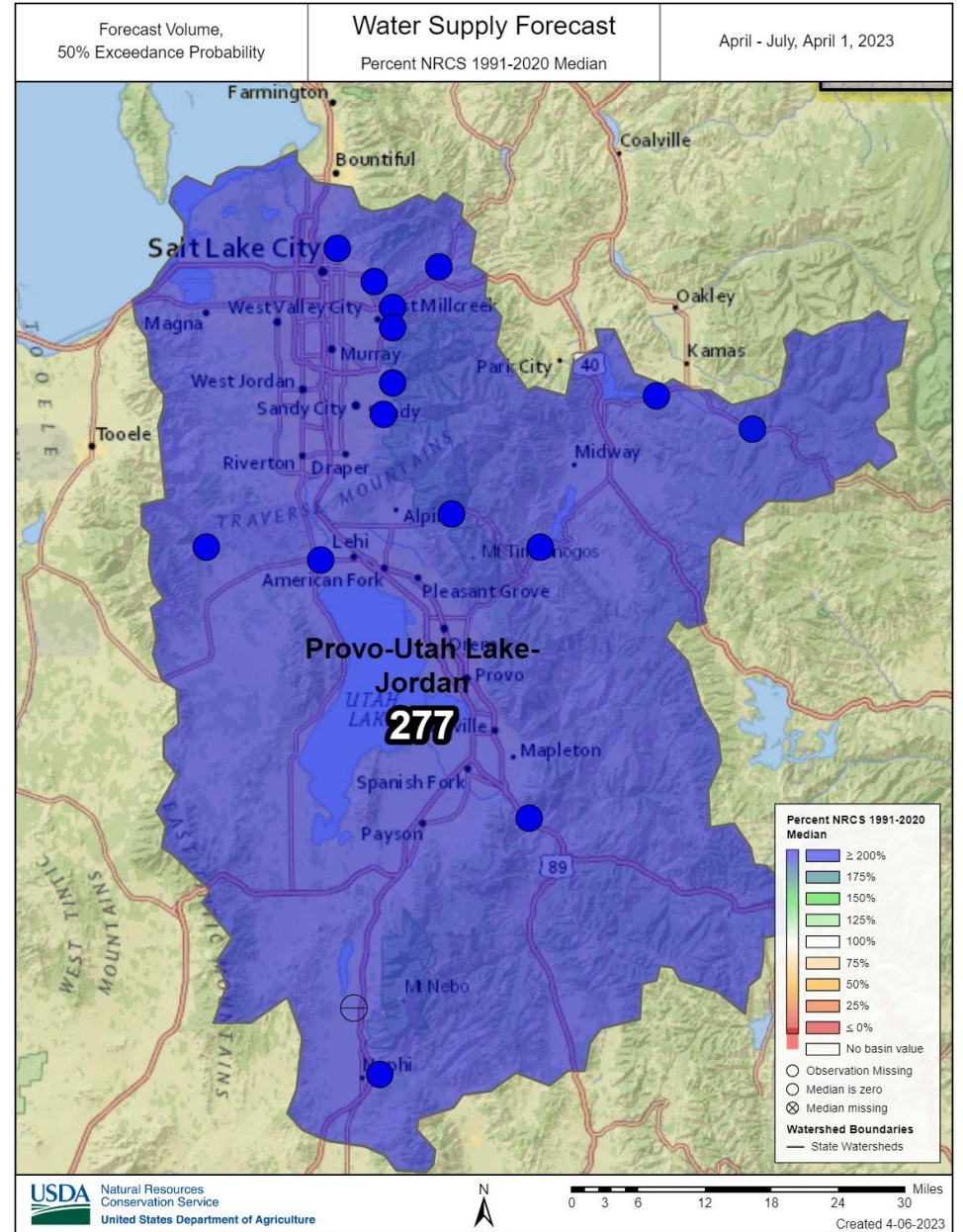
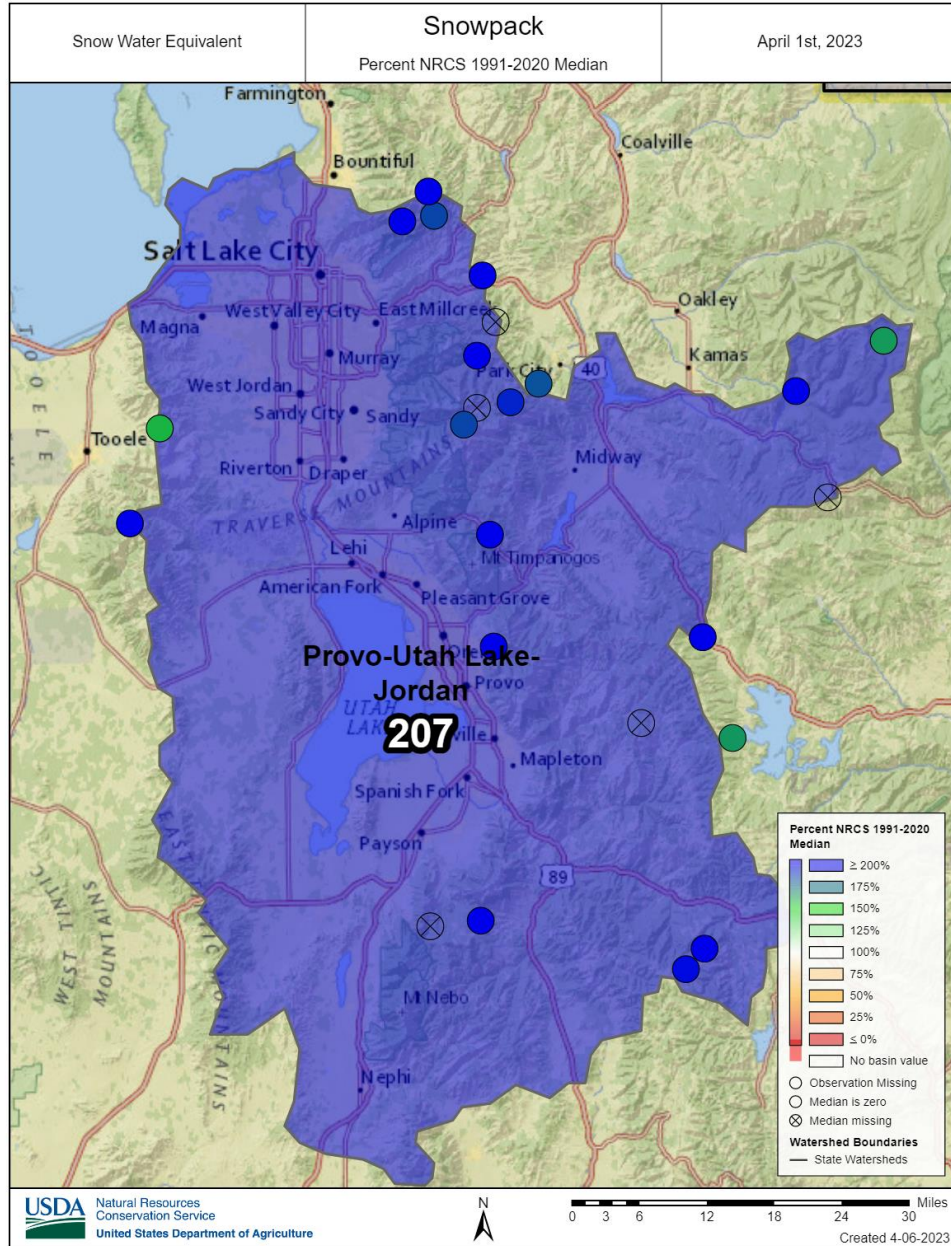
Provo-Jordan-Utah Lake | April 1, 2023

Snowpack in the Provo and Jordan River Basins is well above normal at 206% of median, compared to 70% at this time last year. Precipitation in March was well above normal at 277%, which brings the seasonal accumulation (October-March) to 169% of median. Soil moisture is at 59% saturation compared to 75% saturation last year. Reservoir storage is 66% of capacity, compared to 67% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 196% to 745% of normal. The Surface Water Supply Index percentile is 47% for the Provo.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Provo-Utah Lake-Jordan

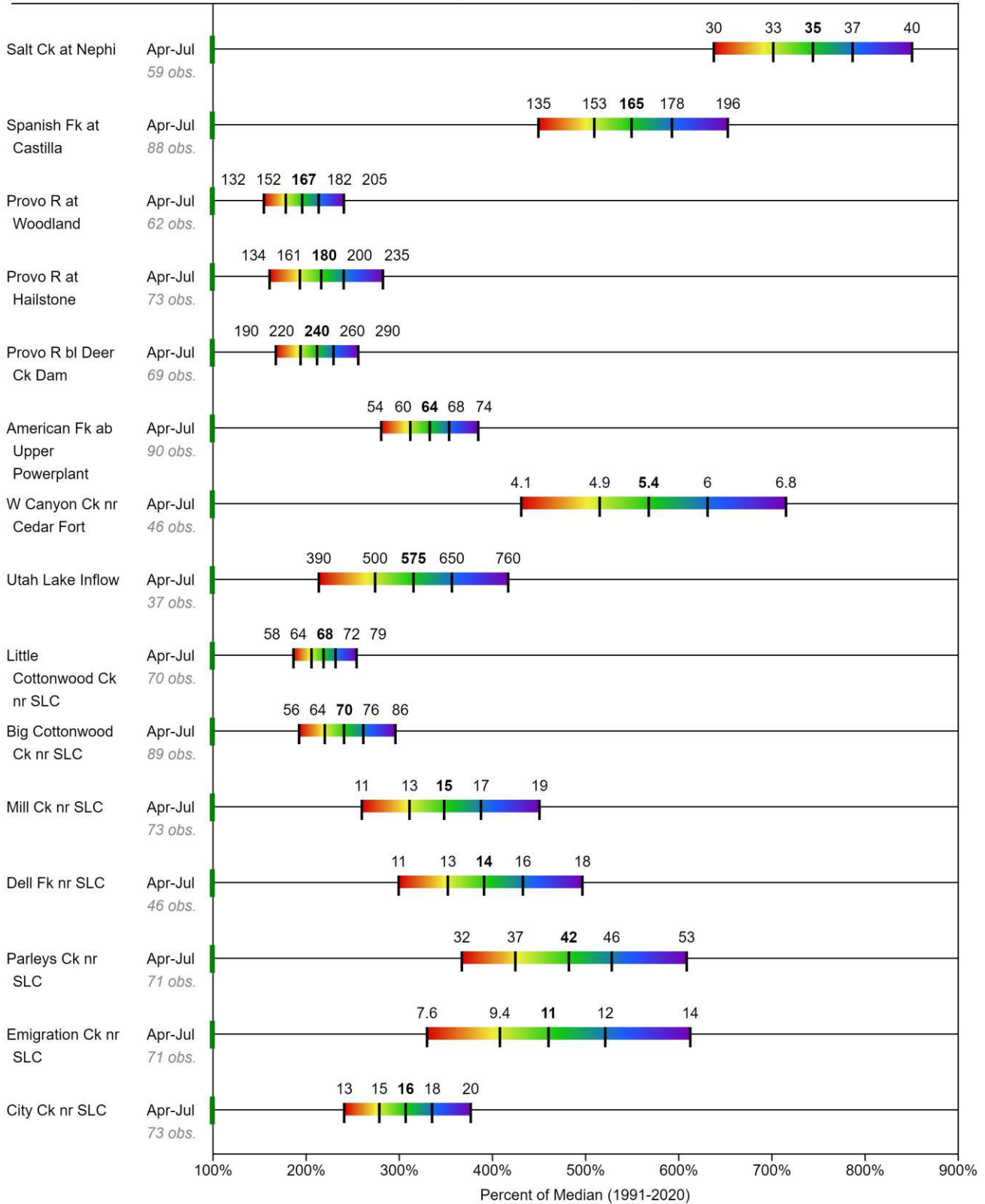


Provo-Utah Lake-Jordan

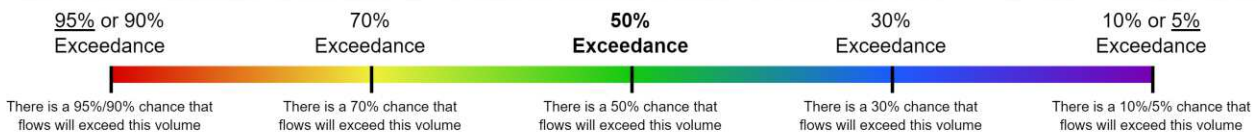
PROVO-UTAH LAKE-JORDAN Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->
Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



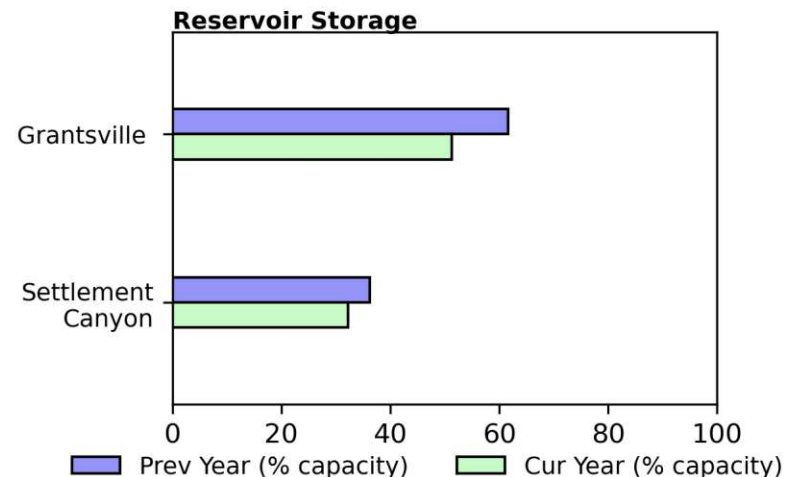
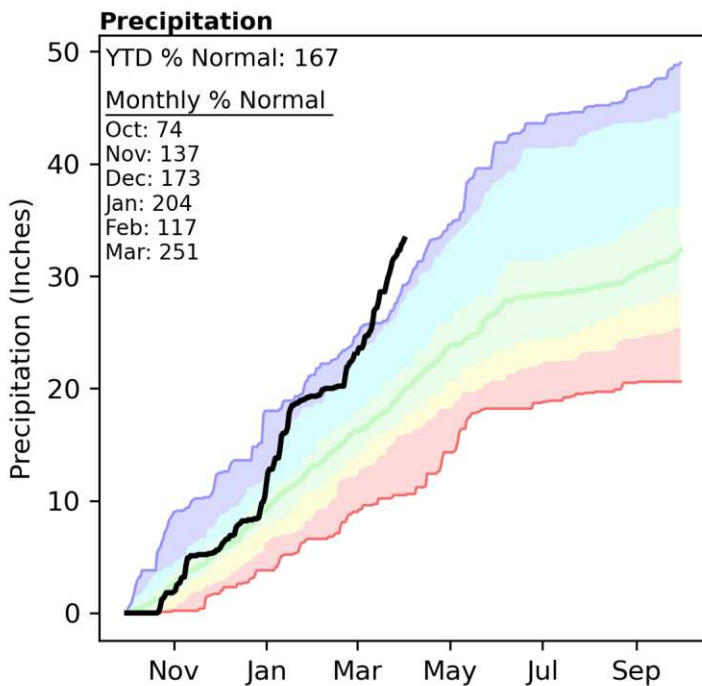
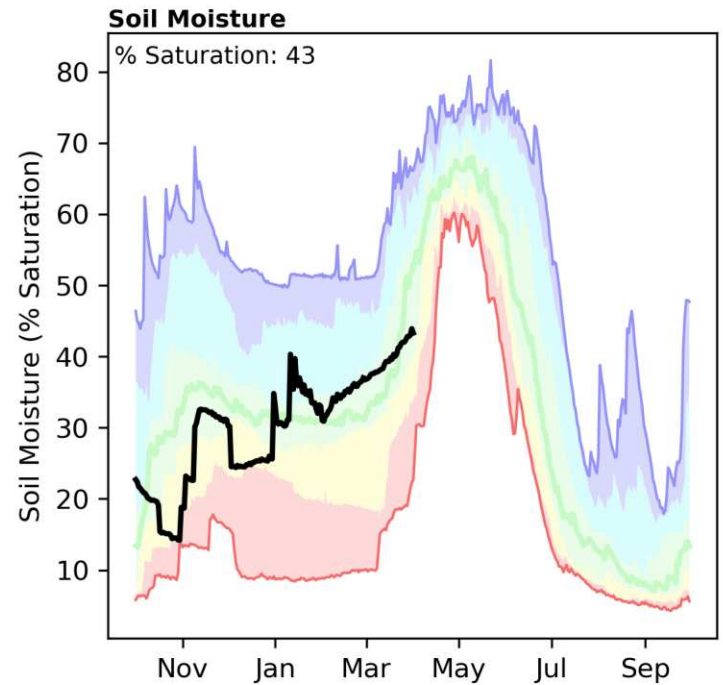
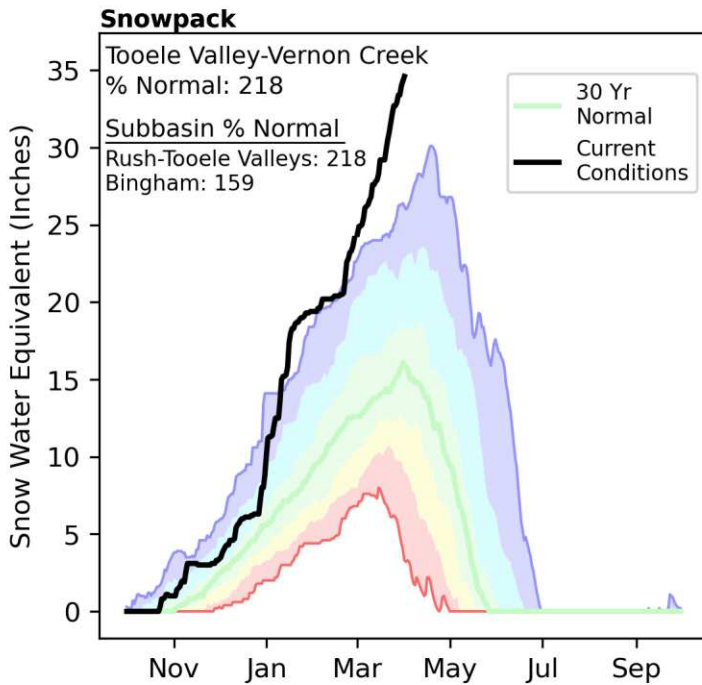
When selected, the following historic streamflow values and statistics will be shown.



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

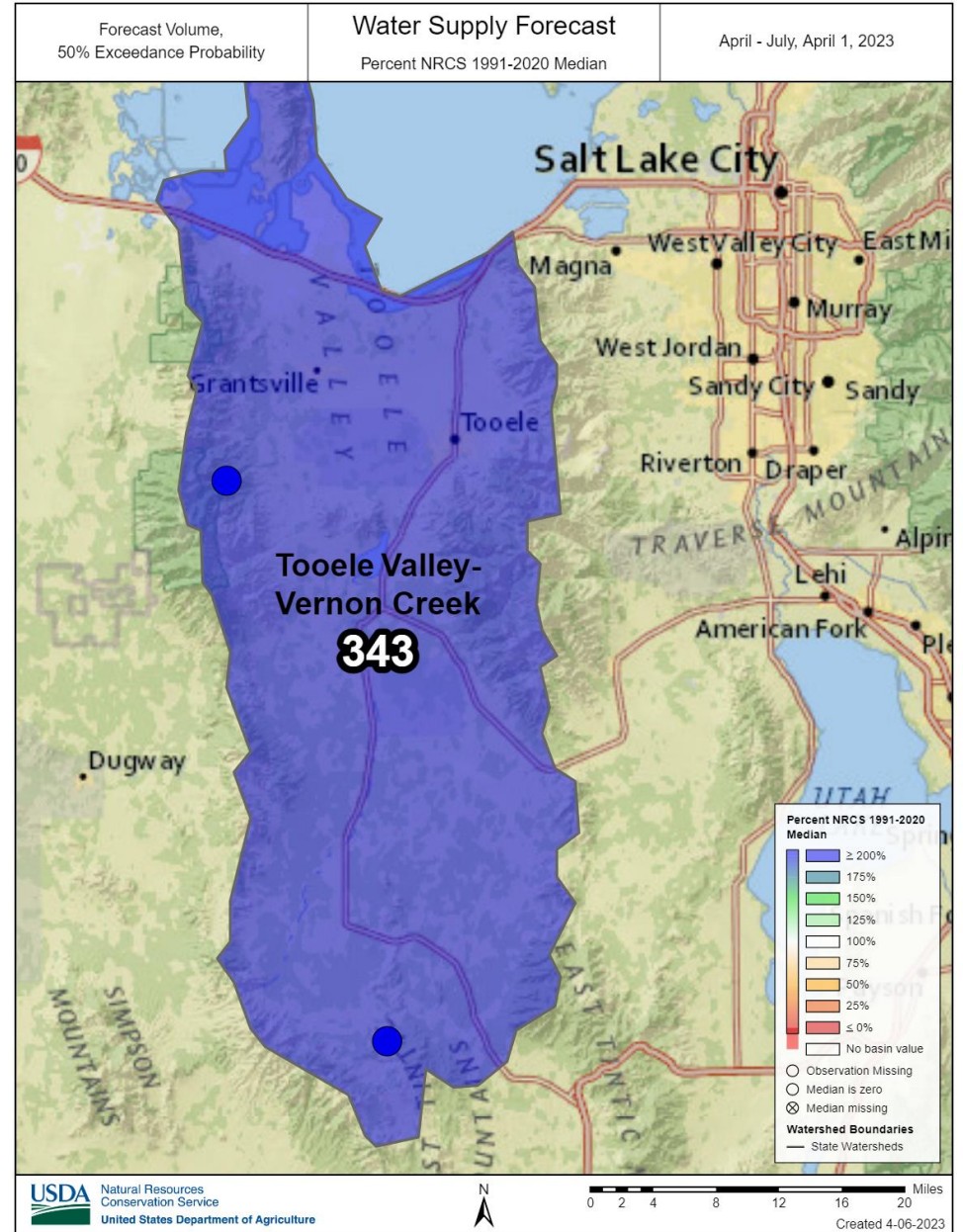
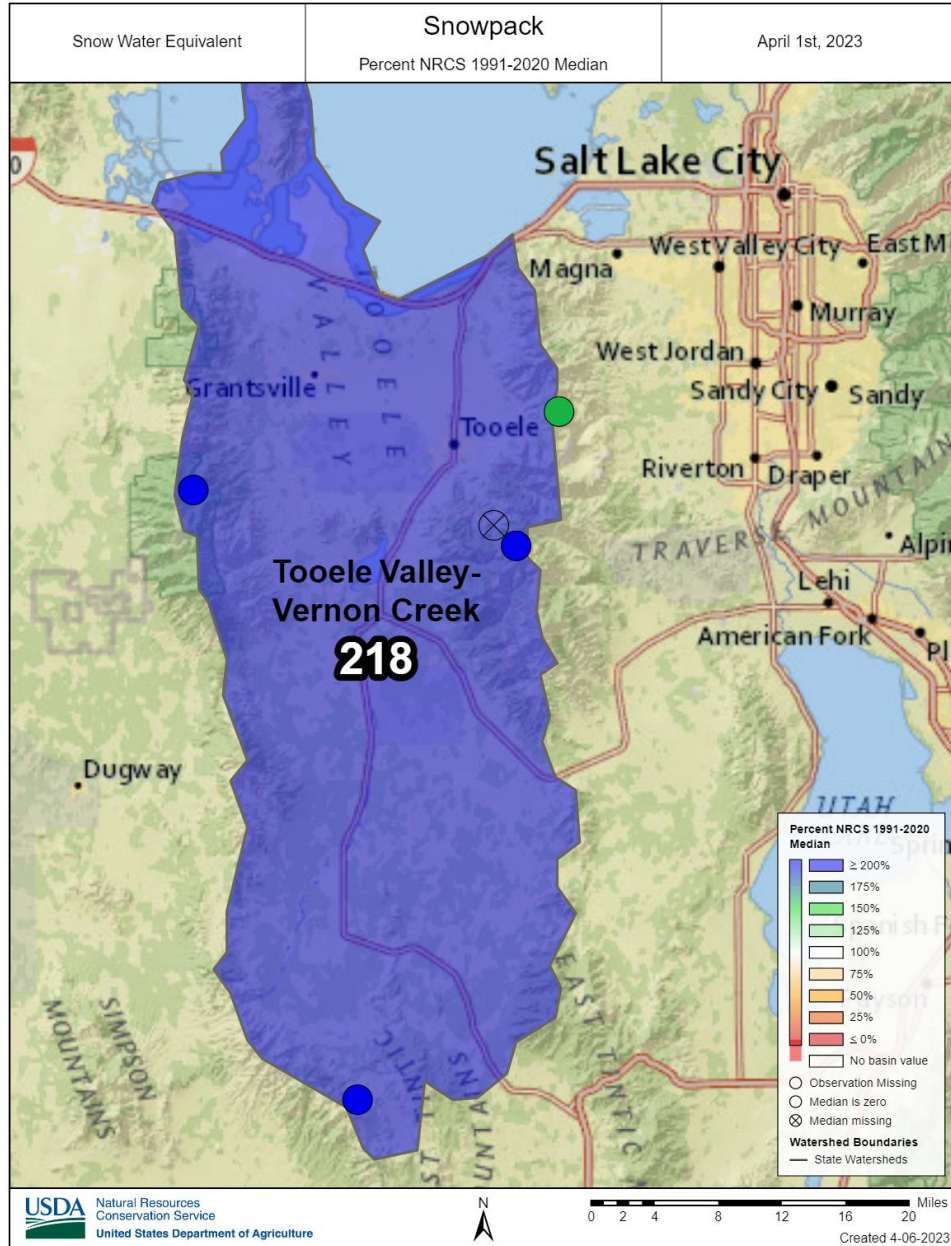
Tooele Valley-Vernon Creek | April 1, 2023

Snowpack in the Tooele Valley and West Desert Region is well above normal at 218% of median, compared to 55% at this time last year. Precipitation in March was well above normal at 251%, which brings the seasonal accumulation (October-March) to 167% of median. Soil moisture is at 43% saturation compared to 66% saturation last year. Reservoir storage is 46% of capacity, compared to 55% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 221% to 541% of normal.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

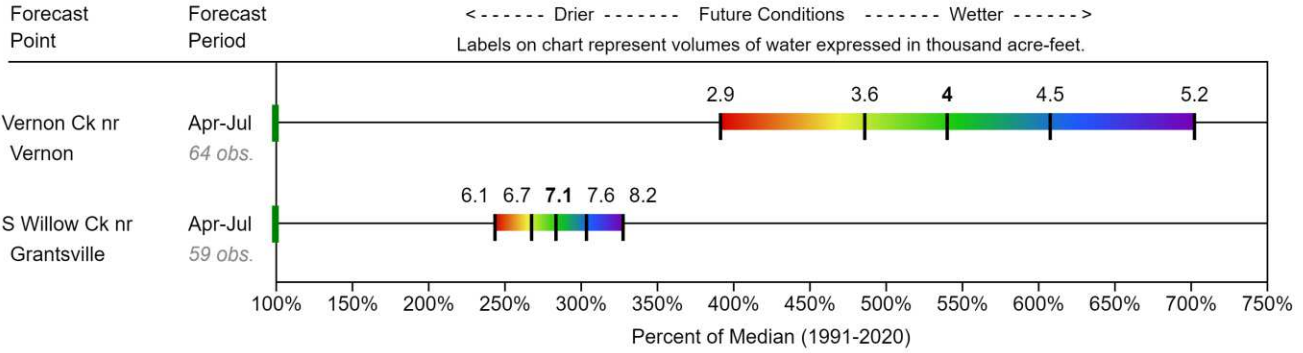
Tooele Valley-Vernon Creek



Tooele Valley-Vernon Creek

TOOELE VALLEY-VERNON CREEK Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities



Legend



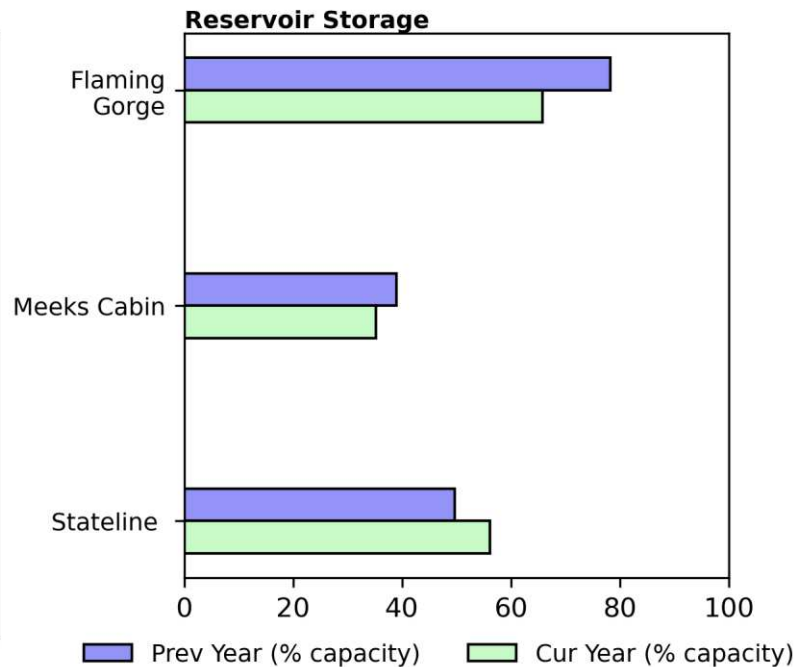
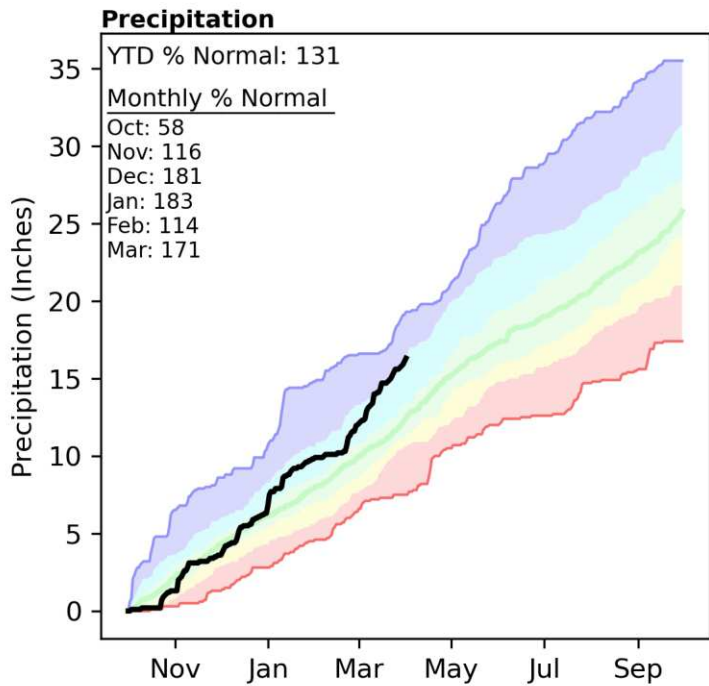
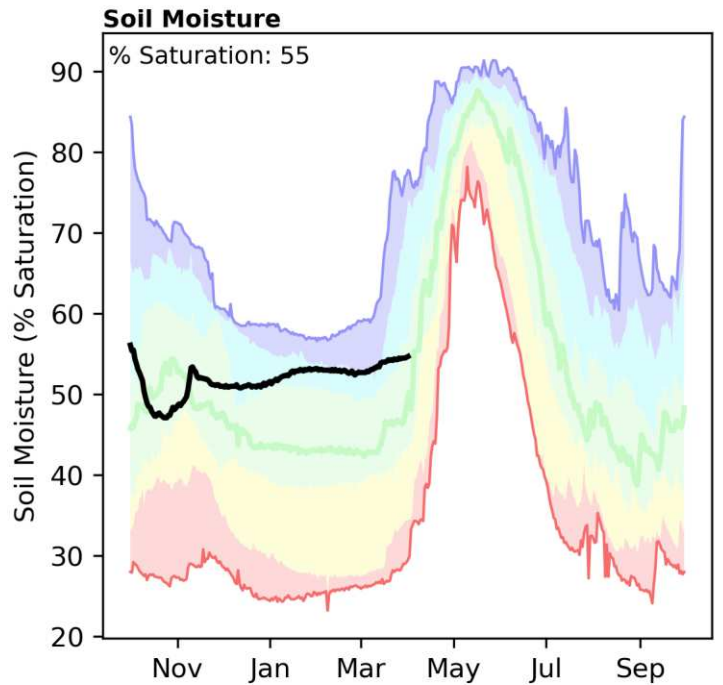
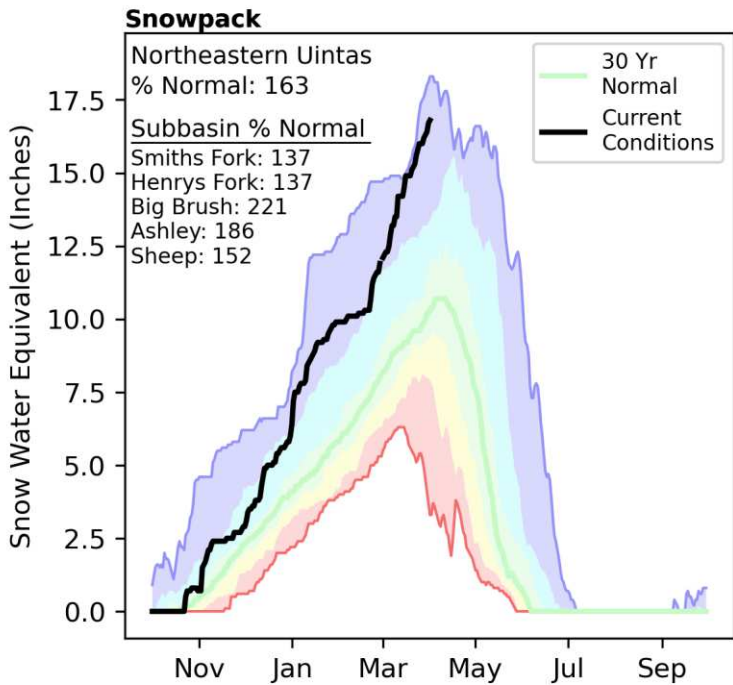
When selected, the following historic streamflow values and statistics will be shown.



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

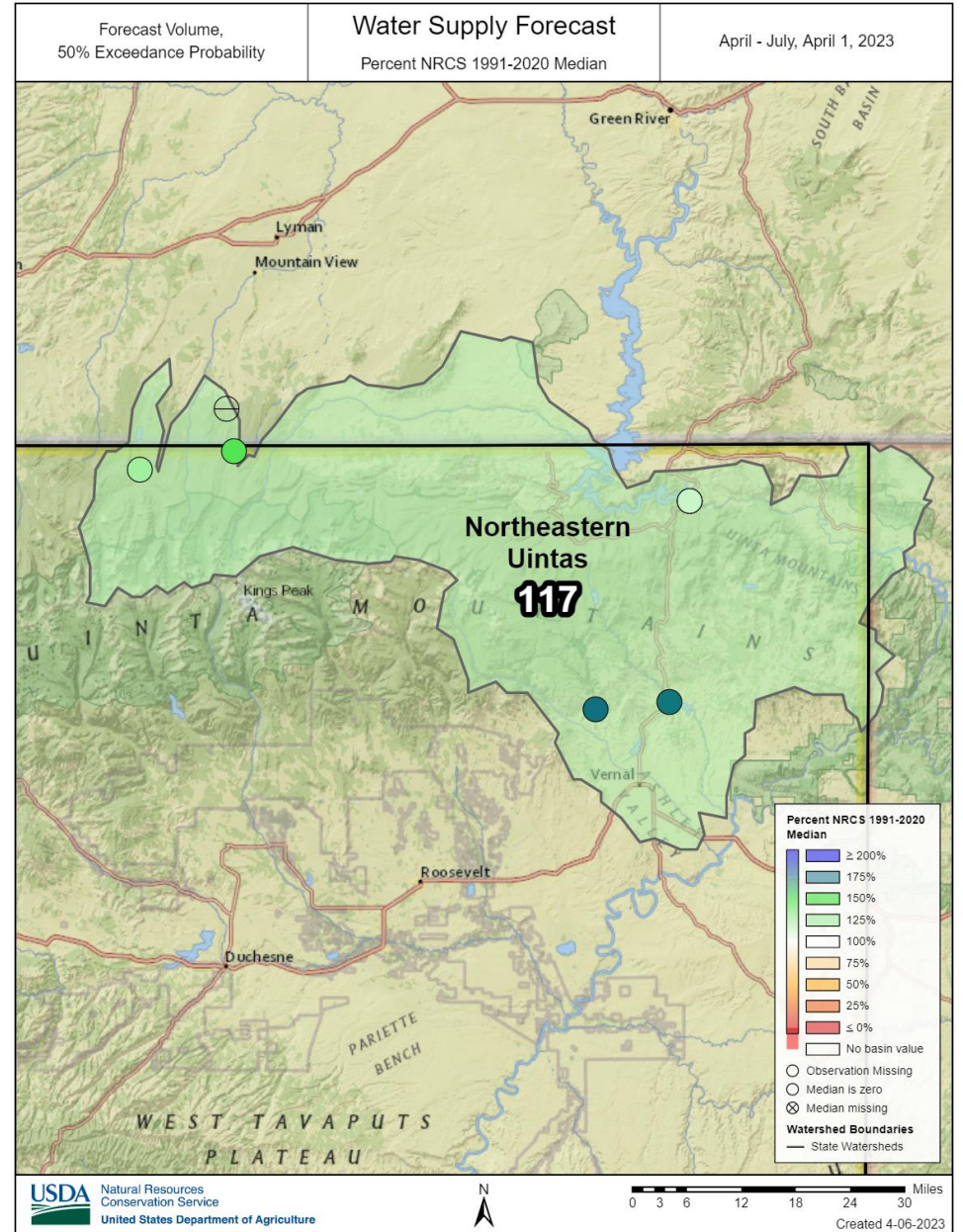
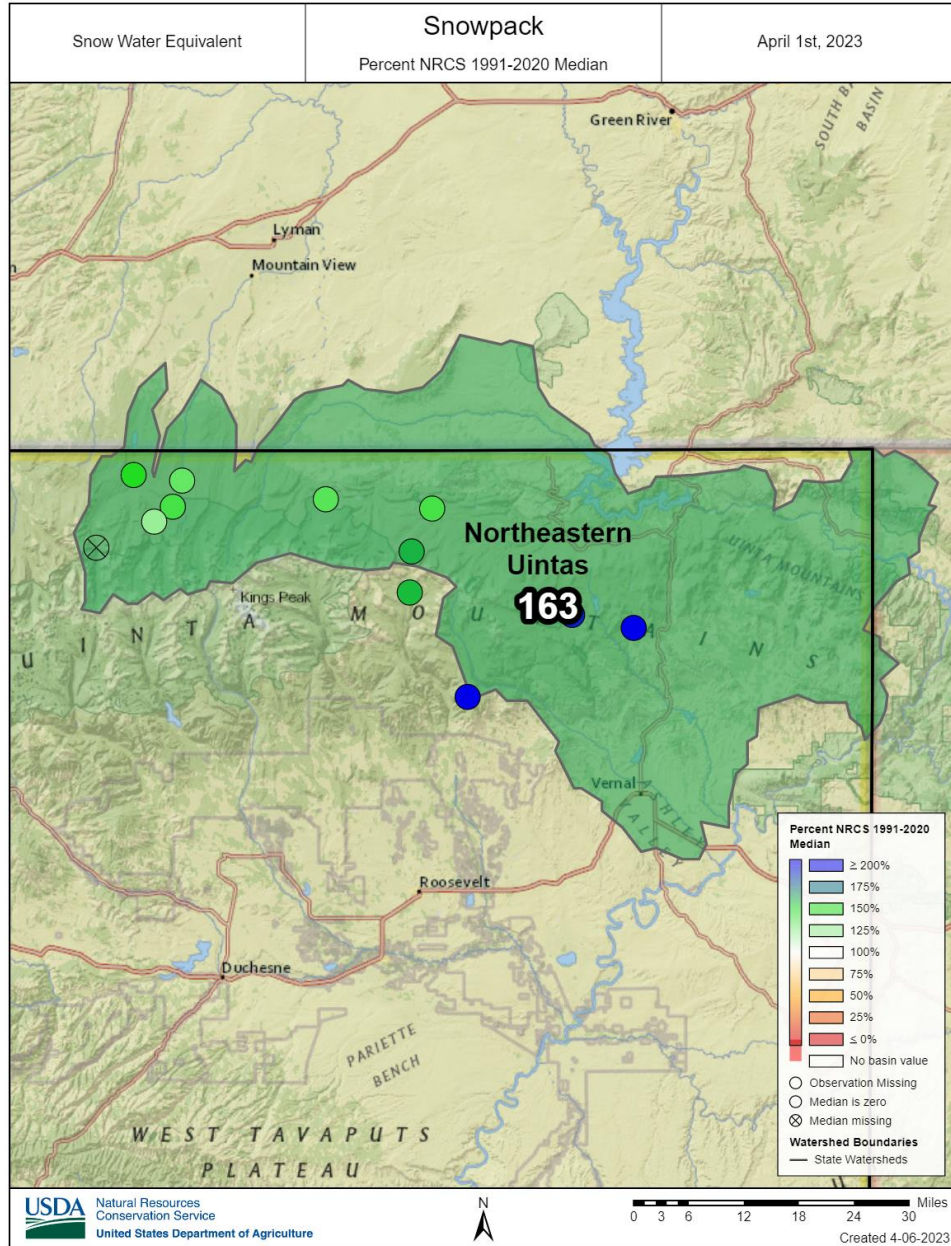
Northeastern Uintas | April 1, 2023

Snowpack in the Northeastern Uintas is well above normal at 163% of median, compared to 90% at this time last year. Precipitation in March was well above normal at 171%, which brings the seasonal accumulation (October-March) to 131% of median. Soil moisture is at 55% saturation compared to 61% saturation last year. Reservoir storage is 65% of capacity, compared to 77% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 112% to 174% of normal. The Surface Water Supply Index percentiles are 78% for the Blacks Fork, and 85% for the Smiths Fork.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: [30 year normal calculation description](#)

Northeastern Uintas

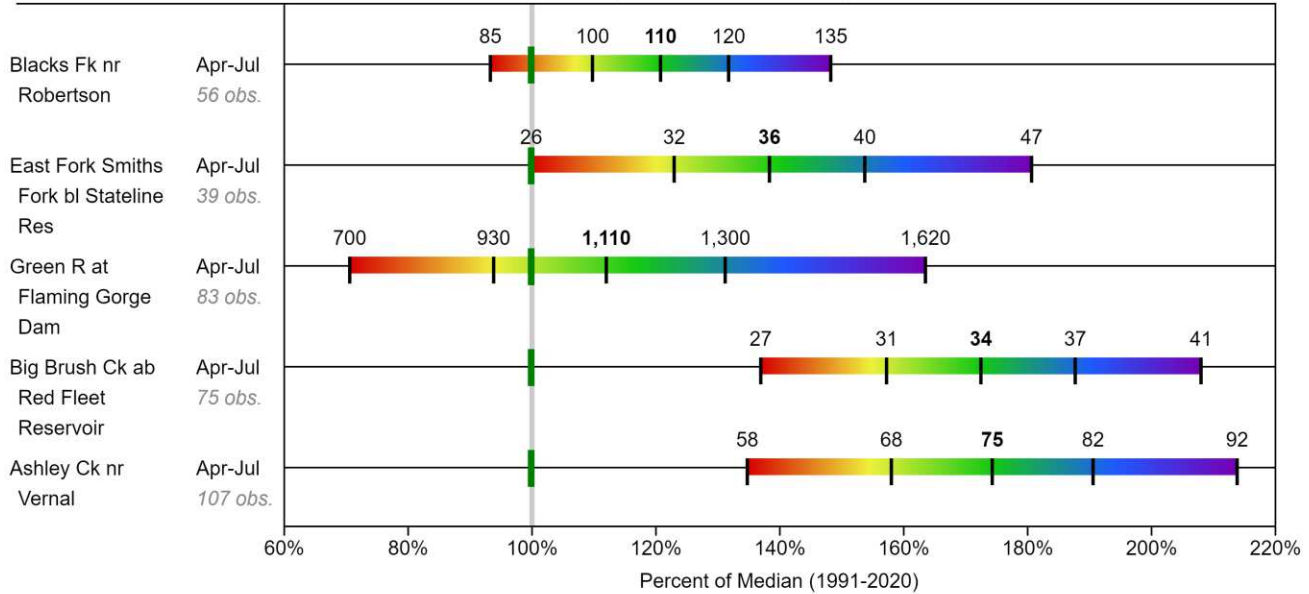


Northeastern Uintas

NORTHEASTERN UINTAS Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->
Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



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

Period of Record Minimum Streamflow KAF (Year)

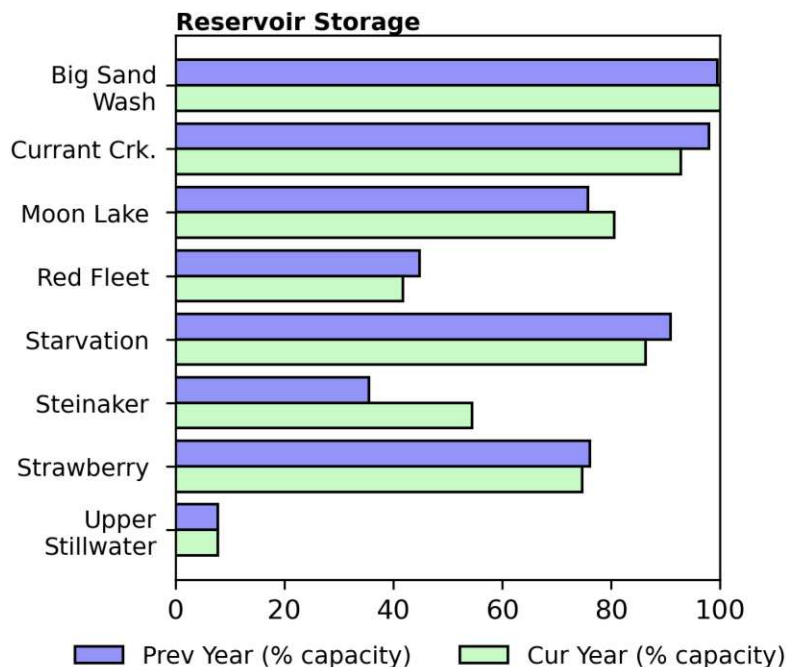
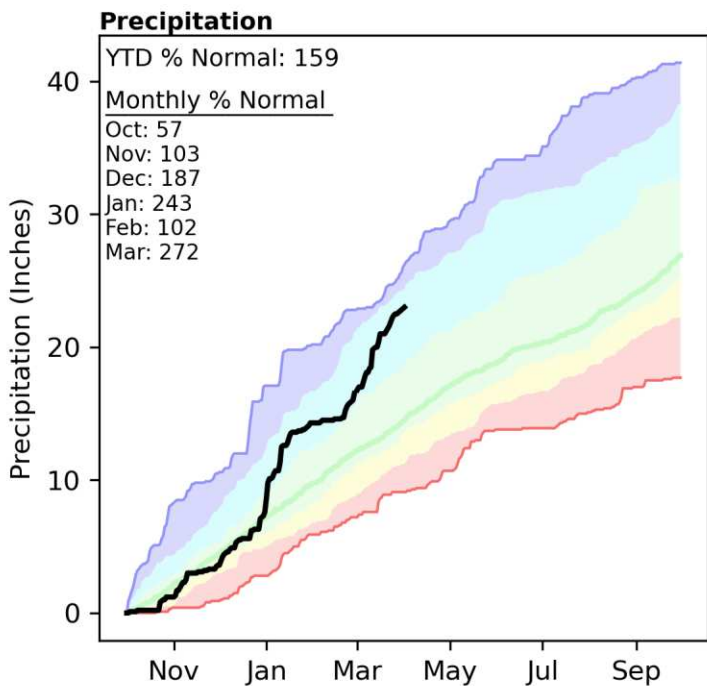
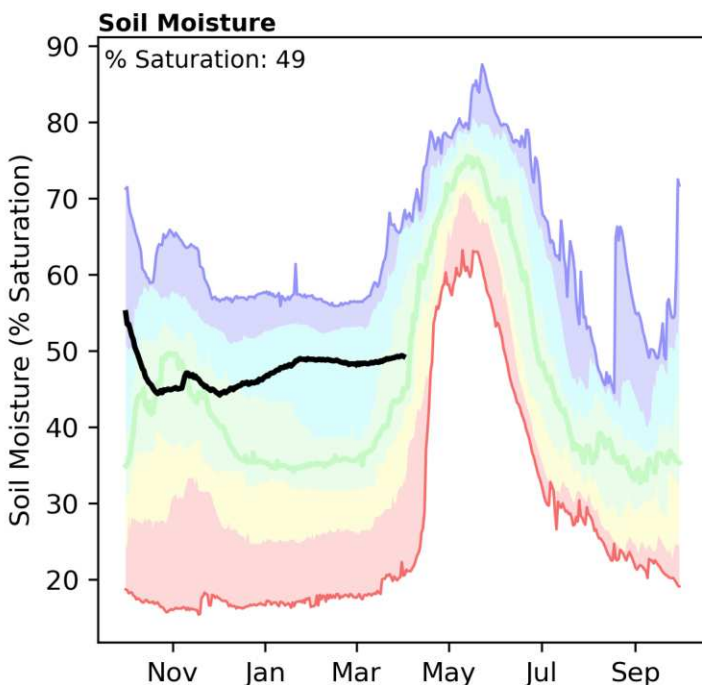
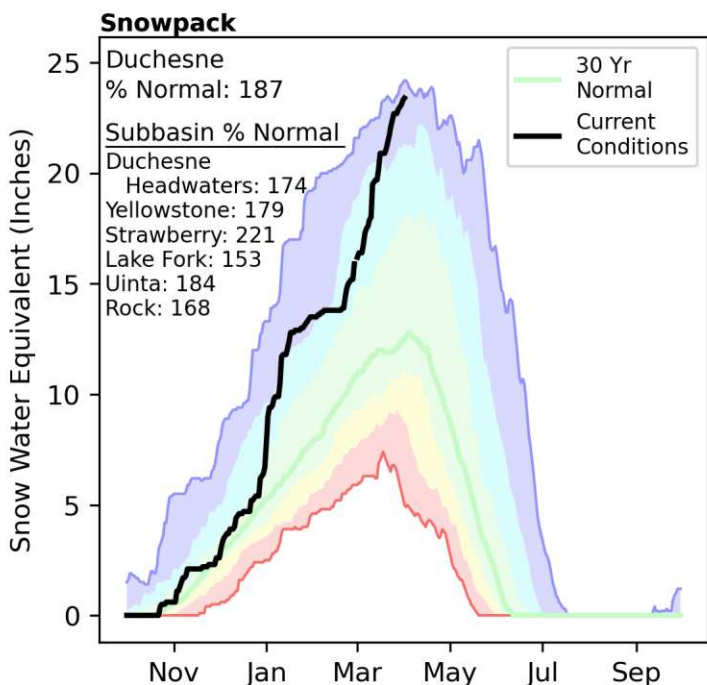
1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

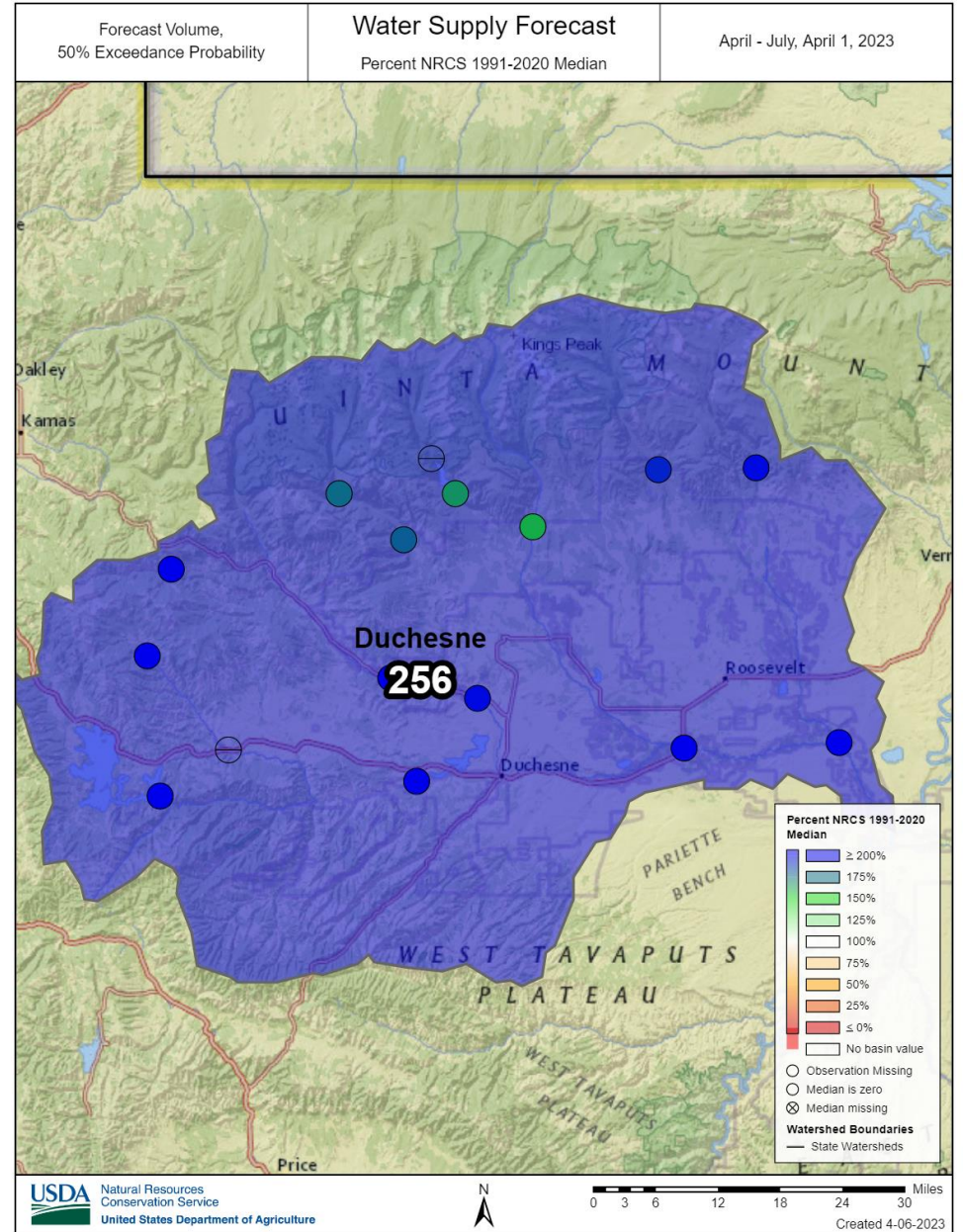
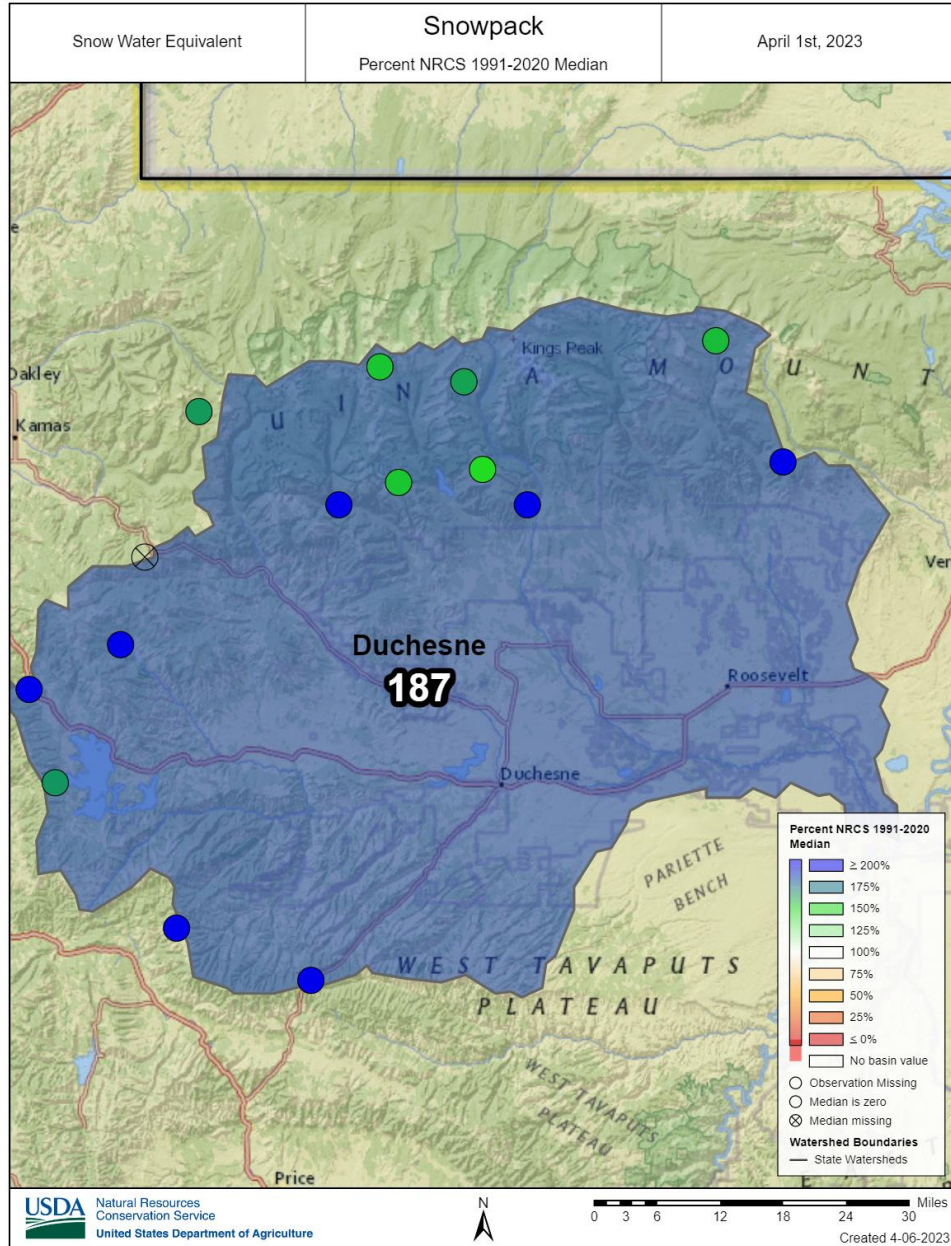
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Snowpack in the Duchesne River Basin is well above normal at 187% of median, compared to 88% at this time last year. Precipitation in March was well above normal at 272%, which brings the seasonal accumulation (October-March) to 159% of median. Soil moisture is at 49% saturation compared to 66% saturation last year. Reservoir storage is 74% of capacity, compared to 75% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 161% to 491% of normal. The Surface Water Supply Index percentiles are 84% for the Western Uintas, and 84% for the Eastern Uintas.



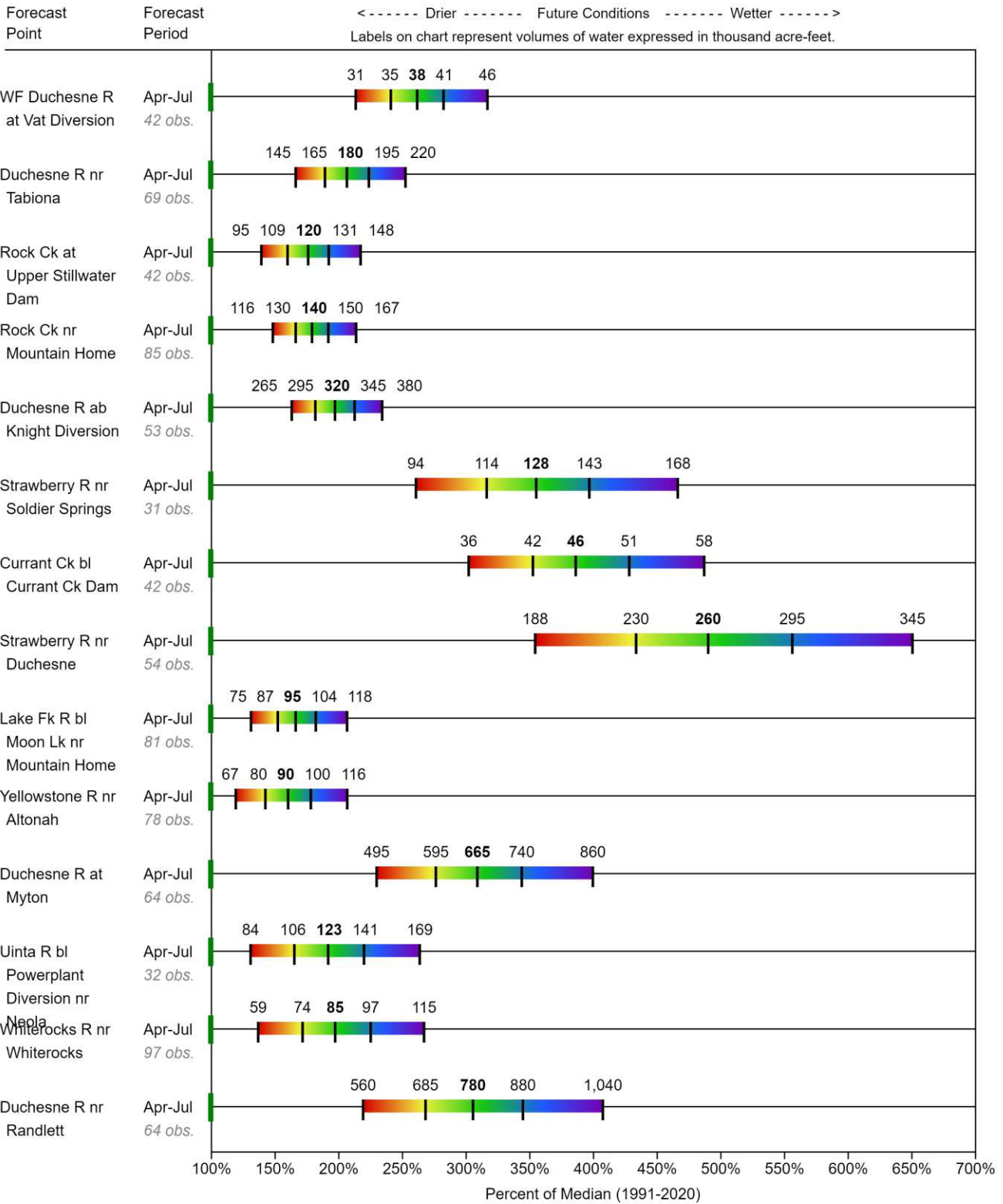
Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Duchesne

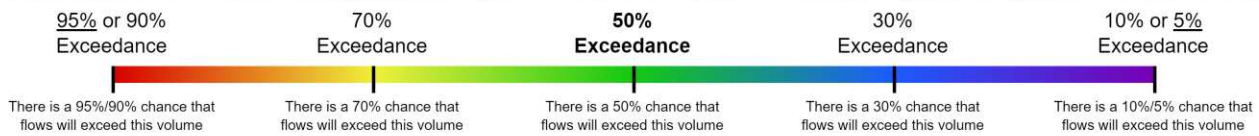


DUCHESNE Water Supply Forecasts April 1, 2023

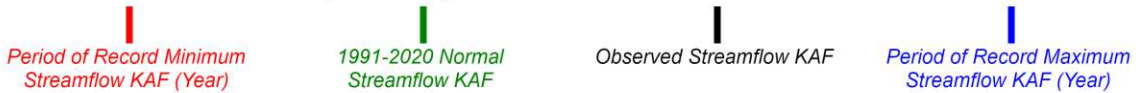
Forecast Exceedance Probabilities



Legend



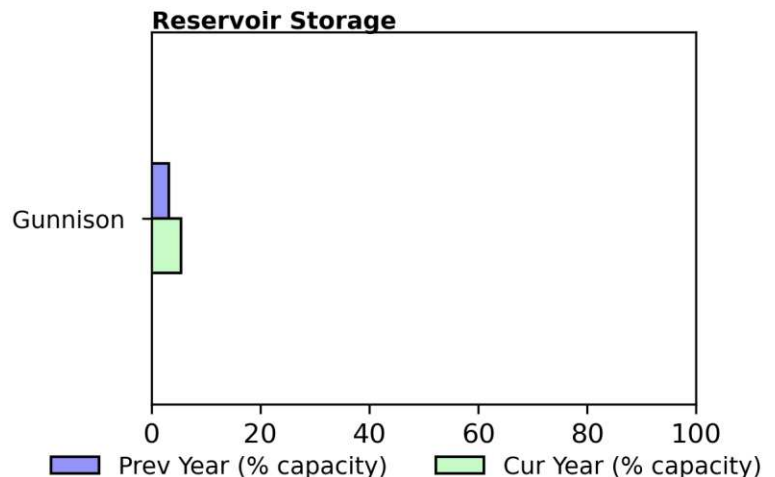
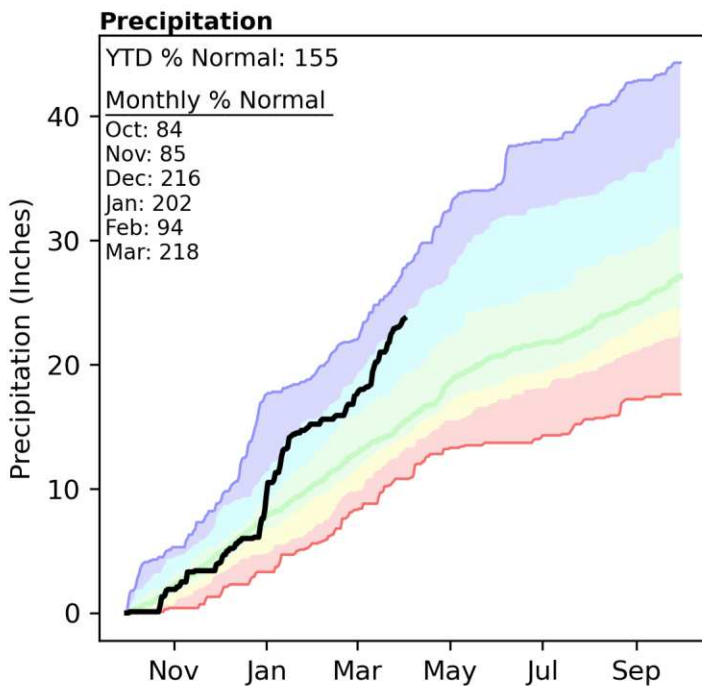
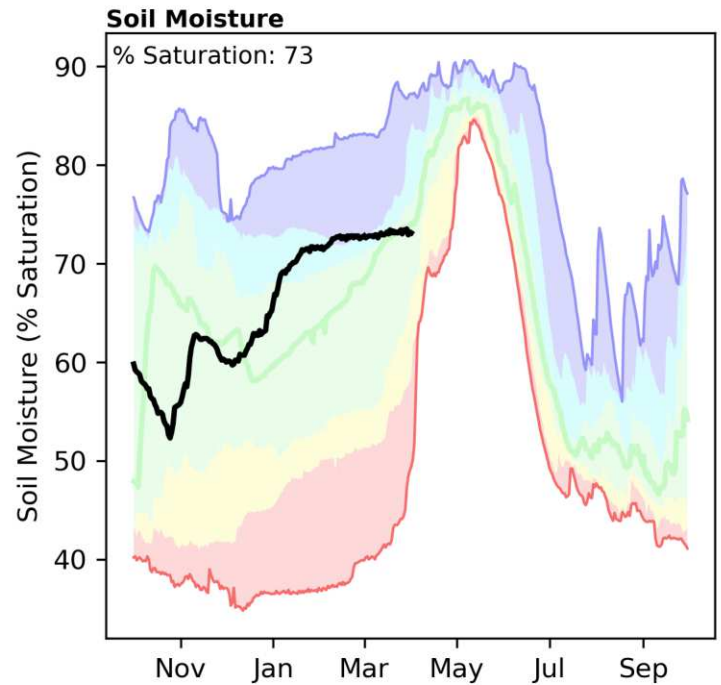
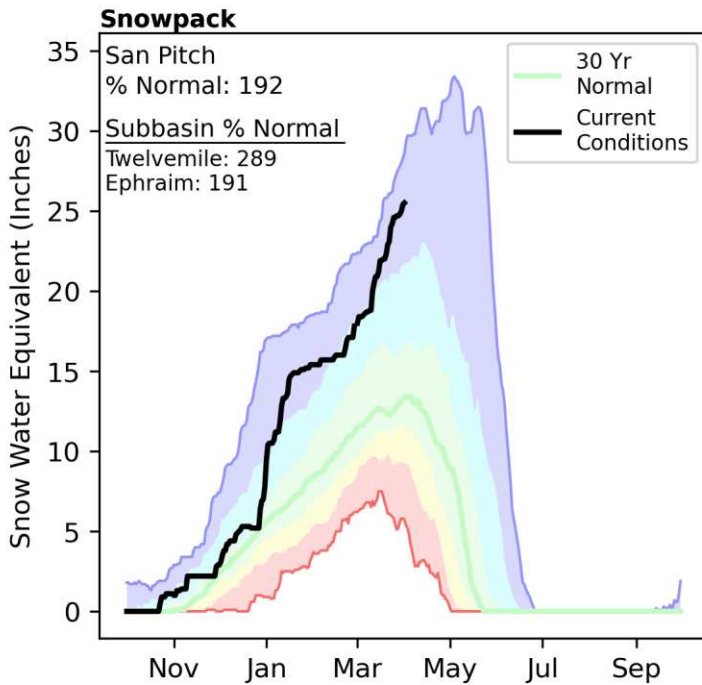
When selected, the following historic streamflow values and statistics will be shown.



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

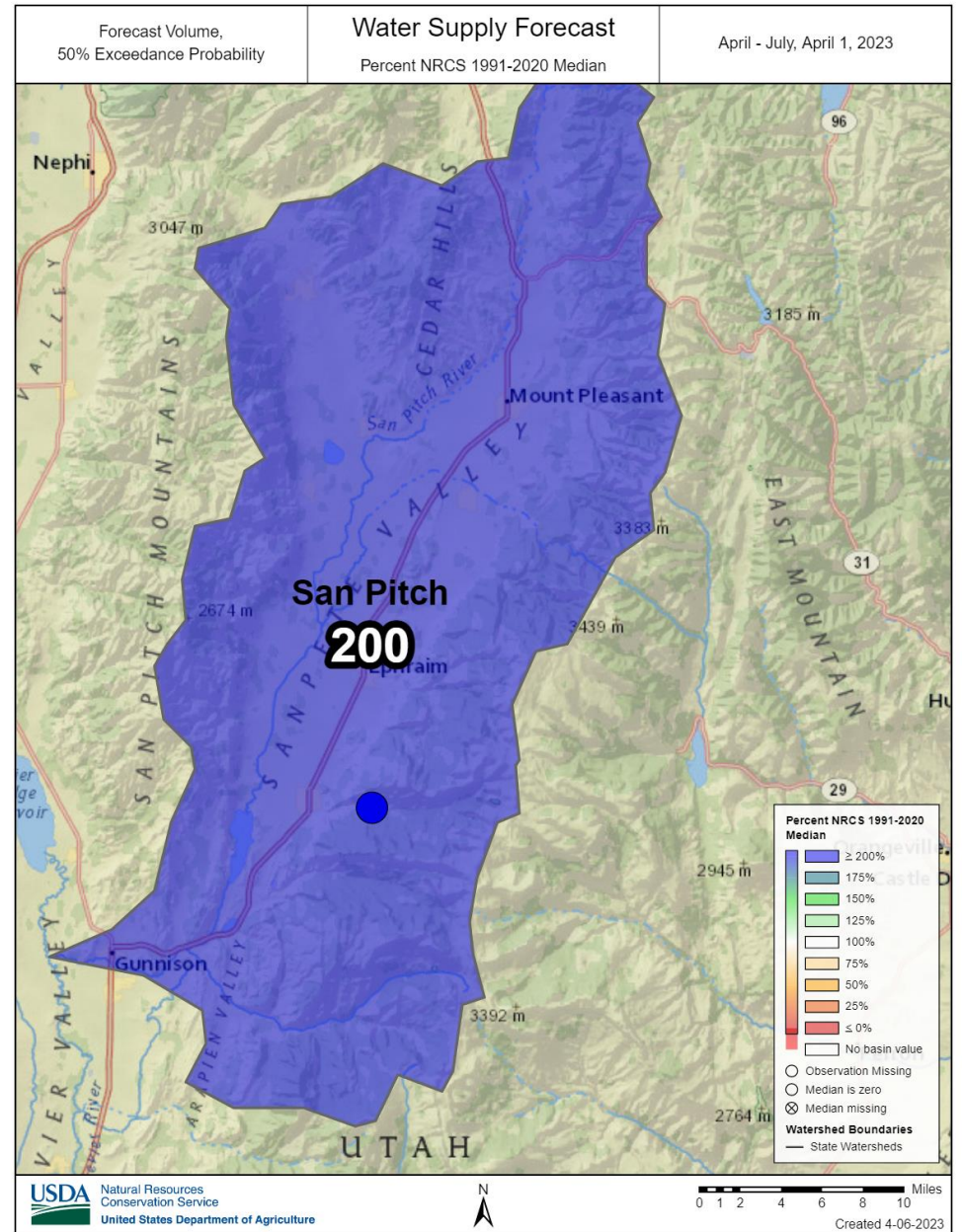
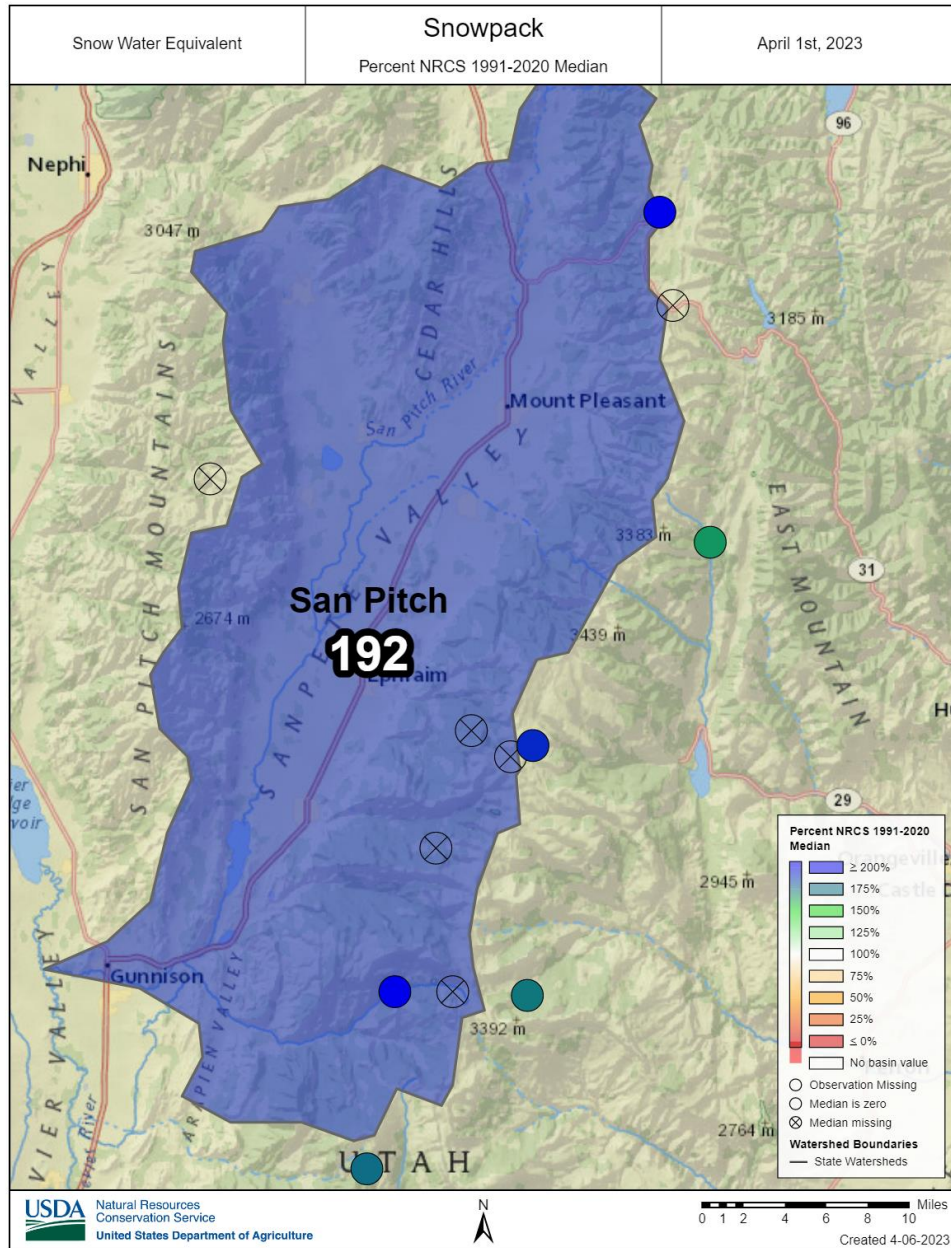
San Pitch | April 1, 2023

Snowpack in the San Pitch River Basin is well above normal at 192% of median, compared to 83% at this time last year. Precipitation in March was well above normal at 218%, which brings the seasonal accumulation (October-March) to 155% of median. Soil moisture is at 73% saturation compared to 76% saturation last year. Reservoir storage is 5% of capacity, compared to 3% last year. The forecast streamflow volume (50% exceedence, April-July) for Manti Creek is 200% of normal. The Surface Water Supply Index percentile is 50% for the San Pitch.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

San Pitch



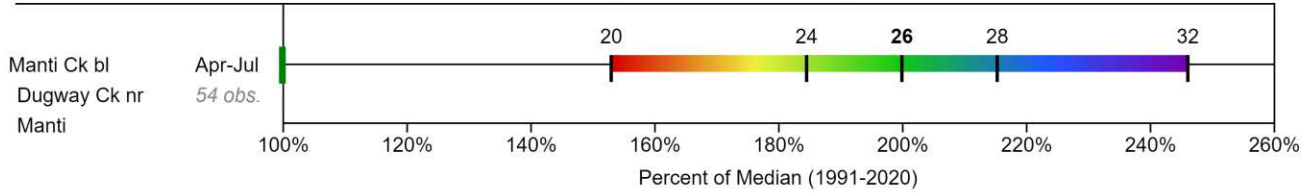
San Pitch

SAN PITCH Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->

Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



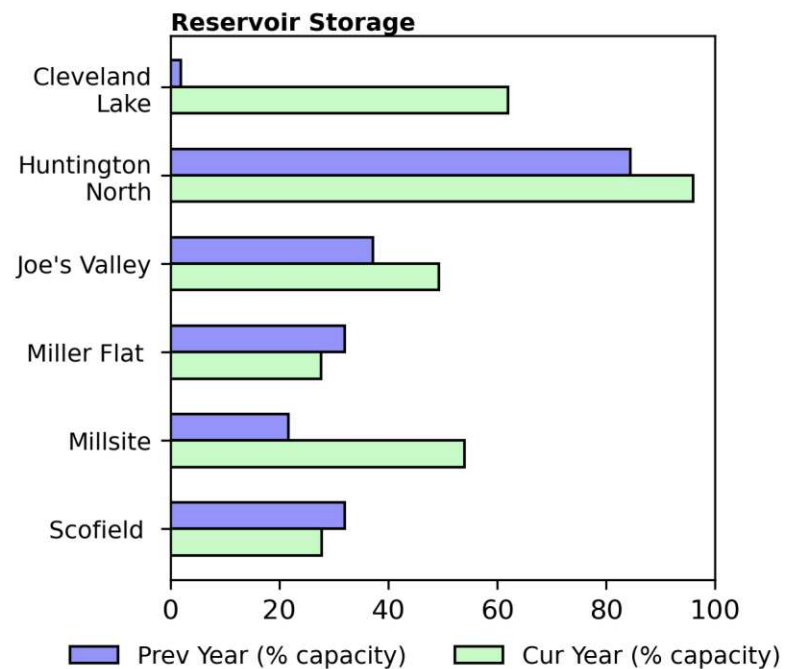
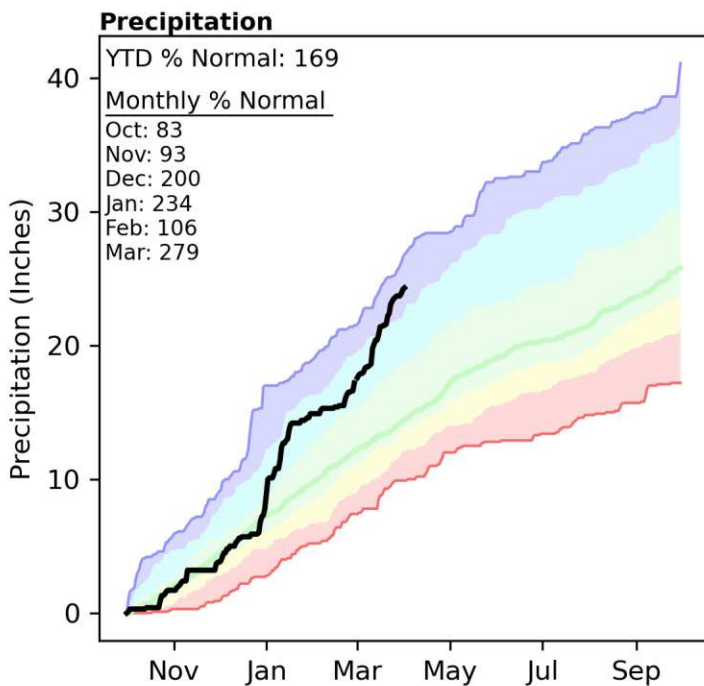
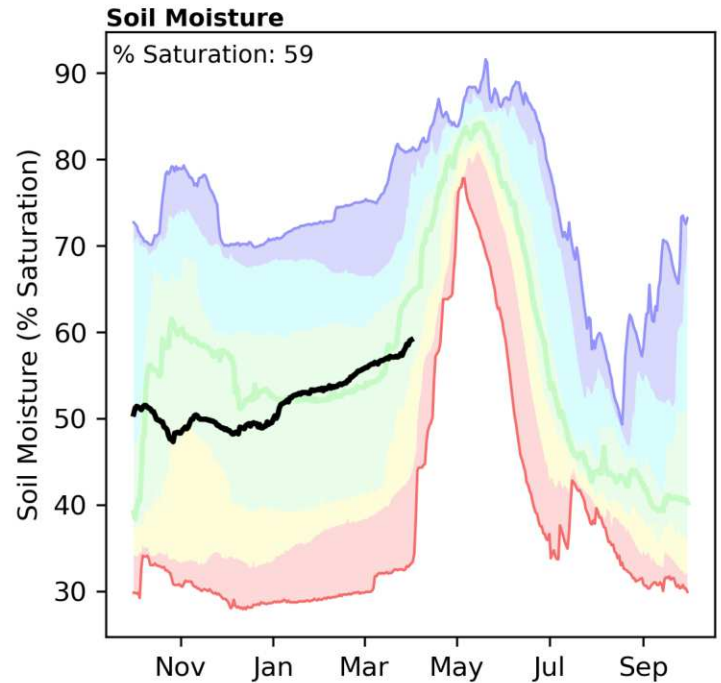
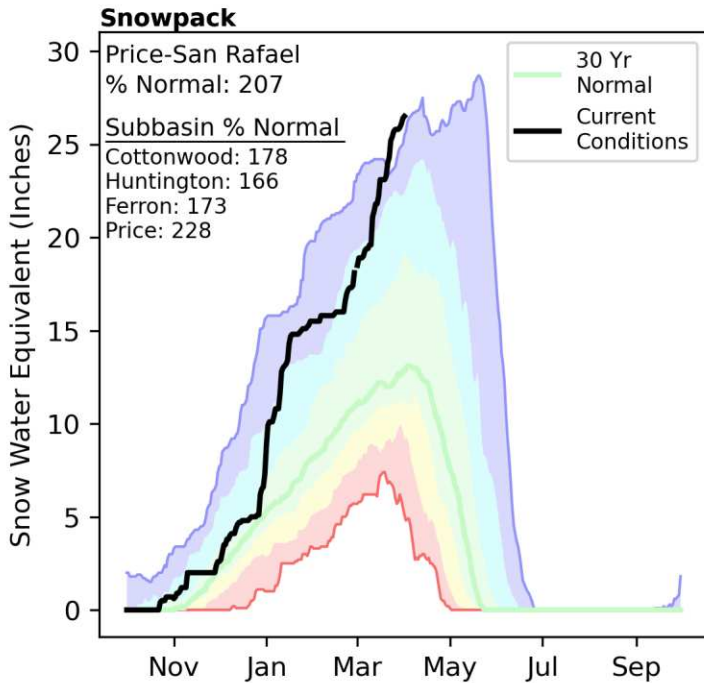
When selected, the following historic streamflow values and statistics will be shown.



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

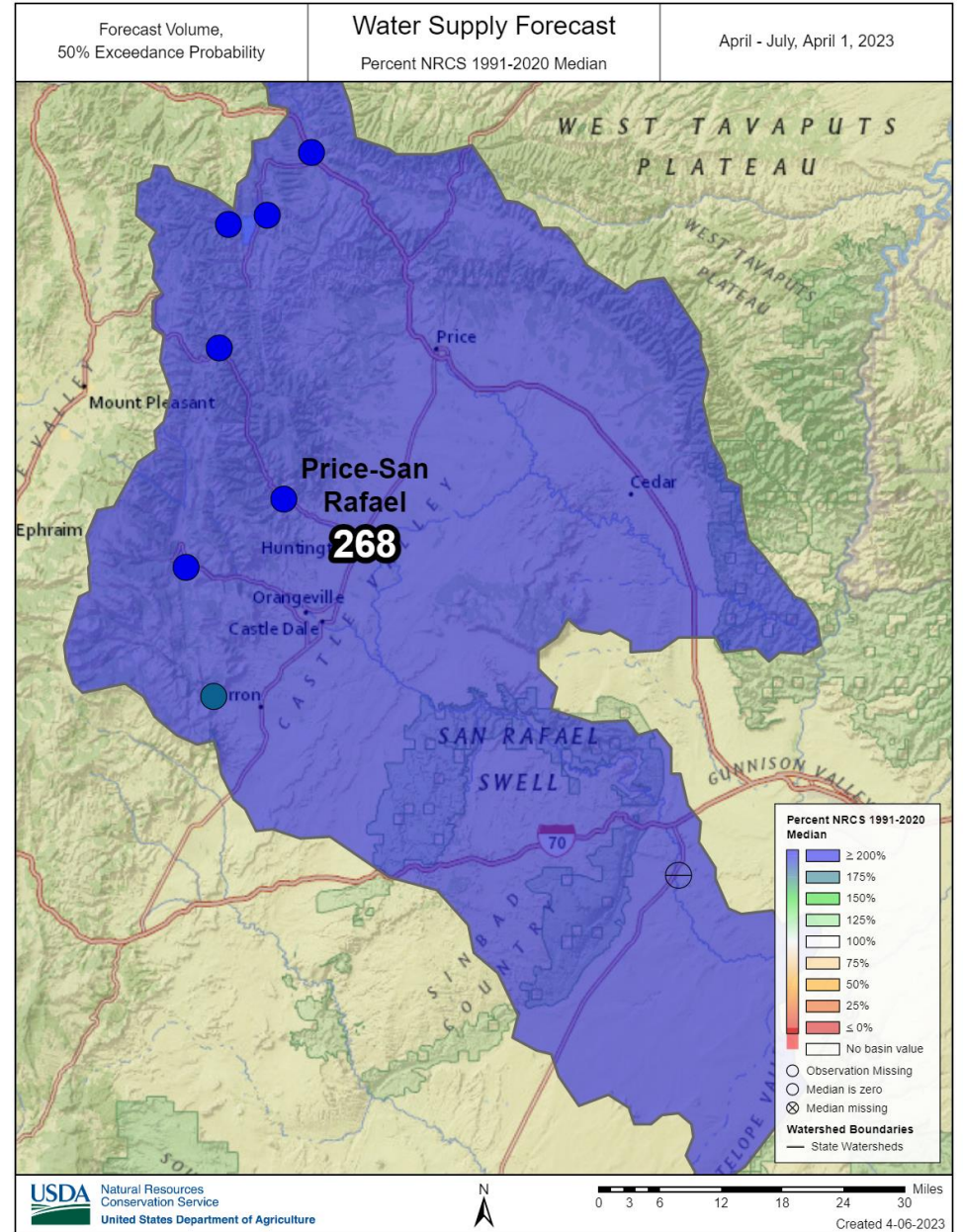
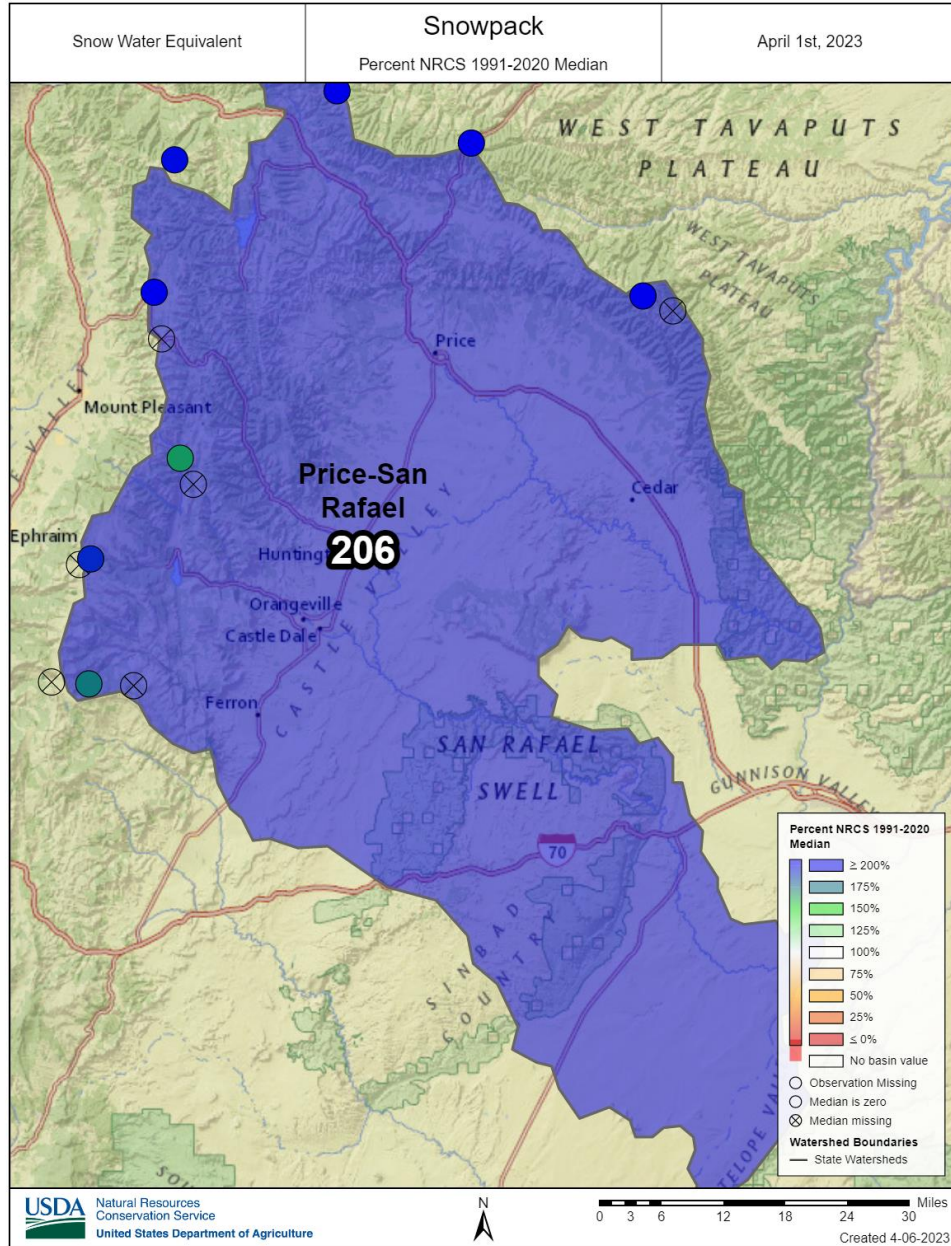
Price-San Rafael | April 1, 2023

Snowpack in the Price and San Rafael River Basins is well above normal at 207% of median, compared to 87% at this time last year. Precipitation in March was well above normal at 279%, which brings the seasonal accumulation (October-March) to 169% of median. Soil moisture is at 59% saturation compared to 70% saturation last year. Reservoir storage is 41% of capacity, compared to 33% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 178% to 583% of normal. The Surface Water Supply Index percentiles are 91% for the Price, 82% for Joes Valley, and 86% for Ferron Creek.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: [30 year normal calculation description](#)

Price San-Rafael



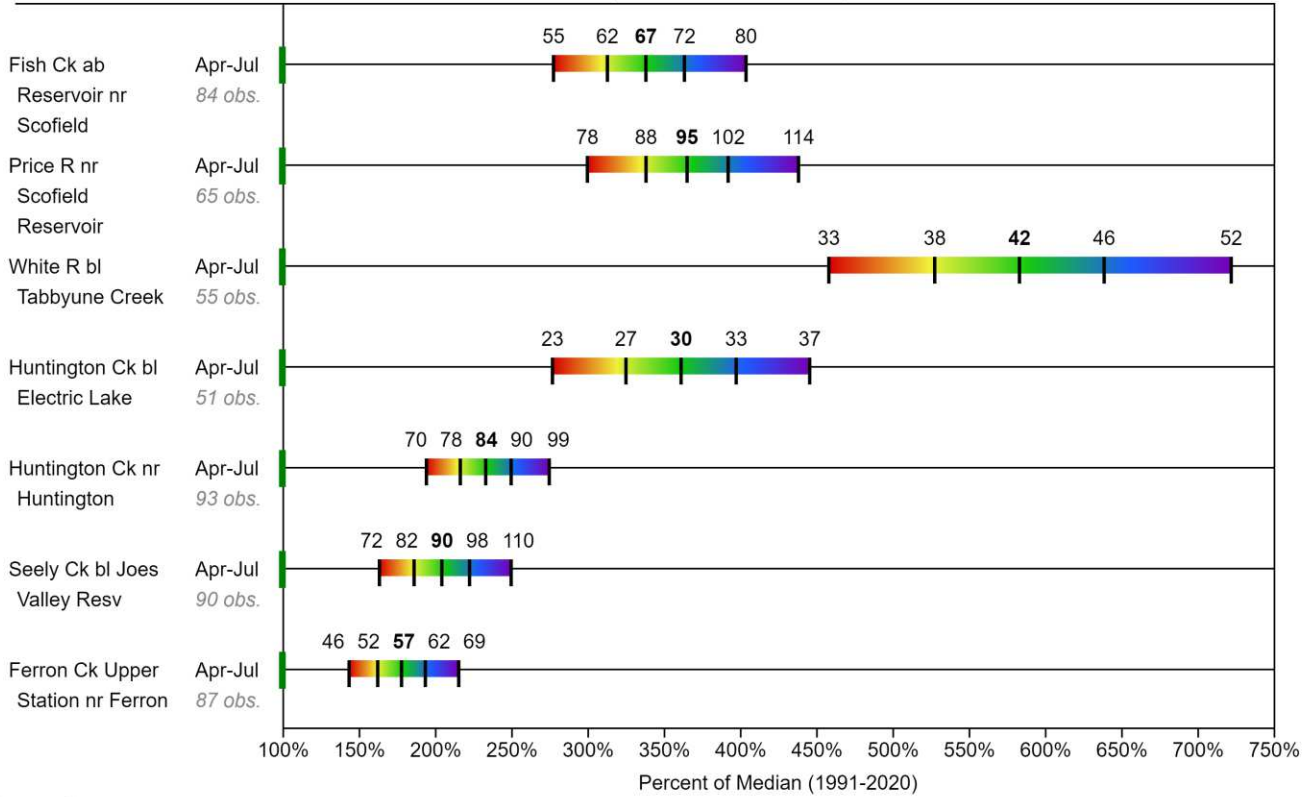
Price-San Rafael

PRICE-SAN RAFAEL Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->

Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



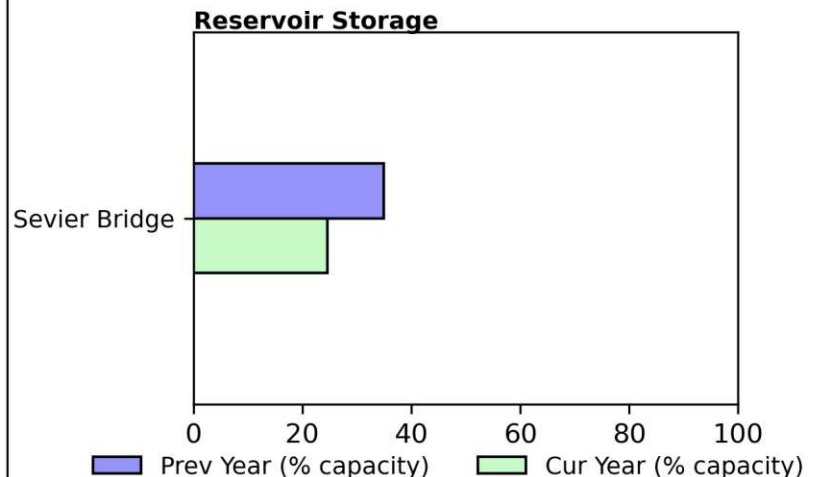
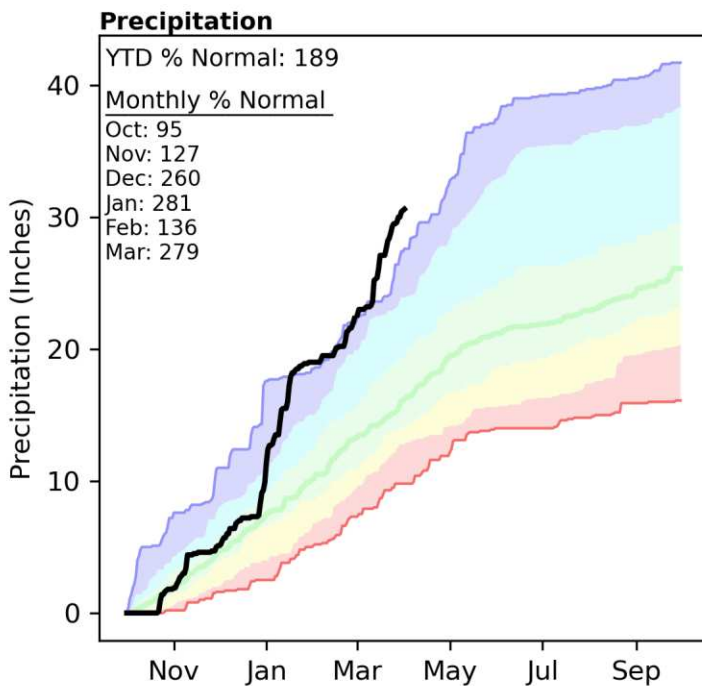
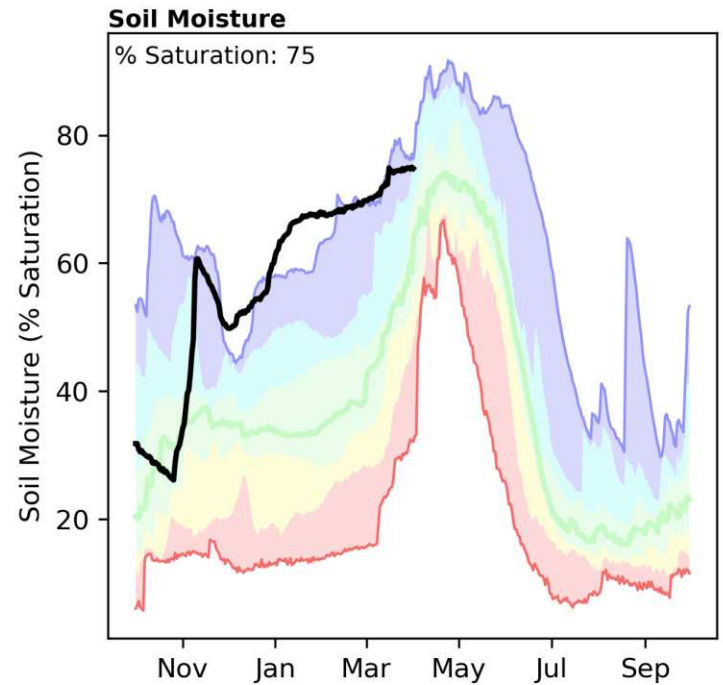
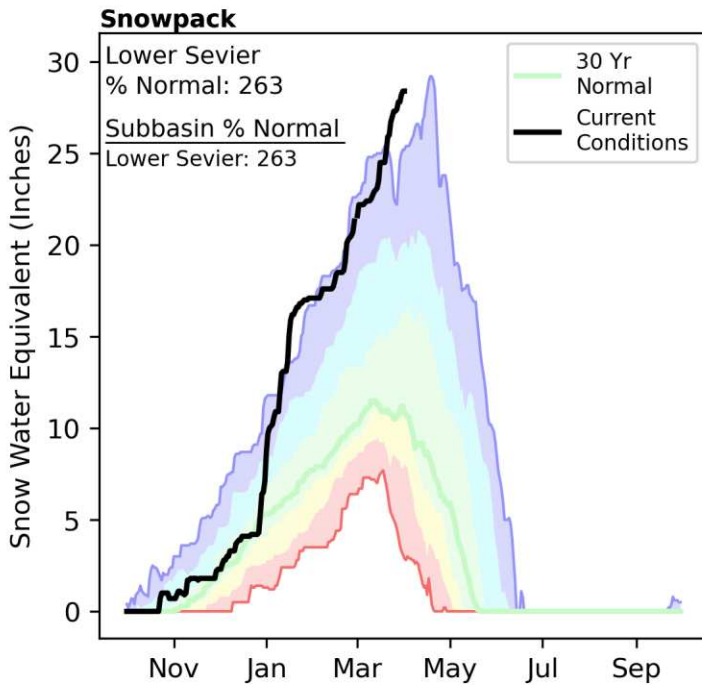
When selected, the following historic streamflow values and statistics will be shown.



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

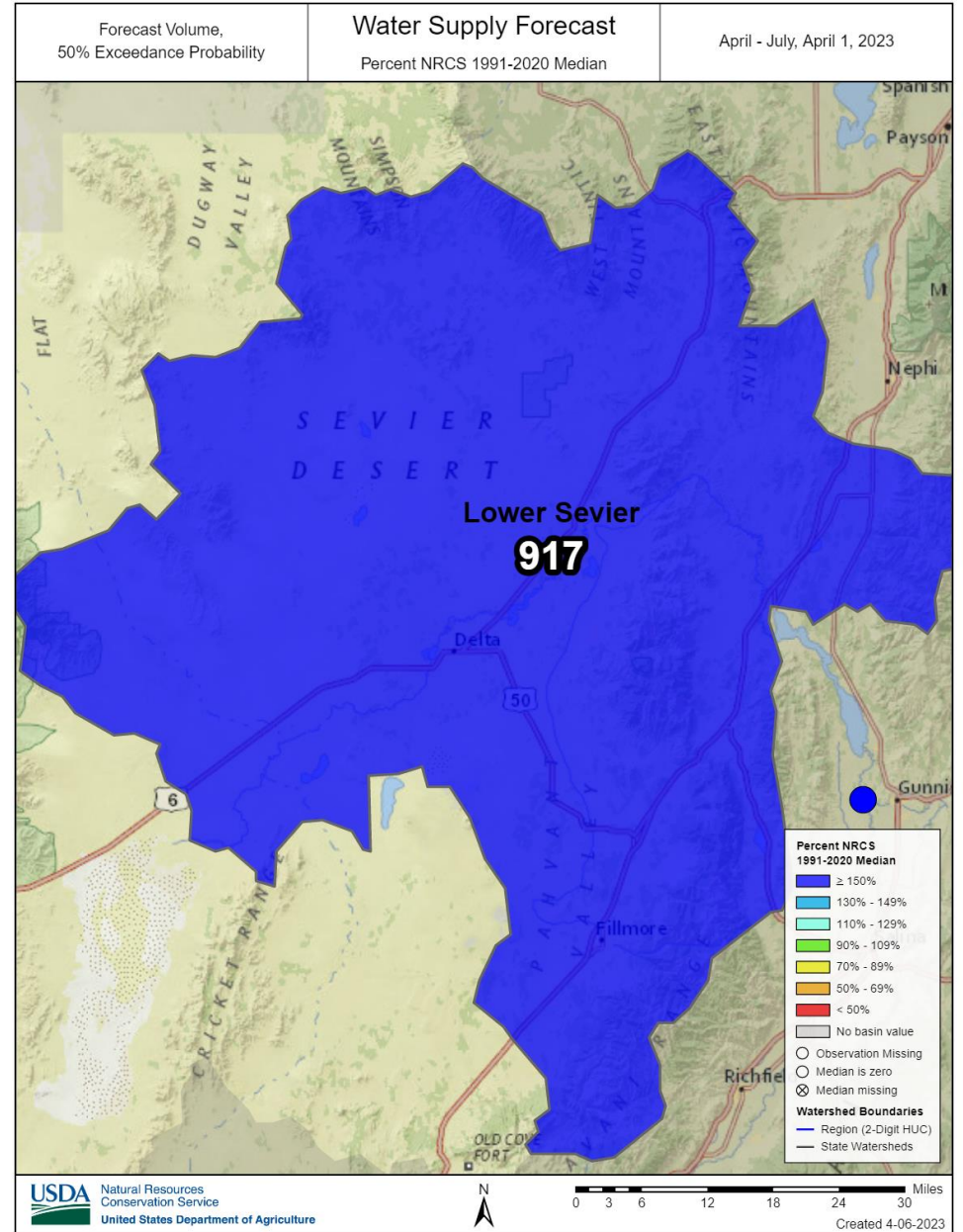
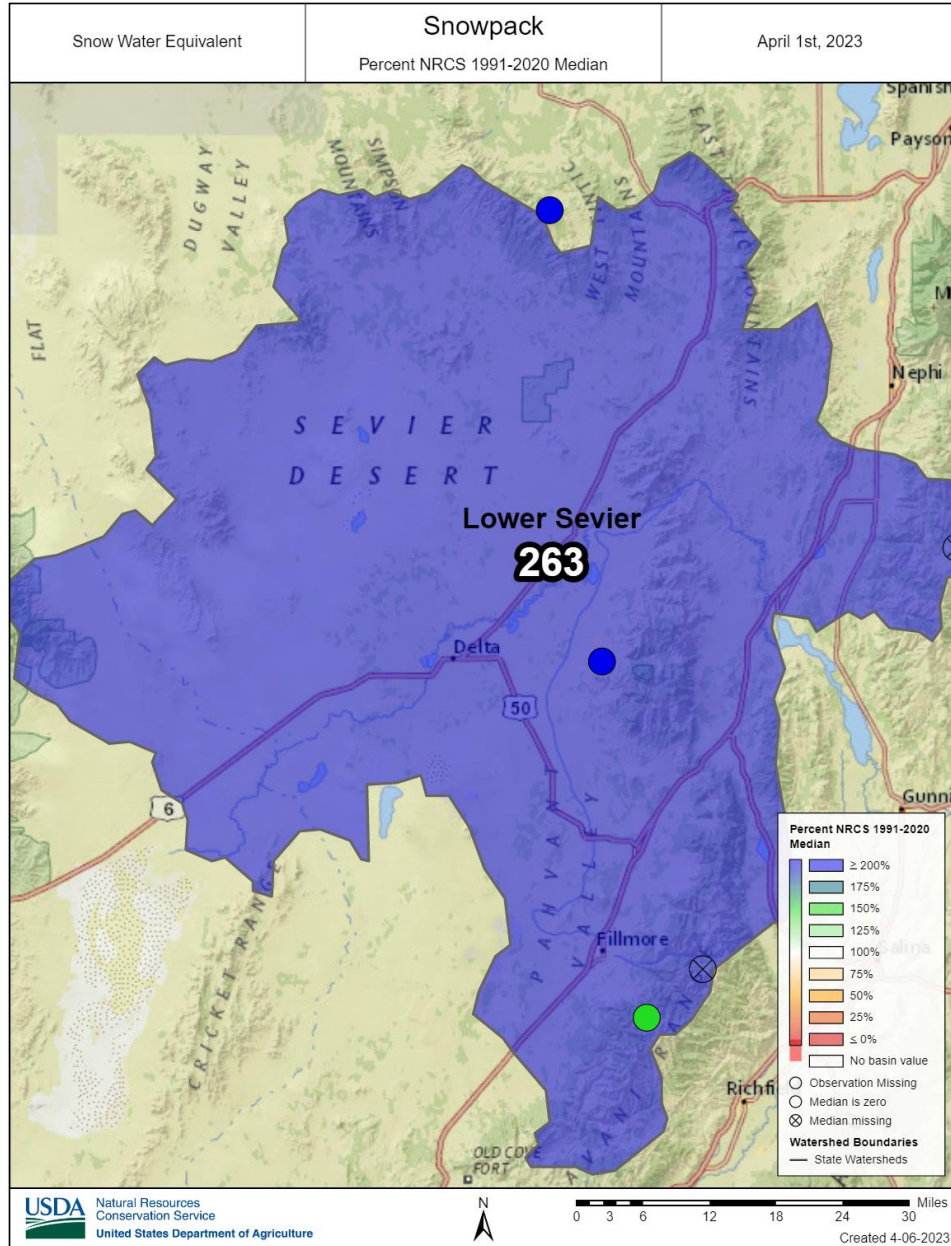
Lower Sevier | April 1, 2023

Snowpack in the Lower Sevier River Basin is well above normal at 263% of median, compared to 74% at this time last year. Precipitation in March was well above normal at 279%, which brings the seasonal accumulation (October-March) to 189% of median. Soil moisture is at 75% saturation compared to 75% saturation last year. Reservoir storage is 24% of capacity, compared to 34% last year. Forecast streamflow volume (50% exceedence, April-July) for the Sevier River near Gunnison is 917% of normal. The Surface Water Supply Index percentile is 82% for the Lower Sevier.

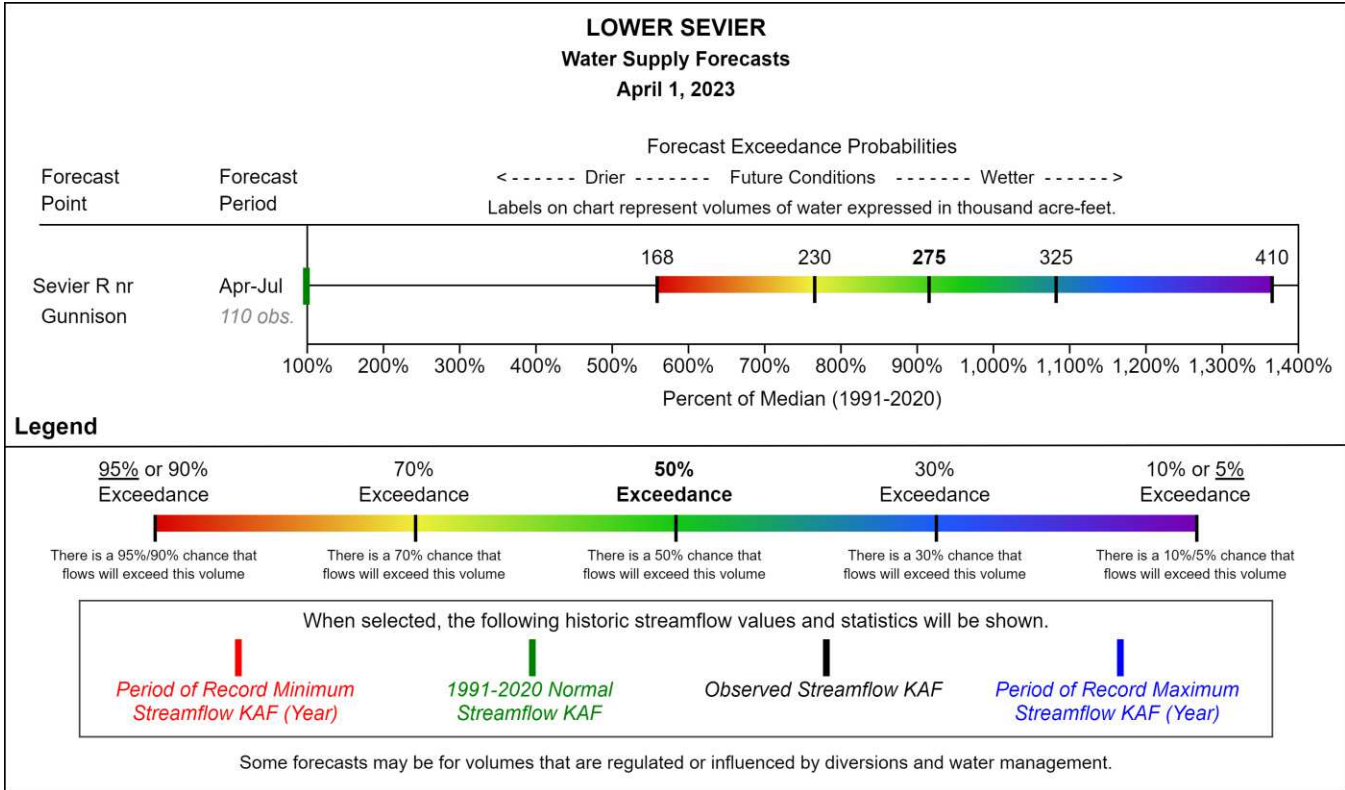


Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Lower Sevier

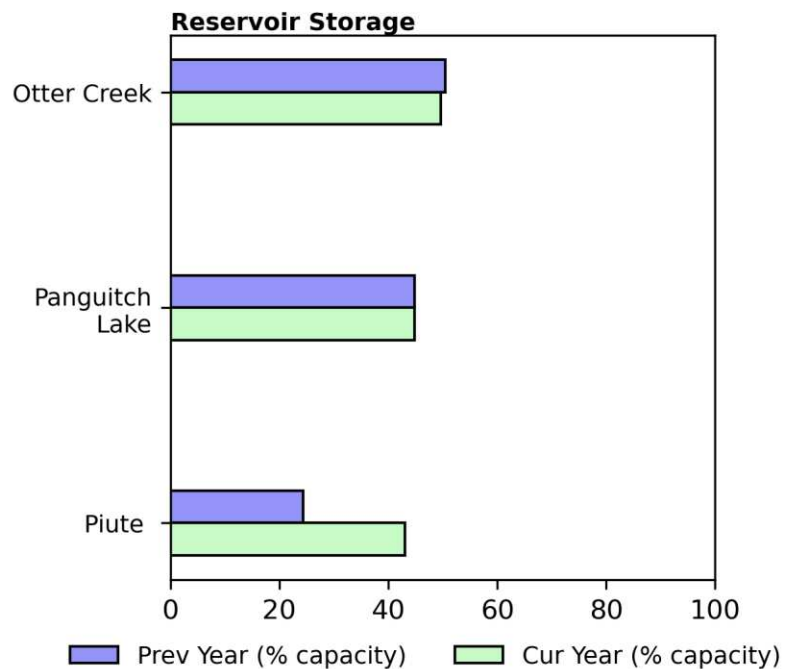
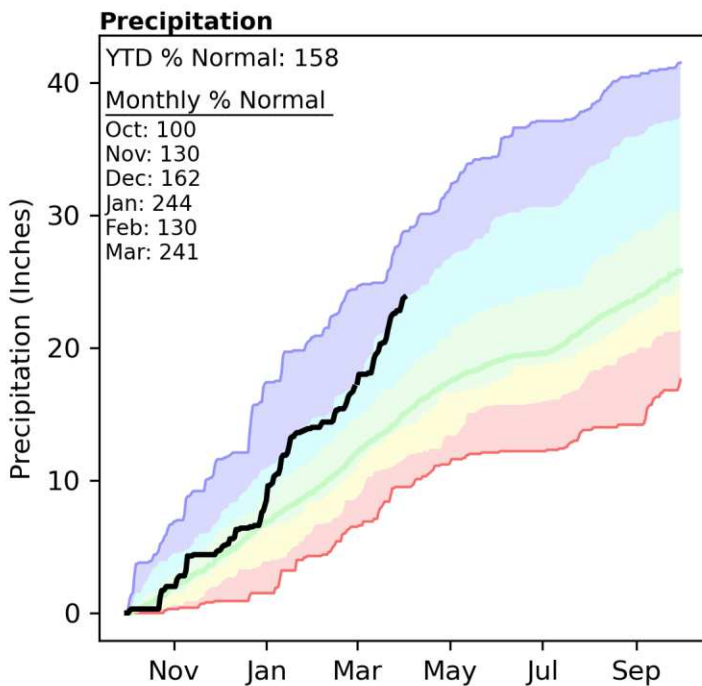
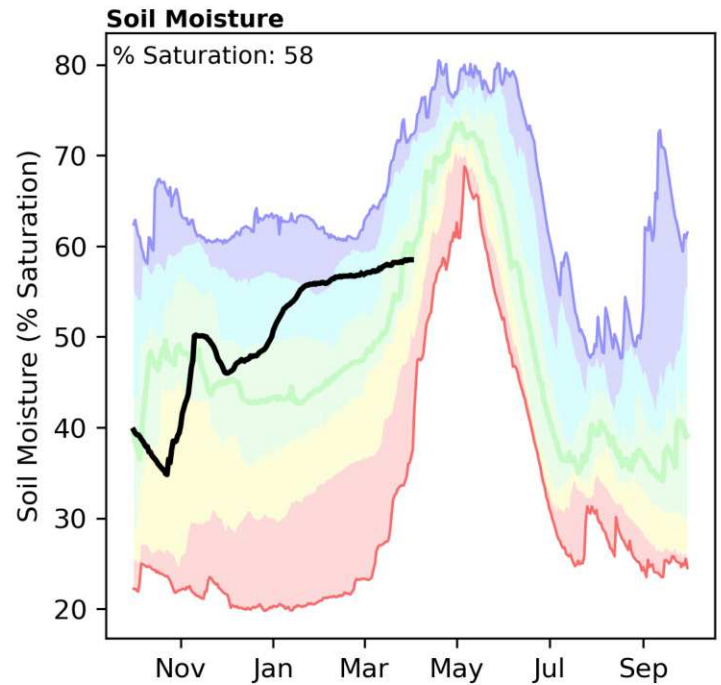
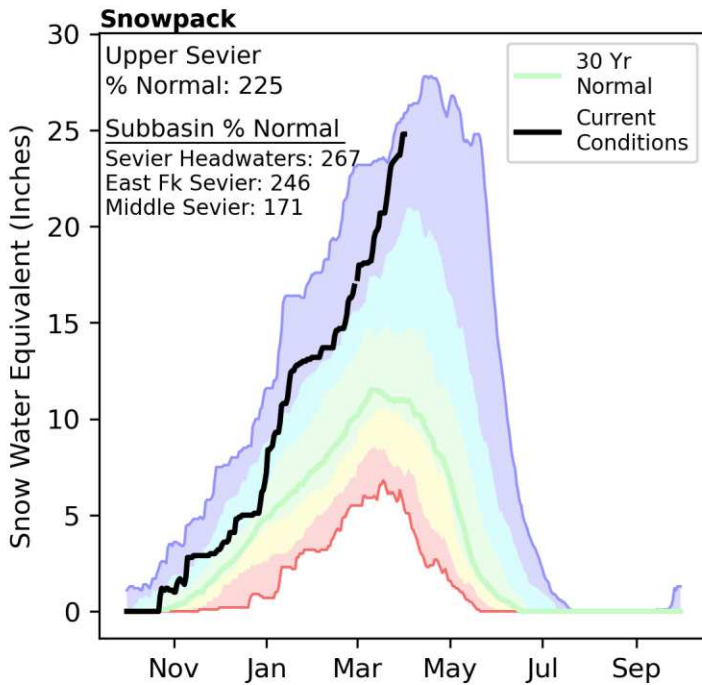


Lower Sevier



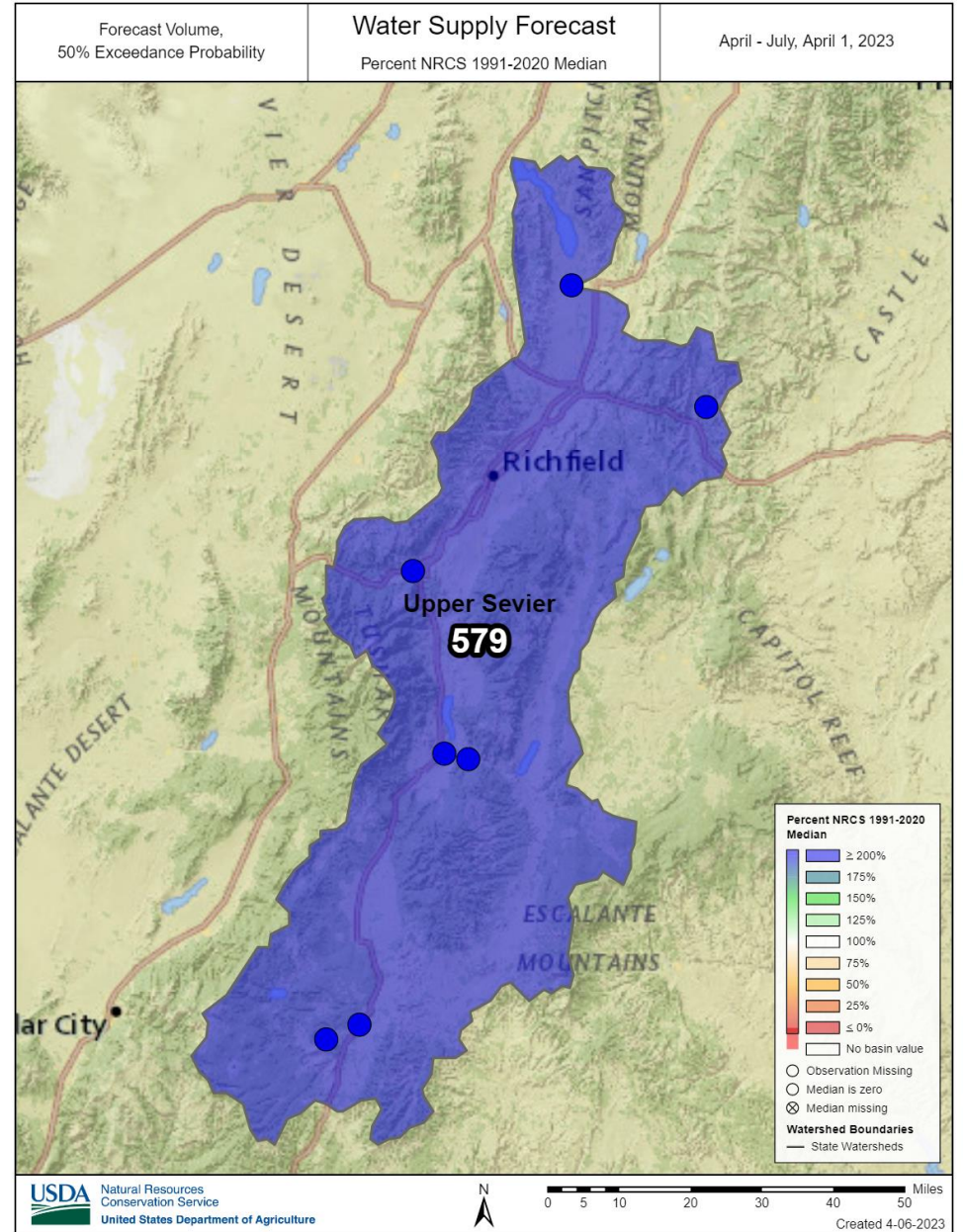
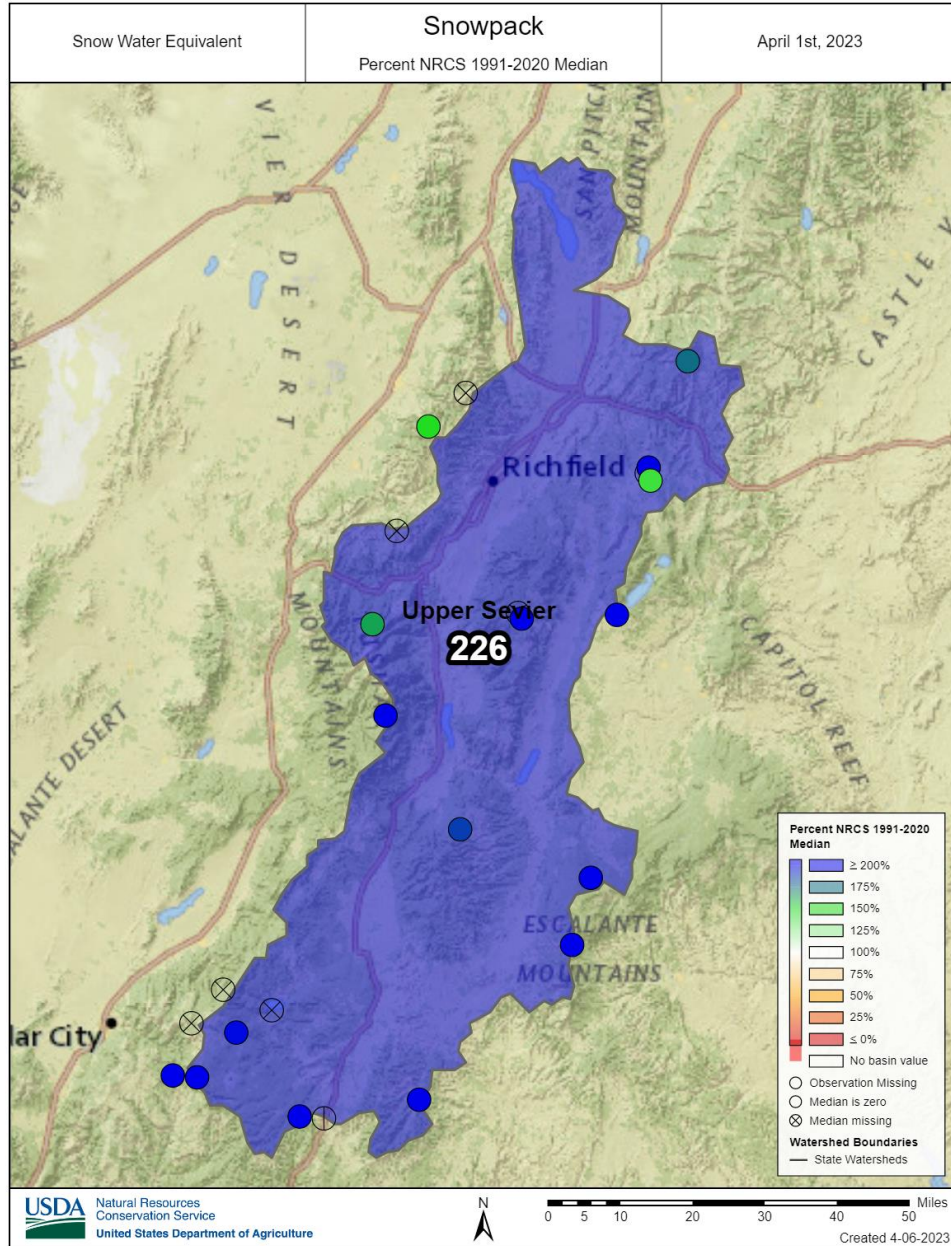
Upper Sevier | April 1, 2023

Snowpack in the Upper Sevier River Basin is well above normal at 225% of median, compared to 86% at this time last year. Precipitation in March was well above normal at 241%, which brings the seasonal accumulation (October-March) to 158% of median. Soil moisture is at 58% saturation compared to 62% saturation last year. Reservoir storage is 45% of capacity, compared to 36% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 262% to 1020% of normal. The Surface Water Supply Index percentile is 91% for the Upper Sevier.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
 For more information visit: [30 year normal calculation description](#)

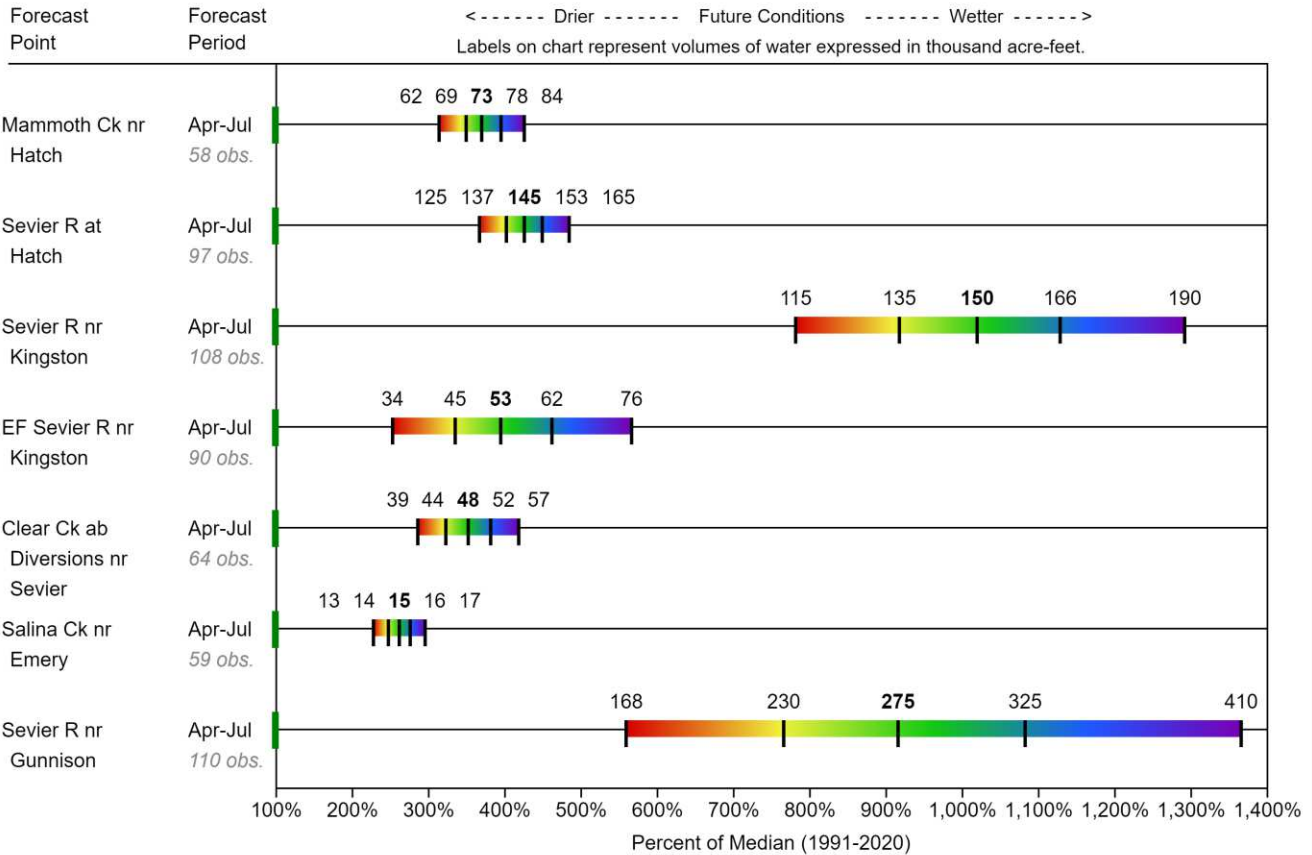
Upper Sevier



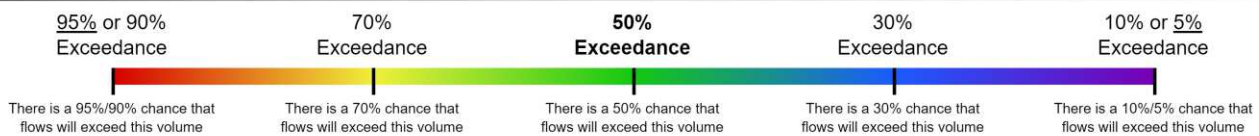
Upper Sevier

UPPER SEVIER Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities



Legend



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

Period of Record Minimum
Streamflow KAF (Year)

1991-2020 Normal
Streamflow KAF

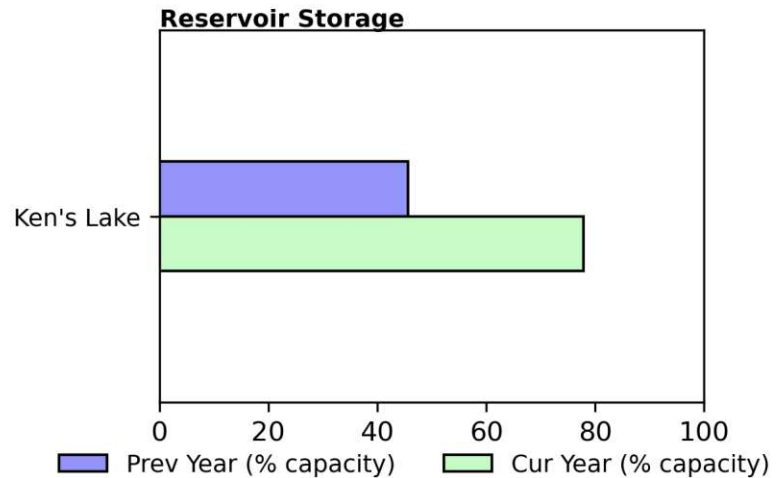
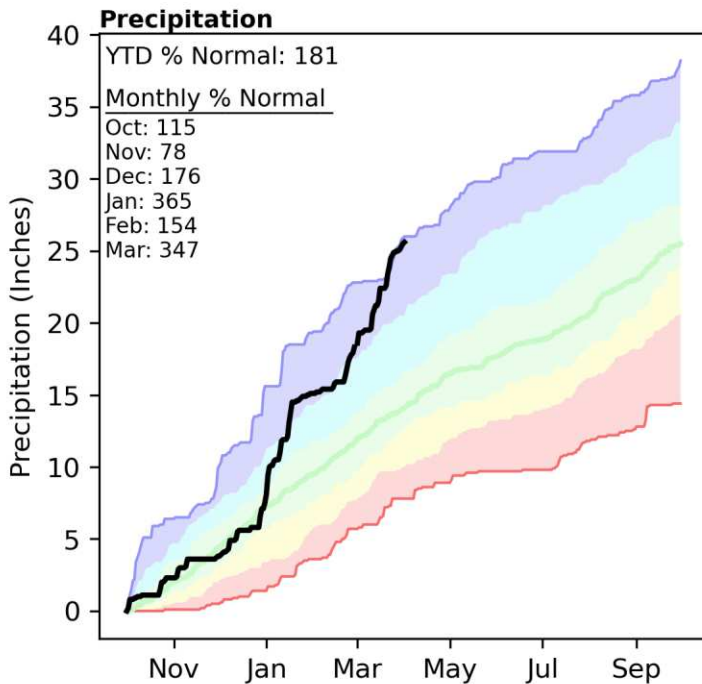
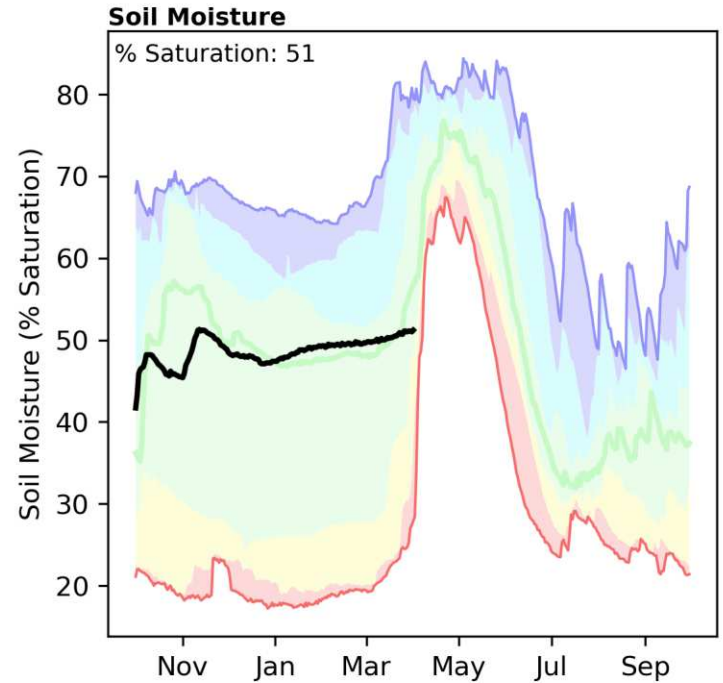
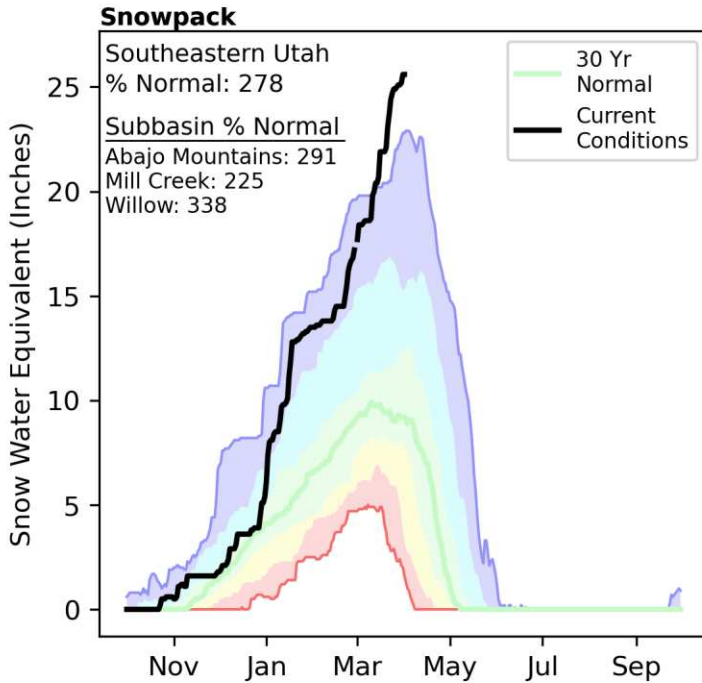
Observed Streamflow KAF

Period of Record Maximum
Streamflow KAF (Year)

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

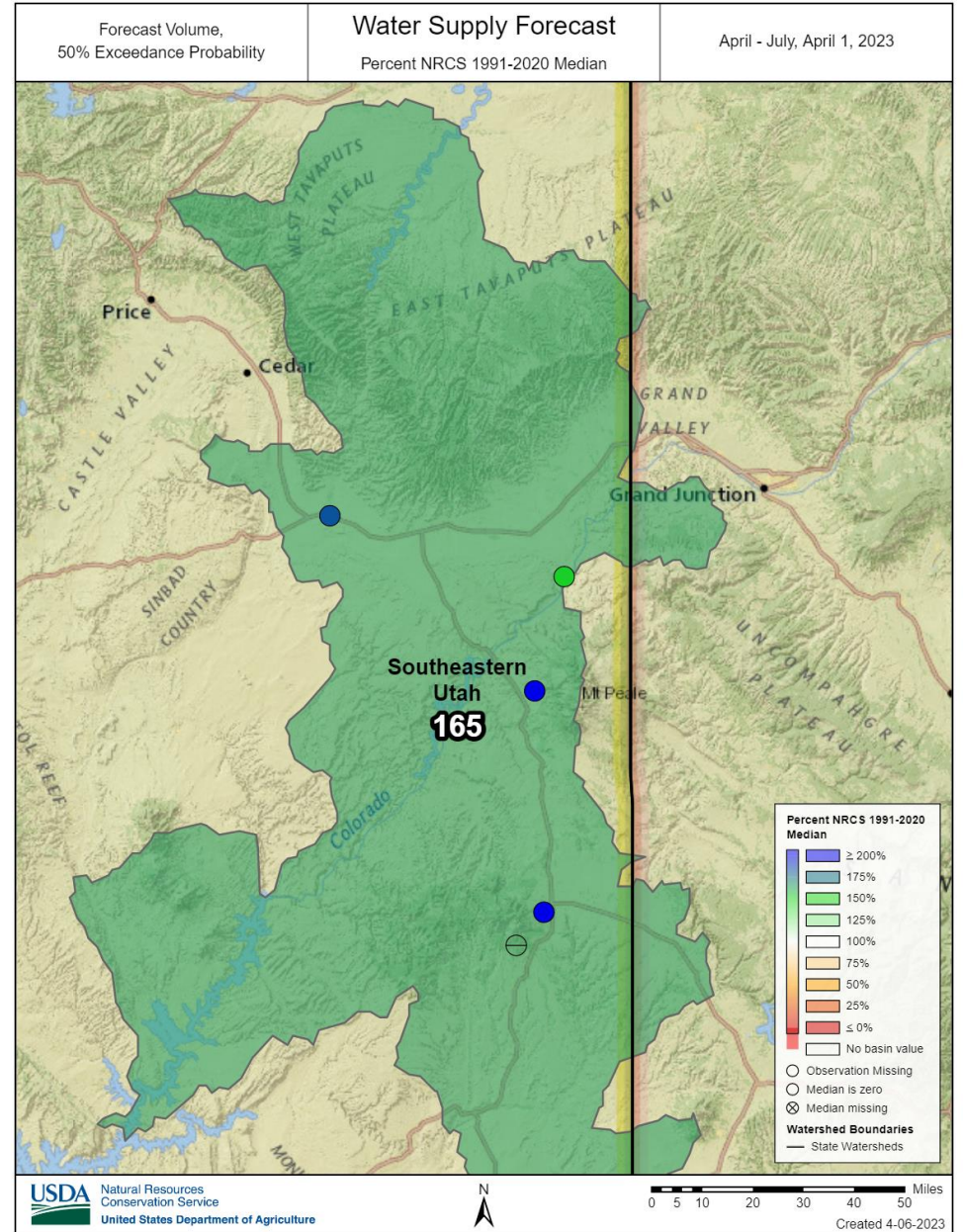
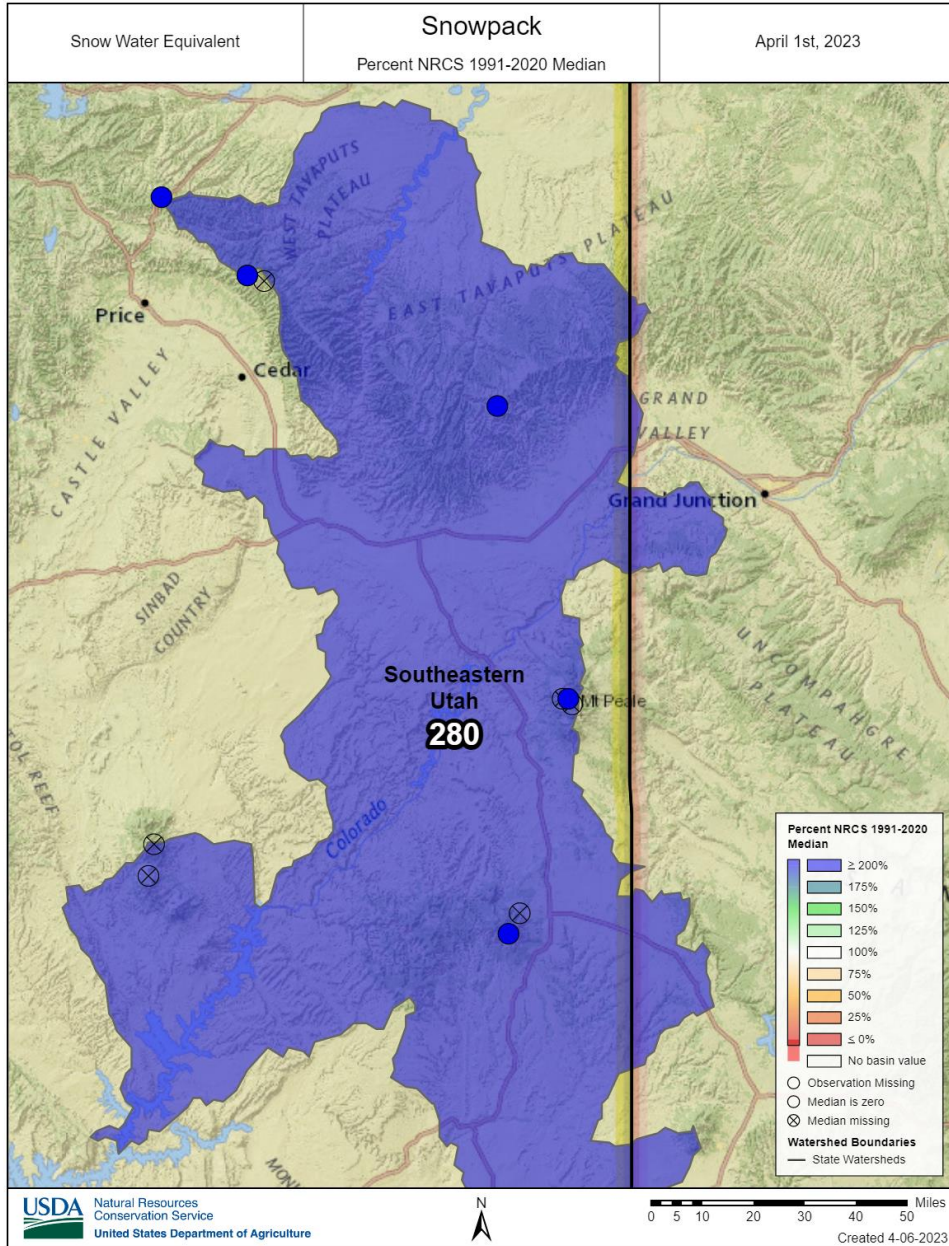
Southeastern Utah | April 1, 2023

Snowpack in Southeastern Utah is well above normal at 278% of median, compared to 96% at this time last year. Precipitation in March was well above normal at 347%, which brings the seasonal accumulation (October-March) to 181% of median. Soil moisture is at 51% saturation compared to 68% saturation last year. Reservoir storage is 77% of capacity, compared to 45% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 153% to 854% of normal. The Surface Water Supply Index percentile is 95% for Moab.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

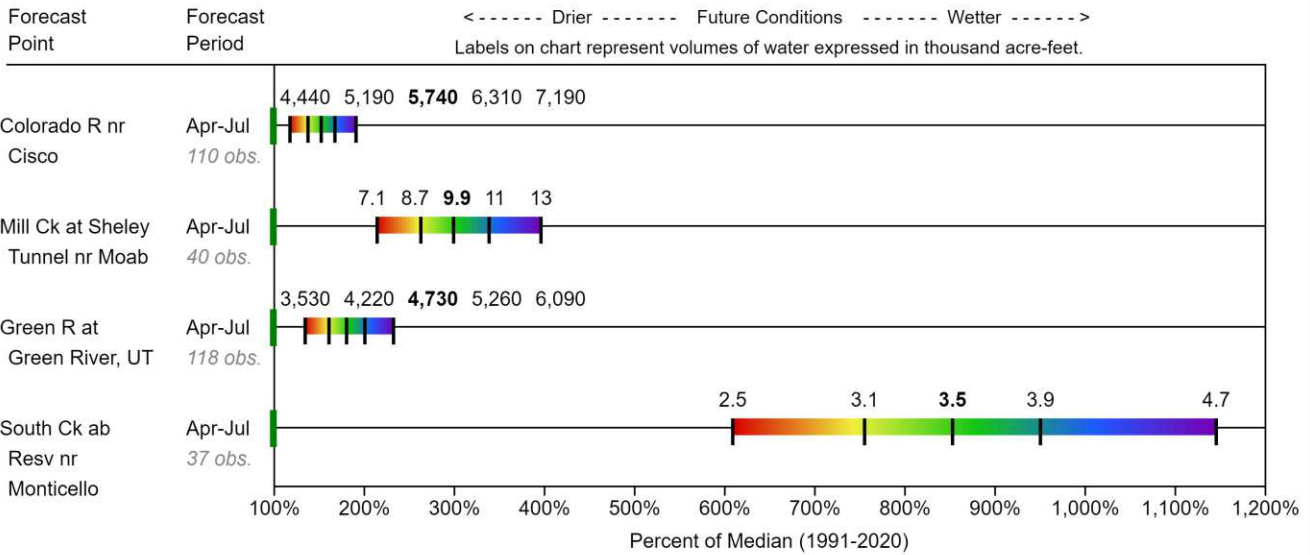
Southeastern Utah



Southeastern Utah

SOUTHEASTERN UTAH Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities



Legend



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

Period of Record Minimum
Streamflow KAF (Year)

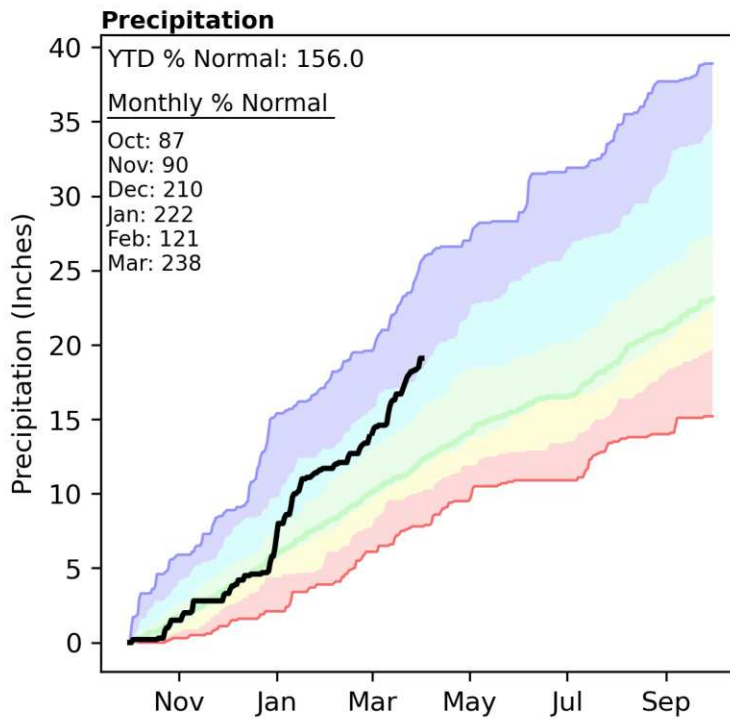
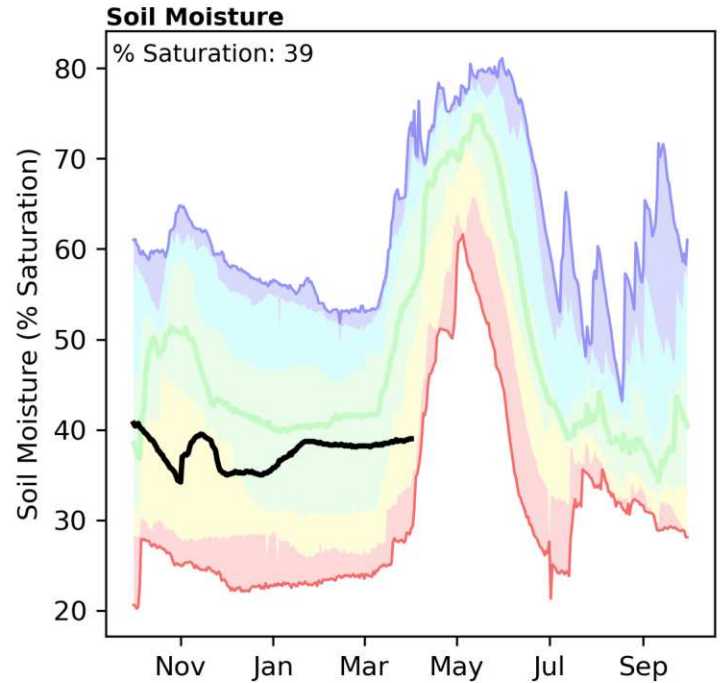
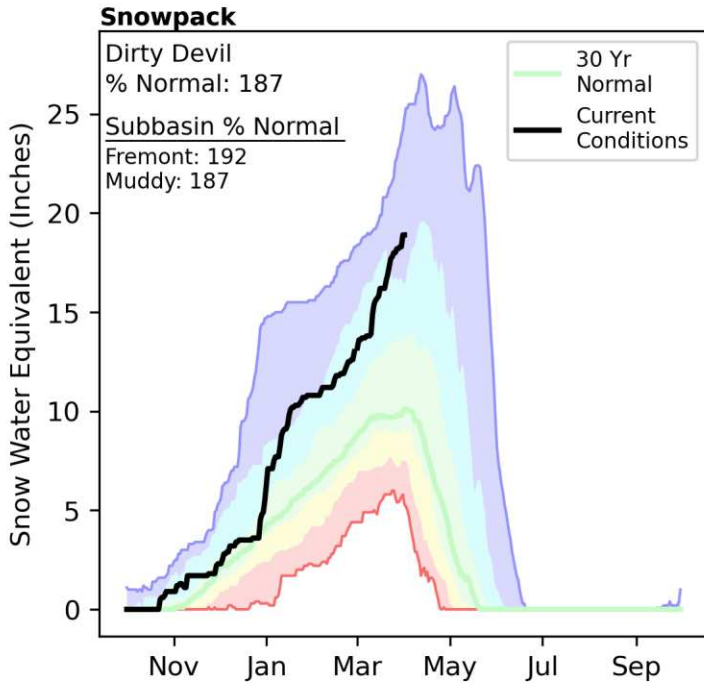
1991-2020 Normal
Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum
Streamflow KAF (Year)

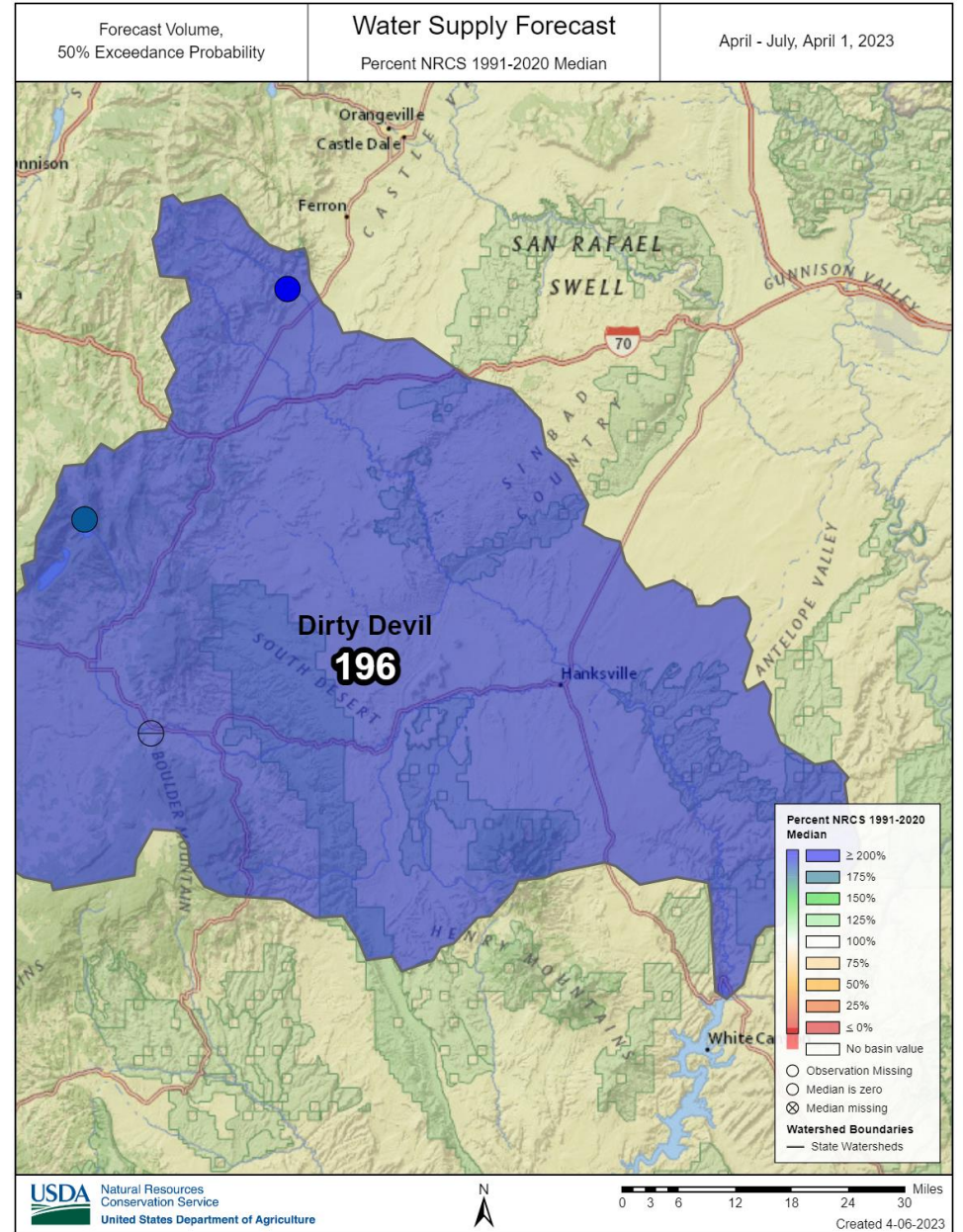
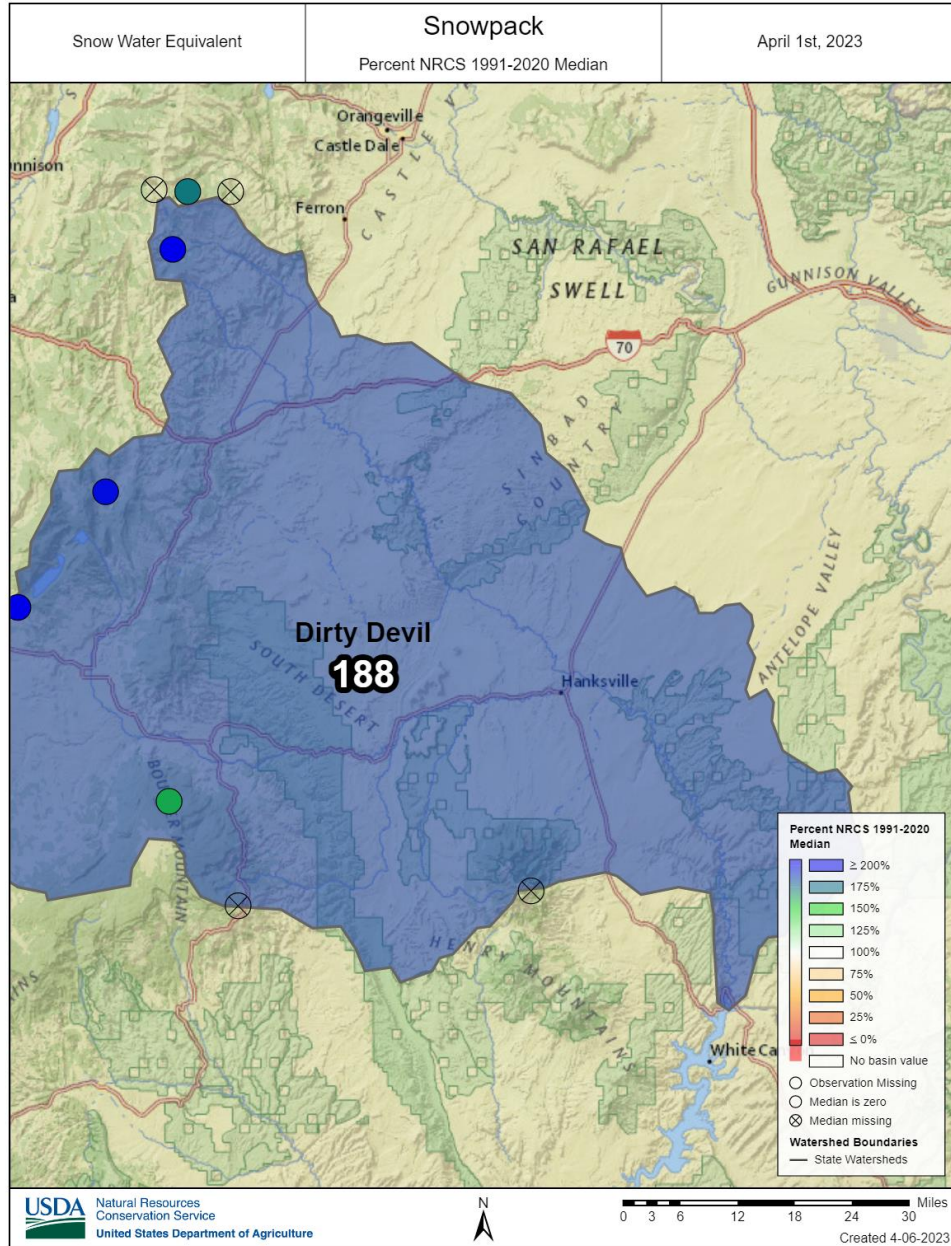
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Snowpack in the Dirty Devil River Basin is well above normal at 187% of median, compared to 83% at this time last year. Precipitation in March was well above normal at 238%, which brings the seasonal accumulation (October-March) to 156% of median. Soil moisture is at 39% saturation compared to 52% saturation last year. Forecast streamflow volumes (50% exceedence, April-July) range from 180% to 202% of normal.



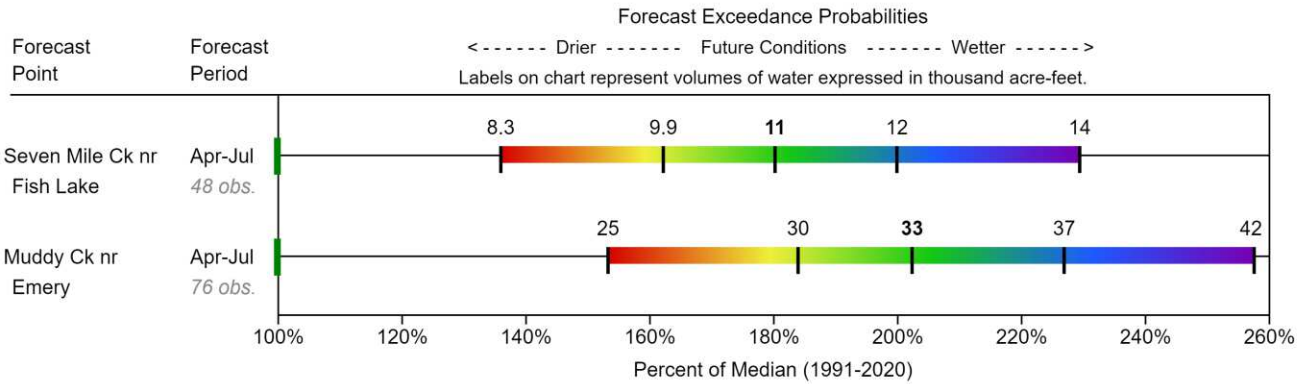
Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Dirty Devil

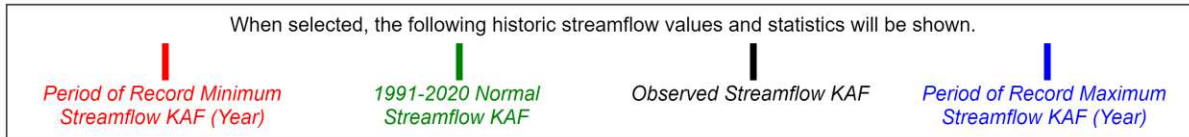
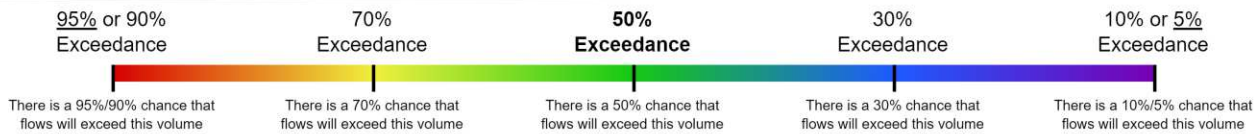


Dirty Devil

DIRTY DEVIL Water Supply Forecasts April 1, 2023



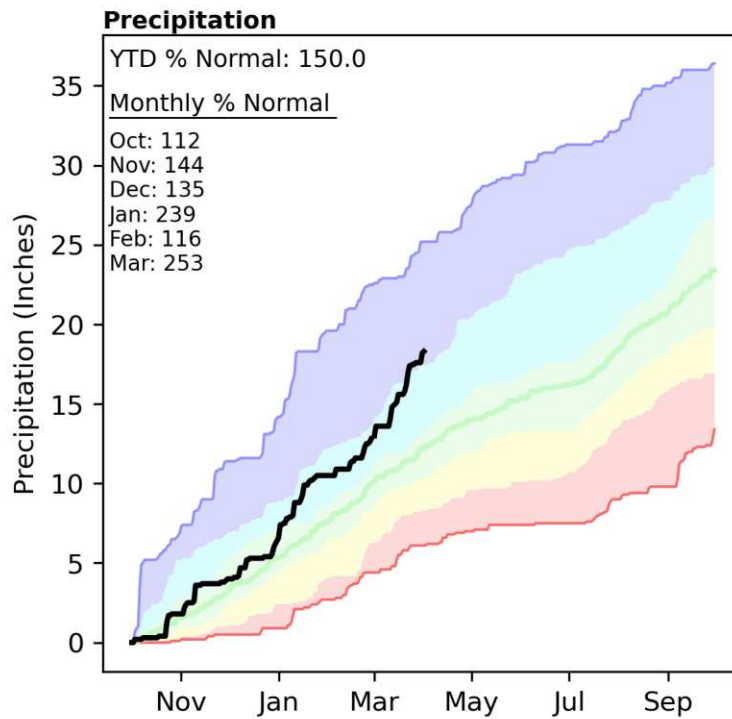
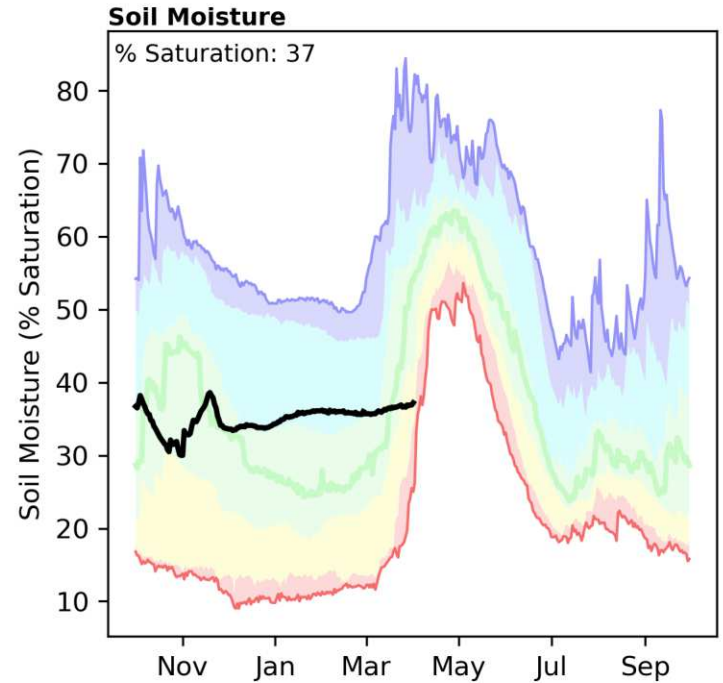
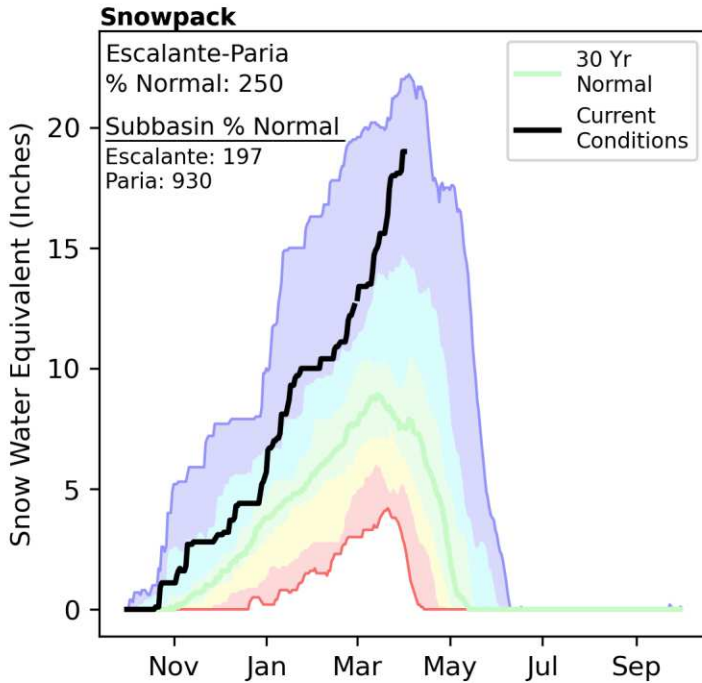
Legend



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

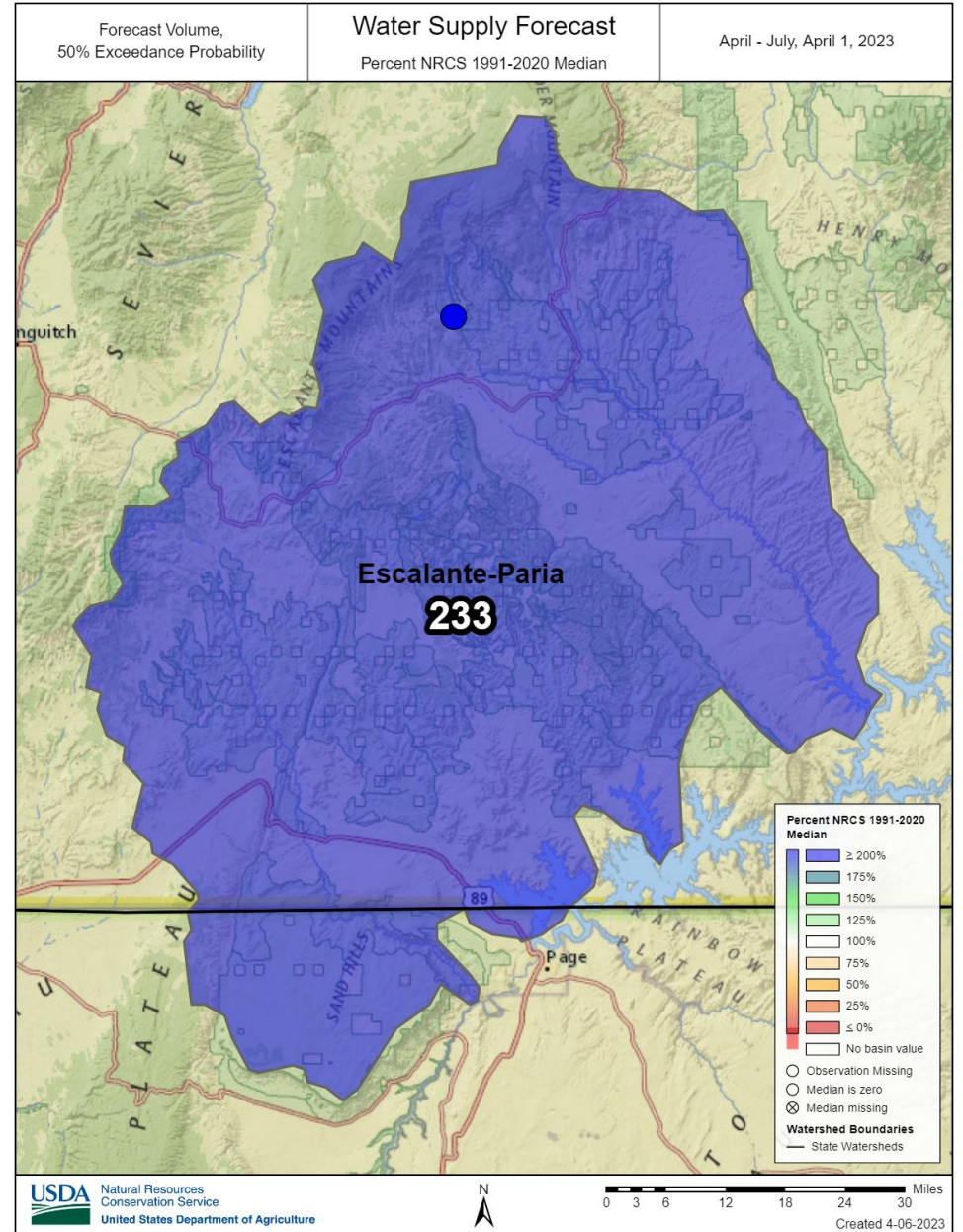
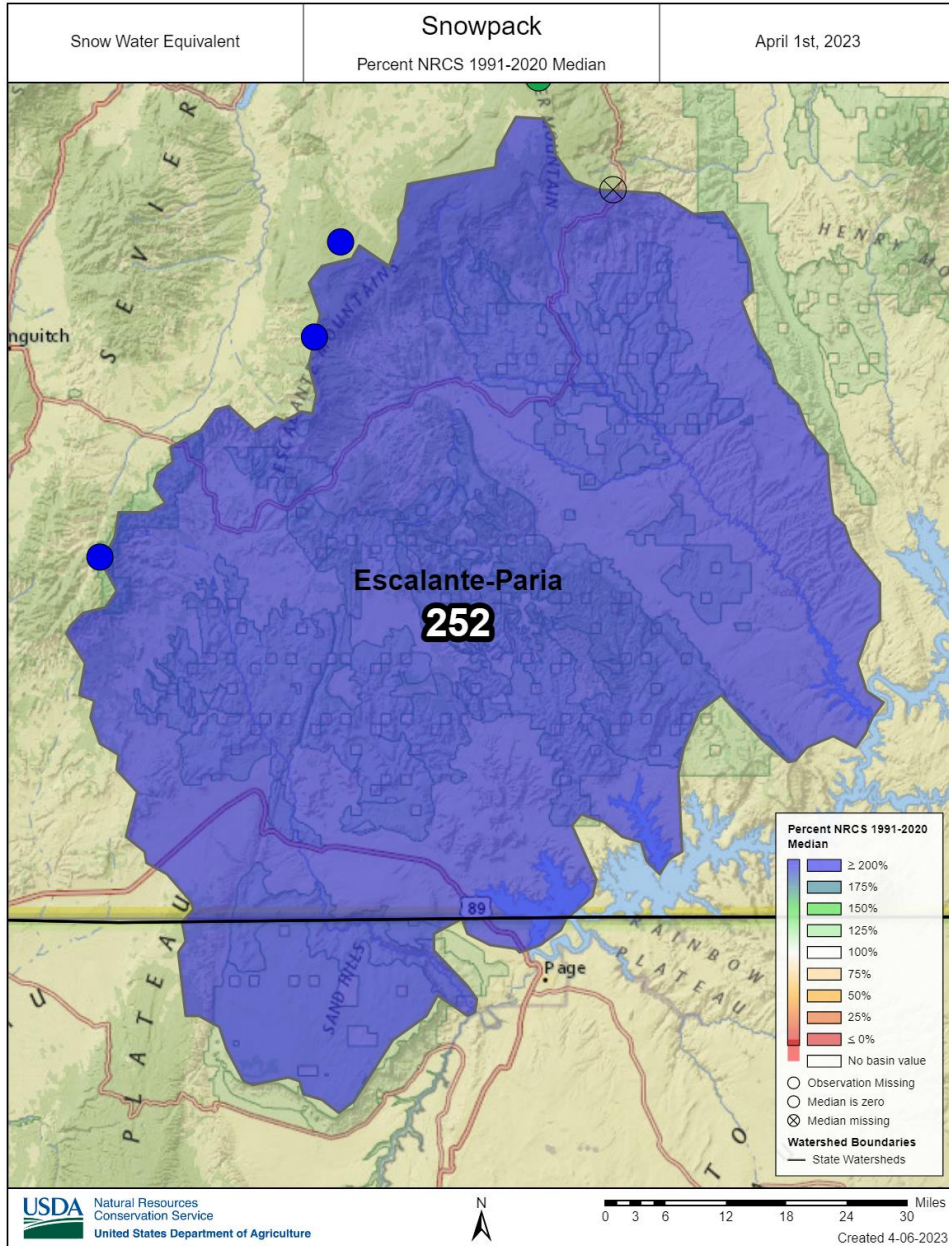
Escalante-Paria | April 1, 2023

Snowpack in the Escalante and Paria River Basins is well above normal at 250% of median, compared to 83% at this time last year. Precipitation in March was well above normal at 253%, which brings the seasonal accumulation (October-March) to 150% of median. Soil moisture is at 37% saturation compared to 51% saturation last year. The forecast streamflow volume (50% exceedence, April-July) for Pine Creek is 233% of normal.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Escalante-Paria

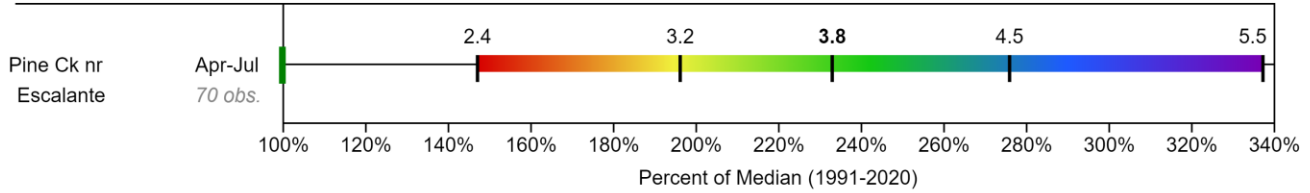


Escalante-Paria

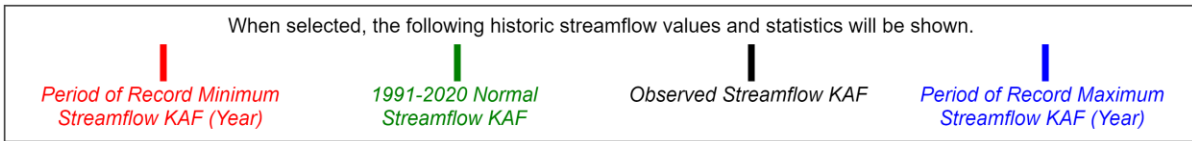
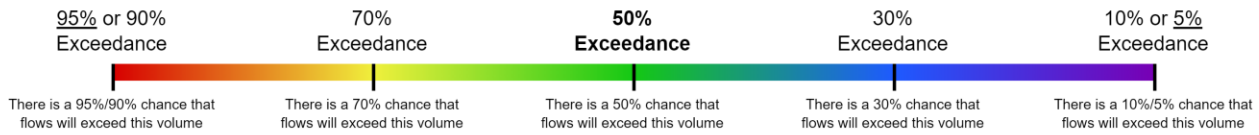
ESCALANTE-PARIA Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->
Labels on chart represent volumes of water expressed in thousand acre-feet.

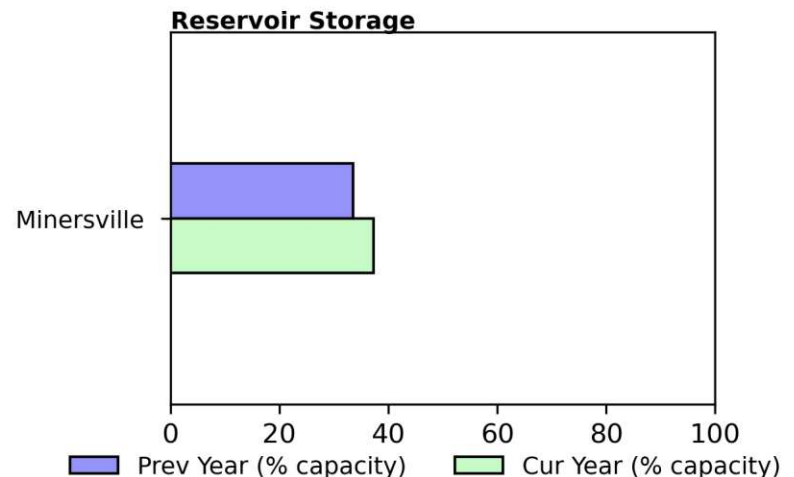
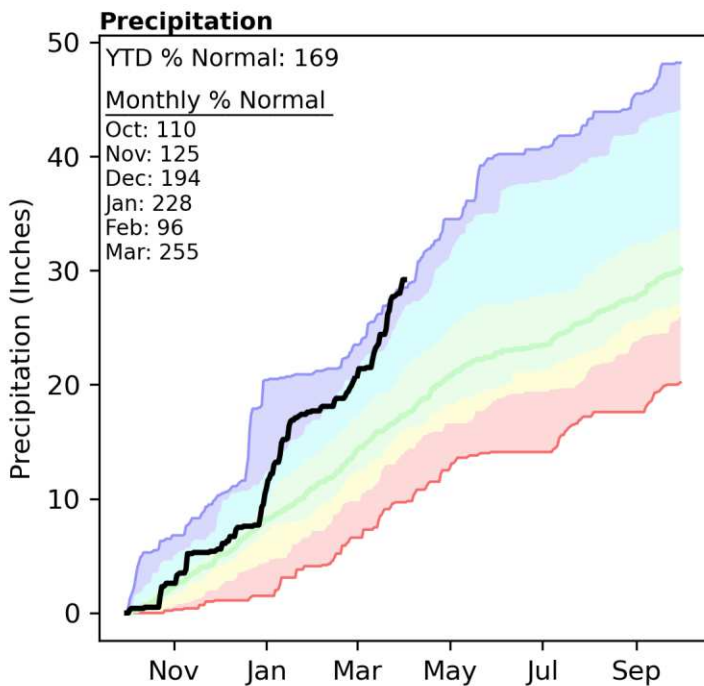
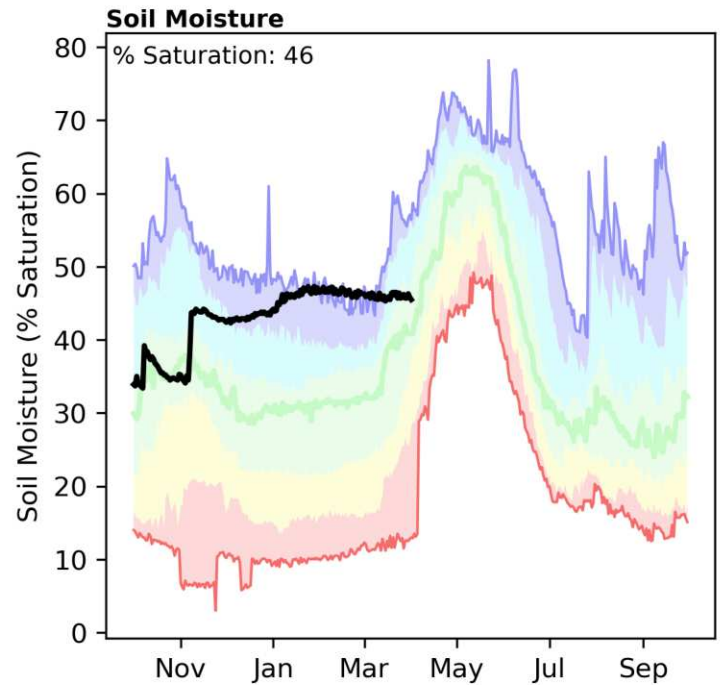
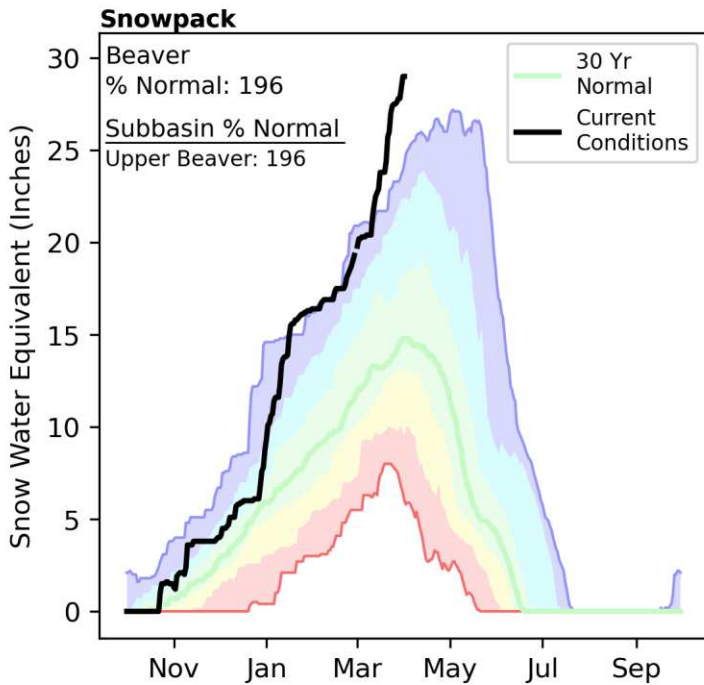


Legend



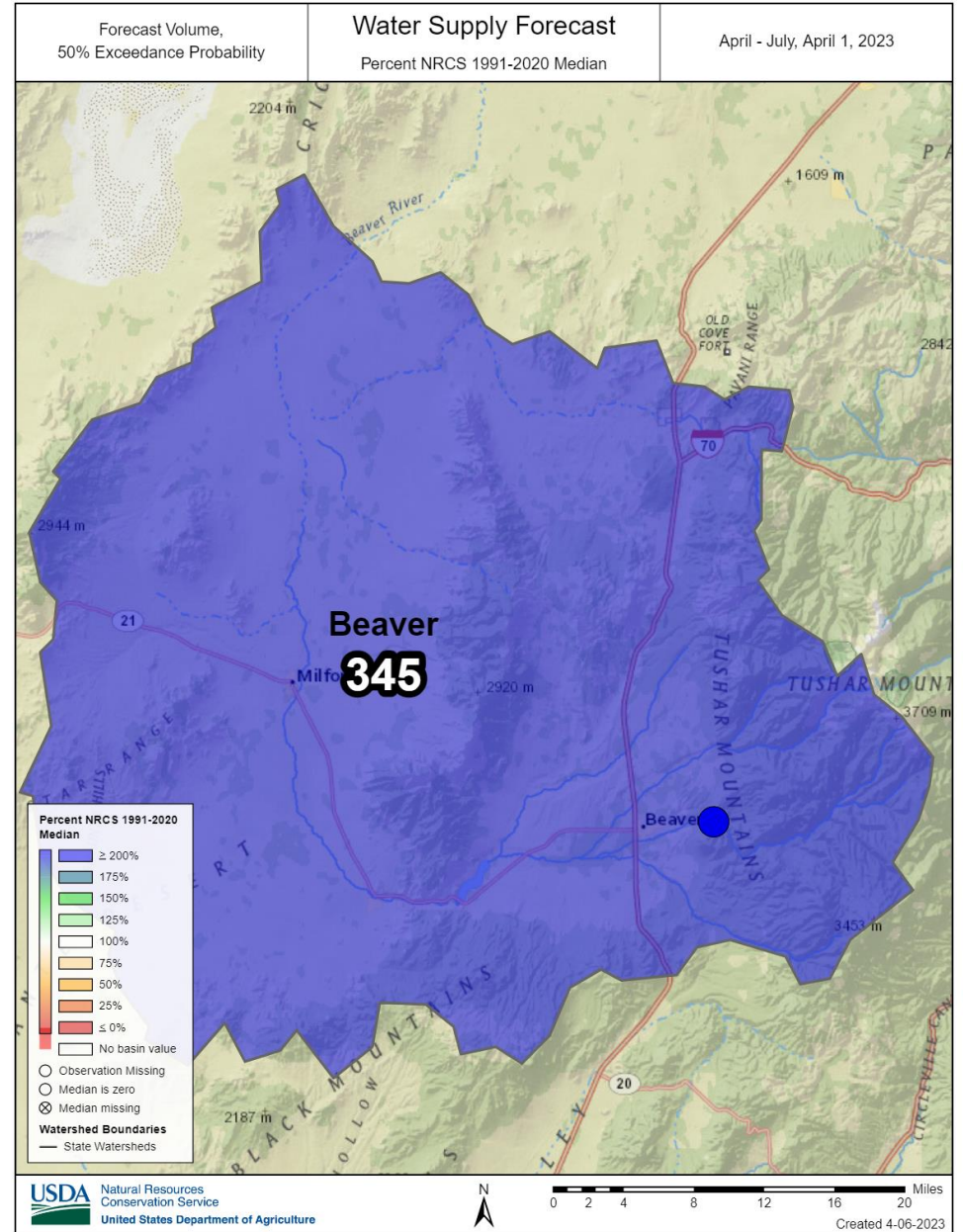
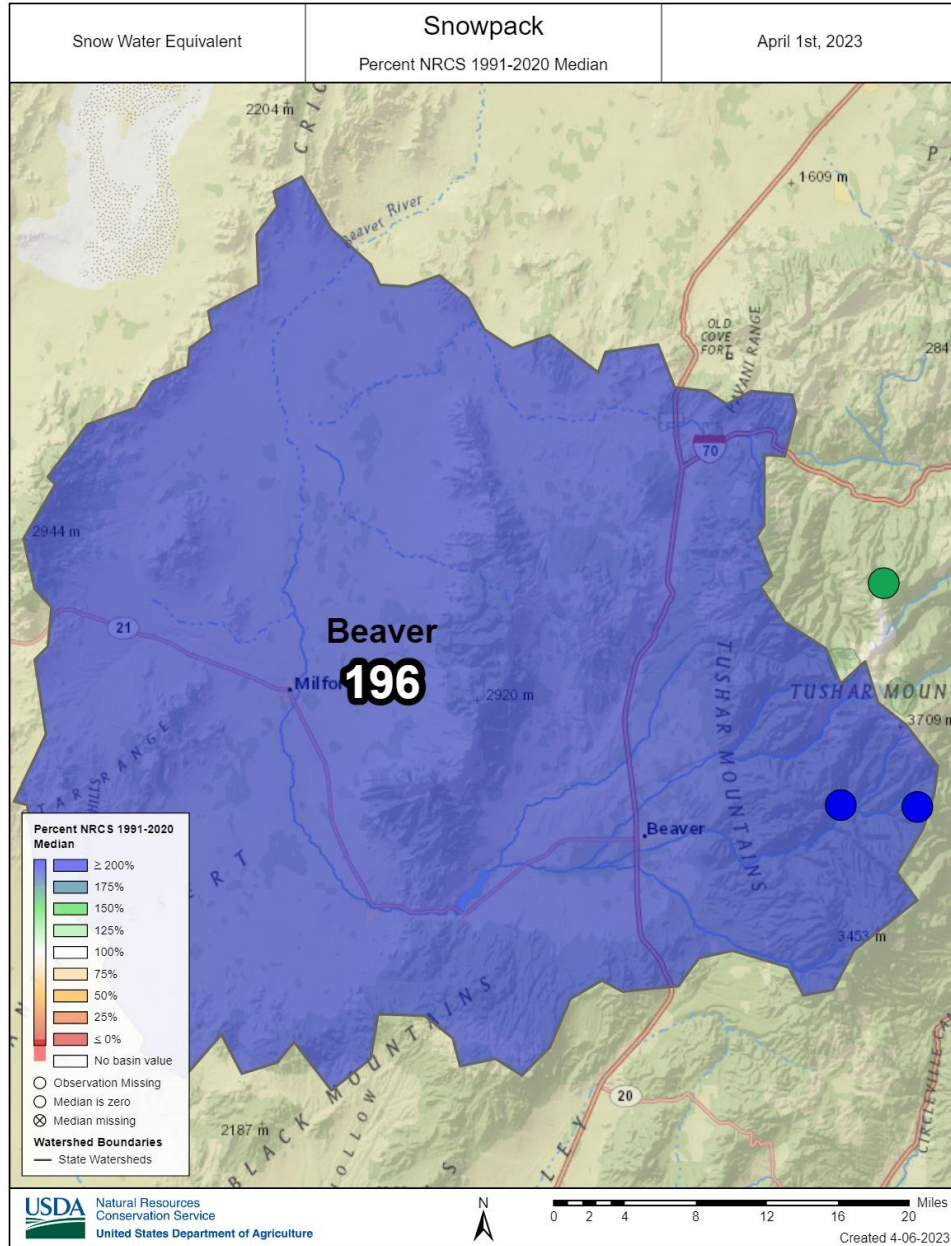
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Snowpack in the Beaver River Basin is well above normal at 196% of median, compared to 103% at this time last year. Precipitation in March was well above normal at 255%, which brings the seasonal accumulation (October-March) to 169% of median. Soil moisture is at 46% saturation compared to 47% saturation last year. Reservoir storage is 37% of capacity, compared to 33% last year. The forecast streamflow volume (50% exceedence, April-July) for the Beaver River is 345% of normal. The Surface Water Supply Index percentile is 93% for the Beaver River.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Beaver



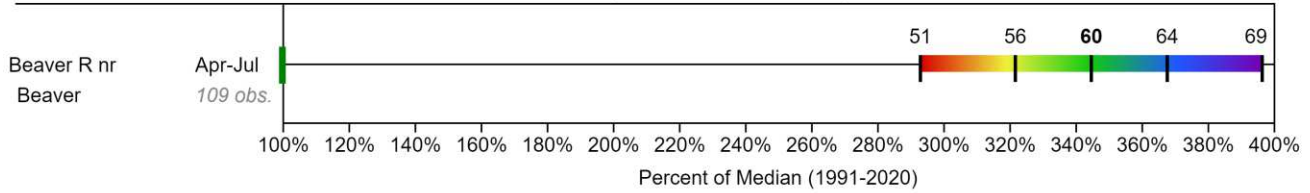
Beaver

BEAVER Water Supply Forecasts April 1, 2023

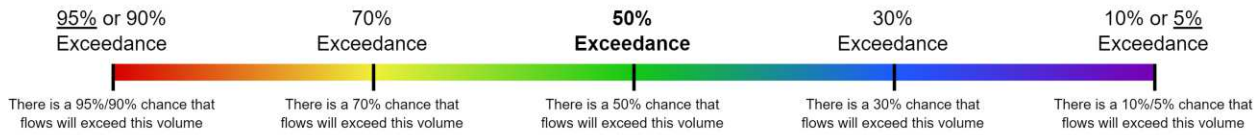
Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->

Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



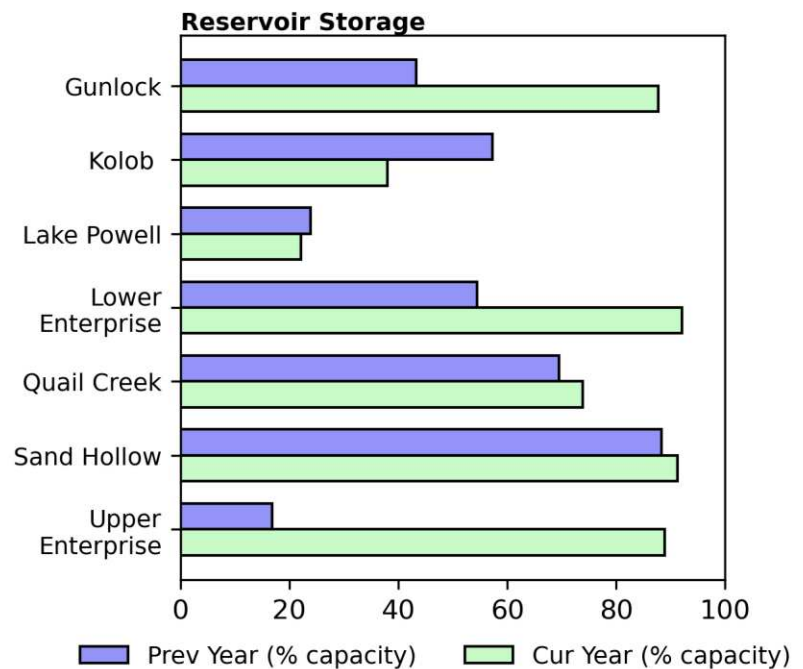
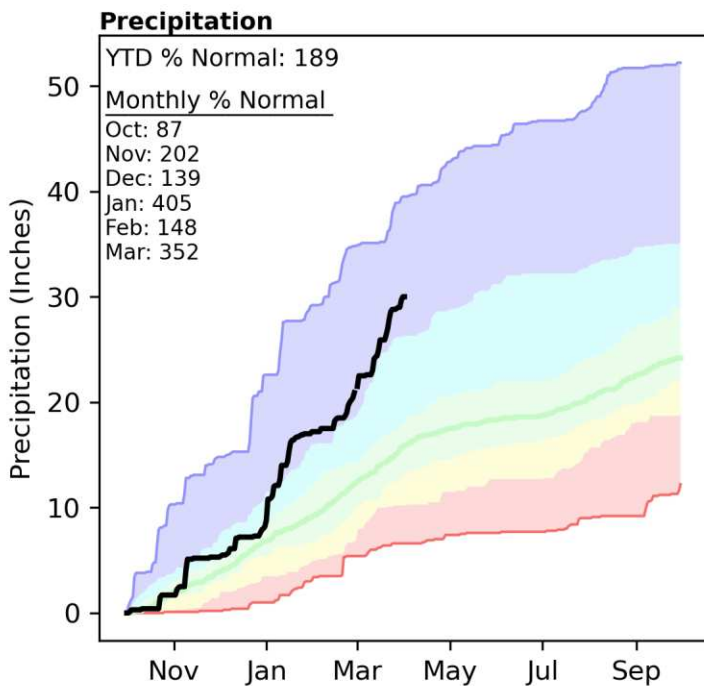
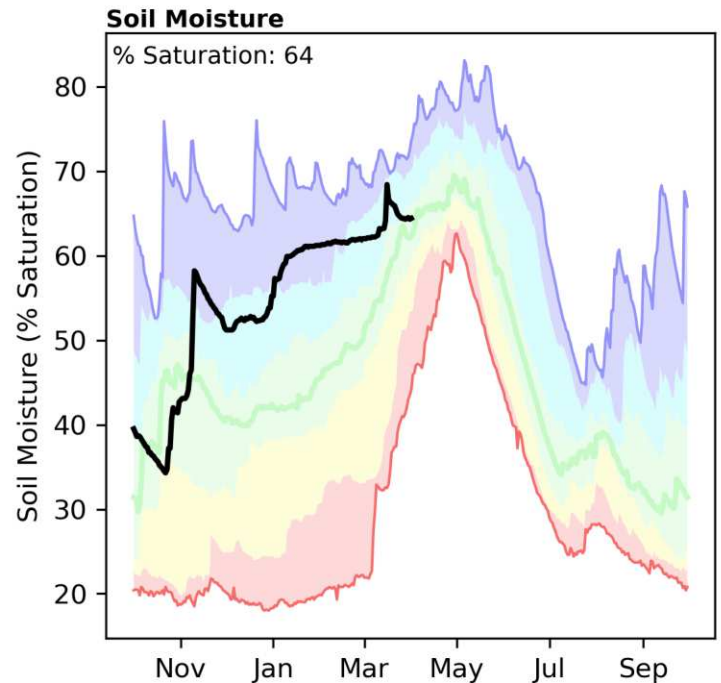
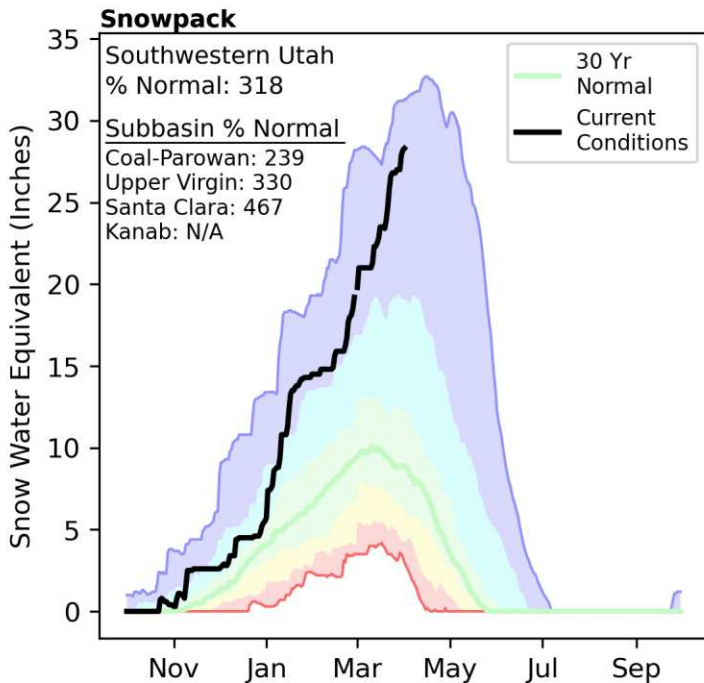
When selected, the following historic streamflow values and statistics will be shown.



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

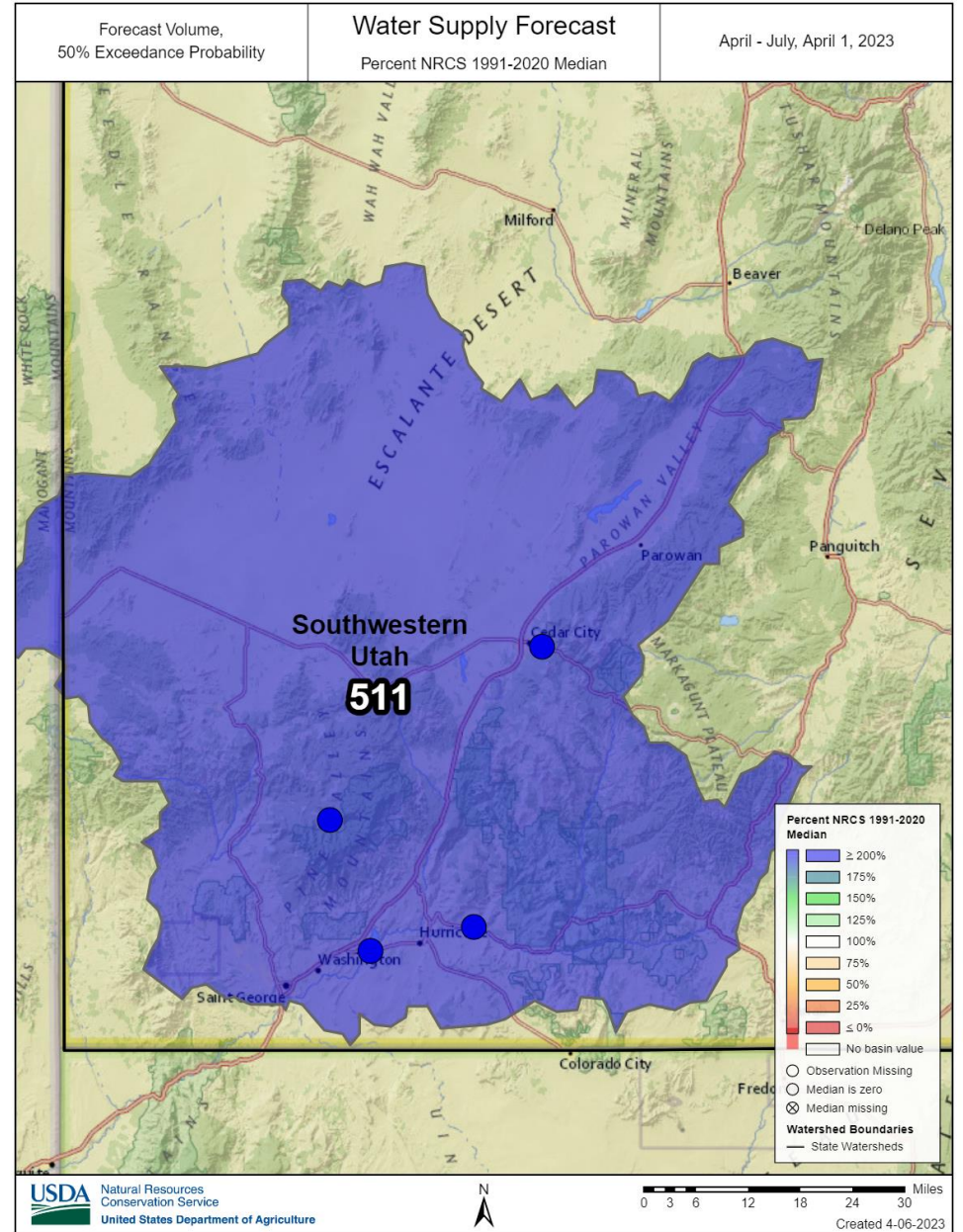
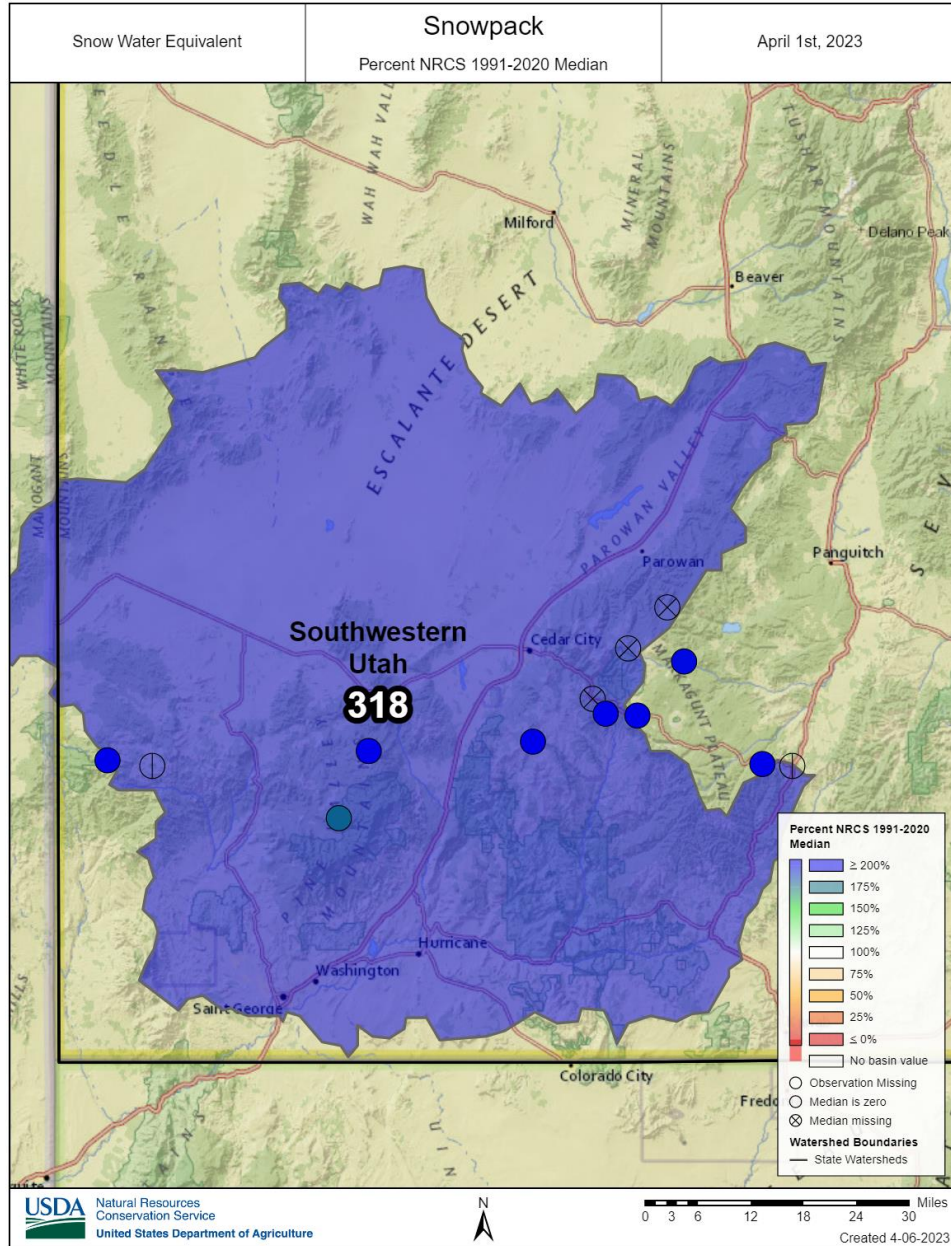
Southwestern Utah | April 1, 2023

Snowpack in Southwestern Utah is well above normal at 318% of median, compared to 70% at this time last year. Precipitation in March was well above normal at 352%, which brings the seasonal accumulation (October-March) to 189% of median. Soil moisture is at 64% saturation compared to 65% saturation last year. Reservoir storage is 22% of capacity, compared to 24% last year. Forecast streamflow volumes (50% exceedence, April-July) range from 384% to 581% of normal. The Surface Water Supply Index percentile is 94% for the Virgin River.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: [30 year normal calculation description](#)

Southwestern Utah

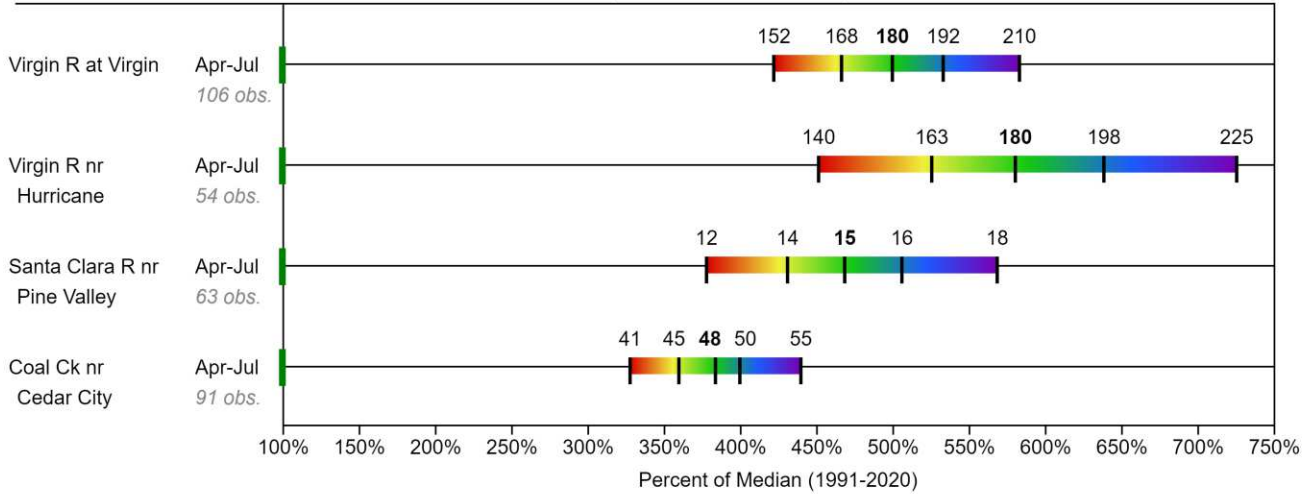


Southwestern Utah

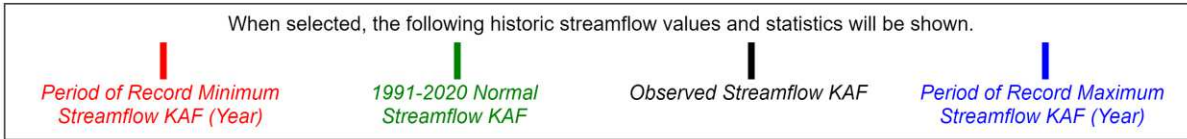
SOUTHWESTERN UTAH Water Supply Forecasts April 1, 2023

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->
Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



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

April 1, 2023 | Utah Reservoir Summary

Watershed/Region	Current Storage (Basinwide KAF)	Reservoir Capacity (Basinwide KAF)	Last Yr % Capacity (Basinwide)	This Yr % Capacity (Basinwide)
Utah (Statewide)	2988	5465	56	54
Utah (Statewide) Incl. Flaming G. & Lk. Powell	10828	33536	35	32
Bear	481	1389	45	34
Weber-Ogden	299	547	48	54
Northeastern Uintas	2512	3852	77	65
Tooele Valley	2	4	55	46
Duchesne	1039	1379	76	75
Provo	817	1334	61	61
San Pitch	1	20	3	5
Price	66	158	33	41
Upper Sevier	125	382	35	32
Southeast UT	1	2	45	77
Beaver	8	23	33	37
Southwest Utah	97	118	69	82

Red (green) shading indicates >5% decrease (increase) in % capacity from this time last year.

Reservoir	Current Storage (KAF)	Reservoir Capacity (KAF)	Last Yr % Capacity	This Yr % Capacity
Bear Lake	443	1302	44	34
Big Sand Wash Reservoir	25	25	99	100
Causey Reservoir	3	7	76	55
Cleveland Lake	3	5	1	61
Currant Creek Reservoir	14	15	97	92
Deer Creek Reservoir	102	149	84	68
East Canyon Reservoir	28	49	62	57
Echo Reservoir	46	73	42	62
Flaming Gorge Reservoir	2465	3749	78	65
Grantsville Reservoir	1	3	61	51
Gunlock	9	10	43	87
Gunnison Reservoir	1	20	3	5
Huntington North Reservoir	4	4	84	95
Hyrum Reservoir	9	15	92	64
Joes Valley Reservoir	30	61	37	49
Jordanelle Reservoir	185	314	48	59
Ken's Lake	1	2	45	77
Kolob Reservoir	2	5	57	37
Lake Powell	5374	24322	23	22
Lost Creek Reservoir	10	22	47	45
Lower Enterprise	2	2	54	92
Meeks Cabin Reservoir	11	32	39	35
Miller Flat Reservoir	1	5	31	27
Millsite	9	16	21	54
Minersville Reservoir	8	23	33	37
Moon Lake Reservoir	28	35	75	80
Otter Creek Reservoir	26	52	50	49
Panguitch Lake	10	22	44	44
Pineview Reservoir	38	110	35	34
Piute Reservoir	30	71	24	43
Porcupine Reservoir	8	11	59	78
Quail Creek	29	40	69	73
Red Fleet Reservoir	10	25	44	41
Rockport Reservoir	29	60	65	47
Sand Hollow Reservoir	45	50	88	91
Scofield Reservoir	18	65	31	27
Settlement Canyon Reservoir	0	1	36	32
Sevier Bridge Reservoir	58	236	34	24
Smith and Morehouse	4	8	60	51
Starvation Reservoir	141	164	90	86
Stateline Reservoir	6	12	49	56
Steinaker Reservoir	18	33	35	54
Strawberry Reservoir	825	1105	76	74
Upper Enterprise	8	10	16	88
Upper Stillwater Reservoir	2	32	7	7
Utah Lake	530	870	61	60
Willard Bay	139	215	46	64
Woodruff Creek	2	4	72	70
Woodruff Narrows Reservoir	16	57	35	28

Red (green) shading indicates >5% decrease (increase) in % capacity from this time last year.

Weber R nr Oakley ²	APR-JUL	102	113	120	293%	127	138	41
Echo Reservoir Inflow ²	APR-JUL	149	167	179	185%	192	210	97
East Canyon Ck nr Jeremy Ranch	APR-JUL	220	260	285	238%	310	350	120
East Canyon Ck nr Morgan ²	APR-JUL	28	33	37	389%	41	46	9.5
	APR-JUL	52	60	65	361%	70	78	18

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Northeastern Uintas	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Ashley Ck nr Vernal	APR-JUL	58	68	75	174%	82	92	43
Flaming Gorge Resvr Local BI Fontenelle ²								
Big Brush Ck ab Red Fleet Reservoir	APR-JUL	27	31	34	173%	37	41	19.7
Flaming Gorge Reservoir Inflow ²	APR-JUL	700	930	1110	112%	1300	1620	990
Blacks Fk nr Robertson	APR-JUL	85	100	110	121%	120	135	91
Stateline Reservoir Inflow ²	APR-JUL	26	32	36	138%	40	47	26

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Tooele Valley-Vernon Creek	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Vernon Ck nr Vernon	APR-JUL	2.9	3.6	4	541%	4.5	5.2	0.74
S Willow Ck nr Grantsville	APR-JUL	6.1	6.7	7.1	284%	7.6	8.2	2.5

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Duchesne	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Currant Ck Reservoir Inflow ²	APR-JUL	36	42	46	387%	51	58	11.9
Lake Fk R bl Moon Lk nr Mountain Home ²	APR-JUL	75	87	95	167%	104	118	57
Duchesne R nr Randlett	APR-JUL	560	685	780	306%	880	1040	255

APR-JUL 135 153 165 550% 178 196 30

- 1) 90% And 10% exceedance probabilities are actually 95% And 5%
 2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Sevier	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Sevier R nr Gunnison	APR-JUL	168	230	275	917%	325	410	30

- 1) 90% And 10% exceedance probabilities are actually 95% And 5%
 2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

San Pitch	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Manti Ck bl Dugway Ck nr Manti	APR-JUL	19.9	24	26	200%	28	32	13

- 1) 90% And 10% exceedance probabilities are actually 95% And 5%
 2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Price-San Rafael	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Joels Valley Reservoir Inflow ²	APR-JUL	72	82	90	205%	98	110	44
Price R nr Scofield Reservoir ²	APR-JUL	78	88	95	365%	102	114	26
Ferron Ck (Upper Station) nr Ferron	APR-JUL	46	52	57	178%	62	69	32
Electric Lake Inflow ²	APR-JUL	23	27	30	361%	33	37	8.3
Huntington Ck nr Huntington ²	APR-JUL	70	78	84	233%	90	99	36
White R bl Tabbyune Creek	APR-JUL	33	38	42	583%	46	52	7.2
Fish Ck ab Reservoir nr Scofield	APR-JUL	55	62	67	338%	72	80	19.8

- 1) 90% And 10% exceedance probabilities are actually 95% And 5%
 2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Upper Sevier	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Mammoth Ck nr Hatch	APR-JUL	62	69	73	371%	78	84	19.7

Sevier R nr Kingston	APR-JUL	115	135	150	1020%	166	190	14.7
EF Sevier R nr Kingston	APR-JUL	34	45	53	396%	62	76	13.4
Sevier R at Hatch	APR-JUL	125	137	145	426%	153	165	34
Clear Ck ab Diversions nr Sevier	APR-JUL	39	44	48	353%	52	57	13.6
Salina Ck nr Emery	APR-JUL	12.8	13.9	14.7	263%	15.5	16.6	5.6
Sevier R nr Gunnison	APR-JUL	168	230	275	917%	325	410	30

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Southeastern Utah	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Colorado R nr Cisco ²	APR-JUL	4440	5190	5740	153%	6310	7190	3750
Green R at Green River, UT ²	APR-JUL	3530	4220	4730	181%	5260	6090	2610
Mill Ck at Sheley Tunnel nr Moab	APR-JUL	7.1	8.7	9.9	300%	11.2	13.1	3.3
South Ck ab Resv nr Monticello	APR-JUL	2.5	3.1	3.5	854%	3.9	4.7	0.41

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Dirty Devil	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Muddy Ck nr Emery	APR-JUL	25	30	33	202%	37	42	16.3
Seven Mile Ck nr Fish Lake	APR-JUL	8.3	9.9	11	180%	12.2	14	6.1

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Beaver	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Beaver R nr Beaver	APR-JUL	51	56	60	345%	64	69	17.4

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Southwestern Utah	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Santa Clara R nr Pine Valley	APR-JUL	12.1	13.8	15	469%	16.2	18.2	3.2
Virgin R at Virgin	APR-JUL	152	168	180	500%	192	210	36
Coal Ck nr Cedar City	APR-JUL	41	45	48	384%	50	55	12.5
Virgin R nr Hurricane	APR-JUL	140	163	180	581%	198	225	31

- 1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Escalante-Paria	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Pine Ck nr Escalante	APR-JUL	2.4	3.2	3.8	233%	4.5	5.5	1.63

- 1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

State of Utah	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Green R at Green River, UT ²	APR-JUL	3530	4220	4730	181%	5260	6090	2610
Smiths Fk nr Border	APR-JUL	97	111	120	140%	129	143	86
	APR-SEP	107	122	133	133%	144	159	100
Lake Fk R bl Moon Lk nr Mountain Home ²	APR-JUL	75	87	95	167%	104	118	57
Sevier R nr Kingston	APR-JUL	115	135	150	1020%	166	190	14.7
White R bl Tabbyune Creek	APR-JUL	33	38	42	583%	46	52	7.2
Seven Mile Ck nr Fish Lake	APR-JUL	8.3	9.9	11	180%	12.2	14	6.1
Spanish Fk at Castilla ²	APR-JUL	135	153	165	550%	178	196	30
Bear R bl Stewart Dam ²	APR-JUL	240	325	390	339%	460	575	115
	APR-SEP	270	360	430	352%	510	635	122
Weber R nr Oakley ²	APR-JUL	149	167	179	185%	192	210	97
Provo R bl Deer Ck Dam ²	APR-JUL	190	220	240	212%	260	290	113
Weber R nr Coalville ²	APR-JUL	171	200	220	237%	240	265	93
Uinta R bl Powerplant Diversion nr Neola	APR-JUL	84	106	123	192%	141	169	64

Sevier R at Hatch	APR-JUL	152	168	180	500%	192	210	36
Salt Ck at Nephi	APR-JUL	125	137	145	426%	153	165	34
Little Bear at Paradise	APR-JUL	30	33	35	745%	37	40	4.7
Big Ck nr Randolph	APR-JUL	82	92	99	354%	106	116	28
Fish Ck ab Reservoir nr Scofield	APR-JUL	7.5	9.6	11	344%	12.5	14.5	3.2
Santa Clara R nr Pine Valley	APR-JUL	55	62	67	338%	72	80	19.8
Weber R at Gateway ²	APR-JUL	12.1	13.8	15	469%	16.2	18.2	3.2
Mammoth Ck nr Hatch	APR-JUL	495	575	625	305%	675	755	205
Pine Ck nr Escalante	APR-JUL	62	69	73	371%	78	84	19.7
Salina Ck nr Emery	APR-JUL	2.4	3.2	3.8	233%	4.5	5.5	1.63
Dunn Ck nr Park Valley	APR-JUL	12.8	13.9	14.7	263%	15.5	16.6	5.6
Stateline Reservoir Inflow ²	APR-JUL	3.9	4.7	5.3	221%	5.9	6.7	2.4
Blacksmith Fk nr Hyrum ²	APR-JUL	26	32	36	138%	40	47	26
East Canyon Ck nr Jeremy Ranch	APR-JUL	73	82	89	307%	96	105	29
Little Cottonwood Ck nr SLC	APR-JUL	28	33	37	389%	41	46	9.5
Muddy Ck nr Emery	APR-JUL	58	64	68	219%	72	79	31
Logan R nr Logan	APR-JUL	25	30	33	202%	37	42	16.3
Ferron Ck (Upper Station) nr Ferron	APR-JUL	159	174	185	203%	196	210	91
Duchesne R nr Tabiona ²	APR-JUL	46	52	57	178%	62	69	32
Duchesne R ab Knight Diversion ²	APR-JUL	145	165	180	207%	195	220	87
Lost Ck Reservoir Inflow	APR-JUL	265	295	320	198%	345	380	162
Colorado R nr Cisco ²	APR-JUL	22	26	29	305%	32	36	9.5
Bear R ab Resv nr Woodruff	APR-JUL	4440	5190	5740	153%	6310	7190	3750
	APR-JUL	136	173	198	215%	225	260	92
	APR-SEP	145	183	210	212%	235	275	99
Provo R at Hailstone ²	APR-JUL	134	161	180	217%	200	235	83
Strawberry R nr Duchesne ²	APR-JUL	188	230	260	491%	295	345	53
Manti Ck bl Dugway Ck nr Manti	APR-JUL	19.9	24	26	200%	28	32	13
Joes Valley Reservoir Inflow ²	APR-JUL	72	82	90	205%	98	110	44
Big Cottonwood Ck nr SLC	APR-JUL	56	64	70	241%	76	86	29
Rockport Reservoir Inflow ²	APR-JUL	164	191	210	241%	225	255	87
Big Brush Ck ab Red Fleet Reservoir	APR-JUL	27	31	34	173%	37	41	19.7

Chalk Ck at Coalville	APR-JUL	54	67	76	292%	85	98	26
SF Ogden R nr Huntsville ²	APR-JUL	102	113	120	293%	127	138	41
Strawberry R nr Soldier Springs ²	APR-JUL	94	114	128	356%	143	168	36
Upper Stillwater Reservoir Inflow ²	APR-JUL	95	109	120	176%	131	148	68
Huntington Ck nr Huntington ²	APR-JUL	70	78	84	233%	90	99	36
Vernon Ck nr Vernon	APR-JUL	2.9	3.6	4	541%	4.5	5.2	0.74
East Canyon Ck nr Morgan ²	APR-JUL	52	60	65	361%	70	78	18
Mill Ck at Sheley Tunnel nr Moab	APR-JUL	7.1	8.7	9.9	300%	11.2	13.1	3.3
Yellowstone R nr Altonah	APR-JUL	67	80	90	161%	100	116	56
Sevier R nr Gunnison	APR-JUL	168	230	275	917%	325	410	30
Flaming Gorge Reservoir Inflow ²	APR-JUL	700	930	1110	112%	1300	1620	990

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Appendix A: Data used in SWSI Calculations

Watershed/ Region	USGS Gauging Station(s)	Reservoir(s)	Start Date
Bear	Bear R nr Ut-Wy State Line	Bear Lake	1981
Woodruff Narrows	Bear R ab Resv nr Woodruff	Woodruff Narrows Reservoir	1986
Little Bear	Little Bear R at Paradise	Hyrum Reservoir	1993
Ogden	Pineview Reservoir Inflow	Pineview Reservoir, Causey Reservoir	1981
Weber	Weber R at Gateway	East Canyon Reservoir, Echo Reservoir, Lost Creek Reservoir, Rockport Reservoir, Smith And Morehouse Reservoir, Willard Bay	1981
Provo	Provo R at Woodland, Spanish Fk at Castilla, W Canyon Ck nr Cedar Fort, Salt Ck at Nephi, American Fk ab Upper Powerplant	Utah Lake, Deer Creek Reservoir, Jordanelle Reservoir	1995
Western Uintas	Yellowstone R nr Altonah	Starvation Reservoir, Moon Lake Reservoir, Upper Stillwater Reservoir	1981
Eastern Uintas	Big Brush Ck ab Red Fleet Reservoir, Ashley Ck nr Vernal, Whiterocks R nr Whiterocks	Red Fleet Reservoir, Steinaker Reservoir	1981
Blacks Fork	Blacks Fk nr Robertson	Meeks Cabin Reservoir	1984
Smiths Fork	East Fork Smiths Fork bl Stateline Res	Stateline Reservoir	1984
Price	Fish Ck ab Reservoir nr Scofield	Scofield Reservoir	1981
Joes Valley	Seely Ck bl Joes Valley Resv	Joes Valley Reservoir	1981
Ferron Creek	Ferron Ck Upper Station nr Ferron	Millsite	1981
Moab	Mill Ck at Sheley Tunnel nr Moab	Ken's Lake	1988
Upper Sevier	Sevier R nr Kingston, EF Sevier R nr Kingston	Piute Reservoir, Otter Creek Reservoir	1981
San Pitch	Manti Ck bl Dugway Ck nr Manti	Gunnison Reservoir	1981
Lower Sevier	Sevier R nr Gunnison	Sevier Bridge Reservoir	1981
Beaver River	Beaver R nr Beaver	Minersville Reservoir	1981
Virgin River	Virgin R at Virgin, Santa Clara R nr Pine Valley	Quail Creek, Gunlock	1993

Water Supply Outlook Reports and Federal - State - Private Cooperative Snow Surveys

For more water supply and resource management information, contact: your local Natural Resources Conservation Service Office or:

Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snowcourses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Utah Water Supply Outlook Report

Natural Resources Conservation Service
Salt Lake City, UT

