United States Department of Agriculture

Natural Resources Conservation Service

Nevada Water Supply Outlook Report
May 1, 2024

Lake Tahoe on April 22, 2024
Credit: Jeff Anderson

Lake Tahoe expected to fill for first time since 2019

The Lake Tahoe rise forecast predicts snowmelt will be sufficient to fill the lake this spring. The last time Lake Tahoe was full was June 2019. The dam at Lake Tahoe's outlet provides up to six feet of storage totaling 744,500 acre-feet. Once full the stored water in Lake Tahoe typically provides sufficient supply to meet demand for three years even if snowpacks are below normal.

Background information about this report:

This report provides an analysis of water supply conditions across Nevada and a part of the eastern Sierra in California. It is published monthly from January to May. First of month data are summarized and used to forecast summer streamflow. The report is best read in digital format which allows readers to click on the blue internet links.

Streamflow Forecasts: Most of the annual streamflow in the western United States originates as snowfall that accumulates in the mountains during the winter. As the snowpack accumulates, hydrologists can estimate the runoff that will occur when the snow melts. Measurements of snow water equivalent (SWE) at snow courses and SNOTEL sites, along with precipitation, antecedent streamflow, and El Niño / Southern Oscillation indices are used in computerized statistical models to produce streamflow runoff forecasts. **Forecasts in this report give the total volume of water expected to flow past a location during a specified period, such as April 1 to July 31.**

Most **streamflow forecast volumes** in this report are expressed in KAF (thousand-acre-feet). Some smaller streams are forecast in acre-feet and noted as such in parentheses after the forecast name, such as "Marlette Lake Inflow (acre-feet)". Forecasts for Lake Tahoe, Pyramid Lake and Walker Lake are expressed in feet of water surface elevation change during the forecast period. A rise in lake level is indicated by a positive value, while a drop caused by evaporation is indicated by a negative number. The East Fork Carson River has two recession forecasts that provide the dates when spring river flows are expected to recede to 500 cfs and 200 cfs levels as the snowmelt decreases in late spring.

Interpreting Streamflow Forecasts: Forecasts of any kind 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. 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. **Unless otherwise stated the 50% exceedance forecast is the one referred to in the text of this report.** To quantify the range around this 50% value, four other forecasts are provided in the forecast tables, two smaller values (90% and 70% exceedances) and two larger values (30% and 10% exceedances). There is a 90% chance that the actual flow will be more than the minimum forecast (90% exceedance forecast). Likewise there is a 10% chance the actual flow will be more than the maximum forecast (10% exceedance forecast). Other forecasts can be interpreted similarly. The wider the spread between these values, the more forecast uncertainty.

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. Water 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 perhaps due to a dry climate outlook for the coming months, 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 if there is a 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, they should be prepared to deal with either more or less water.

Streamflow Adjustments: Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream lakes, reservoirs and diversions. Certain forecasts are adjusted for these structures; these are footnoted with a (2) in the report. A summary list of all streamflow adjustments is provided on the back cover of this report.

"Normal" = Median: Starting in water year 2022 the NRCS selected the statistical median for the 1991-2020 period as the default central tendency for all parameters including snowpack, precipitation, soil moisture, streamflow and reservoir storage. Unless otherwise stated all percentages in this report are based on median. For more information about the 1991-2020 normals and how they impact our region visit the Nevada Normals Dashboard.

Soil moisture has been measured at SNOTEL sites since ~2006. Due to the short record the soil moisture normal is based on water years 2006-2020. Soil moisture data are depth averaged from sensors located at soil depths of 8 and 20 inches.

Maximums and Minimums: Graphs in this report display "Max" and "Min" lines for snowpack, precipitation and soil moisture. For snow and precipitation these are basin-wide, daily maximums and minimums for water years 1981-2021; for soil moisture the period is 2006-2021.

Watershed Snowpack Analysis: These tables summarize the snowpack percent of median for each basin and its sub-basins. Percentages are based on SNOTEL and snow course measurements. Basin snowpack files are available here. Select "Nevada" and report type "Snow" a full report with station-by-station data. Basin order is alphabetical by main bain, followed by its sub-basins, then the next main basin.

For questions contact:

Jeff Anderson, Nevada NRCS Snow Survey
jeff.anderson@usda.gov

To join our email subscription list click here.

Nevada Water Supply Outlook Report
Table of Contents

Cover…… 1

Background Information…… 2

Table of Contents..... 3

Summary of Water Supply Conditions..... 4

Valley and Rangeland Conditions……. 8

Drought Status……9

State of Nevada and Eastern Sierra Summary……10

- *Snowpack Map……..11*
- *Monthly Precipitation Maps…….. 12*
- *Water Year to Date Precipitation Map…… 13*
- *Streamflow Forecast Map …… 14*
- *Streamflow Forecast Chart…….. 15*

Basin Conditions and Streamflow Forecasts

- *Lake Tahoe Basin…… 16-17*
- *Truckee River Basin…… 18-19*
- *Carson River Basin……..20-21*
- *Walker River Basin…… 22-23*
- *Northern Great Basin…… 24-25*
- *Upper Humboldt Basin…… 26-27*
- *Lower Humboldt Basin…… 28-29*
- *Clover Valley and Franklin River Basin…… 30-31*
- *Snake River Basin…… 32-33*
- *Owyhee River Basin…… 34-35*
- *Eastern Nevada…… 36-37*
- *Spring Mountains and Colorado Basin…… 38-40*

Appendix

- *SNOTEL and Snow Course Overview…… 41*
- *Forecast Chart Explanation…… 42*
- *Streamflow Adjustments & Credits…… 43*

Nevada Water Supply Outlook
May 1, 2024

SUMMARY

The water year continues through September, but it is already a safe bet to pencil in a win on this year's report card especially for northern Nevada. Below is a summary of what we have seen so far.

- ✓ This winter's **snowpack** peaked above median thanks to strong precipitation in January, February and March. April 1 snowpacks were 108-244% of median across the region and May 1 snowpacks continue to be above normal at 102-184% of median despite a dry April and areas of record snowmelt.
- ✓ **Water year precipitation** through May 1 is 93-132% based on SNOTEL data. The Humboldt basin shines brightest with the highest May 1 percentage in the western United States outside of Alaska.
- ✓ **Soil moisture** is high and will help with an efficient runoff. Last year's late melting snow and aided by Hurricane Hilary's mid-summer deluge soil moisture started water year 2024 well above normal. April snowmelt brought soil saturation to record late April levels seven of the twelve major basins.
- ✓ **Streamflow forecasts** call for April-July and May-July volumes near normal to well above normal for points across Nevada and the eastern Sierra based on the 50% exceedance forecasts.
- ✓ Most key **reservoirs** in northern Nevada and the Sierra are expected to fill this spring even if observed streamflow is a bit less than the 50% exceedance volumes.
- ✓ **Drought status** is better than at the beginning of April with the removal of abnormally dry conditions in western Nevada. Most of Nevada is currently drought free except for a small portion of southern Nevada.

In summary, water year 2024 is well on its way to receiving an A on its final report card. The difference between an A- and an A+ might come down to how much spring precipitation the region receives and how those amounts impact observed streamflow volumes. An early May storm already added a good dose of precipitation to start the month, but after a dry April additional precipitation will be needed to produce observed flows equal to or more than the 50% exceedance streamflow volumes. Also, all basins still need additional precipitation to reach normal water year totals by September 30.

SNOWPACK

Snowpacks across the state peaked above normal for the second winter in a row. May 1 snowpack remains above median ranging from 102% of median in the Lake Tahoe Basin to 184% of median in the Lower Humboldt basin. In southern Nevada, the three SNOTEL sites in the Spring Mountains melted out between April 20 and May 2, which was nearly three weeks later than normal. May 1 snow in the Upper Colorado Basin is slightly below normal at 91% of median. May 1 snowpack percentages are lower than April 1 percentages in most basins indicating that snow melted at a faster rate than the normal in April. Sunny days combined with above normal temperatures combined to accelerate snow melt. A number of SNOTELs located in the eastern Sierra, Great Basin and the Upper Colorado Basin recorded record or near record snow melt between April 1 and the May 1. Check out current snow water charts to see how the early May storm paused melt and boosted snow levels.

PRECIPITATION

Water year precipitation percentages on May 1 are 93-98% of median in the Eastern Sierra basins, 101% in the Upper Colorado, 109% in the Spring Mountains, 113-132% across the rest of northern Nevada. The Humboldt basin leads the western United States outside of Alaska in precipitation percentages based on SNOTEL data. As of May 1, SNOTEL sites in Humboldt basin have received on average 23.7 inches of precipitation which is 125% of median and 4.8 inches ahead of normal. In April, the Lower Humboldt was the only area of the state with

near normal precipitation. In other areas, April was the first month since December with below normal monthly precipitation. The eastern Sierra, Upper Humboldt, Owyhee, Snake, and Clover-Franklin basins received 39-60%, while the Northern Great Basin, Eastern Nevada and Spring Mountains had 78-88% for the month. Spring precipitation is a very important variable to track when considering streamflow forecasts. The 50% exceedance forecast volumes are most likely to be observed if snowmelt is accompanied with normal springtime precipitation. May is starting strong after a cold storm brought up to 1 to 2 feet of snow at the highest elevations and added ~0.5 to 1.5 inches of precipitation at SNOTELs across northern Nevada and up to 2.5 inches sites along the Sierra Crest. Even so, more precipitation is needed before totals will exceed May median amounts. To track monthly precipitation compared to normal monthly totals use the Precipitation Summary Update Report.

SOIL MOISTURE

Soil moisture is above normal across northern Nevada and the Eastern Sierra based on sensors at SNOTEL sites. This year's above normal snowpack combined with good soil moisture are expected to produce an efficient runoff this spring as less snowmelt will be soaked up by the soil. Sustained snowmelt in April produced basin averaged soil saturation levels close to or exceeding previous records for late April in a number of basins including the Truckee, Walker, Northern Great Basin, Humboldt, Clover-Franklin, Snake, Owyhee and Eastern Nevada. Soil moisture graphs found later in this report average data from sensors located at soil depths of 8 and 20 inches for all the SNOTEL sites in a basin. SNOTEL soil moisture data has a short period of record. Soil moisture graphs in this report are based on data since October 2005.

RESERVOIRS

Table 1 shows May 1 reservoir storage amounts. Based on streamflow forecasts and current storage most reservoirs in northern Nevada and the Eastern Sierra are expected to fill including Lake Tahoe, Lahontan, and Rye Patch. Chimney Creek Reservoir, on the Little Humboldt River, may not fill since 10.3 KAF of space exists and the May-July forecast is 6.5 KAF, however its storage is currently the highest it has been since 2017.

Table 1: Reservoir storage for May 1, 2024.

Reservoir	May 1, 2024 Storage (KAF)	Median May 1 Storage (KAF)	Reservoir Capacity (KAF)	Current Storage % Capacity	Current Storage % Median
Lake Tahoe	657.3	311.8	744.5	88%	211%
Marlette Lake	12.0	11.9	11.8	102%	101%
Boca Reservoir	20.3	25.7	40.9	50%	79%
Donner Lake	6.5	6.3	9.5	68%	103%
Independence Lake	16.2	15.5	17.3	94%	105%
Prosser Reservoir	18.7	13.7	29.8	63%	136%
Stampede Reservoir	215.7	154.8	226.5	95%	139%
Lahontan Reservoir	285.5	201.0	313.0	91%	142%
Bridgeport Reservoir	39.0	23.3	42.5	92%	168%
Topaz Lk nr Topaz	57.4	24.3	59.4	97%	236%
Chimney Ck Reservoir	24.7	7.1	35.0	71%	347%
Rye Patch Reservoir	130.2	56.8	194.3	67%	229%
Wild Horse Reservoir	75.7	41.1	71.5	106%	184%
Lake Powell	7,774.0	12892.0	24,322.0	32%	60%
Lake Mead	9,378.0	14916.0	26,159.0	36%	63%
Lake Mohave	1,700.0	1699.0	1,810.0	94%	100%

STREAMFLOW FORECASTS

The NRCS May 1 streamflow forecasts predict near normal to well above normal runoff across Nevada and the eastern Sierra based on the 50% exceedance forecasts. May through July volumes range from 93-652% of median across northern Nevada and the eastern Sierra. Forecast for the Virgin River at Littlefield and Lake Powell Inflow are lower at 82% and 86% of median respectively. Looking at the full Apil-July runoff period forecasts in the Humboldt, Owyhee and Snake basins and in Eastern Nevada have volumes that rank above the 75th percentile when compared to historic volumes. Forecasts in the Tahoe, Truckee, Carson and Walker basins are generally between the 50th and 65th percentile. April-July forecast volumes this month dropped compared to last month due to below normal precipitation in April. Precipitation from May 1 through the end of July will determine which of the five exceedance volumes ends up closest to the observed flow. The five exceedance forecasts quantify the range of volumes that could be expected depending on whether future precipitation is below normal (90% and 70% exceedances), near normal (50% exceedance), or above normal (30% and 10% exceedances).

The mainstem of the Humboldt River is of particular interest this year since it's the first time since the early 1980s that we've had back-to-back winters with so much snow. Last month's report pointed out that April-July streamflow volumes for the Humboldt River near Imlay gage typically increase each year when there are consecutive winters with above normal snowpacks. Three period stand out: 1982-1984, 1996-1998 and 2005-2006. Each of these periods saw greater April-July streamflow volumes during the second and third years with above normal snow. Last winter the Upper Humboldt had its second-best snowpack since the start of SNOTEL records in 1981. This year it had the seventh highest snowpack which was also well above median. Last year's April – July streamflow at the Imlay gage was 233 KAF and this month's 50% exceedance forecast is 270 KAF. The likelihood of seeing 270 KAF will also depend on spring precipitation. To illustrate this, consider Figure 1 which compares historic snowpack, spring precipitation and April-July streamflow volumes. The figure highlights in red eight years with April-July volumes greater than 240 KAF including 1983, 1984, 1997,1998, 2017 and 2019. Each of those years had a snowpacks that peaked above median AND April-July precipitation that was also above median. Seven of the highlighted years also had an above median snowpack the year before. The only exception is 2019, which saw an April-July volume of 253 KAF but 2018's snowpack was below a median peak. 2019 made up for 2018's low snow with an extremely wet April and May in 2019. Time will tell how this runoff season plays out and if this season's volume can outpace the 233 KAF measured last spring. April's monthly precipitation in the Upper Humboldt was only 45% of median, hopefully precipitation picks up in May. The drier 70% exceedance forecast volume is 235 KAF so there is a chance 2024 could bring more snow melt water than last season even without above normal spring precipitation. Time will tell.

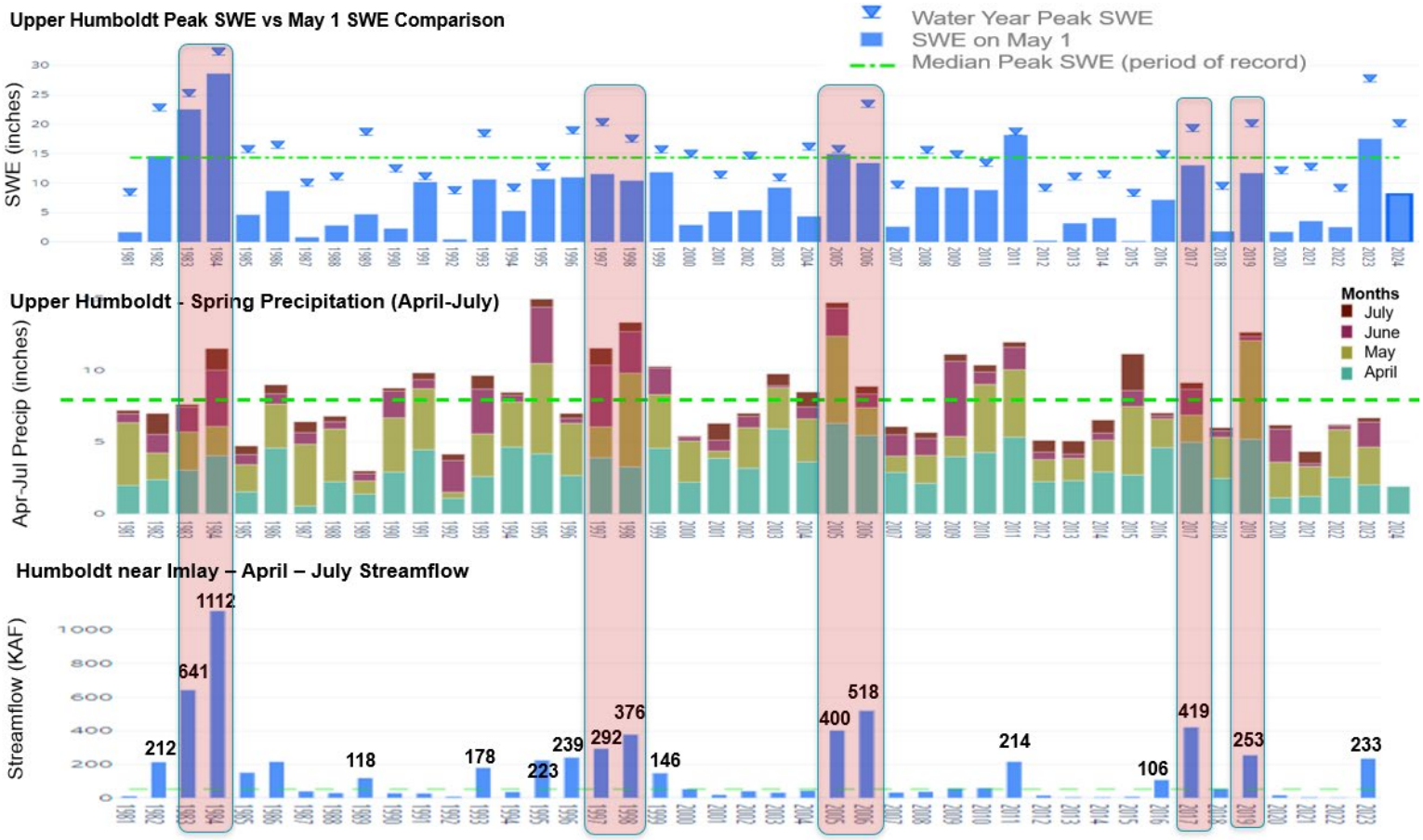


Figure 1: ***Click on the image above to see a larger version of the graphic.*** *The three panels in this figure compare snowpack and April-July precipitation for the Upper Humboldt Basin with April – July streamflow volumes at the Humboldt River near Imlay streamflow gage for the period 1981-present. In the top panel the triangles represent peak basin SWE for each year compared to the median peak represented by the dotted green line. In the middle panel stacked monthly precipitation totals for April, May, June and July for each year are compared to the median amounts for the four-month period in the dotted green line. The bottom panel shows April-July observed streamflow volumes for each year. Total volumes for the highest runoff years are labeled. The years highlighted in red had April-July streamflow greater than 240 KAF.*

A note about streamflow medians and averages in Nevada. Starting in 2022 forecast percentages in NRCS Water Supply Outlook Reports have been based on medians, not averages. The Normals Dashboard has 15-minute YouTube presentation that goes into details about how this impacts Nevada. The boom or bust nature of runoff in the Great Basin creates large difference between median and average streamflow. The Humboldt River at Imlay is an extreme example. Its April-July median streamflow volume is 52 kaf, while the average is 130 kaf, two and a half time more. Due to this it is possible for a streamflow forecast for Imlay to be far above 100% of median, while also being far below 100% of average. While the Humboldt River at Imlay is the most extreme example, many other streams in the Great Basin have large differences between median and average streamflow. Click the links that follow to compare this month's forecasts as a percent of median and a percent of average. Water users should always focus on the forecasted volumes, and not only the percent of normal, when assessing forecasts.

VALLEY AND RANGELAND CONDITIONS

Most the data presented in this report comes from NRCS SNOTEL stations located in the mountains above 6,000 feet. This section summarizes data from valley locations to provide a look at conditions at lower elevations.

Seasonal snow cover replenishes soil moisture and provides water for plant growth on rangelands. A useful tool to track the lower elevation snowpack is [NOAA's Modeled Snow Water Equivalent Map]. The May 1 map (right) shows significant melt occurred since April 1 (left) and that the snowline has receded to higher elevations.

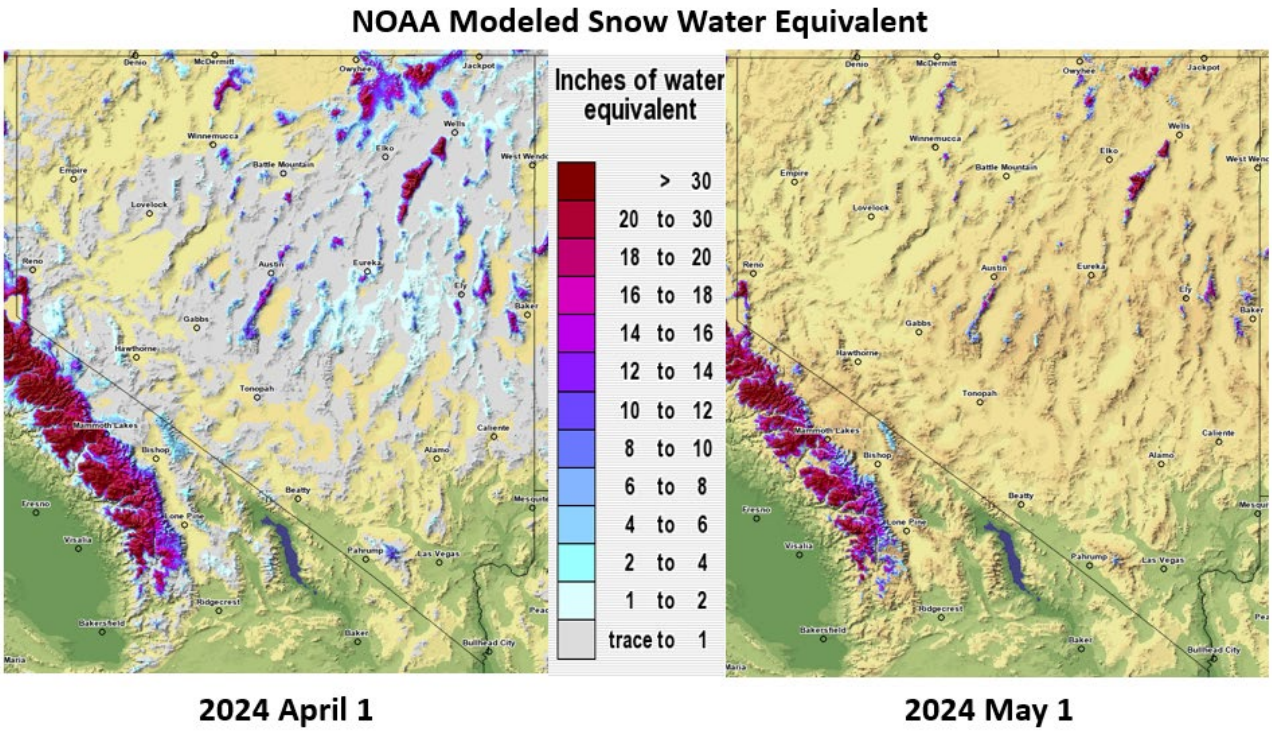


Figure 4: Modeled snow water content across Nevada. Source: NOAA

Valley Temperature and Precipitation: Table 2 provides precipitation and temperature data for valley climate stations for the month of April. Valley precipitation totals in April were a mixed bag of above and below normal amounts. Temperature trends were more consistent, with most stations warmer than normal.

Table 2. April summary of valley climate stations. Source: http://www.rcc-acis.org/

Climate Station	Precipitation April Total (inches)	Precipitation April Departure from Normal (inches)	April Temperature Average (deg F)	April Temperature Departure from Normal (deg F)
Reno Airport	0.25	-0.19	53.6	+2.0
Yerington	0.74	+0.41	51.1	+0.0
Fallon NAS	0.16	-0.33	52.9	+1.8
Lovelock Airport	0.38	-0.08	49.6	+0.3
Winnemucca Airport	2.10	+1.10	48.6	+1.0
Elko Airport	0.85	-0.20	47.3	+1.7
Eureka	0.14	-1.22	42.8	+1.1
Ely Airport	1.03	-0.04	43.7	+0.5
Tonopah	0.16	-0.30	47.4	+0.4
Las Vegas Airport	0.24	+0.04	67.5	-0.2

DROUGHT STATUS:

Drought status improved since last month with the removal of abnormally dry conditions in western Nevada. Most of Nevada is currently classified as drought free except for a portion of southern Nevada that has moderate drought due the multi-decade declines in storage in the lower Colorado reservoirs. Storage in Lake Powell and Lake Mead at the end of April totaled 17 million acre-feet which is just 36% of their capacity.

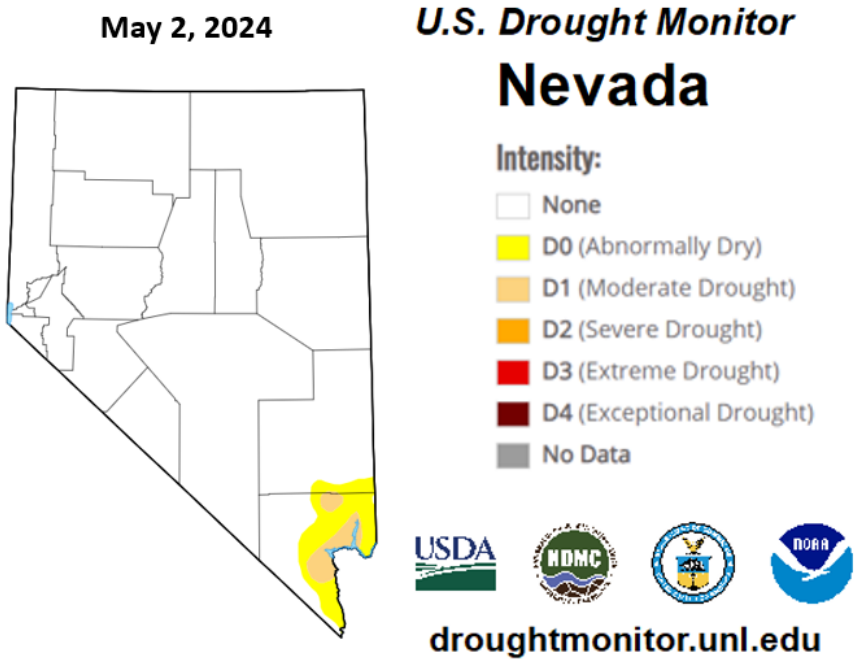
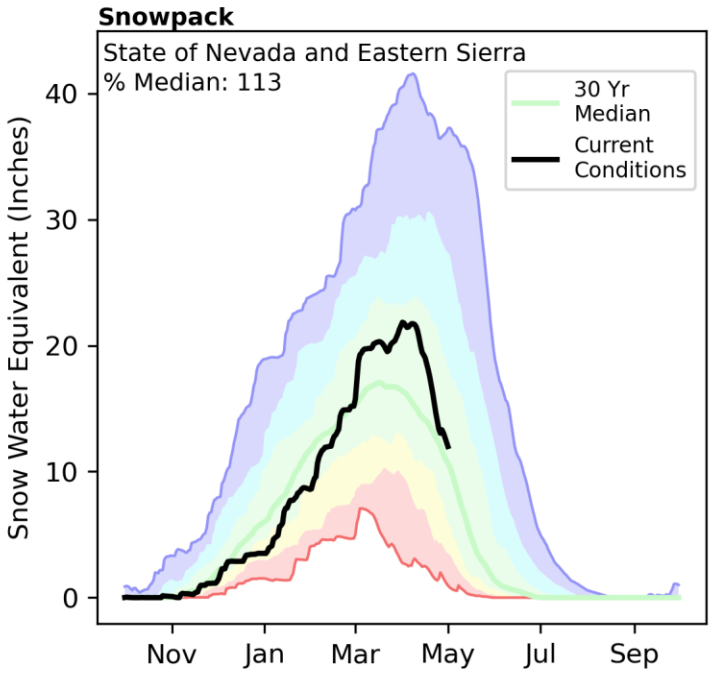
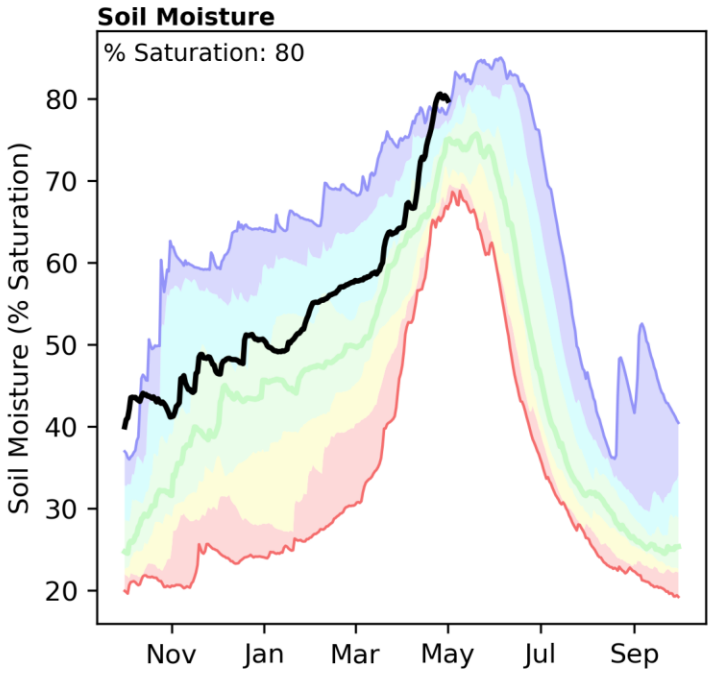


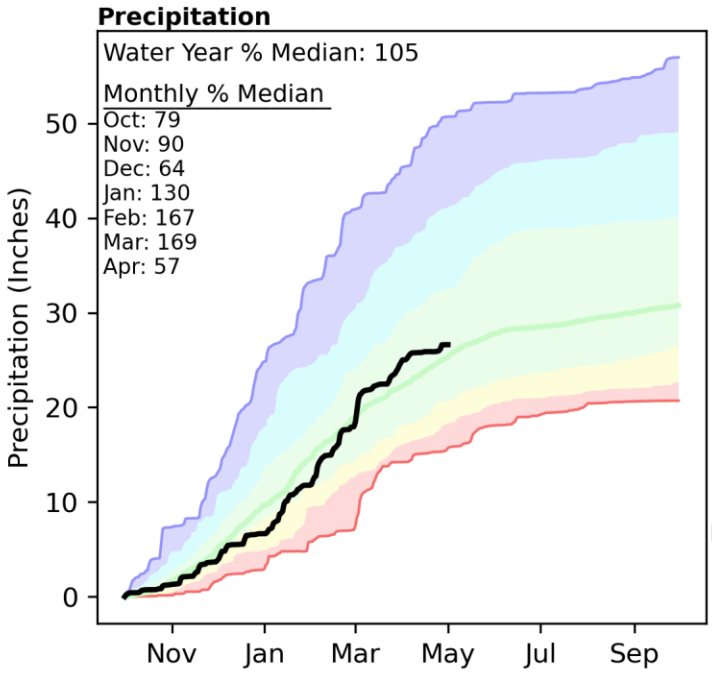
Figure 5: Drought status for May 2, 2024 Source: U.S. Drought Monitor

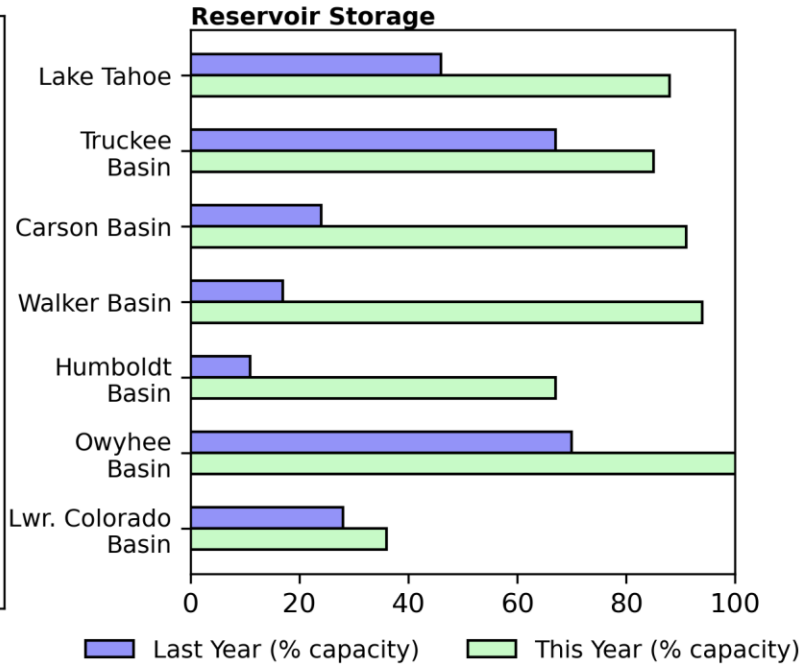
State of Nevada and Eastern Sierra | May 1, 2024

Snowpack in the State of Nevada and Eastern Sierra is above normal at 113% of median, compared to 290% at this time last year. Precipitation in April was well below normal at 57%, which brings the seasonal accumulation (October-April) to 105% of median. Soil moisture is at 80% saturation compared to 76% saturation last year.



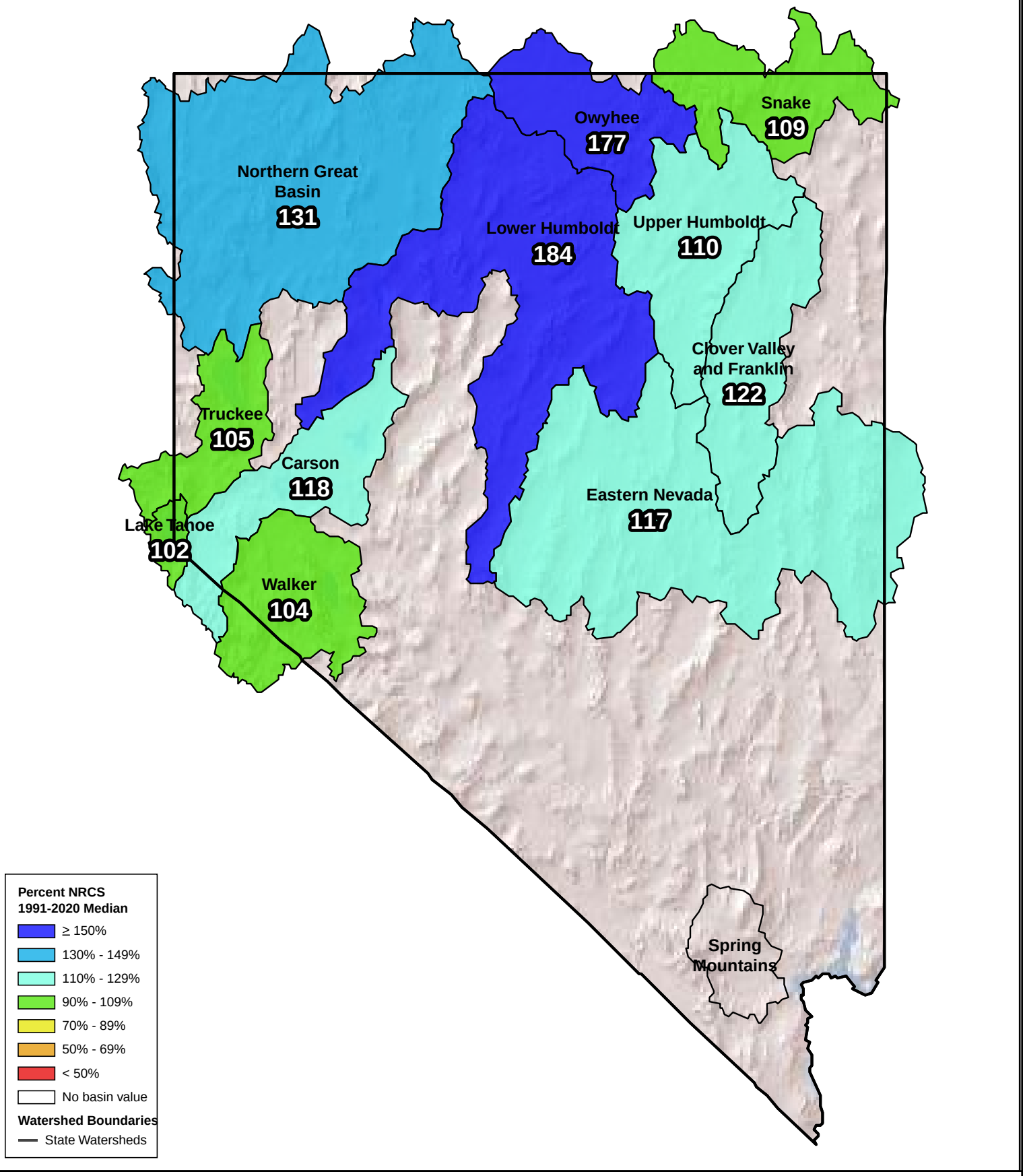






Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: 30 year normal calculation description

Snow Water Equivalent	Percent NRCS 1991-2020 Median	May 1st, 2024

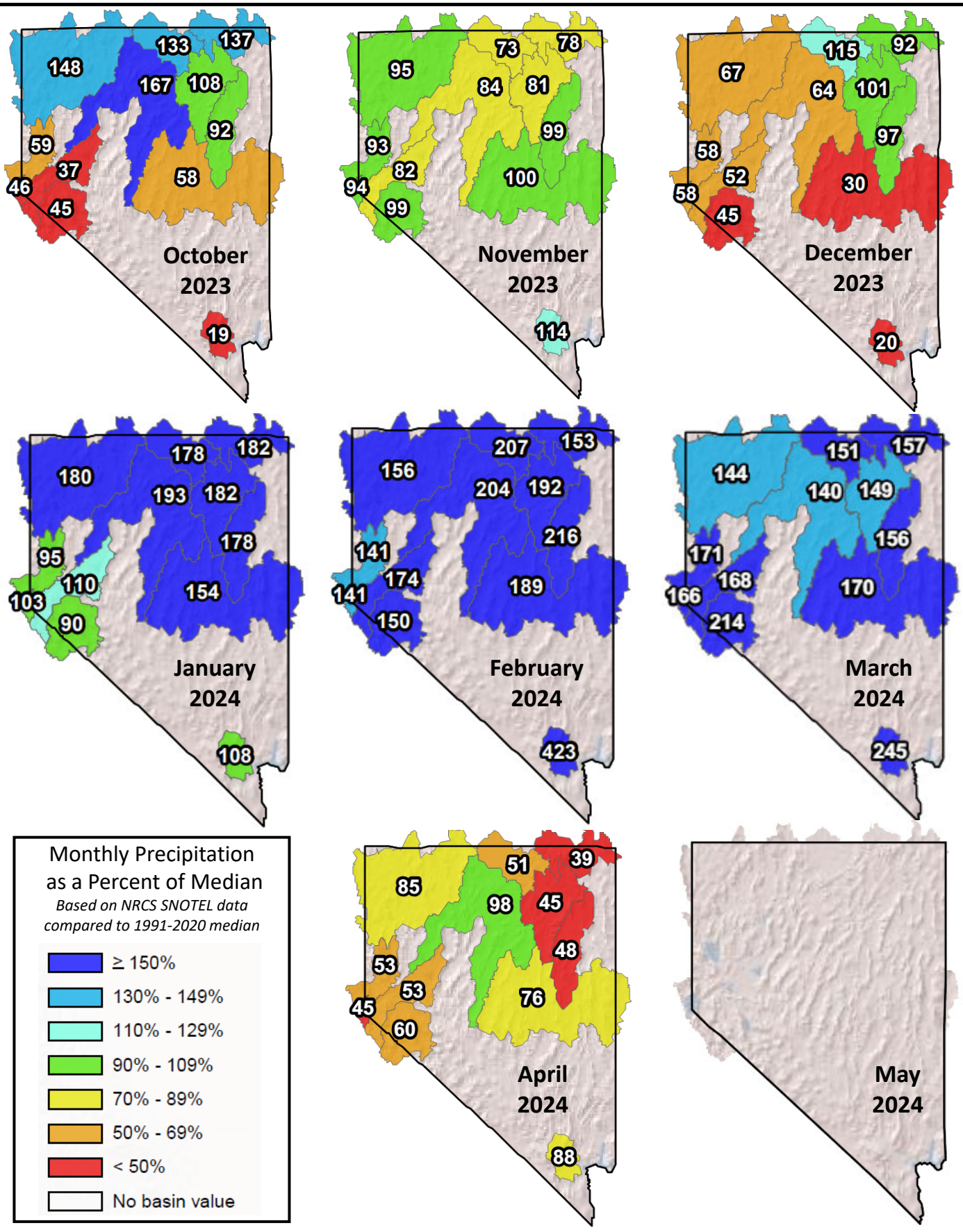


USDA Natural Resources Conservation Service
United States Department of Agriculture

N
0 20 40 80 120 160 200 Miles

Created 5-06-2024

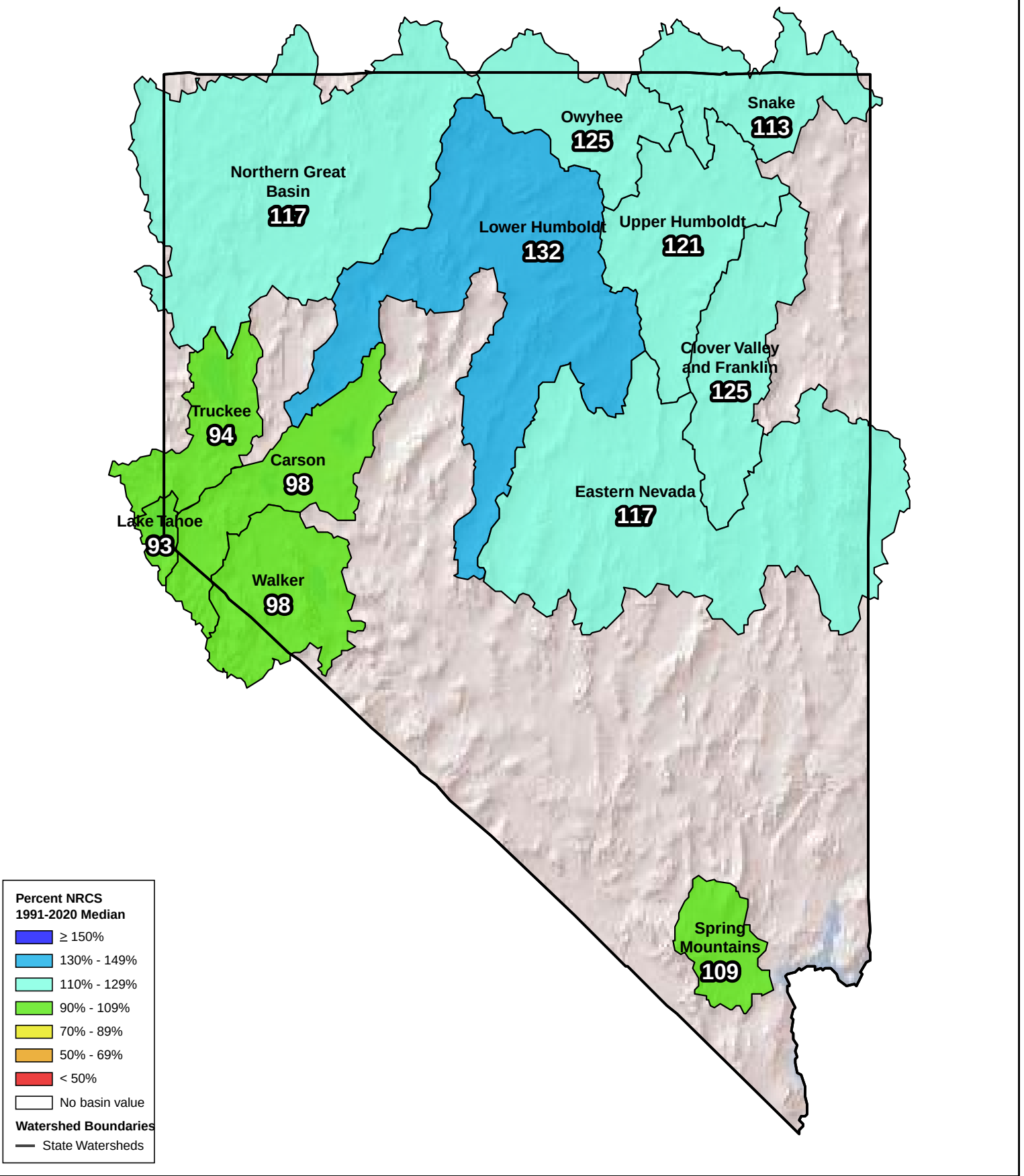
Monthly Precipitation as Percent of Median – Water Year 2024



USDA Natural Resources Conservation Service
United States Department of Agriculture

N

Water Year to Date Precipitation	Percent NRCS 1991-2020 Median	October 1, 2023 - April 30, 2024



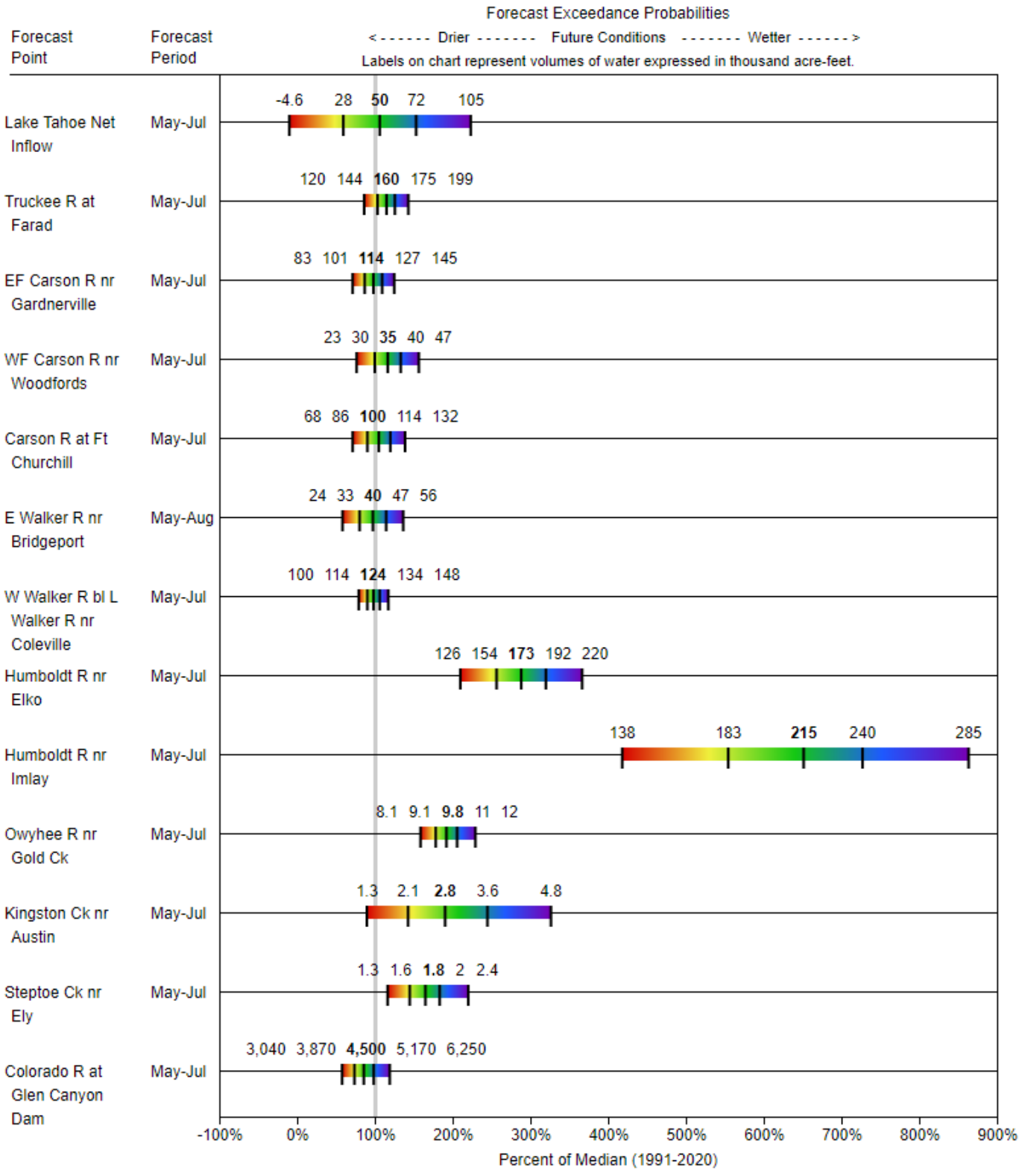
USDA Natural Resources Conservation Service
United States Department of Agriculture

N
0 20 40 80 120 160 200 Miles

Created 5-01-2024

Streamflow Forecasts - State of Nevada Summary

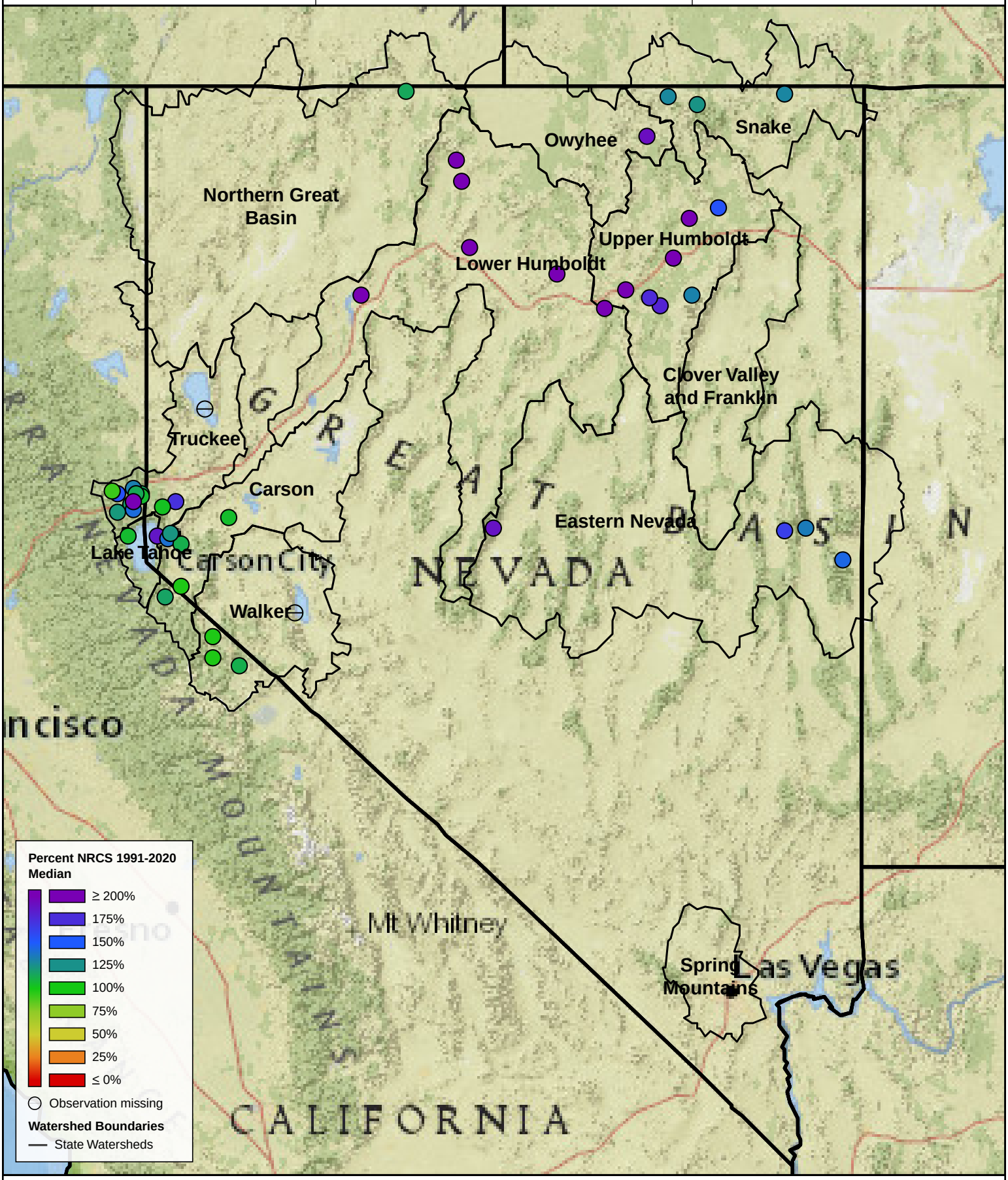
May 1, 2024



See appendix for more information

Individual Basin Charts: https://nwcc-apps.sc.egov.usda.gov/forecast-plots/#state=NV

Streamflow Forecast Volume 50% Exceedance Probability	Percent NRCS 1991-2020 Median	May 1, 2024 Primary Forecast Period *(May-July in most cases)*



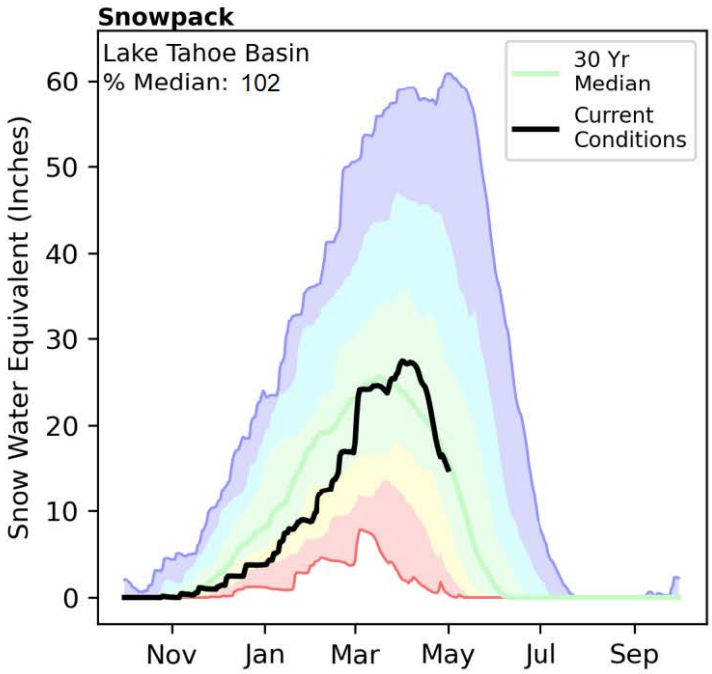
USDA Natural Resources Conservation Service
United States Department of Agriculture

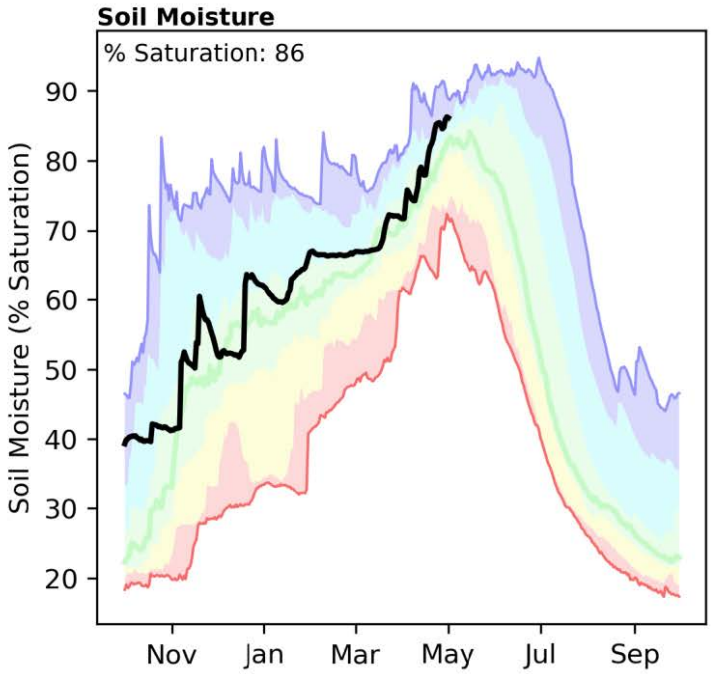
N

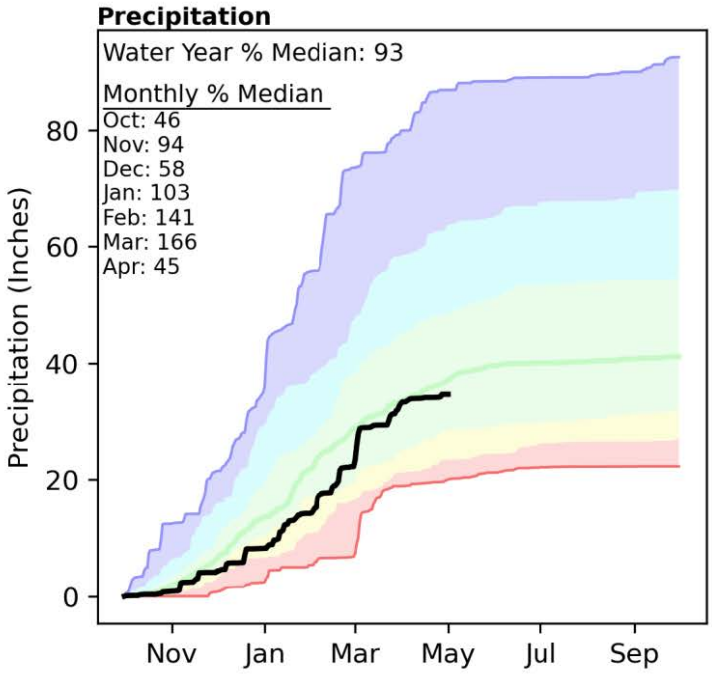
0 10 20 40 60 80 100 Miles

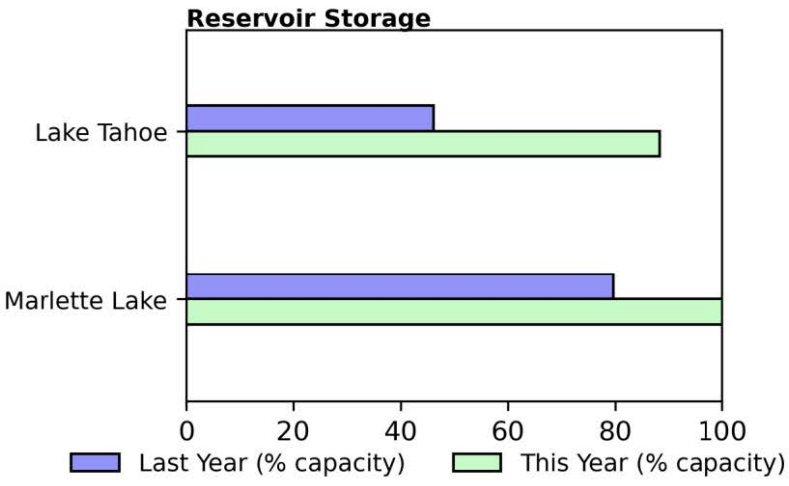
Created 5-07-2024

Snowpack in the Lake Tahoe Basin is about normal at 102% of median, compared to 293% at this time last year. Precipitation in April was well below normal at 45%, which brings the seasonal accumulation (October-April) to 93% of median. Soil moisture is at 86% saturation compared to 84% saturation last year. Reservoir storage is 88% of capacity, compared to 47% last year.









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

Important Information about Forecast Coordination: Hydrologists with the NRCS and National Weather Service California Nevada River Forecast Center (CNRFC) coordinate Lake Tahoe Rise, Truckee River at Farad, Little Truckee River near Boca, and the Carson River at Ft. Churchill forecasts (following page) using output of their respective hydrology models at the request of the Bureau of Reclamation. The NRCS model is a statistical model based on the current data as of the first of each month. The CNRFC ensemble forecasting system incorporates near-term weather prediction and climatology into their model. These models can provide different answers because of the nature of the model systems, and from the inclusion of future weather in the CNRFC model. The hydrologists agree on forecast values using guidance from both models to best provide an accurate water supply forecast for these points.

Data Current As of: 5/6/2024 7:22:59 PM

Lake Tahoe
Streamflow Forecasts - May 1, 2024

Lake Tahoe	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
Marlette Lake Inflow								
	APR-JUL	0.02	0.37	0.6	150%	0.83	1.18	0.4
	MAY-JUL	-0.31	0.05	0.3	188%	0.55	0.91	0.16
Lake Tahoe Rise Gates Closed[2]								
	APR-HIGH	0.87	1.08	1.22	105%	1.36	1.57	1.16
	MAY-HIGH	0.5	0.72	0.87	123%	1.02	1.24	0.71
Lake Tahoe Net Inflow								
	APR-JUL	61	90	110	109%	130	159	101
	MAY-JUL	-4.6	28	50	106%	72	105	47

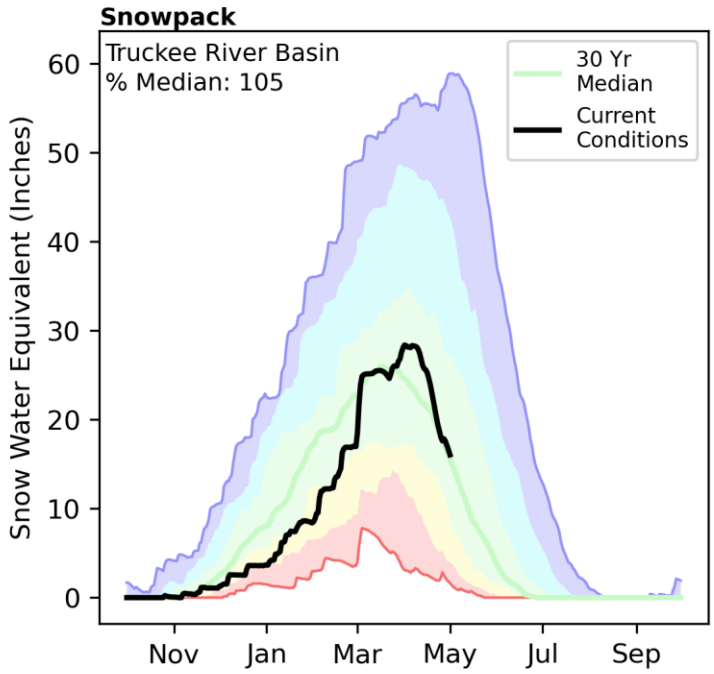
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

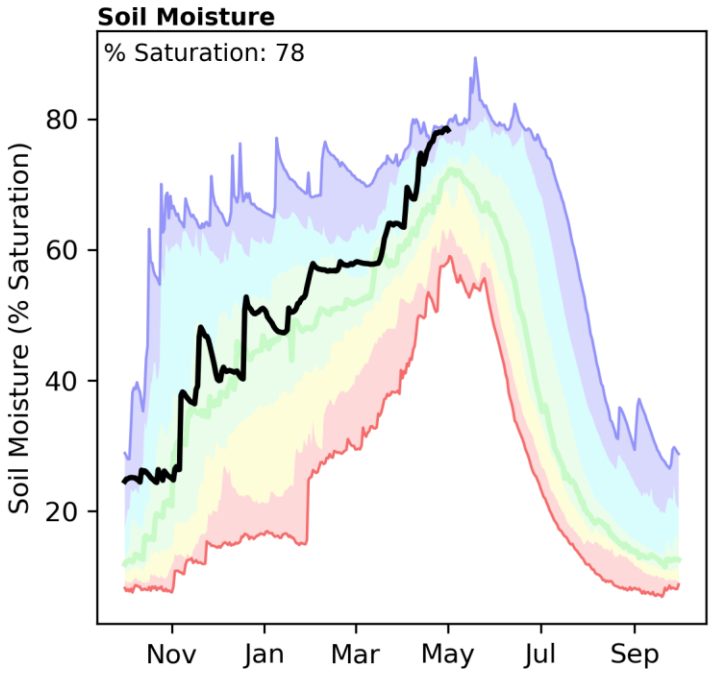
Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Tahoe	657.3	342.8	311.8	744.5
Marlette Lk nr Carson City	12.0	9.4	11.9	11.8

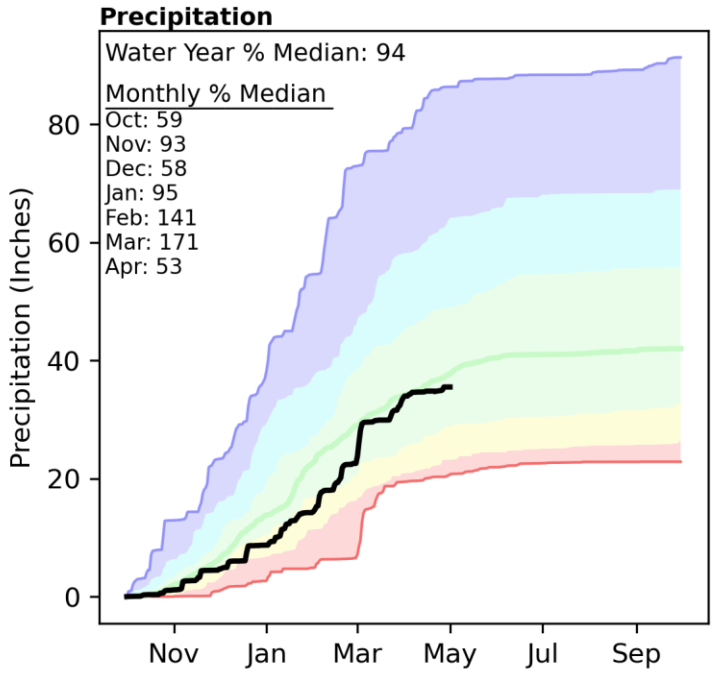
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Lake Tahoe	13	102%	293%

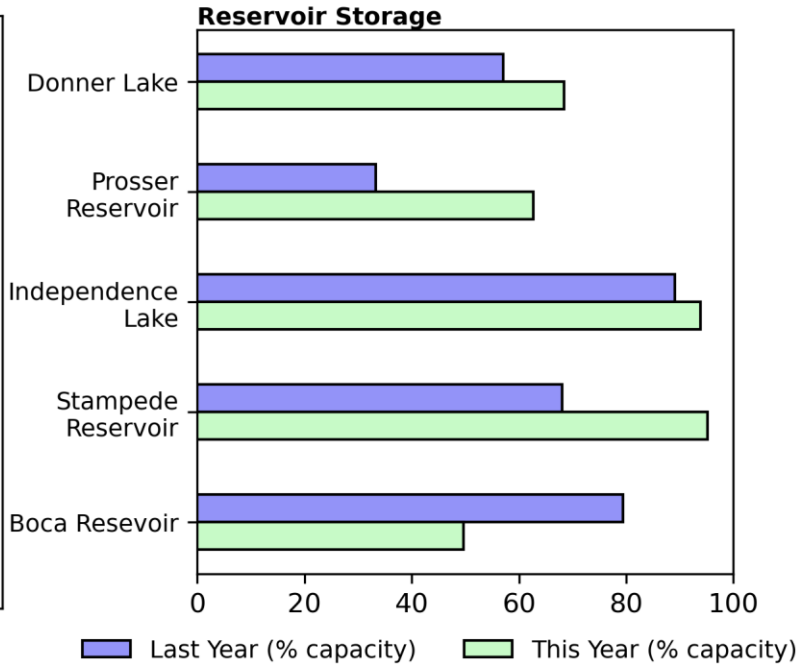
Truckee River Basin | May 1, 2024

Snowpack in the Truckee River Basin is about normal at 105% of median, compared to 270% at this time last year. Precipitation in April was well below normal at 53%, which brings the seasonal accumulation (October-April) to 94% of median. Soil moisture is at 78% saturation compared to 76% saturation last year. Reservoir storage is 86% of capacity, compared to 67% last year.









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

Important Information about Forecast Coordination: Hydrologists with the NRCS and National Weather Service California Nevada River Forecast Center (CNRFC) coordinate Lake Tahoe Rise, Truckee River at Farad, Little Truckee River near Boca, and the Carson River at Ft. Churchill forecasts (following page) using output of their respective hydrology models at the request of the Bureau of Reclamation. The NRCS model is a statistical model based on the current data as of the first of each month. The CNRFC ensemble forecasting system incorporates near-term weather prediction and climatology into their model. These models can provide different answers because of the nature of the model systems, and from the inclusion of future weather in the CNRFC model. The hydrologists agree on forecast values using guidance from both models to best provide an accurate water supply forecast for these points.

Data Current As of: 5/6/2024 7:23:21 PM

Truckee
Streamflow Forecasts - May 1, 2024

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

Truckee	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Donner Lake Inflow[2]								
	APR-JUL	12.9	15.3	17	113%	18.7	21	15
	MAY-JUL	5.4	8.1	10	122%	11.9	14.6	8.2
Martis Ck Res Inflow[2]								
	APR-JUL	5.4	6.9	8	140%	9.1	10.6	5.7
	MAY-JUL	1.16	2.7	3.7	142%	4.7	6.2	2.6
Prosser Ck Res Inflow[2]								
	APR-JUL	31	36	39	111%	42	47	35
	MAY-JUL	19.4	23	26	118%	29	33	22
Independence Lk Inflow[2]								
	APR-JUL	7.8	9.1	10	95%	10.9	12.2	10.5
	MAY-JUL	5.4	6.6	7.4	93%	8.2	9.4	8
Sagehen Ck nr Truckee								
	APR-JUL	3.7	4.5	5	122%	5.5	6.3	4.1
	MAY-JUL	1.94	2.8	3.4	155%	4	4.9	2.2
Stampede Res Local Inflow[2]								
	APR-JUL	56	64	70	119%	76	84	59
	MAY-JUL	29	40	48	133%	56	67	36
L Truckee R ab Boca Reservoir[2]								
	APR-JUL	64	72	78	108%	84	93	72
	MAY-JUL	36	44	50	114%	56	65	44
Boca Res Local Inflow[2]								
	APR-JUL	0.12	2.4	4	263%	5.6	7.9	1.52
	MAY-JUL	-0.57	0.48	1.2	286%	1.92	3	0.42
Truckee R at Farad[2]								
	APR-JUL	205	230	245	109%	260	285	225
	MAY-JUL	120	144	160	115%	175	199	139
Truckee R ab Farad Sidewater[2]								
	APR-JUL	77	91	100	111%	109	123	90
	MAY-JUL	48	60	67	106%	74	86	63
Galena Ck at Galena Ck State Pk								
	APR-JUL	2.8	3.7	4.3	108%	4.9	5.7	4
	MAY-JUL	2.1	2.8	3.3	103%	3.8	4.5	3.2
Steamboat Ck at Steamboat								
	APR-JUL	1.79	3.8	5.5	262%	7.6	11.2	2.1
	MAY-JUL	0.9	1.9	2.8	173%	3.9	5.8	1.62
Pyramid Lake Elevation Change								
	LOW-HIGH	-0.38	0.43	0.98		1.53	2.3	

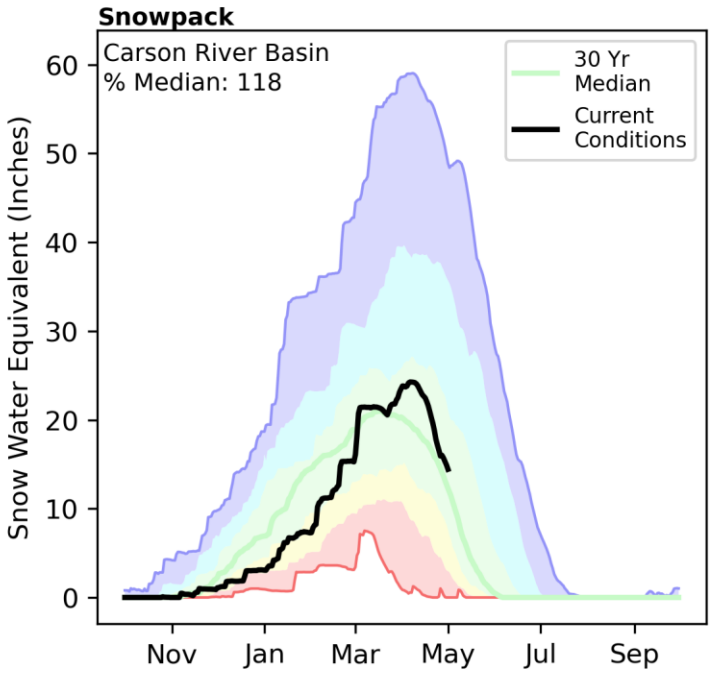
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

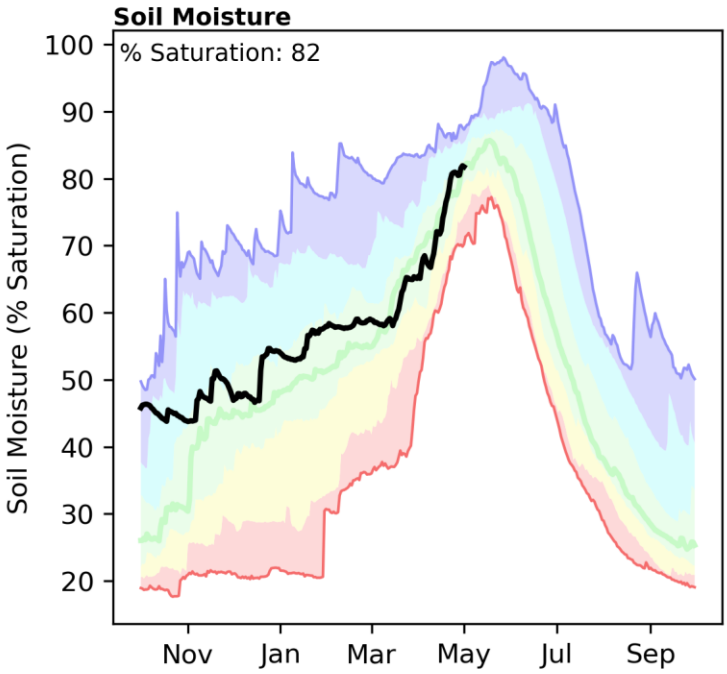
Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Boca Reservoir	20.3	32.4	25.7	40.9
Donner Lake	6.5	5.4	6.3	9.5
Independence Lake	16.2	15.4	15.5	17.3
Prosser Reservoir	18.7	9.9	13.7	29.8
Stampede Reservoir	215.7	154.1	154.8	226.5

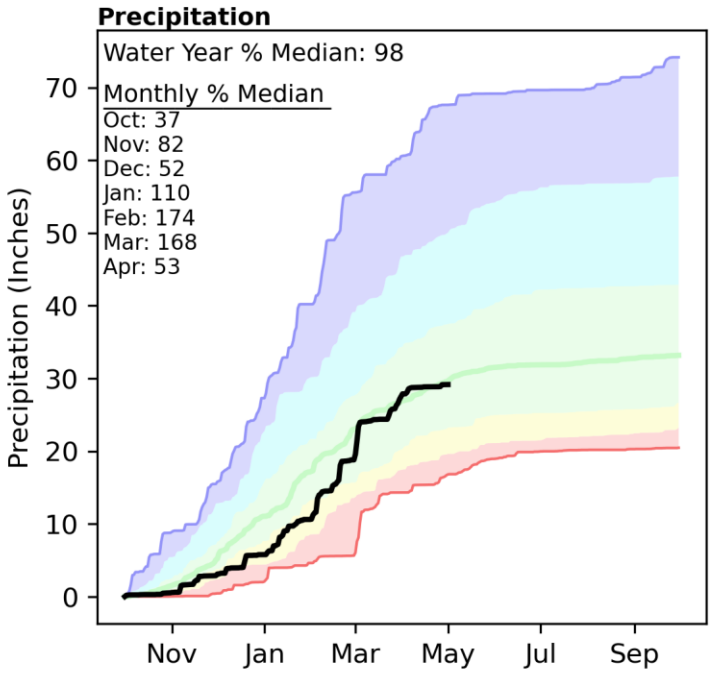
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Truckee	15	105%	270%
Little Truckee ab Stampede	5	107%	260%
Sagehen-Independence	3	112%	278%
Galena	1	86%	209%
Steamboat	1	86%	209%
Truckee above Pyramid Lake	22	106%	292%

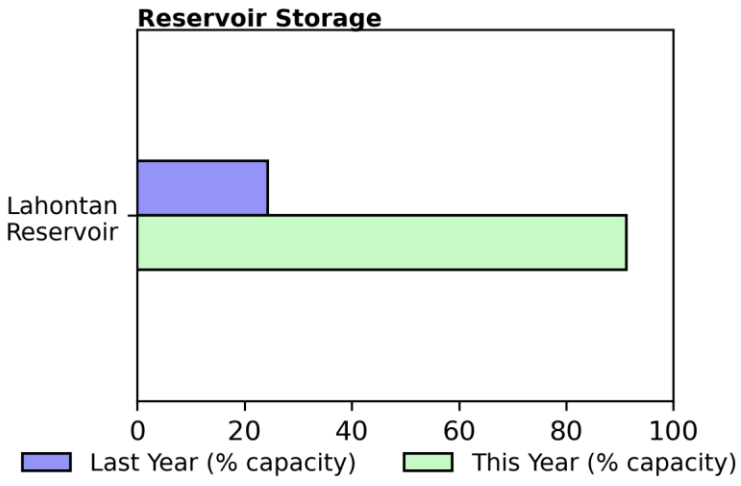
Carson River Basin | May 1, 2024

Snowpack in the Carson River Basin is above normal at 118% of median, compared to 381% at this time last year. Precipitation in April was well below normal at 53%, which brings the seasonal accumulation (October-April) to 98% of median. Soil moisture is at 82% saturation, same as last year at this time. Reservoir storage is 91% of capacity, compared to 24% last year.









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

Important Information about Forecast Coordination: Hydrologists with the NRCS and National Weather Service California Nevada River Forecast Center (CNRFC) coordinate Lake Tahoe Rise, Truckee River at Farad, Little Truckee River near Boca, and the Carson River at Ft. Churchill forecasts (following page) using output of their respective hydrology models at the request of the Bureau of Reclamation. The NRCS model is a statistical model based on the current data as of the first of each month. The CNRFC ensemble forecasting system incorporates near-term weather prediction and climatology into their model. These models can provide different answers because of the nature of the model systems, and from the inclusion of future weather in the CNRFC model. The hydrologists agree on forecast values using guidance from both models to best provide an accurate water supply forecast for these points.

Data Current As of: 5/6/2024 7:23:42 PM

Carson
Streamflow Forecasts - May 1, 2024

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

Carson	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
EF Carson R nr Gardnerville								
	APR-JUL	136	153	165	101%	177	194	164
	MAY-JUL	83	101	114	98%	127	145	116
	200 cfs	23 Jun	30 Jun	05 Jul		10 Jul	17 Jul	14 Jul
	500 cfs	21 May	02 Jun	10 Jun		18 Jun	30 Jun	20 Jun
WF Carson R nr Woodfords								
	APR-JUL	39	45	49	109%	53	59	45
	MAY-JUL	23	30	35	117%	40	47	30
Carson R nr Carson City								
	APR-JUL	124	145	160	120%	175	196	133
	MAY-JUL	70	93	109	112%	125	148	97
Kings Canyon Ck nr Carson City								
	APR-JUL	0.06	0.11	0.15	115%	0.2	0.29	0.13
	MAY-JUL	0.06	0.1	0.14	140%	0.19	0.26	0.1
Ash Canyon Ck nr Carson City								
	APR-JUL	0.86	1.03	1.15	140%	1.28	1.49	0.82
	MAY-JUL	0.53	0.66	0.75	123%	0.85	1.01	0.61
Carson R at Ft Churchill								
	APR-JUL	122	140	154	118%	168	186	131
	MAY-JUL	68	86	100	105%	114	132	95

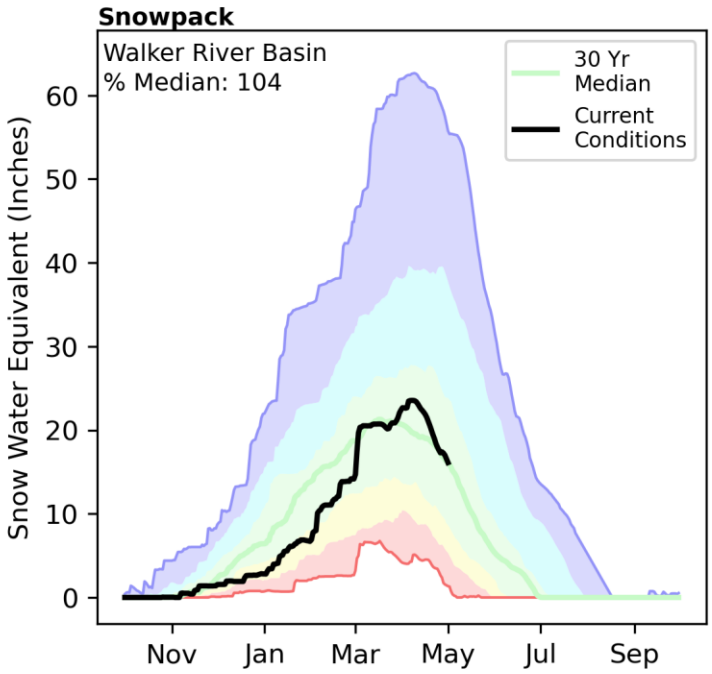
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

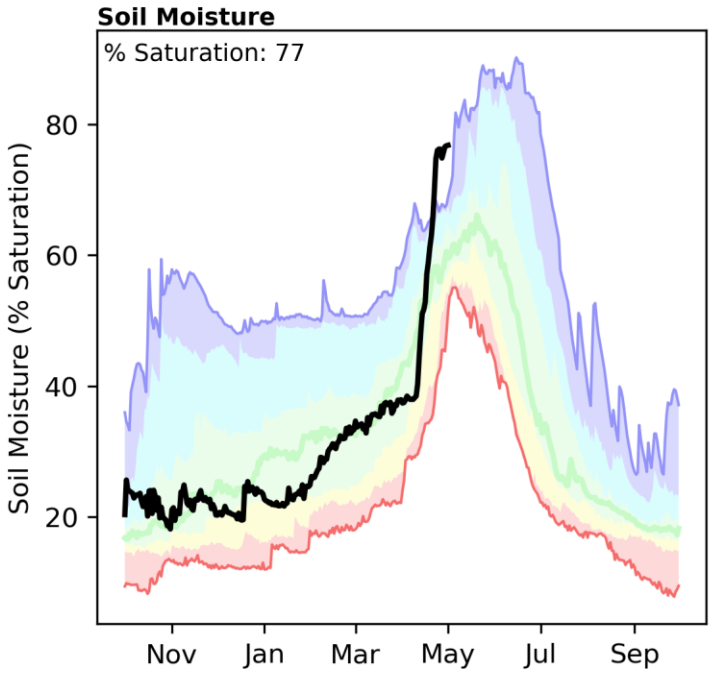
Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lahontan Reservoir	285.5	76.1	201.0	313.0

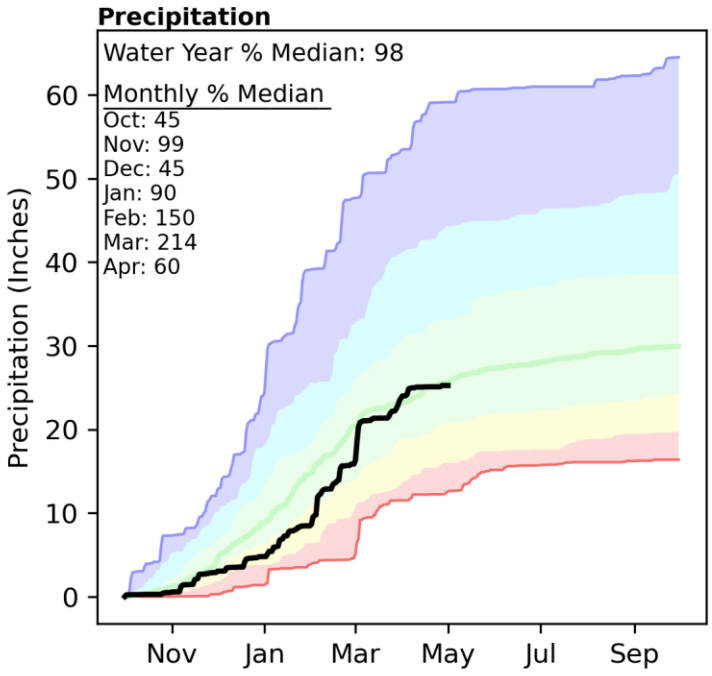
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Carson	14	118%	381%
East Fork Carson	7	111%	375%
West Fork Carson	9	119%	358%

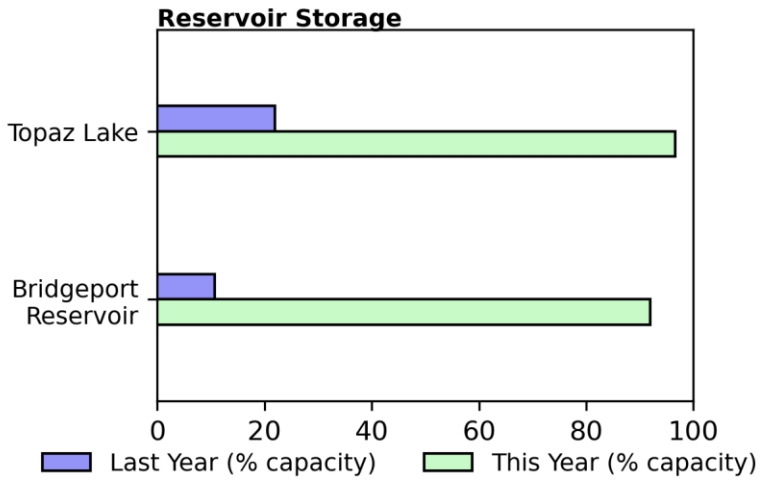
Walker River Basin | May 1, 2024

Snowpack in the Walker River Basin is about normal at 104% of median, compared to 345% at this time last year. Precipitation in April was well below normal at 60%, which brings the seasonal accumulation (October-April) to 98% of median. Soil moisture is at 77% saturation compared to 64% saturation last year. Reservoir storage is 95% of capacity, compared to 17% last year.









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

Data Current As of: 5/6/2024 7:24:03 PM

Walker

Streamflow Forecasts - May 1, 2024

		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
Walker	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
E Walker R nr Bridgeport[2]								
	APR-AUG	31	42	49	111%	56	67	44
	MAY-AUG	24	33	40	98%	47	56	41
W Walker R bl L Walker R nr Coleville								
	APR-JUL	127	141	150	98%	159	173	153
	MAY-JUL	100	114	124	98%	134	148	126
W Walker R nr Coleville								
	APR-JUL	121	135	145	99%	155	169	147
	MAY-JUL	95	110	120	98%	131	146	122
Walker Lake Elevation Change								
	LOW-HIGH	-0.44	0.69	1.46		2.2	3.4	

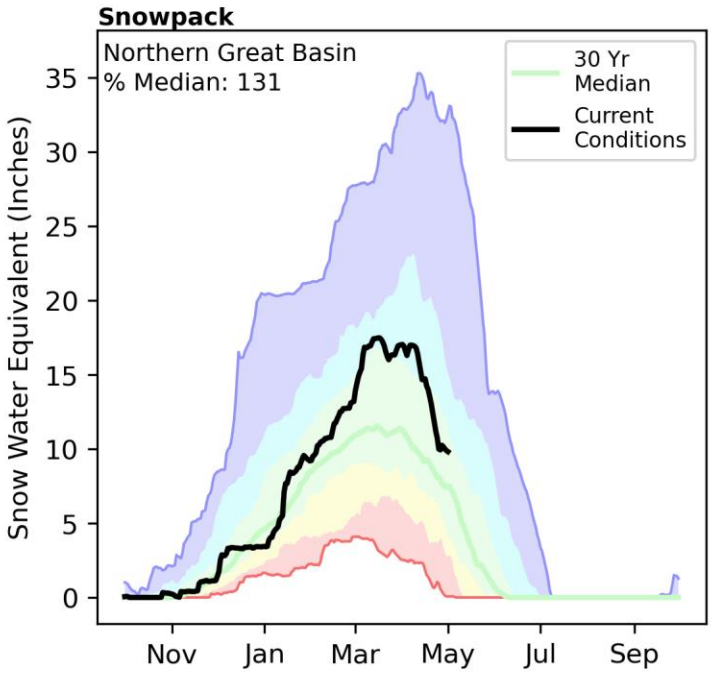
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

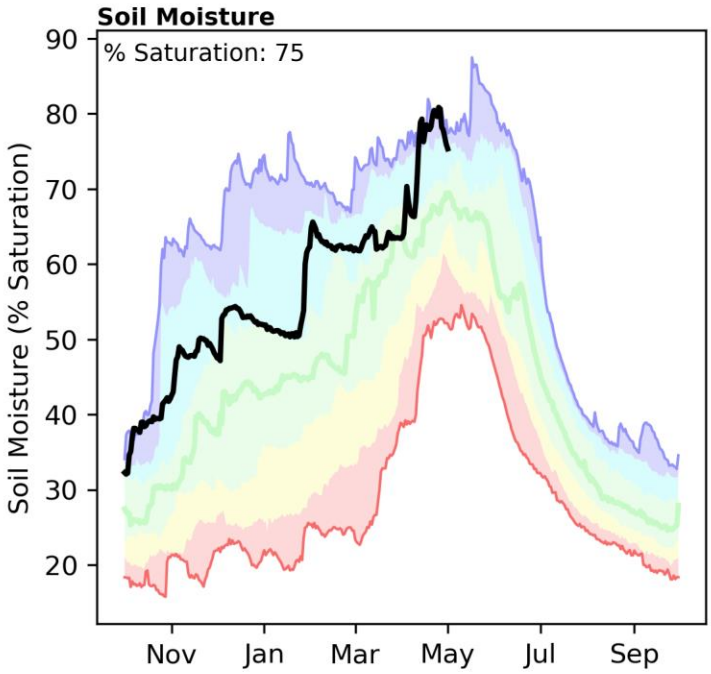
Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Bridgeport Reservoir	39.0	4.5	23.3	42.5
Topaz Lk nr Topaz	57.4	13.1	24.3	59.4

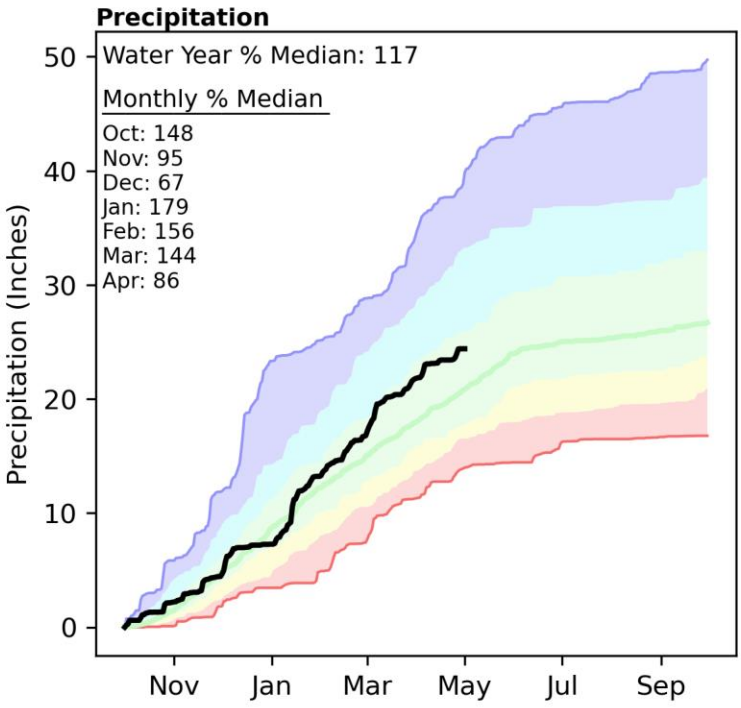
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Walker	8	104%	345%
East Walker ab Bridgeport	2	74%	430%
West Walker ab Coleville	7	105%	345%

Northern Great Basin | May 1, 2024

Snowpack in the Northern Great Basin is well above normal at 131% of median, compared to 178% at this time last year. Precipitation in April was below normal at 86%, which brings the seasonal accumulation (October-April) to 117% of median. Soil moisture is at 75% saturation compared to 70% saturation last year.







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

Data Current As of: 5/6/2024 7:24:24 PM

Northern Great Basin
Streamflow Forecasts - May 1, 2024

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

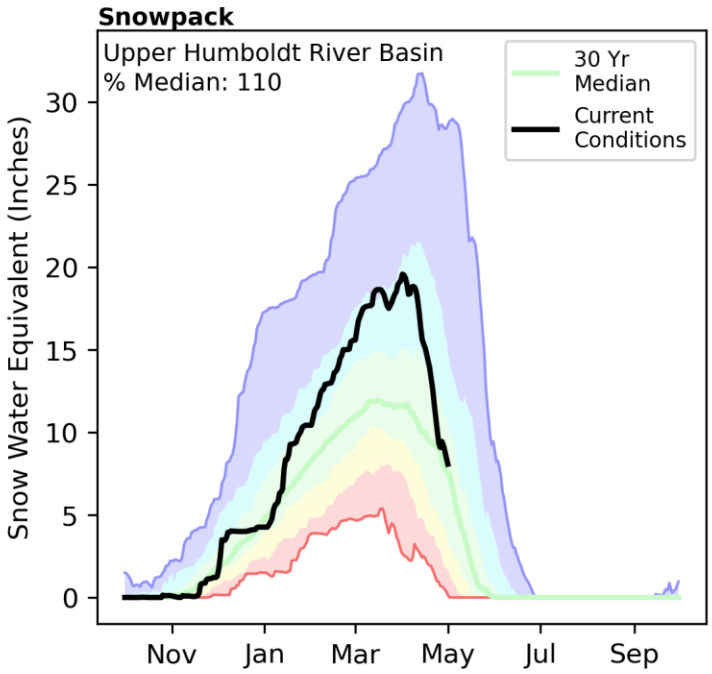
Northern Great Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
McDermitt Ck nr McDermitt								
	APR-JUL	8	11	13.3	182%	15.8	19.9	7.3
	MAY-JUL	2.4	4	5.3	115%	6.8	9.2	4.6

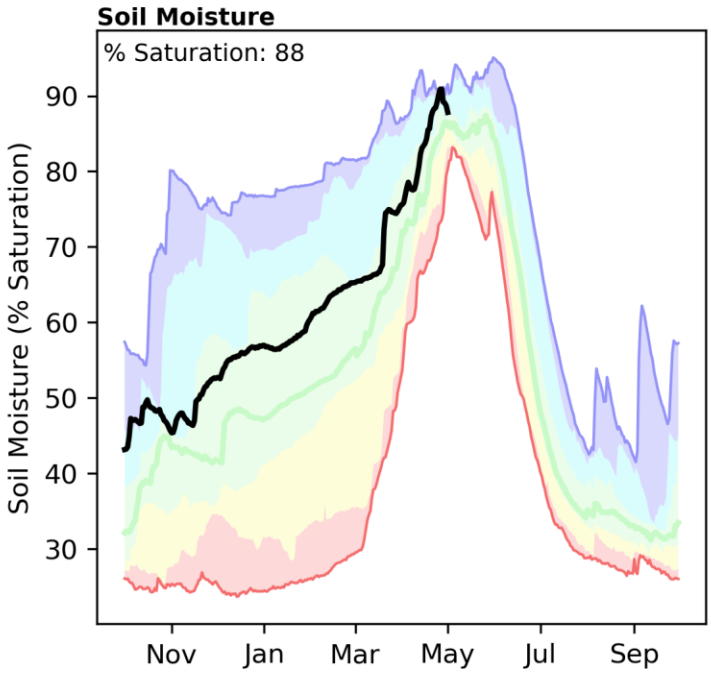
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

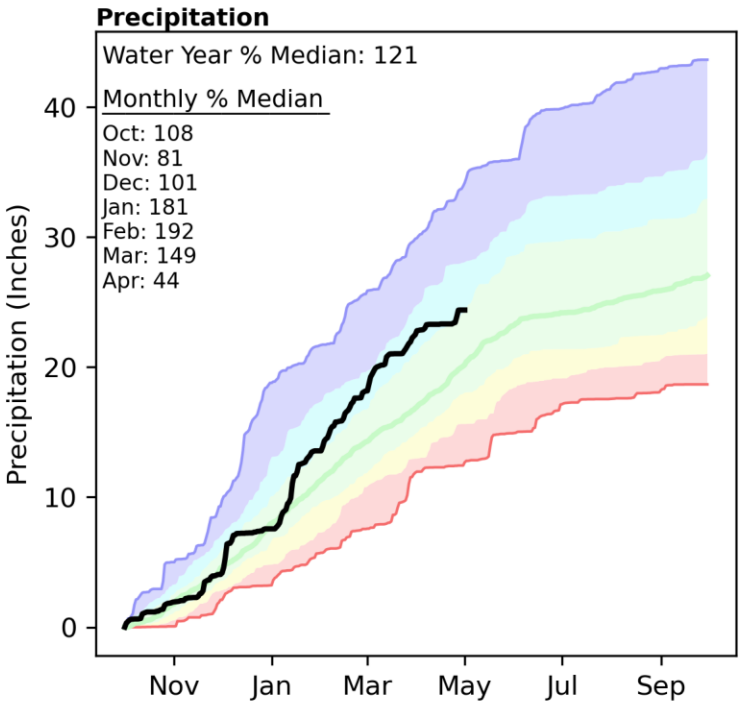
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Northern Great Basin	7	131%	178%
Surprise Valley-Warner Mtns	2	123%	151%
McDermitt	1		
Quinn	4	148%	240%

Upper Humboldt River Basin | May 1, 2024

Snowpack in the Upper Humboldt River Basin is about normal at 110% of median, compared to 229% at this time last year. Precipitation in April was well below normal at 44%, which brings the seasonal accumulation (October-April) to 121% of median. Soil moisture is at 88% saturation compared to 80% saturation last year.







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

Data Current As of: 5/6/2024 7:24:44 PM

Upper Humboldt
Streamflow Forecasts - May 1, 2024

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

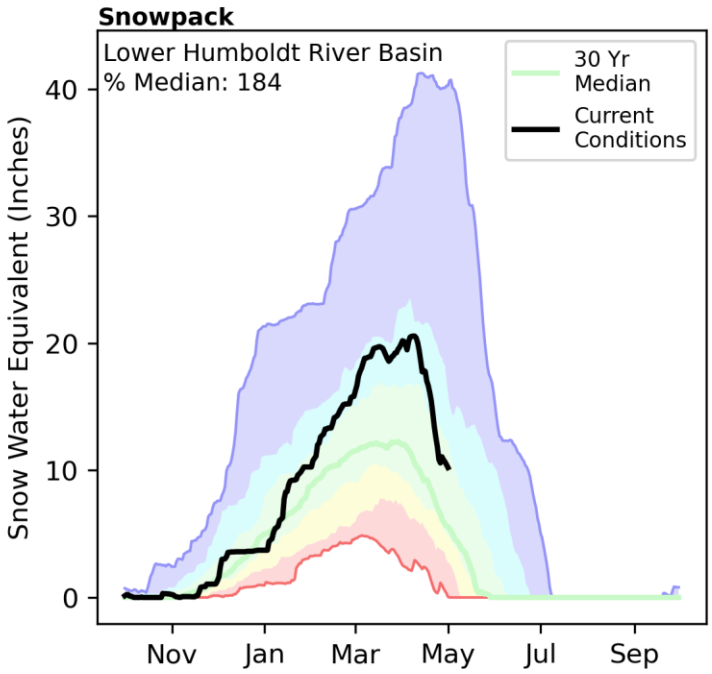
Upper Humboldt	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Marys R nr Deeth								
	APR-JUL	36	41	44	169%	48	54	26
	MAY-JUL	21	16	29	154%	33	39	18.8
Lamoille Ck nr Lamoille								
	APR-JUL	28	33	36	138%	40	45	26
	MAY-JUL	24	30	33	132%	37	42	25
NF Humboldt R at Devils Gate								
	APR-JUL	45	54	60	333%	66	75	18
	MAY-JUL	24	31	36	279%	40	47	12.9
Humboldt R nr Elko								
	APR-JUL	166	198	220	319%	240	275	69
	MAY-JUL	126	154	173	288%	192	220	60
SF Humboldt R abv Tenmile Ck								
	APR-JUL	78	92	102	196%	112	126	52
	MAY-JUL	60	74	83	180%	92	106	46
SF Humboldt R ab Dixie Ck								
	APR-JUL	74	89	100	196%	111	126	51
	MAY-JUL	54	70	81	176%	92	108	46
Humboldt R nr Carlin								
	APR-JUL	225	280	320	320%	360	430	100
	MAY-JUL	177	220	250	294%	285	335	85
Humboldt R at Palisade								
	APR-JUL	255	315	360	330%	405	480	109
	MAY-JUL	194	240	270	307%	305	360	88

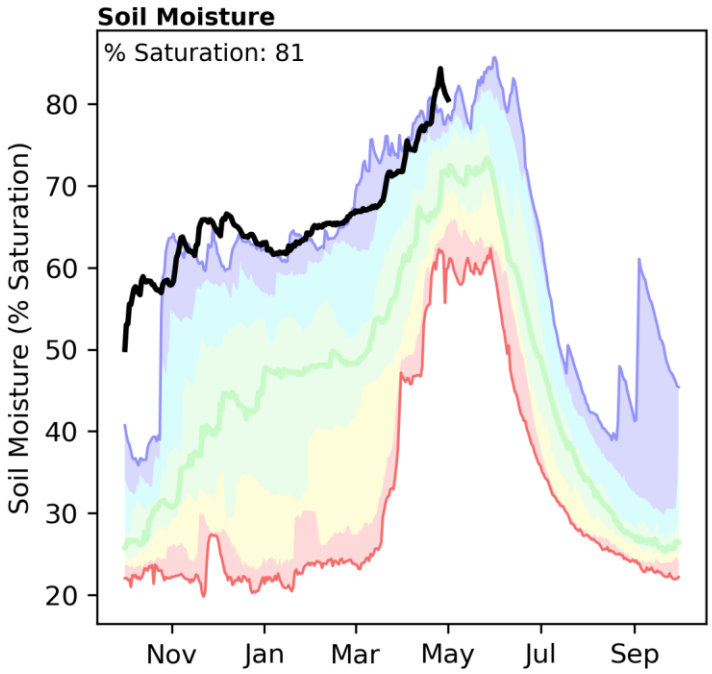
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

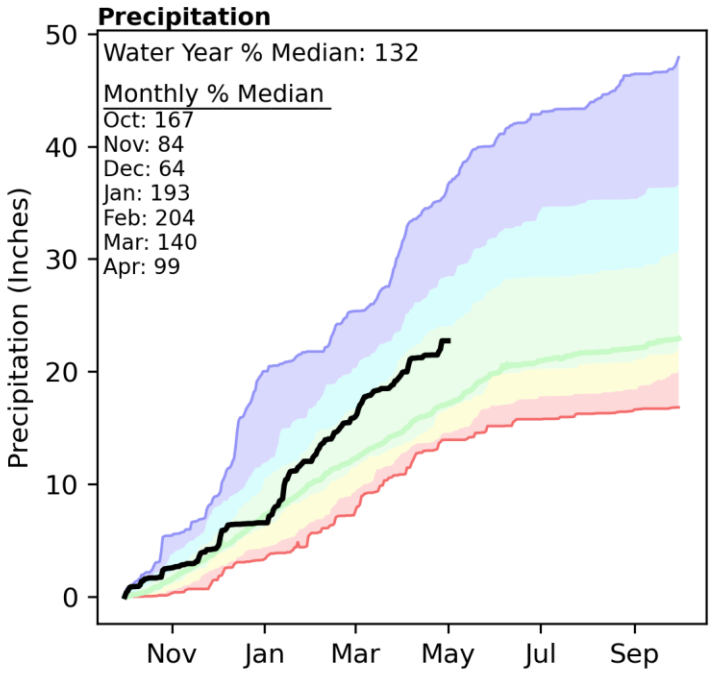
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Upper Humboldt	9	110%	229%
Mary's	3	122%	251%
Lamoille	1	57%	311%
North Fork Humboldt	2	121%	148%
South Fork Humboldt	3	90%	267%

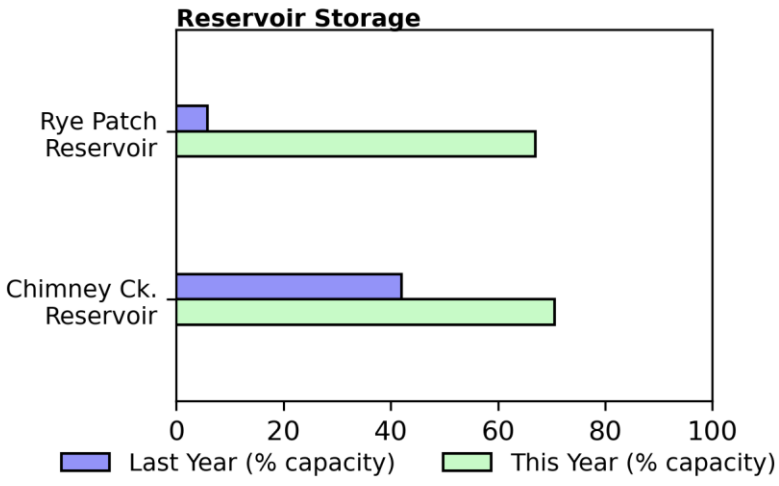
Lower Humboldt River Basin | May 1, 2024

Snowpack in the Lower Humboldt River Basin is well above normal at 184% of median, compared to 290% at this time last year. Precipitation in April was about normal at 99%, which brings the seasonal accumulation (October-April) to 132% of median. Soil moisture is at 81% saturation compared to 71% saturation last year. Reservoir storage is 68% of capacity, compared to 11% last year.









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

Data Current As of: 5/6/2024 7:25:05 PM

Lower Humboldt
Streamflow Forecasts - May 1, 2024

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

Lower Humboldt	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Rock Ck nr Battle Mountain								
	APR-JUL	19.8	29	36	590%	44	57	6.1
	MAY-JUL	6.5	11.7	16	571%	21	30	2.8
Humboldt R at Comus								
	APR-JUL	215	275	315	399%	365	435	79
	MAY-JUL	161	205	240	393%	275	335	61
L Humboldt R nr Paradise Valley[2]								
	APR-JUL	10.3	13.1	15	259%	16.9	19.7	5.8
	MAY-JUL	1.64	4.5	6.5	232%	8.5	11.4	2.8
Martin Ck nr Paradise Valley								
	APR-JUL	21	24	27	250%	30	33	10.8
	MAY-JUL	8.3	12.3	15	221%	17.7	22	6.8
Humboldt R nr Imlay								
	APR-JUL	180	235	270	519%	305	360	52
	MAY-JUL	138	183	215	652%	240	285	33

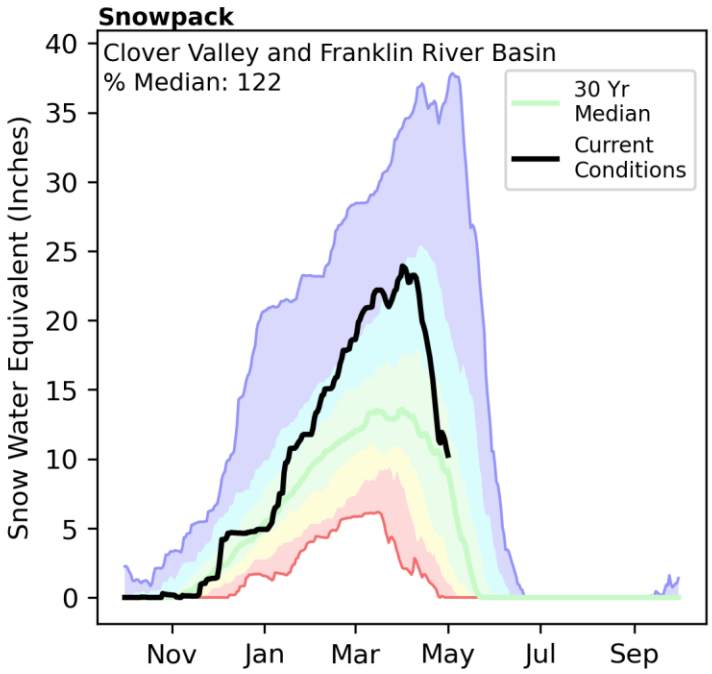
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

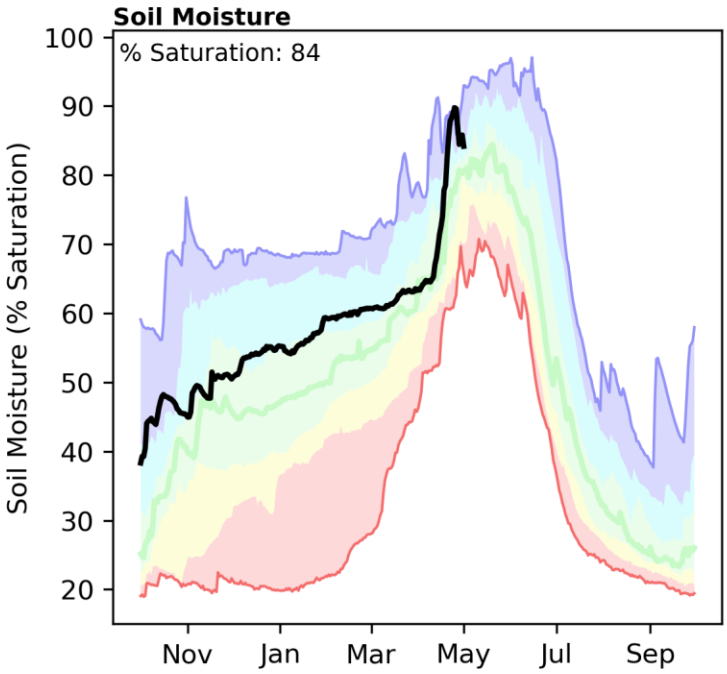
Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Chimney Creek Reservoir	24.7	14.7	7.1	35.0
Rye Patch Re nr Rye Patch, NV	130.2	11.3	56.8	194.3

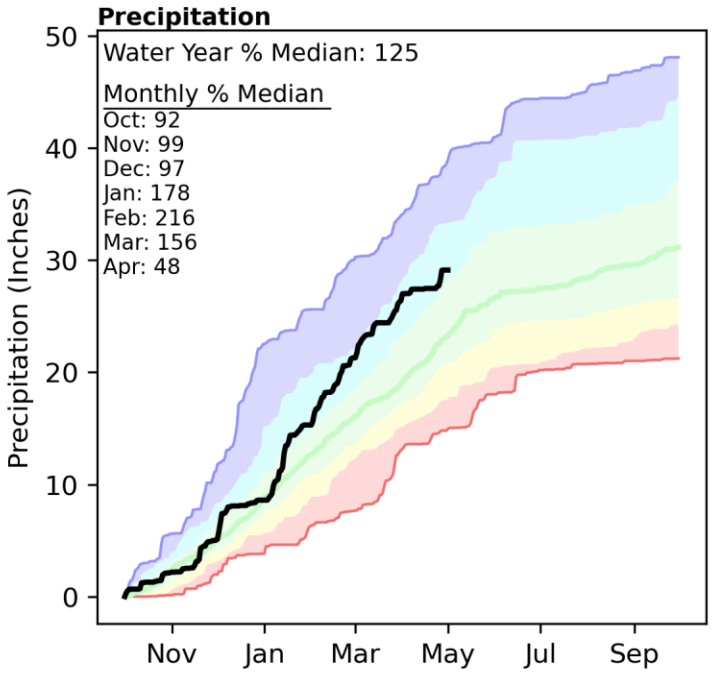
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Lower Humboldt	6	184%	290%
Rock	1	2200%	2200%
Reese	2	133%	259%
Martin	2	148%	240%
Little Humboldt	3	148%	240%
Humboldt above Imlay	15	134%	249%

Clover Valley and Franklin River Basin | May 1, 2024

Snowpack in the Clover Valley and Franklin River Basin is above normal at 122% of median, compared to 267% at this time last year. Precipitation in April was well below normal at 48%, which brings the seasonal accumulation (October-April) to 125% of median. Soil moisture is at 84% saturation compared to 76% saturation last year.







Hole-in-Mountain SNOTEL - Status
Starting in water year 2020, automated snow water and snow depth measurements have been moved back to the original Hole-in-Mountain SNOTEL location used from 1981-2015. This move allows daily snow water percent of median to be calculated using historic data. The SNOTEL was re-located outside an avalanche zone in 2016 following an avalanche that damaged the site. Unfortunately, the new location while protected from future slides, was subject to drifting and snow data proved unrepresentative. Snow data from 2016-2020 have been removed from the public database and will appear as missing in NRCS products. Other SNOTEL parameters collected at the newer location are representative and were not moved. These include air temperature, precipitation and soil moisture.

Contact Jeff Anderson for more information:
jeff.anderson@usda.gov or 775-834-0913

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

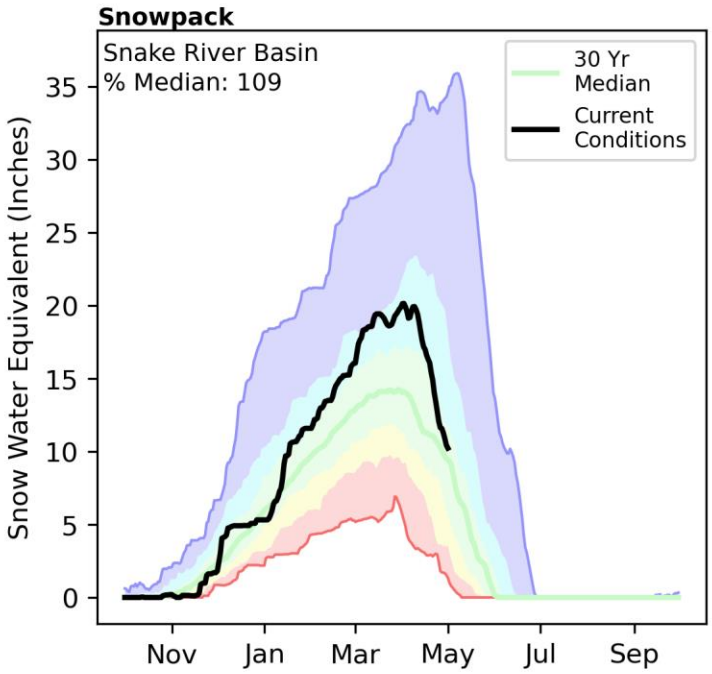
Data Current As of: 5/6/2024 7:25:26 PM

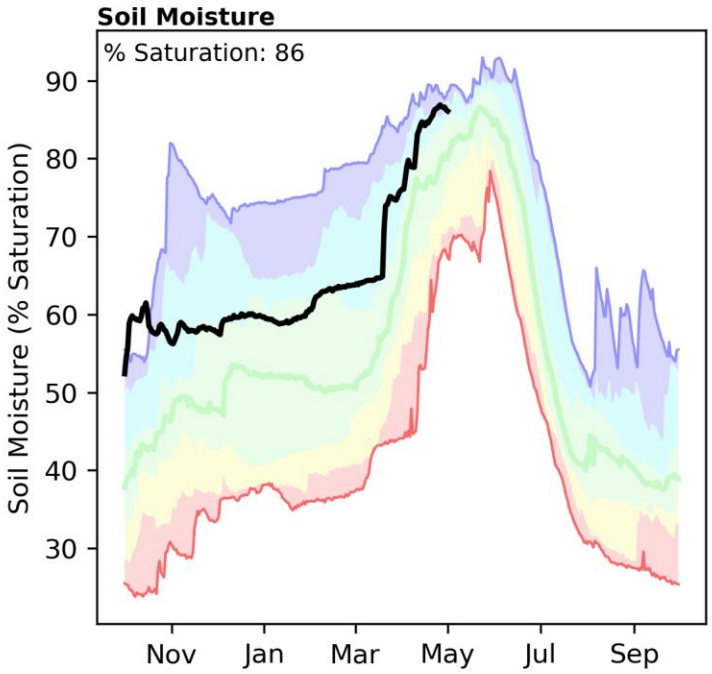
Clover Valley And Franklin - May 1, 2024

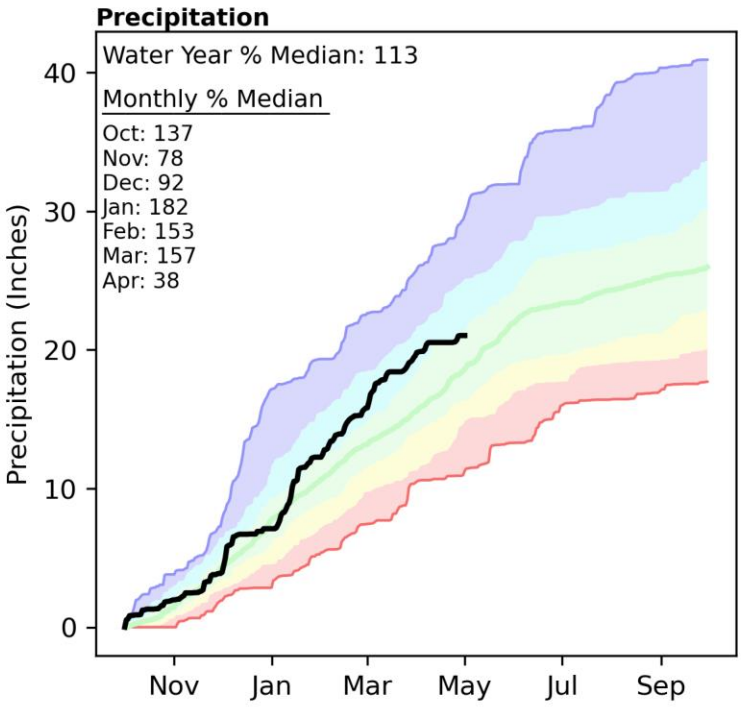
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Clover Valley and Franklin	5	122%	267%
Clover Valley	2	166%	267%
Franklin	4	99%	249%

Snake River Basin | May 1, 2024

Snowpack in the Snake River Basin is about normal at 109% of median, compared to 197% at this time last year. Precipitation in April was well below normal at 38%, which brings the seasonal accumulation (October-April) to 113% of median. Soil moisture is at 86% saturation compared to 79% saturation last year.







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

Data Current As of: 5/6/2024 7:25:41 PM

Snake

Streamflow Forecasts - May 1, 2024

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

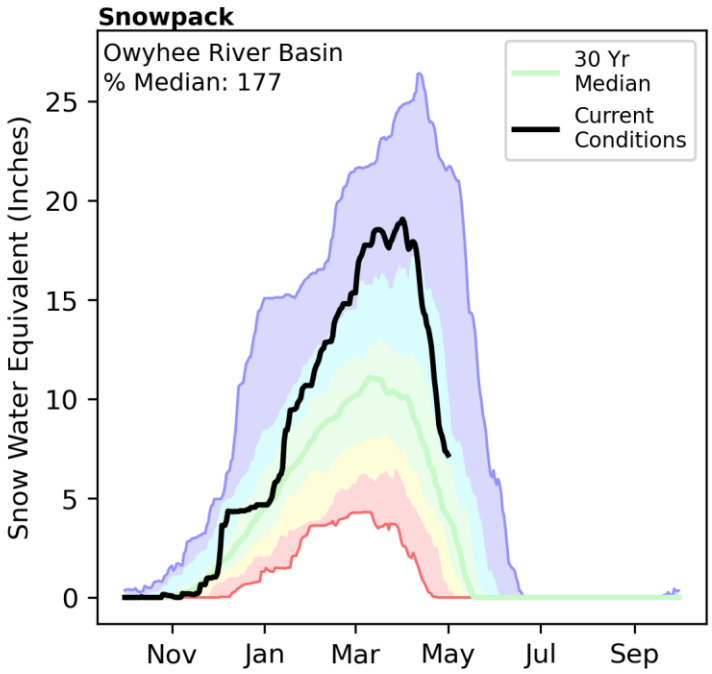
Snake	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Bruneau R at Rowland								
	MAY-JUL	23	33	40	129%	47	57	31
	MAY-SEP	24	35	42	135%	49	59	31
Jarbidge River Below Jarbidge								
	MAY-JUL	16.3	19	21	124%	23	26	17
	MAY-SEP	16.9	19.8	22	125%	24	26	17.6
Salmon Falls Ck nr San Jacinto								
	MAY-JUL	31	43	52	130%	62	79	40
	MAY-SEP	34	47	56	130%	66	83	43

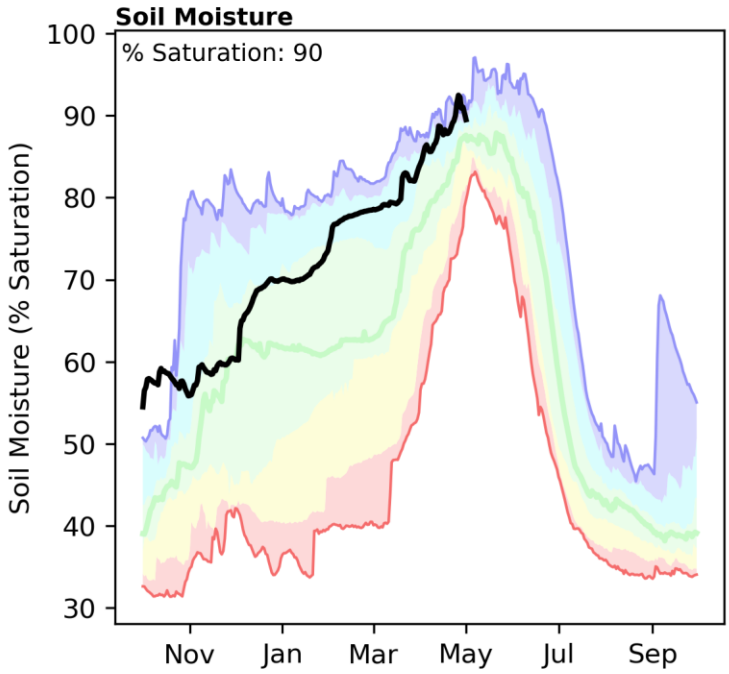
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

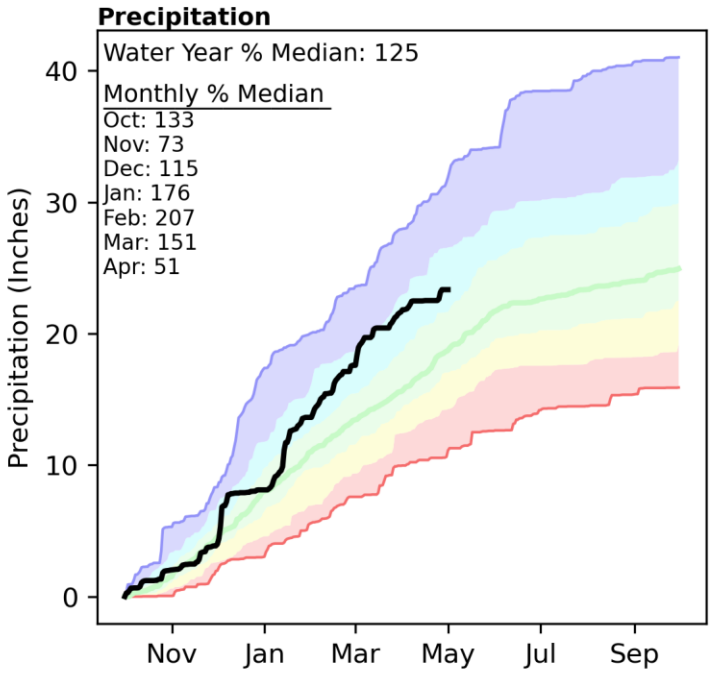
Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Snake	7	109%	197%
Bruneau Headwaters	3	94%	232%
Jarbidge	3	101%	159%
Salmon Falls	4	114%	184%

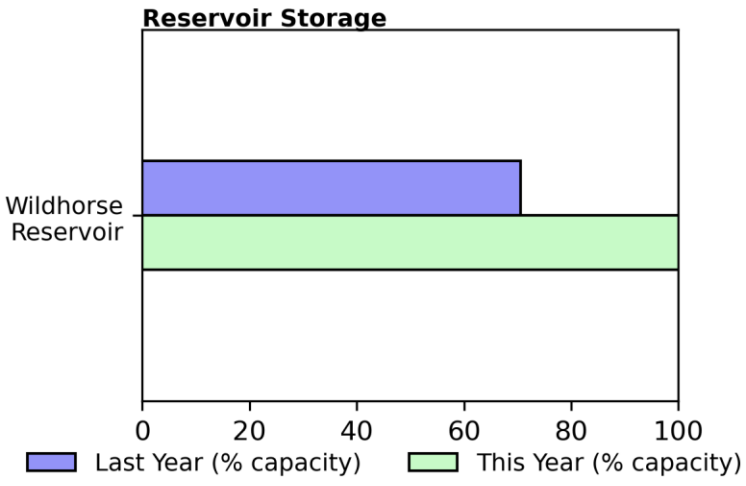
Owyhee River Basin | May 1, 2024

Snowpack in the Owyhee River Basin is well above normal at 177% of median, compared to 247% at this time last year. Precipitation in April was well below normal at 51%, which brings the seasonal accumulation (October-April) to 125% of median. Soil moisture is at 90% saturation, same as last year at this time. Reservoir storage is 106% of capacity, compared to 71% last year.









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

Data Current As of: 5/6/2024 7:26:02 PM

Owyhee

Streamflow Forecasts - May 1, 2024

		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
Owyhee	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Owyhee R nr Gold Ck[2]								
	MAY-JUL	8.1	9.1	9.8	192%	10.5	11.7	5.1

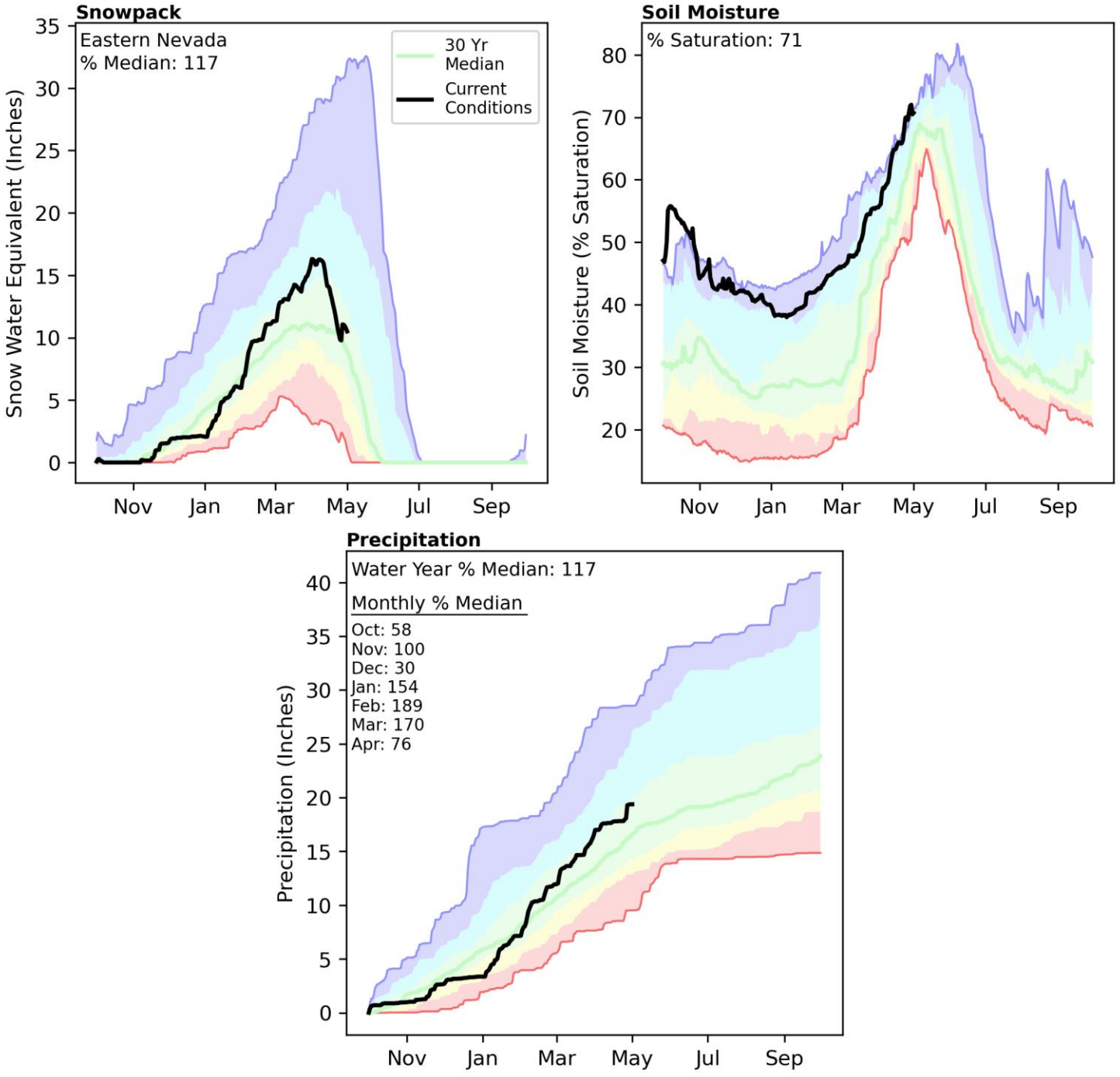
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wild Horse Reservoir	75.7	50.4	41.1	71.5

Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Owyhee	6	177%	247%
Owyhee ab Owhyee	4	117%	189%
Owhyee ab Gold Creek	2	121%	194%
South Fork Owyhee	5	177%	221%

Eastern Nevada | May 1, 2024

Snowpack in Eastern Nevada is above normal at 117% of median, compared to 242% at this time last year. Precipitation in April was below normal at 76%, which brings the seasonal accumulation (October-April) to 117% of median. Soil moisture is at 71% saturation compared to 65% saturation last year.



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

Data Current As of: 5/6/2024 7:26:21 PM

Eastern Nevada
Streamflow Forecasts - May 1, 2024

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

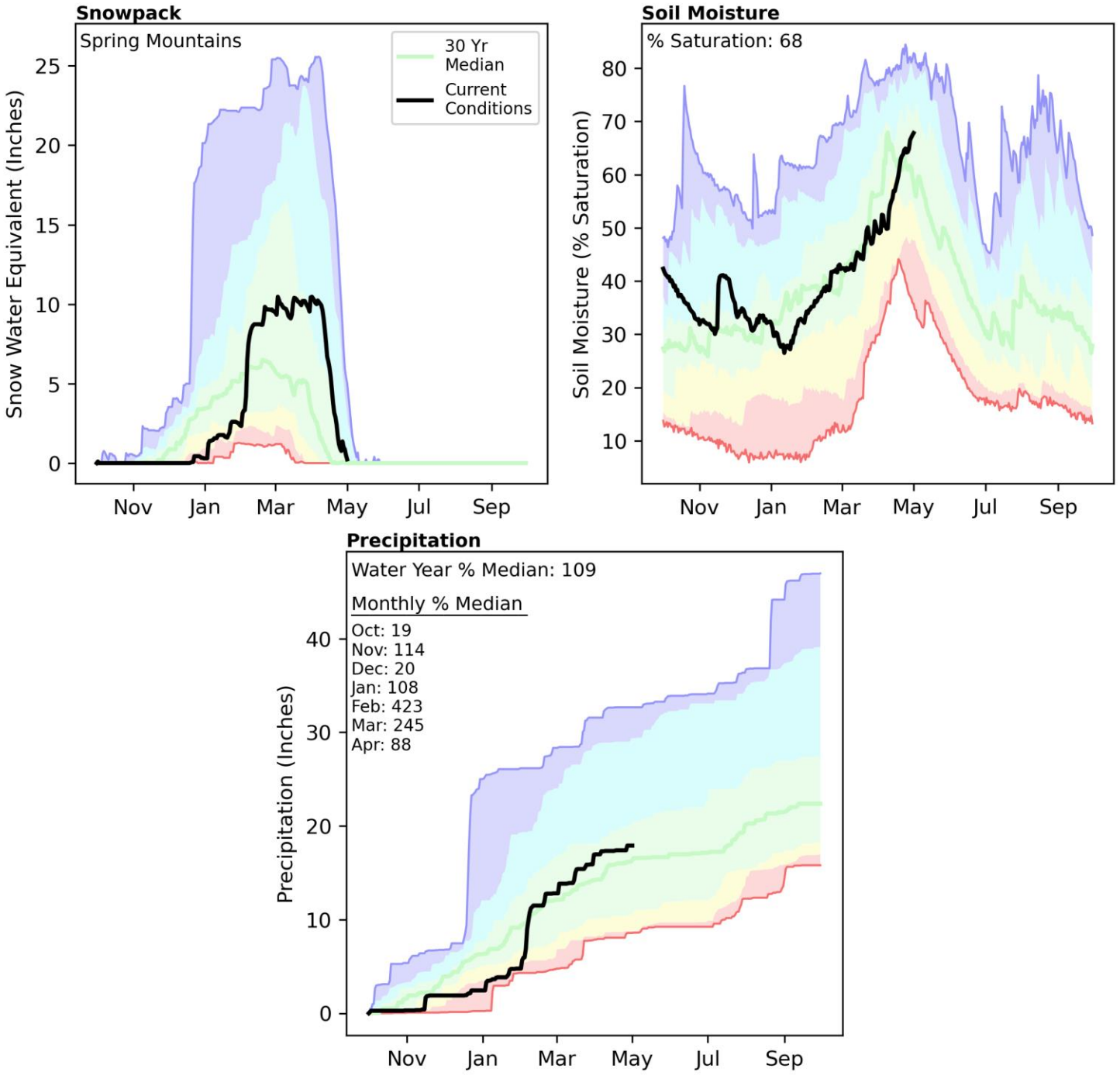
Eastern Nevada	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Kingston Ck nr Austin								
	APR-JUL	1.99	2.9	3.6	202%	4.4	5.7	1.78
	MAY-JUL	1.32	2.1	2.8	190%	3.6	4.8	1.47
Steptoe Ck nr Ely								
	APR-JUL	1.59	1.94	2.2	162%	2.5	2.9	1.36
	MAY-JUL	1.27	1.58	1.8	165%	2	2.4	1.09
Cleve Ck nr Ely								
	APR-JUL	2.9	3.7	4.2	156%	4.8	5.7	2.7
	MAY-JUL	2	2.6	3.1	135%	3.6	4.4	2.3
Lehman Ck nr Baker								
	APR-JUL	1.76	2.4	2.9	146%	3.4	4	1.99
	MAY-JUL	1.57	2.2	2.7	144%	3.2	3.8	1.88

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

Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Eastern Nevada	5	117%	242%
Kingston	1	110%	196%
Steptoe Valley	2	108%	228%

Spring Mountains | May 1, 2024

Rainbow Canyon and Bristlecone Trail SNOTELs in the Spring Mountains melted out prior to May 1. Lee Canyon SNOTEL had 0.6 inches of SWE on May 1. The median May 1 snow water amount is zero at all three sites. Precipitation in April was below normal at 88%, which brings the seasonal accumulation (October-April) to 109% of median. Soil moisture is at 68% saturation compared to 83% saturation last year.

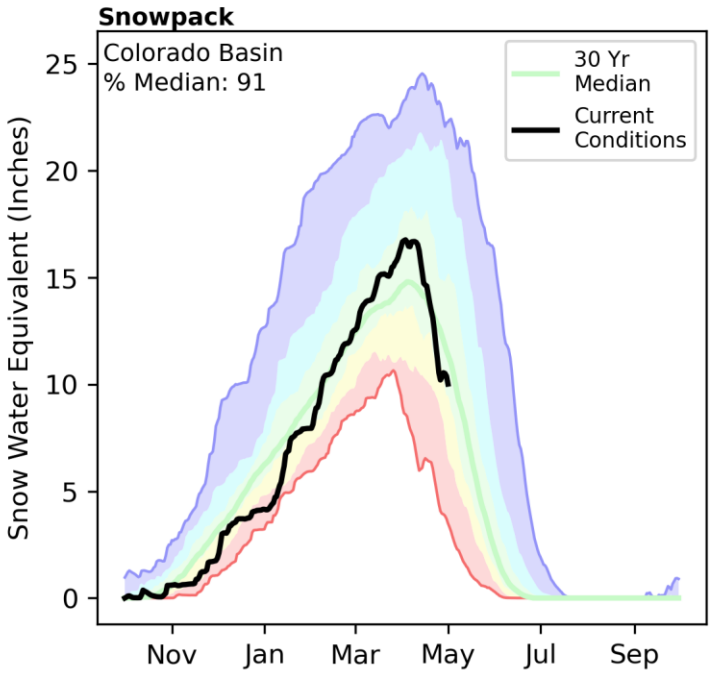


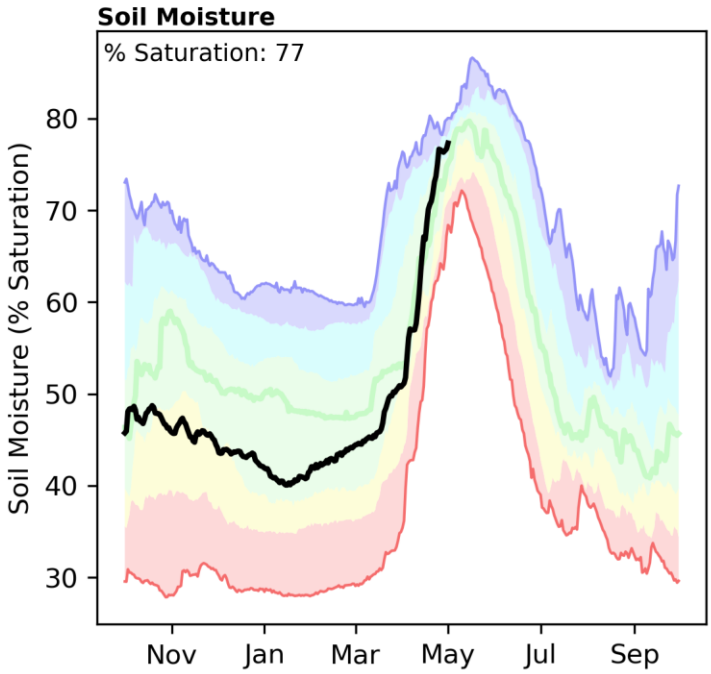
Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles.
For more information visit: 30 year normal calculation description

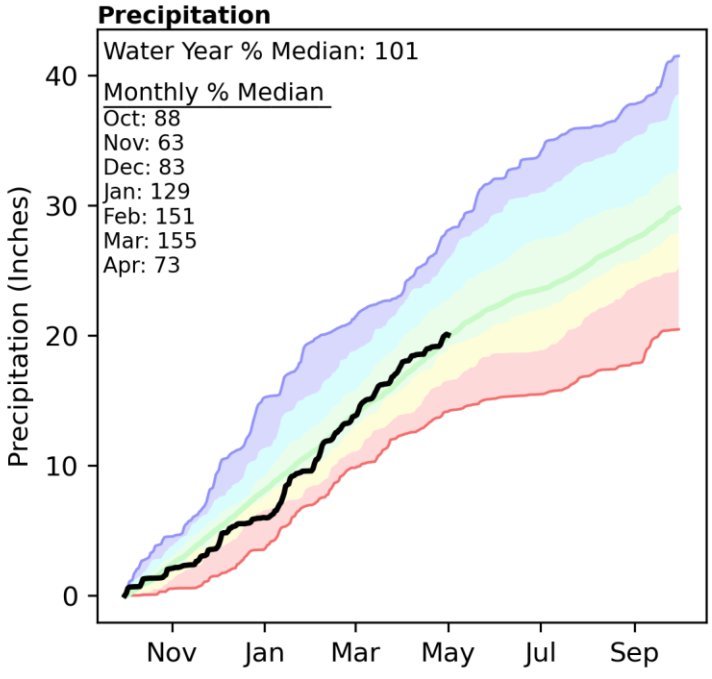
SNOTEL sites in the Spring Mountains were installed in 2008. Reported percentages are based on SNOTEL medians calculated using data from water years 2009-2020, not the full 30-year period. Snowpack percentages in the March and April reports include snow course measurements from long term data collection transects.

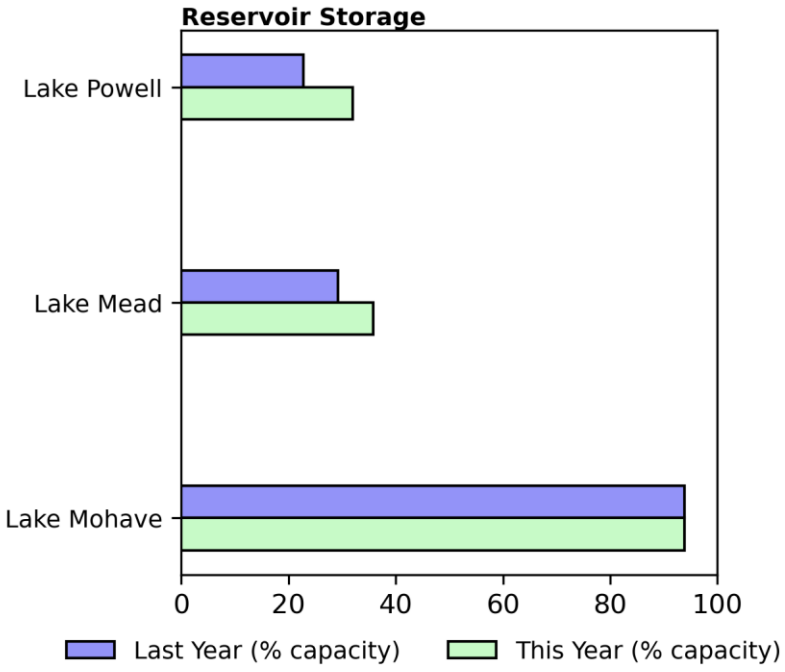
Colorado Basin | May 1, 2024

Snowpack in the Colorado Basin above Lake Powell is about normal at 91% of median, compared to 162% at this time last year. Precipitation in April was below normal at 73%, which brings the seasonal accumulation (October-April) to 101% of median. Soil moisture is at 77% saturation compared to 75% saturation last year. Reservoir storage in the Lower Colorado Basin is 36% of capacity, compared to 28% last year.









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

Data Current As of: 5/6/2024 7:26:59 PM

Colorado
Streamflow Forecasts - May 1, 2024

		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
Colorado	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Lake Powell Inflow [2]								
	APR-JUL	3770	4600	5230	85%	5900	6980	6130
	MAY-JUL	3040	3870	4500	86%	5170	6250	5240
Virgin R at Littlefield								
	APR-JUL	22	28	33	100%	41	50	33
	MAY-JUL	6.2	12.2	17.2	82%	25	34	21
Virgin R nr Hurricane								
	APR-JUL	22	29	33	106%	38	46	31
	MAY-JUL	7.6	14.6	18.6	101%	24	32	18.5

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

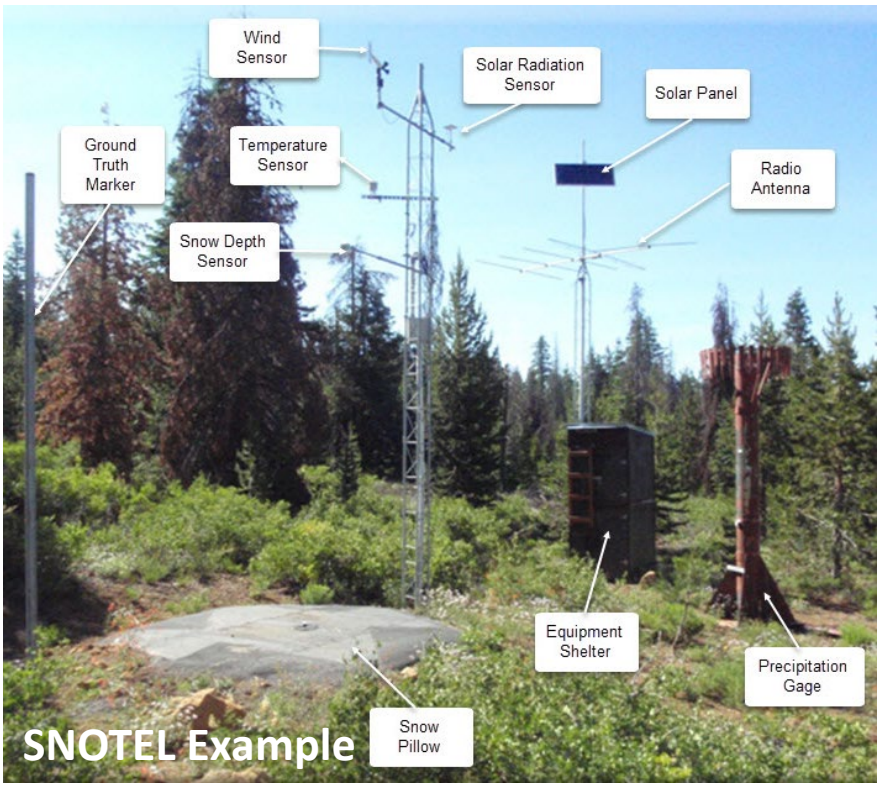
Reservoir Storage End of April, 2024	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Powell	7774.0	5544.3	12892.0	24322.0
Lake Mead	9378.0	7661.0	14916.0	26159.0
Lake Mohave	1700.0	1698.0	1699.0	1810.0

Watershed Snowpack Analysis May 1, 2024	# of Sites	% Median	Last Year % Median
Virgin	9	101%	308%
Upper Colorado	131	88%	166%

Appendix - SNOTEL and Snow Course Overview

SNOTEL

The NRCS operates an extensive, automated data collection network called SNOTEL (short for Snow Telemetry). SNOTEL sites are designed to operate unattended in remote mountain locations. Data are collected and transmitted hourly and available on the internet. Daily data (midnight values) are quality checked by NRCS hydrologists on at least a weekly basis. SNOTEL sites provide snowpack water content data via a pressure-sensing snow pillow. Other data include snow depth, water year precipitation accumulation, air temperature with daily maximums, minimums, and averages, soil moisture and soil temperature at depths of 2, 8 and 20 inches. The earliest NRCS SNOTEL sites have data back to 1981 or a bit earlier.



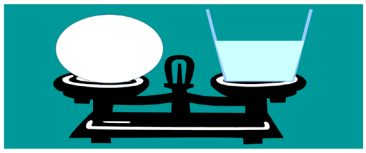
Snow Course

Snow courses are measurement transects where snow tubes are used by snow surveyors during the winter season to determine the depth and water content of the snowpack. Hollow snow tubes are used to vertically core the snowpack. The tubes are then weighed to determine the water content of the snow. Generally, snow courses are situated in meadows or forest openings protected from the wind. A snow course measurement is the average of a number of sample points, typically 5 to 10. Snow courses are measured on a monthly basis typically between February 1 and April 1. Snow courses provide a longer record than SNOTEL. The earliest snow courses in the Lake Tahoe and Truckee basins have data back to 1910.

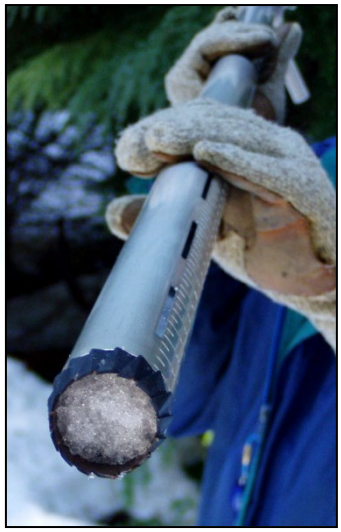
Snow Water Equivalent (SWE):

Sometimes also called snow water content, this is the amount of water contained within the snowpack. It can be thought of as the depth of water (in inches) that would result if you melted the snowpack. For example, if the snowpack was contained 12 inches of SWE, then when melted there would a puddle of water 12 inches deep on the ground.

SWE measurements made by snow pillows or snow tubes rely on the fact that water weighs the same whether it is liquid or frozen.



Weight of frozen water = Weight of liquid water



Snow core inside snow tubes

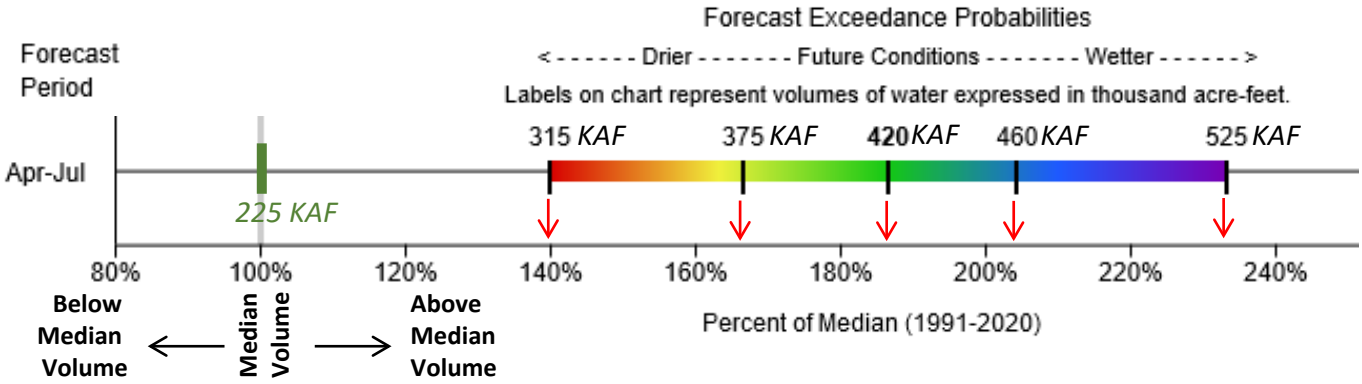
Appendix: Interpreting the Streamflow Forecast Chart

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

Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
APR-JUL	315	375	420	187%	460	525	225

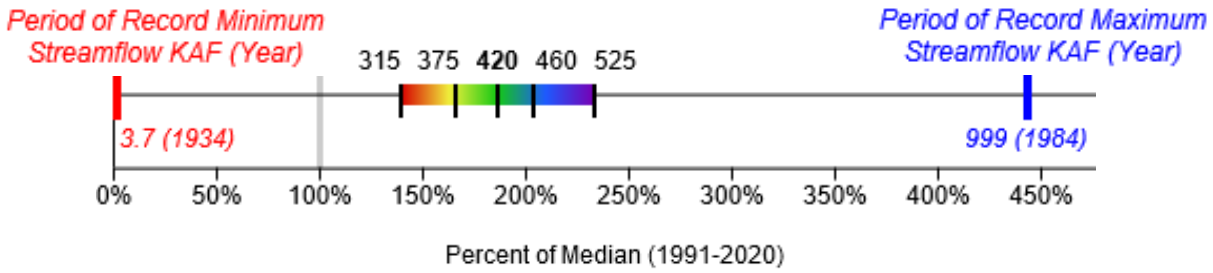
The Forecast Chart (below) provides an alternative to the tables (above) used in the basin summaries. The chart displays the forecast exceedance range as a colored bar. The vertical lines on the bar signify the five forecast exceedances.

The numbers above the forecast bar are the five exceedance probability volumes in thousand acre-feet (KAF). Each exceedance forecast's percent of median can be estimated by looking at the horizontal axis. The green line and number centered above 100% on the horizontal axis represents the 1981-2010 historical median streamflow for the forecast period in KAF.



In the example above, the entire forecast bar is shifted right of the green bar indicating a forecast for above the median Apr-Jul streamflow of 225KAF. The 50% exceedance is represented by the black line in the green portion of the colored bar. This represents a forecast volume of 420KAF which is ~185% of median. If drier than normal future conditions occur the 70% exceedance forecast may be more likely (375KAF or ~165% of median). If future conditions turn wetter than normal, the 30% exceedance forecast may be more likely (460KAF or ~205% of median). Water users are encouraged to consider the range of forecast exceedances instead of relying solely only on the 50% forecast.

In very wet or dry years forecasts may approach historical records. In these cases the period of record minimum or maximum may be displayed. The minimum is represented by a heavy red line, while the maximum is represented by a heavy blue line. The numbers below the red and blue lines represent the volume in KAF and the year it occurred in parentheses.



Click here for an online version which allows users to see averages instead of medians, as well as historic forecasts and records as illustrated above.

USDA Natural Resources Conservation Service
C. Clifton Young Federal Building
300 Booth Street, Room 2070
Reno, NV 89509

Issued by:
Terry Cosby, Chief
Washington, DC

Released by:
Heidi Ramsey, State Conservationist
Reno, Nevada

Prepared by:
Jeff Anderson, Water Supply Specialist
Reno, Nevada

Assistance provided by:
Utah NRCS Snow Survey

Forecasts provided by the
NRCS National Water and Climate Center:
Gus Goodbody, Team Lead Forecast Hydrologist
Julie Koeberle, Forecast Hydrologist
Patrick Kormos, Forecast Hydrologist
Karl Wetlaufer, Forecast Hydrologist

A number of NRCS field offices and outside agencies provide assistance with snow course measurements. This cooperation is greatly appreciated.

List of Streamflow Adjustments:

Lake Tahoe Net Inflow (2) (externally adjusted by US Water Master*) = Lake Tahoe storage change + Lake Tahoe Release. Net inflow used due to complexities with estimating Lake Tahoe evaporation and precipitation.

Marlette Lake Inflow (2) = Marlette Lake Inflow, observed + Marlette Lake storage change

Donner Lake inflow (2) (externally adjusted by US Water Master*) **=** Donner Lake storage change + Donner Lake Release + Lake Evaporation – Lake Precipitation

Martis Creek Reservoir inflow (2) (externally adjusted by US Water Master*) = Martis Creek Reservoir storage change + Martis Creek Reservoir Release + Lake Evaporation – Lake Precipitation

Prosser Creek Reservoir Inflow (2) (externally adjusted by US Water Master*) = Prosser Creek Reservoir storage change + Prosser Creek Reservoir Release + Lake Evaporation – Lake Precipitation

Independence Lake Inflow (2) (externally adjusted by US Water Master*) = Independence Lake storage change + Independence Lake Release + Lake Evaporation – Lake Precipitation

Stampede Reservoir Local Inflow (2) (externally adjusted by US Water Master*) = Stampede Reservoir storage change + Stampede Reservoir Release + Lake Evaporation – Lake Precipitation – Independence Lake Release + Sierra Valley Diversion

Boca Reservoir Local Inflow (2) (externally adjusted by US Water Master*) = Boca Reservoir storage change + Boca Reservoir Release + Lake Evaporation – Lake Precipitation – Stampede Reservoir Release

Little Truckee River above Boca Reservoir (2) (externally adjusted by US Water Master*) **=** Independence Lake Inflow (2) + Stampede Reservoir Local Inflow (2) + Boca Reservoir Local Inflow (2)

Truckee R above Farad Sidewater (2) (externally adjusted by US Water Master*) **=** Truckee River at Farad, observed – Boca Creek Reservoir Release – Prosser Creek Reservoir Release – Donner Lake Release – Martis Creek Reservoir Release – Lake Tahoe Release

Truckee River at Farad (2) (externally adjusted by US Water Master*) = Donner Lake inflow (2) + Martis Creek Reservoir inflow (2) + Prosser Creek Reservoir Inflow (2) + Independence Lake Inflow (2) + Stampede Reservoir Local Inflow (2) + Boca Reservoir Local Inflow (2) + Truckee R above Farad Sidewater (2)

East Walker River near Bridgeport (2) = East Walker River near Bridgeport, observed + Bridgeport Reservoir storage change

L Humboldt R nr Paradise Valley (2) = L Humboldt R nr Paradise Valley + Chimney Creek Reservoir storage change

Owyhee River near Gold Creek (2) = Owyhee River near Gold Creek + Wildhorse Reservoir storage change

Lake Powell Inflow (2) (externally adjusted by Bureau of Reclamation for major upstream reservoirs, but not trans-basin diversions to Missouri or Rio Grande)

*Externally adjusted US Water Master data comes from Hydrologic Flow Report which accounts for precipitation and evaporation from each reservoir: http://www.troa.net/reports/wm_hydrologicflow/