USDA United States Department of Agriculture
Natural Resources Conservation Service

Colorado
Water Supply Outlook Report
June 1, 2019

A dirty snow surface is evident in the San Juan Mountains as three out of six observed dust layers that were buried in the snowpack this winter have now merged at the snow surface in Senator Beck Basin near the top of Red Mountain Pass. Once dust layers in the snowpack reach the surface the darker color can absorb more of the sun's energy and increase the rate of snowmelt. More information about dust on snow and current conditions across the state can be found on the Colorado Dust on Snow Project's website.

Photo By: Jeff Derry: Center for Snow and Avalanche Studies Date: June 4th, 2019

REMINDER: We are soliciting field work photos from the field again this year. Each month we will pick one to grace the cover of this report! Please include information on where, when and of who/what the photo was taken.

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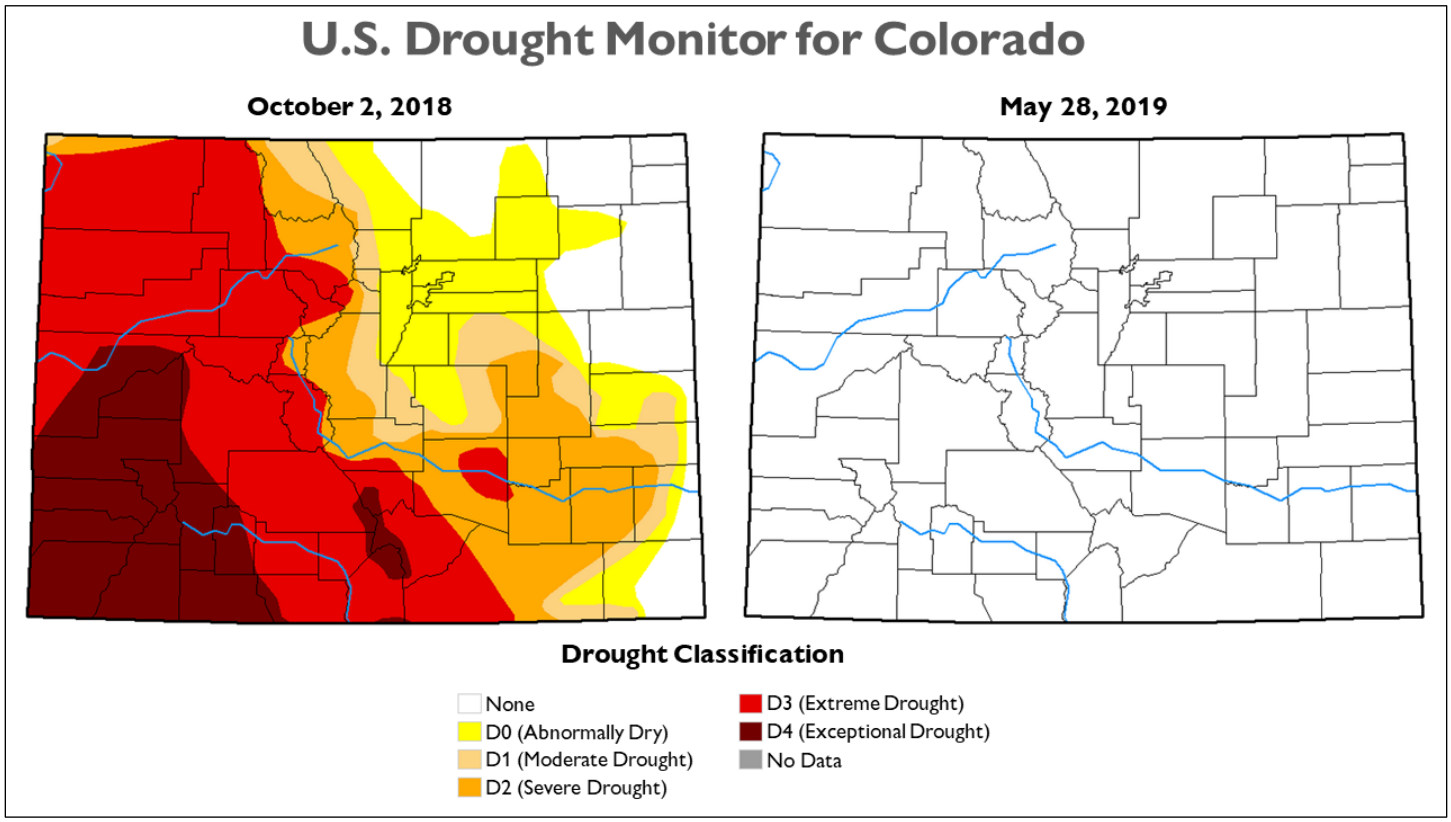
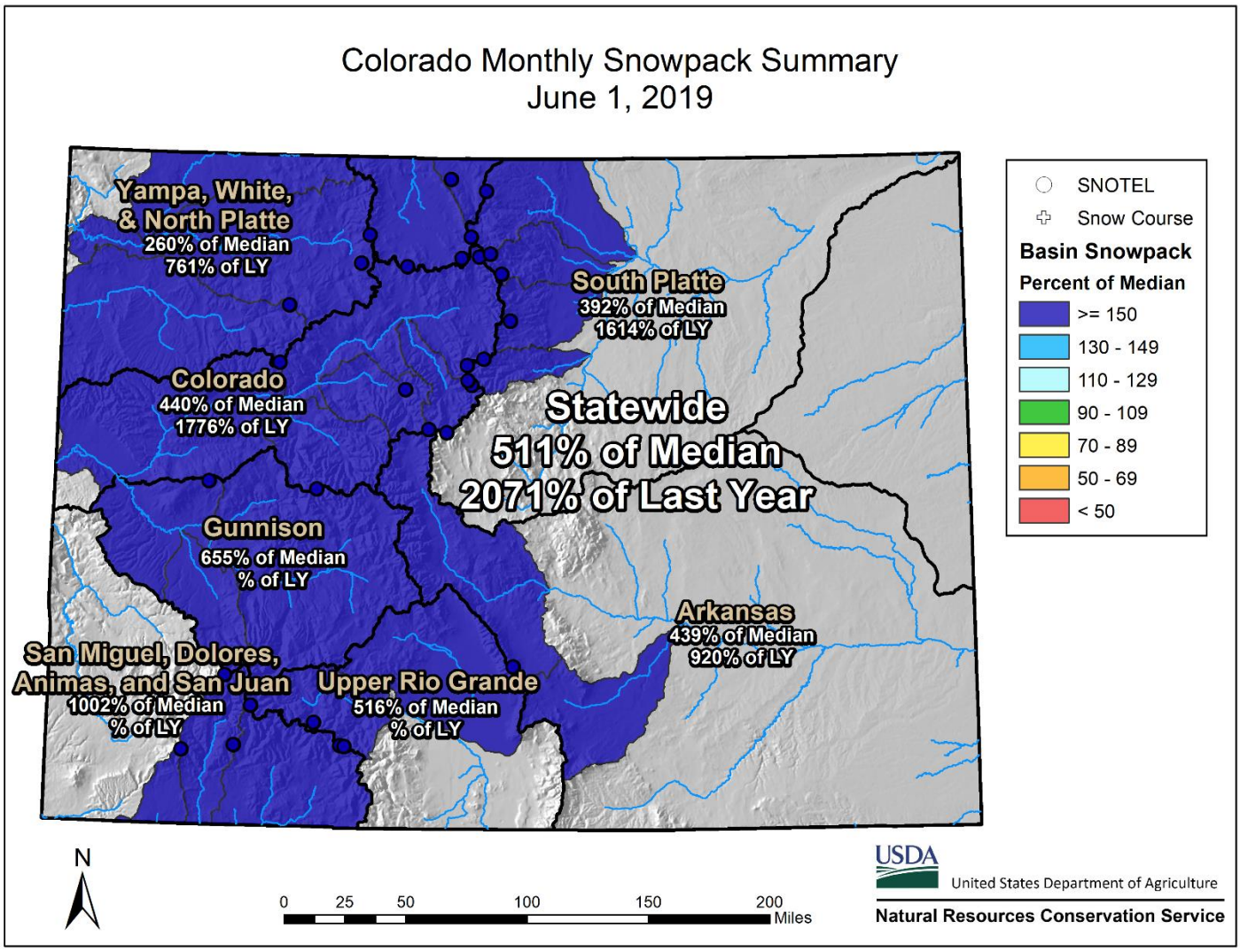
Colorado Statewide Water Supply Conditions

Summary



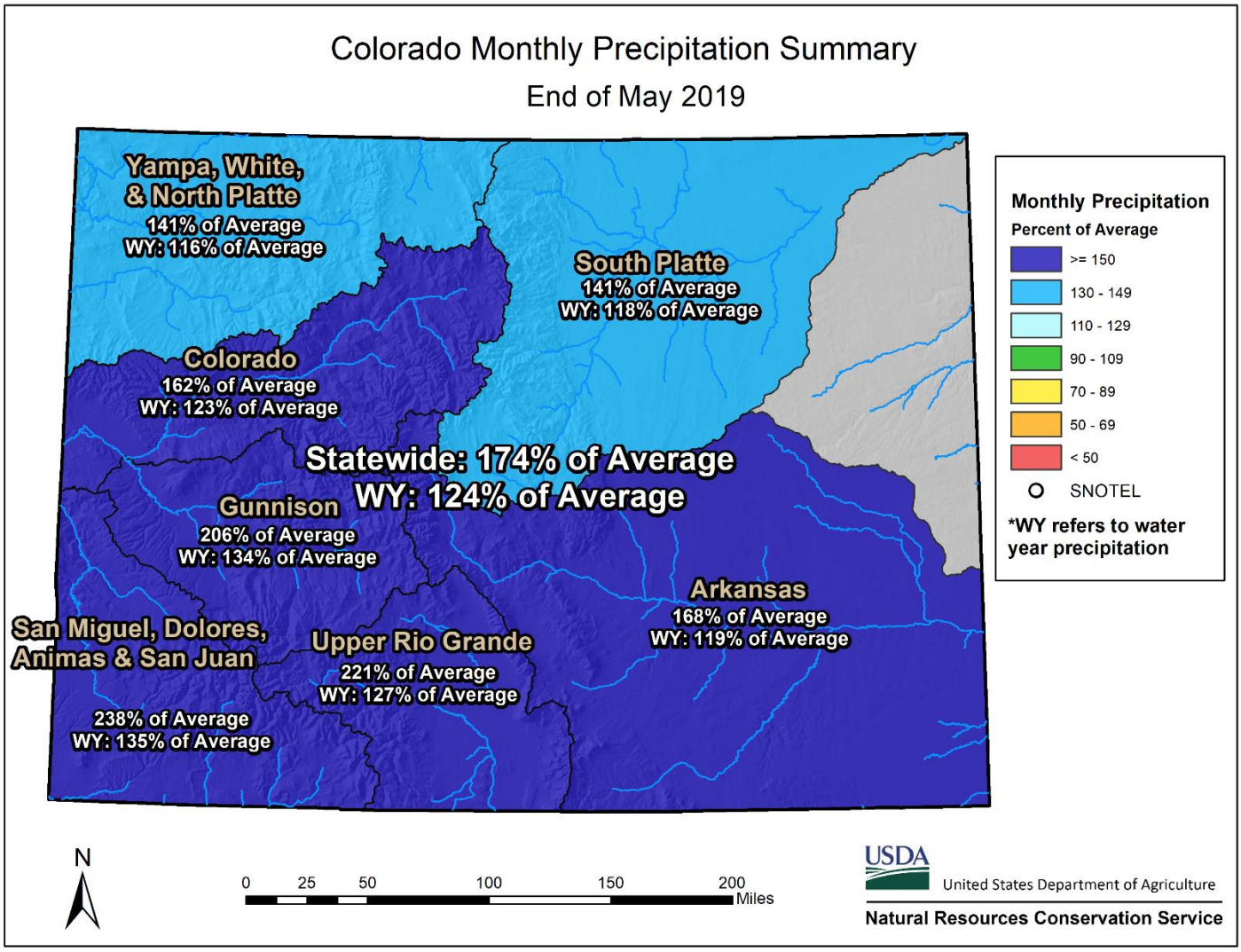
The winter and spring of water year 2019 have been a huge change from the previous year. At the end of water year 2018 most SNOTEL sites in southern Colorado had experienced their record low annual precipitation amounts, while so far this year many have recorded some of the higher precipitation values on record. While the most precipitation has been received in southern Colorado, every major river basin in the state has received well above average water year-to-date precipitation, and statewide it was 124 percent of normal on June 1st. This dramatic increase in snow and precipitation accumulation has led to a major shift in the state's drought classifications. At the start of the water year substantial parts of the state were designated as having some level of drought and many areas were in the highest category, D4-exceptional drought, but currently the entire state is designated as drought-free. The entire state has not been drought-free in nearly 20 years. These improvements have been accompanied by increases in reservoir storage after many were severely depleted last year. Statewide snowpack reached its seasonal peak at 134 percent of normal and considerable accumulations have continued to occur during the ongoing melt season. While cool temperatures and continued snow accumulation have kept streamflows at moderate levels through April and May, it can be anticipated that above to well above average streamflow volumes will be observed in June and July as the snowpack begins to melt at an accelerated rate. While the current situation has started to raise concerns for flooding in certain areas, the plentiful snowpack and forecasted streamflows should continue to help improve the overall water supply situation across all of Colorado and downstream states.

Snowpack



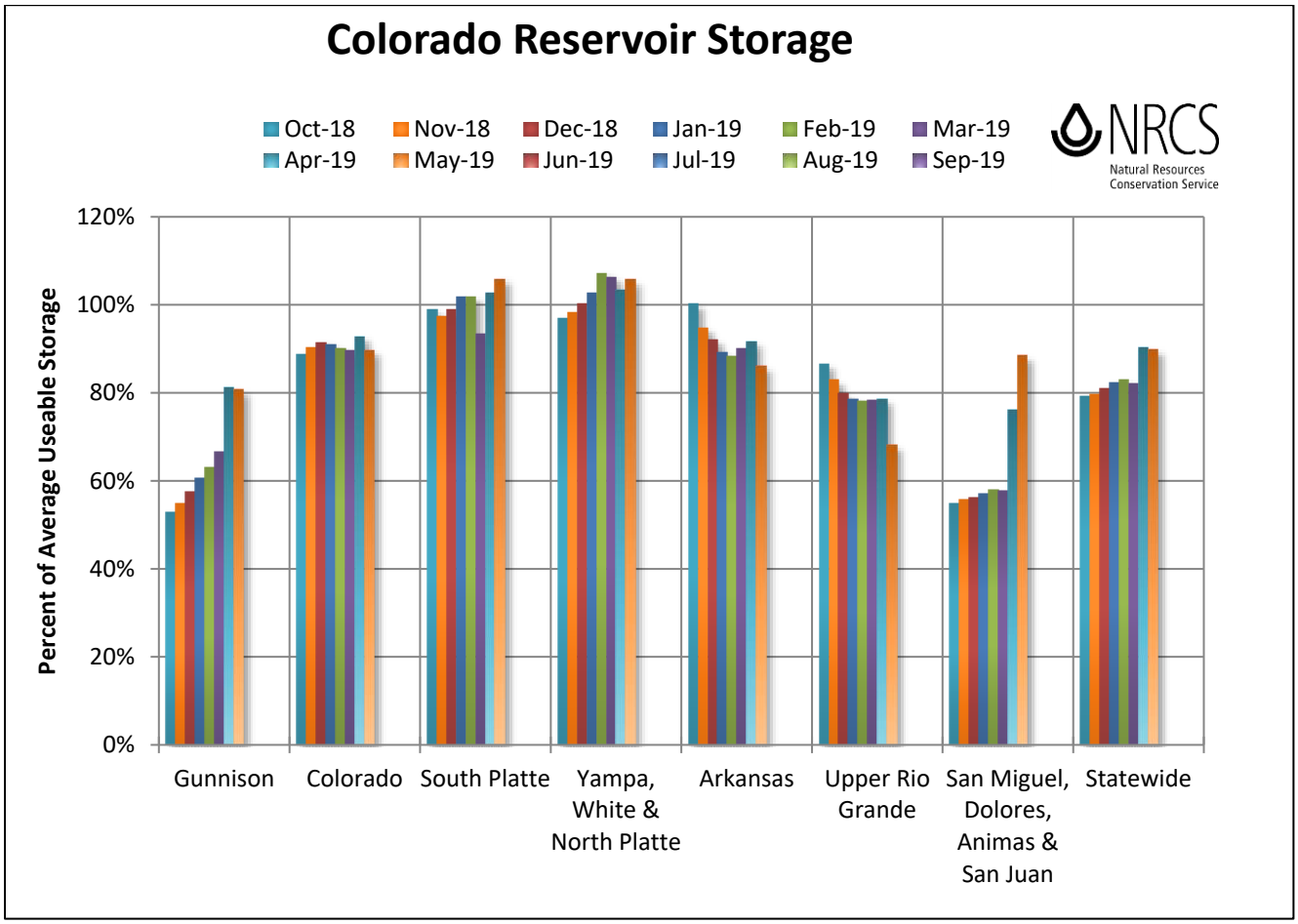
The snowpack across Colorado's mountains this June looks dramatically different than last spring, when the vast majority of SNOTEL sites were completely snow-free on June 1st. In contrast, above normal precipitation and below average temperatures this May coincided to leave Colorado's mountains with an exceptional snowpack. Many low elevation sites that would be melted by now are still retaining snow, and many mid to high elevation sites only just started to melt significantly during the last days of May. All the major river basins reached peak snowpack levels that were above normal this year and continued to see new accumulations after the official peak. The combined San Miguel, Dolores, Animas, and San Juan basins had the highest snowpack peak at 154 percent of median, while the Gunnison and Rio Grande basins peaked at 146 percent. These three basins still hold at least half of this year's snowpack, when typically they would have only about 10 percent remaining. Some locations continue to retain snowpack levels that are still greater than their normal snowpack peaks, which usually occur in mid to late April. This has pushed the timing of snowmelt out much later than usual. Columbus Basin, located near the La Plata River, is usually snow-free in early June, but still has more than 40 inches of SWE, and has been at record levels since mid-May. Schofield Pass, near Crested Butte, and Wolf Creek Pass still also have greater than 40 inches of SWE while many other SNOTEL sites report more than 30 inches. The Arkansas and Colorado River basins achieved snowpack peaks that were 138 and 128 percent of median, respectively, and each basin still has about 60 percent of the season's snowpack remaining. The combined Yampa, White, and North Platte River basins reached peak snowpack levels at 117 percent of median while the South Platte peaked at 113 percent, but still holds more than 80 percent of the season's snowpack. These numbers indicate there's still a lot of snowmelt runoff yet to come.

Precipitation



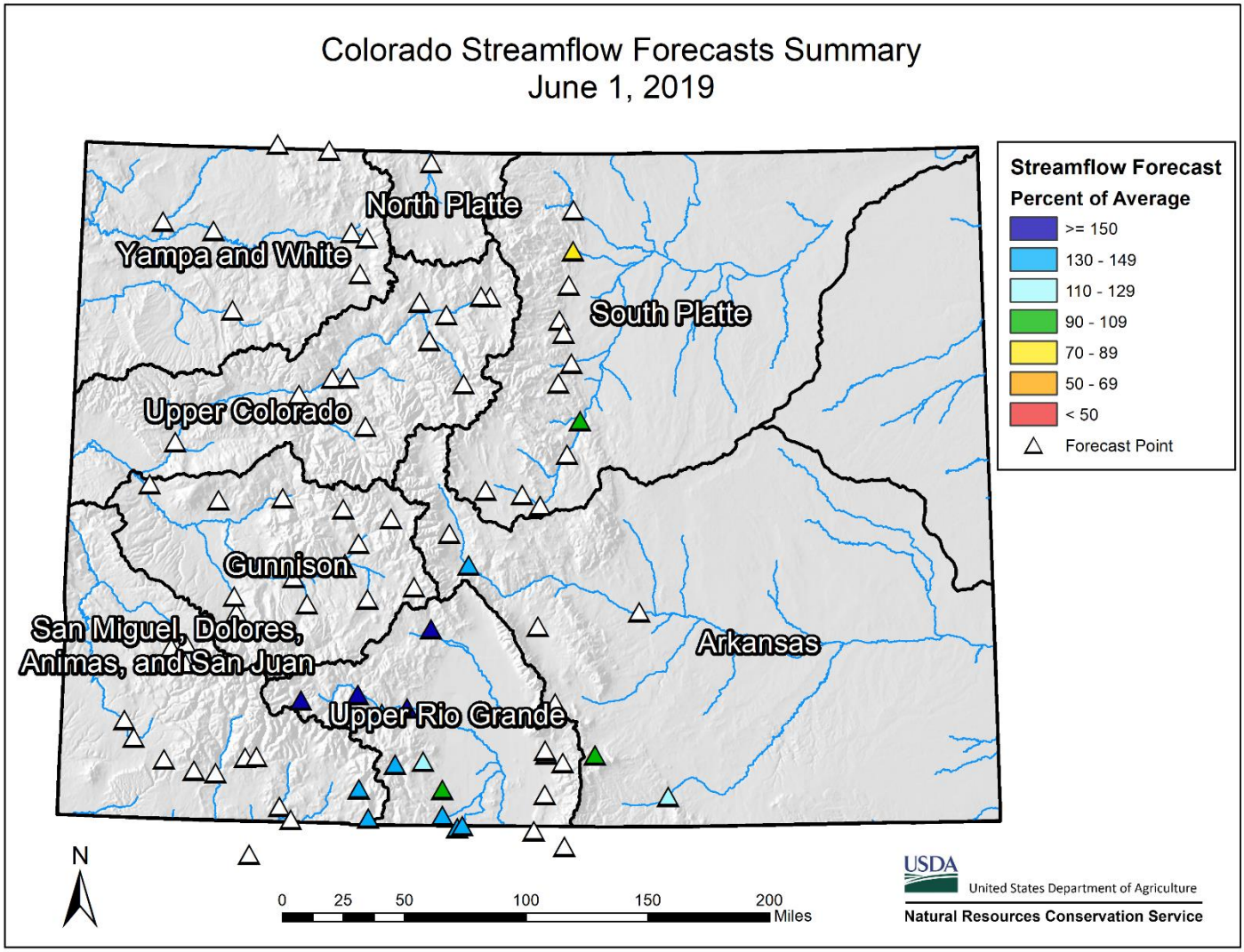
Wet weather returned to the state last month, dropping above normal precipitation across of Colorado's river basins. The southwest portions of the state were hit particularly hard with abundant precipitation that fell mostly as snow in the mountains. The Gunnison, Rio Grande, and combined San Miguel, Dolores, Animas, and San Juan River basins all received more than double normal May amounts at 206, 221, and 238 percent of average respectively. The Arkansas and Colorado River basins received 168 and 162 percent of average precipitation, respectively, while the South Platte and combined Yampa, White, and North Platte both received 141 percent of average accumulations. The wet weather experienced during May has solidified the above normal water year precipitation across the state and already all the river basins have received more precipitation so far this year than they did in all of the 2018 water year. Additionally, with four months still remaining to this water year, most of the river basins are within only a few inches of reaching the average water year totals. The combined southwest basins have received the most precipitation, with respect to normal this water year, at 135 percent of average. The Gunnison River basin, at 134 percent of average for the water year, has already surpassed the total precipitation seen in an average water year. The Rio Grande and Colorado River basins are at 127 and 123 percent of average, respectively, for the water year. The Arkansas, South Platte, and combined Yampa, White and North Platte are all similarly positioned between 115 and 119 percent of average for water year precipitation. Statewide, after receiving May precipitation at 174 percent of average, the water year totals are at 124 percent of average providing a nice moisture buffer as we enter the months that are typically drier for Colorado's mountains.

Reservoir Storage



Statewide reservoir storage remained similar to last month, relative to normal values, and is currently at 90 percent of the average amount for June 1st. Storage across most major basins remained at a percent of average similar to last month with the exception of the Upper Rio Grande and combined San Miguel, Dolores, Animas, and San Juan basins. The Upper Rio Grande had a drop from 79 to 68 percent of average while the combined southwest basins rose from 76 to 88 percent. This represents a huge two month change in particular for the southwest basins which were only holding 58 percent of average storage as of April 1st. While there has been steady improvement in storage across the state throughout the water year, and notable improvement in some basins, only the South Platte and combined Yampa and White River basins currently have above average reservoir storage, both at 106 percent of average. Change in the Colorado basin throughout the season has been minimal and storage currently resides at 90 percent of normal. The Arkansas basin is slightly below this with 86 percent of normal storage for this time of year. The Gunnison has shown huge improvements in reservoir storage over the course of the water year rising from a meager 53 percent of average in October to where it currently resides at 81 percent. While many parts of the state haven't seen huge changes in storage, the southwestern corner of the state has seen substantial recovery after being extremely depleted last summer. There is still well above normal amounts of snow in the mountains across the state which should provide further opportunity to continue adding inflows to Colorado reservoirs.

Streamflow



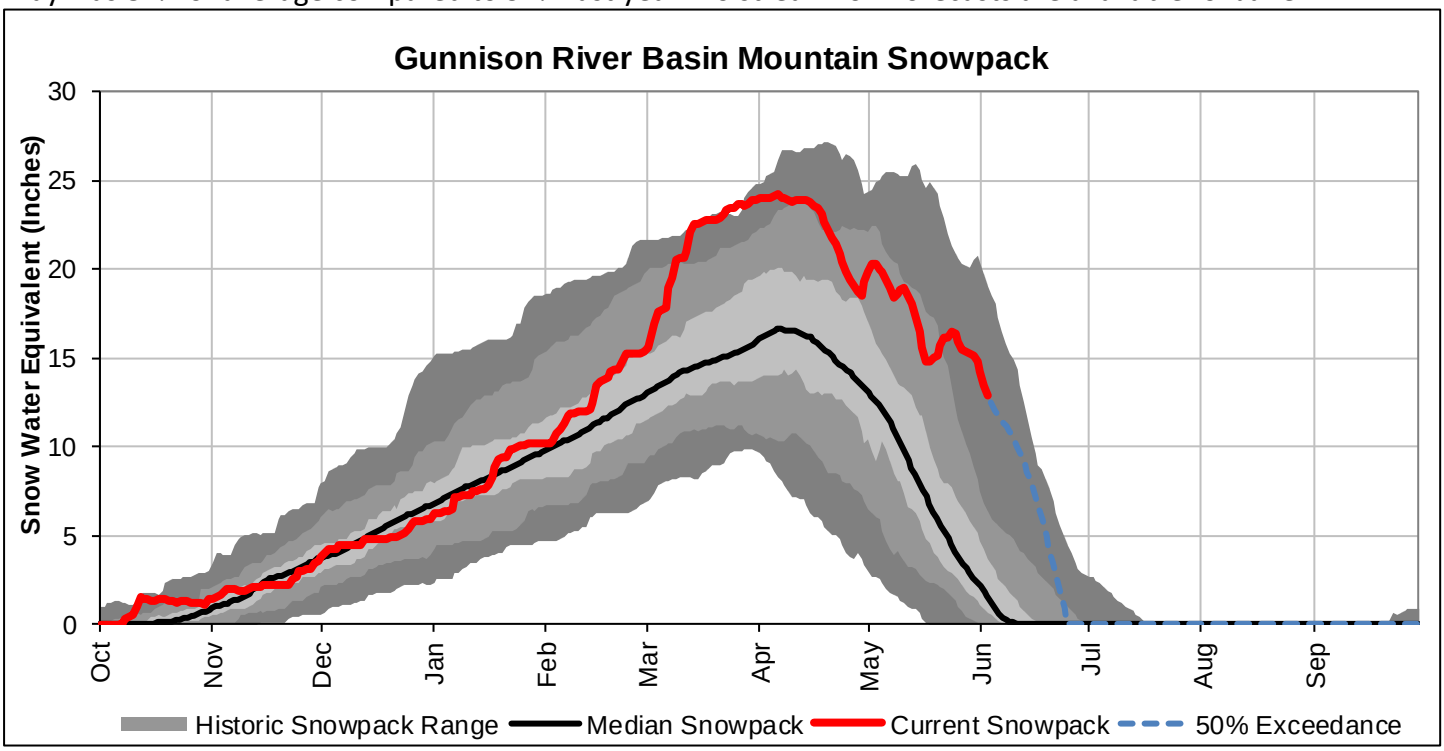
Due to current staffing, most official forecasts will only be available February through May. If you rely on January or June forecasts, please contact cara.s.mccarthy@usda.gov or brian.domonkos@usda.gov.

Based on forecasts from previous months and the well above average May precipitation, it is anticipated that most rivers in the state will observe above average April through July streamflows. Many streamflow forecast points across western and southern Colorado are expected to produce in the general range of 130 to 150 percent of average seasonal streamflows. In the northern half of the state spring and summer flows are expected to be lower relative to southern Colorado but still at near and mostly above average volumes. It has been a unique snowmelt runoff season so far and the patterns have been variable across the state. Cool temperatures and continued snow accumulation have delayed snowmelt longer than normal across much of Colorado. With the days getting longer and warmer the potential for accelerated snowmelt and corresponding increases in streamflow are possible to occur over the coming weeks. These elevated streamflow levels will likely bring a substantial portion of the seasonal streamflow from a water supply standpoint, but also may have other implications as well. With the potential for high flows also comes an increased risk of flooding and more hazardous conditions for recreation on or near rivers and streams. With rapid changes possible in both the mountains and rivers throughout June, it will be worth paying close attention to local conditions because of the wide variety of potential impacts.

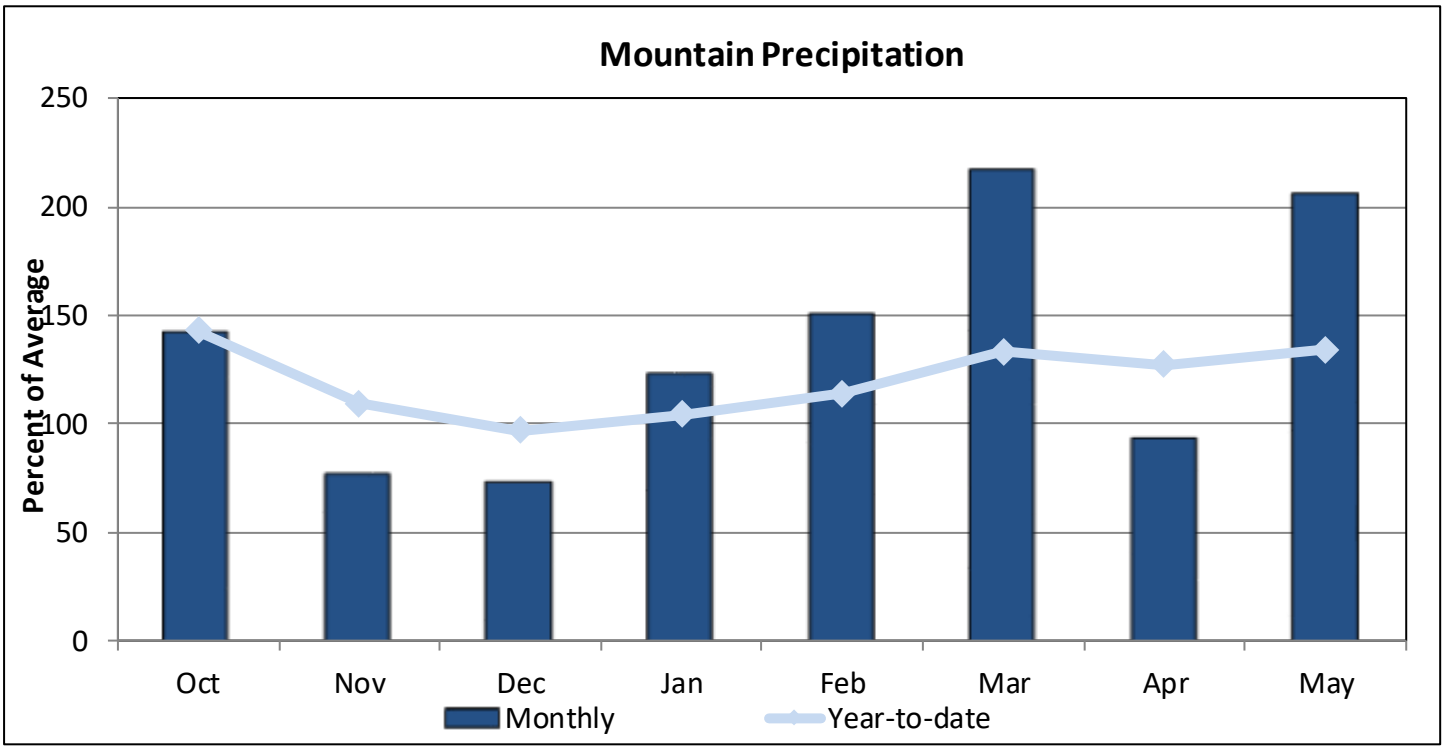
GUNNISON RIVER BASIN

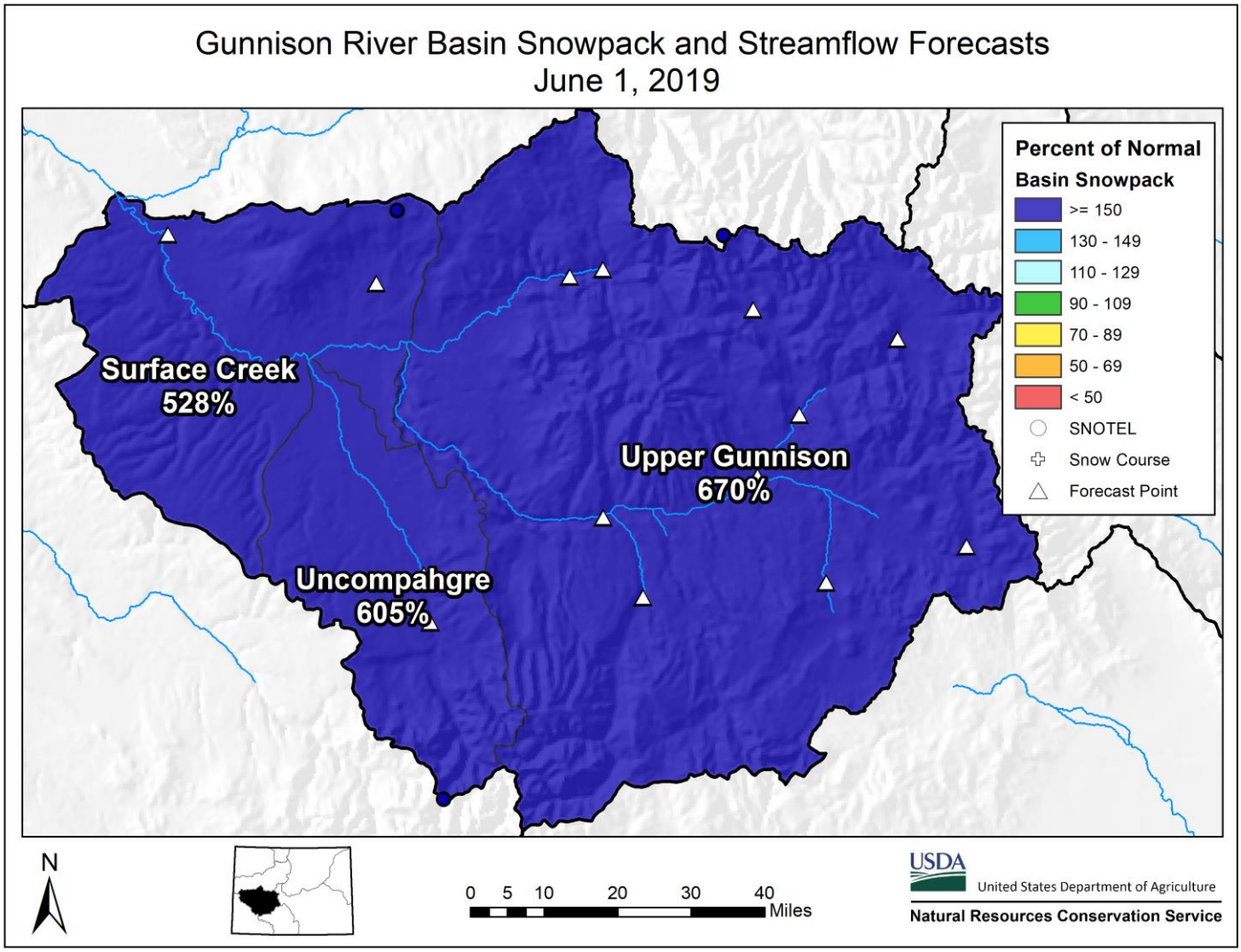
June 1, 2019

Snowpack in the Gunnison River basin is above normal at 655% of the median. Precipitation for May was 206% of average which brings water year-to-date precipitation to 134% of average. Reservoir storage at the end of May was 81% of average compared to 92% last year. No streamflow forecasts are available for June



*SWE values calculated using daily SNOTEL data only

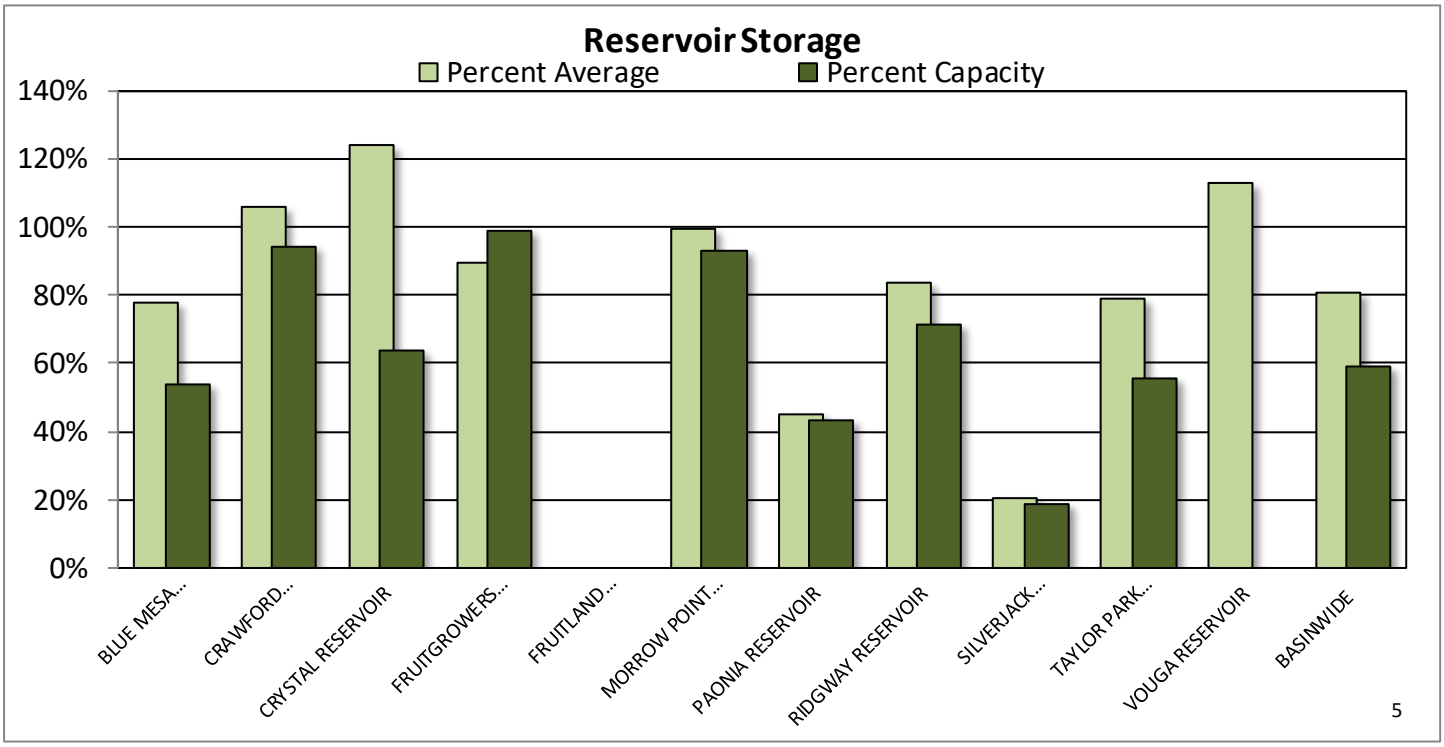




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Upper Gunnison	10	670	
Surface Creek	2	528	
Uncompahgre	3	605	
Basin-Wide Total	13	655	

*SWE values calculated using first of month SNOTEL data and snow course measurements



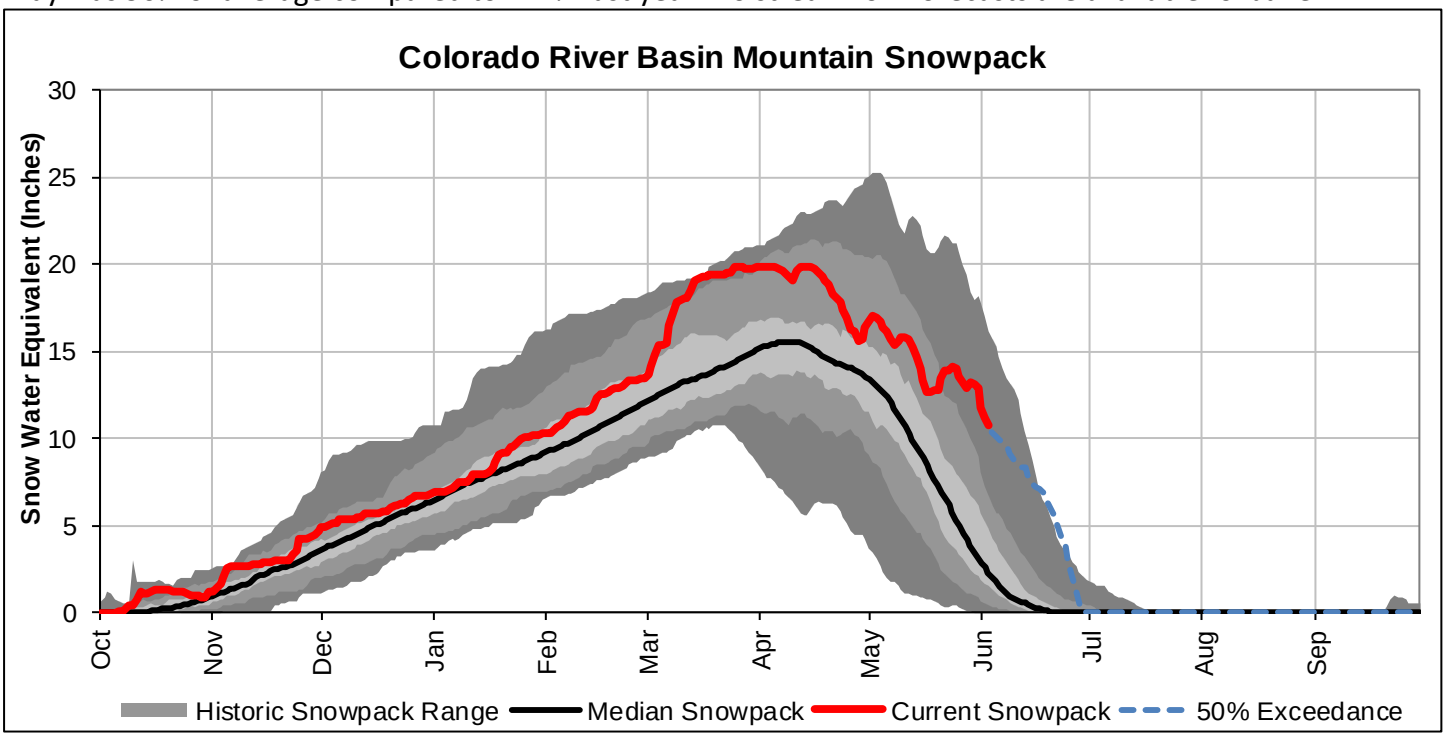
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
BLUE MESA RESERVOIR	447.2	512.6	575.3	830.0
CRAWFORD RESERVOIR	13.2	7.1	12.5	14.0
CRYSTAL RESERVOIR	11.2	8.2	9.0	17.5
FRUITGROWERS RESERVOIR	3.6	2.9	4.0	3.6
FRUITLAND RESERVOIR		2.5		9.2
MORROW POINT RESERVOIR	112.8	112.0	113.2	121.0
PAONIA RESERVOIR	6.7	15.5	14.9	15.4
RIDGWAY RESERVOIR	59.1	64.4	70.6	83.0
SILVERJACK RESERVOIR	2.4	12.4	11.8	12.8
TAYLOR PARK RESERVOIR	58.8	83.9	74.7	106.0
VOUGA RESERVOIR	1.0	0.7	0.9	0.9
BASINWIDE	716.0	822.2	886.9	1213.4
Number of Reservoirs	10	11	10	11

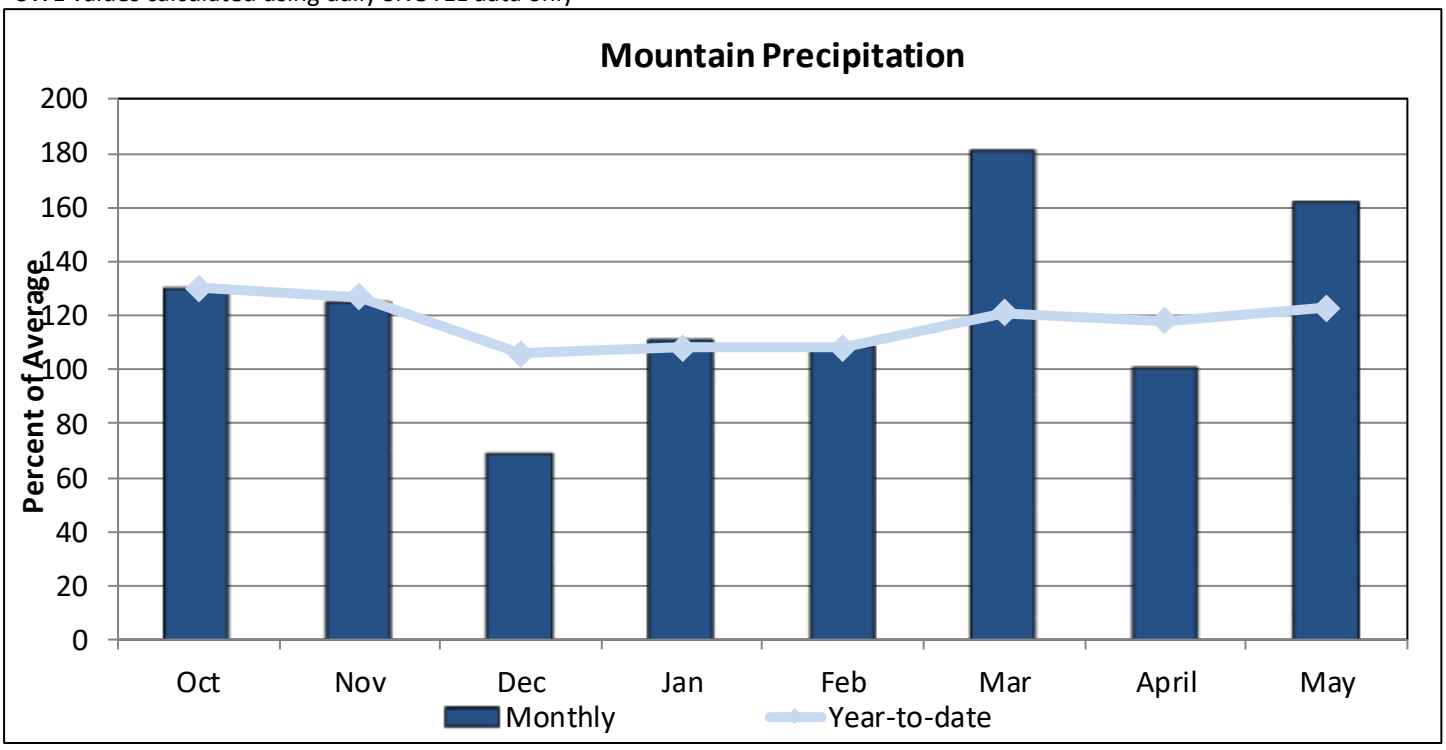
UPPER COLORADO RIVER BASIN

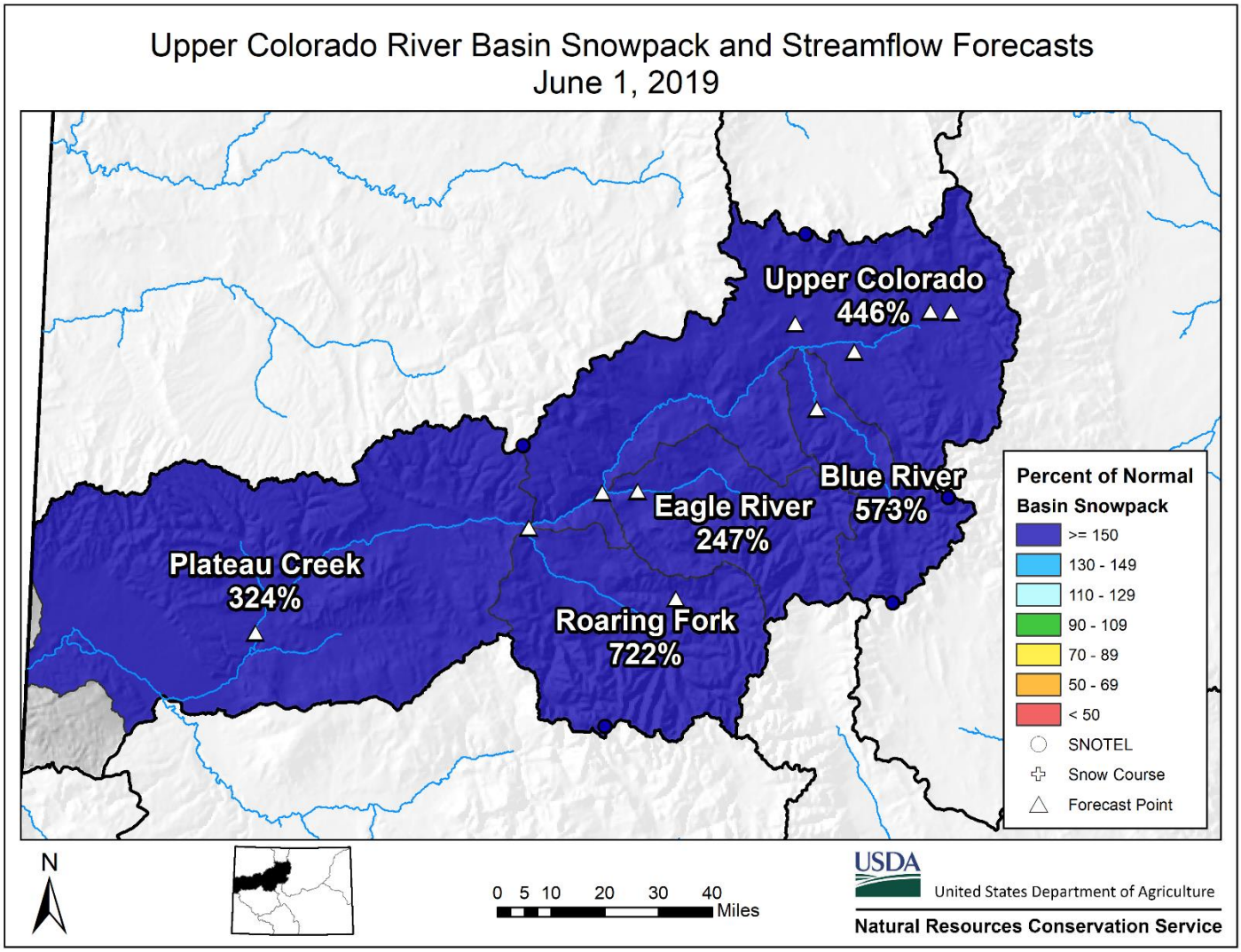
June 1, 2019

Snowpack in the Colorado River basin is above normal at 440% of the median. Precipitation for May was 162% of average which brings water year-to-date precipitation to 123% of average. Reservoir storage at the end of May was 90% of average compared to 117% last year. No streamflow forecasts are available for June.



*SWE values calculated using daily SNOTEL data only

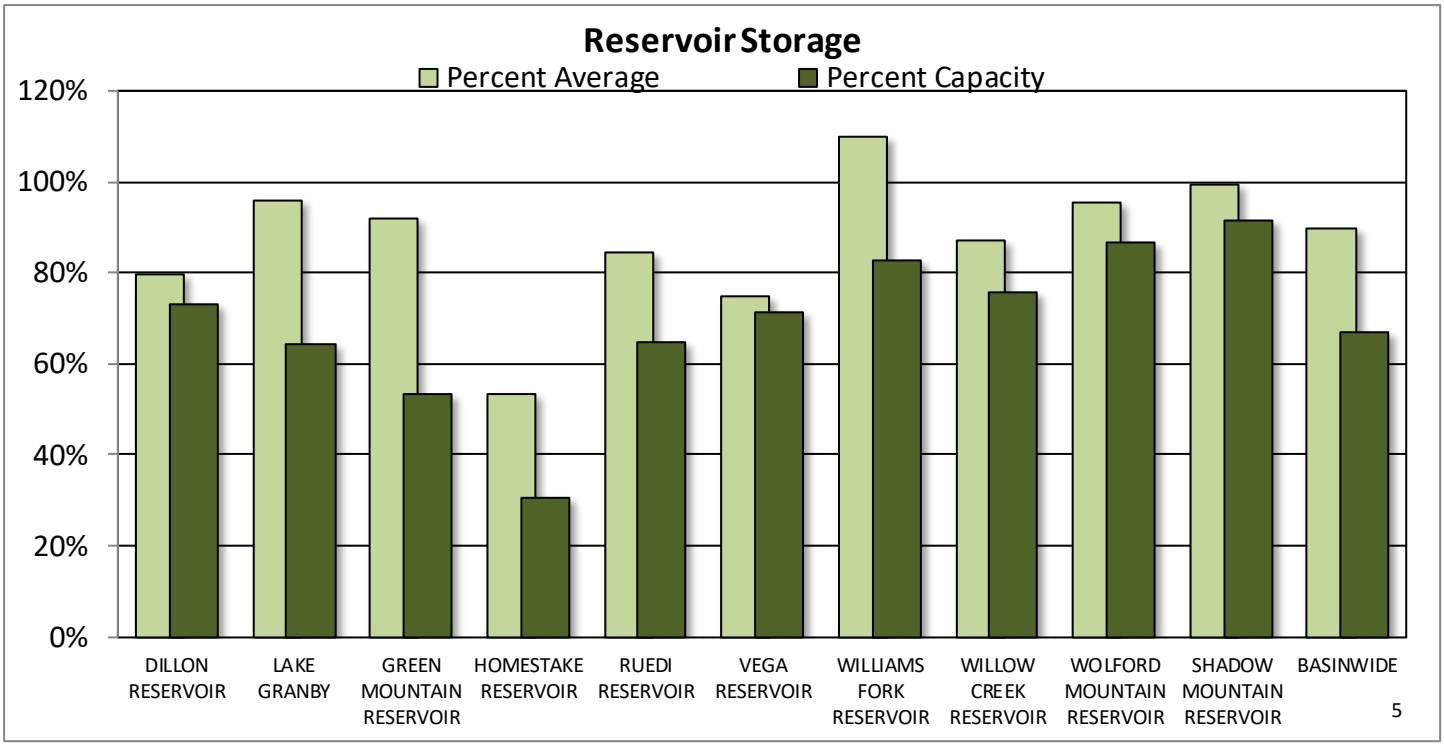




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Blue River	5	573	63
Upper Colorado	19	446	26
Muddy Creek	3	509	31
Eagle River	4	247	53
Plateau Creek	5	324	13
Roaring Fork	7	722	
Williams Fork	3	343	
Willow Creek	2		
Basin-Wide Total	28	440	21

*SWE values calculated using first of month SNOTEL data and snow course measurements



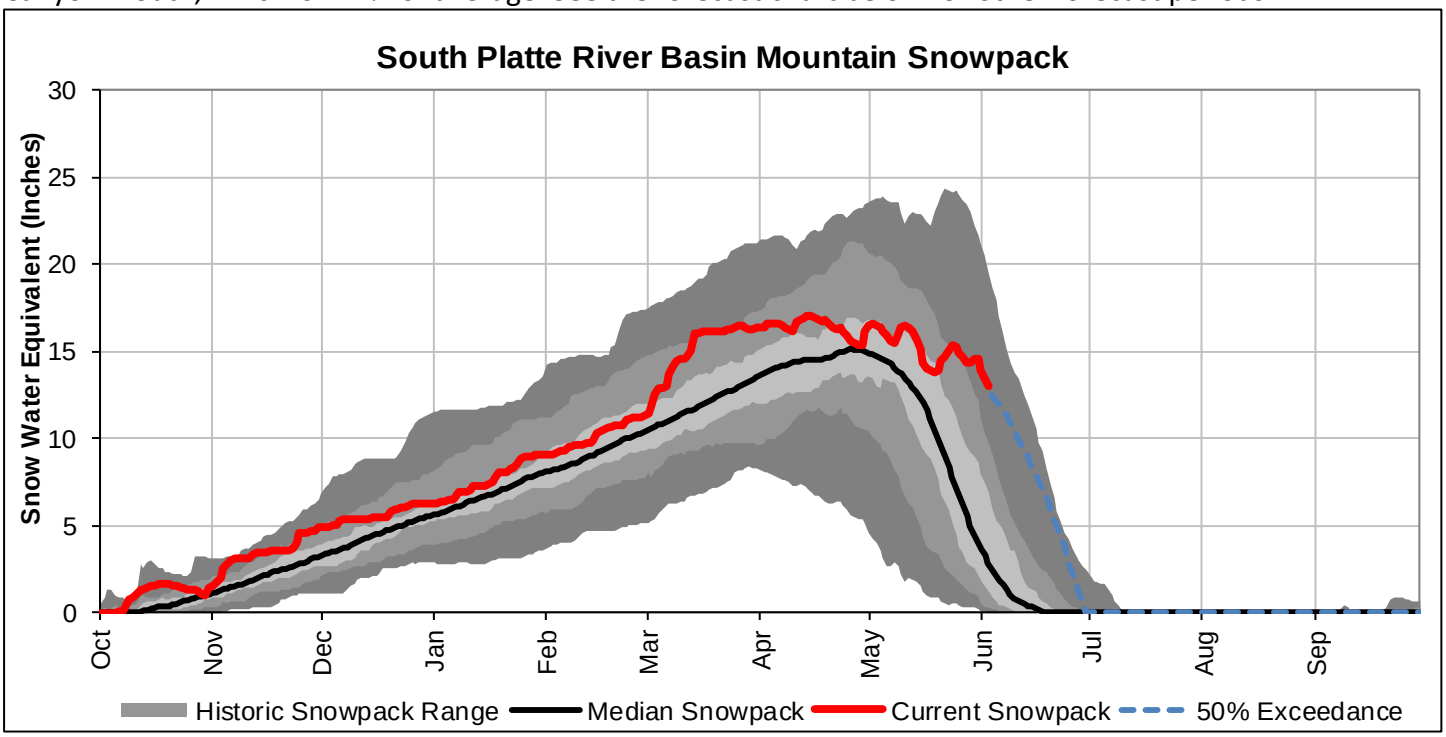
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
DILLON RESERVOIR	181.7	252.1	227.8	249.1
LAKE GRANBY	300.2	415.8	313.6	465.6
GREEN MOUNTAIN RESERVOIR	78.1	89.0	84.9	146.8
HOMESTAKE RESERVOIR	13.1	35.3	24.7	43.0
RUEDI RESERVOIR	66.0	81.1	78.0	102.0
VEGA RESERVOIR	23.4	24.0	31.3	32.9
WILLIAMS FORK RESERVOIR	80.3	88.1	73.0	97.0
WILLOW CREEK RESERVOIR	6.9	8.0	7.9	9.1
WOLFORD MOUNTAIN RESERVOIR	57.2	66.6	59.9	65.9
SHADOW MOUNTAIN RESERVOIR	16.8	17.0	16.9	18.4
BASINWIDE	823.7	1077.1	918.0	1229.8
Number of Reservoirs	10	10	10	10

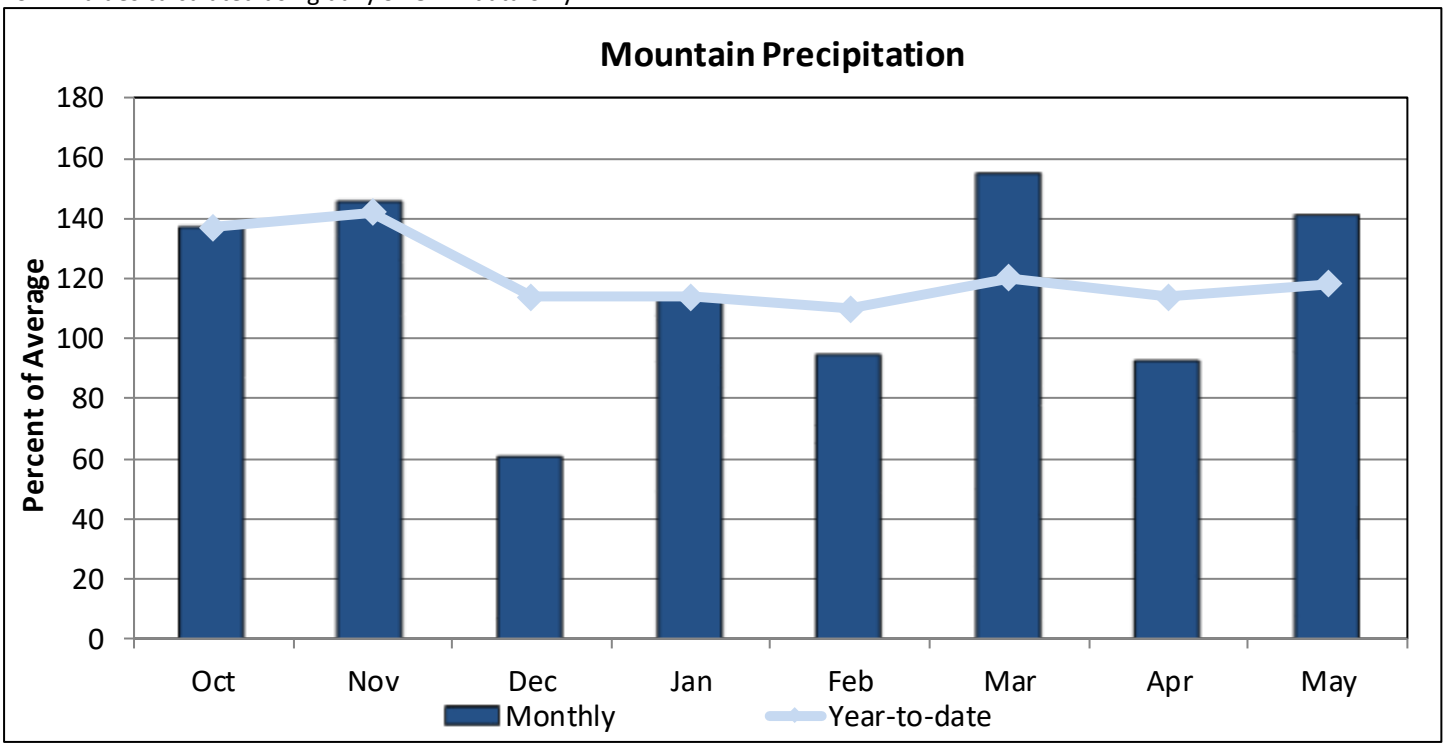
SOUTH PLATTE RIVER BASIN

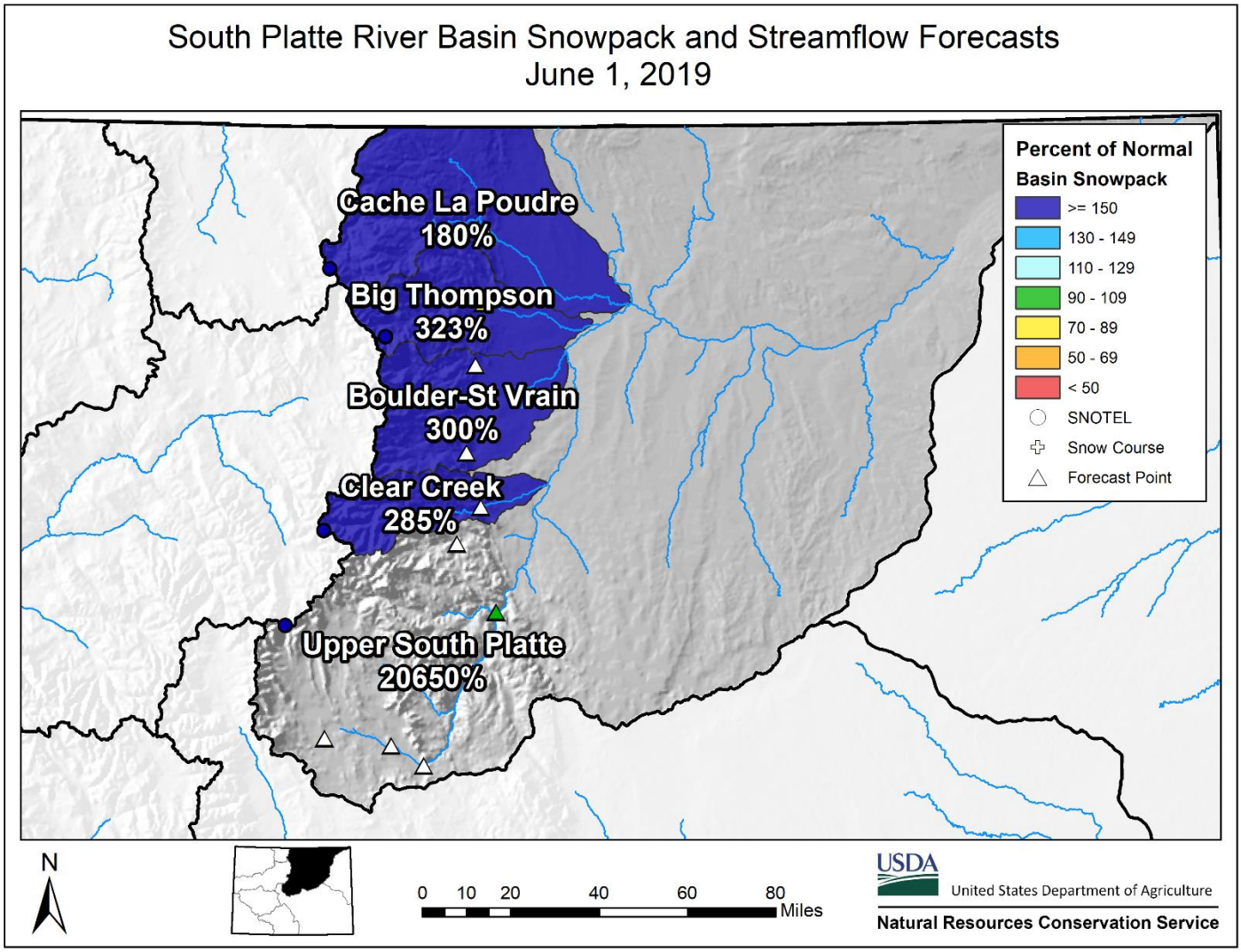
June 1, 2019

Snowpack in the South Platte River basin is above normal at 392% of the median. Precipitation for May was 141% of average which brings water year-to-date precipitation to 118%. Reservoir storage at the end of May was 106% of average compared to 115% last year. Available streamflow forecasts include the South Platte River at South Platte, which is 139% of average for the June through July period and the Big Thompson at Canyon mouth, which is 124% of average. See the forecast chart below for other forecast periods.



*SWE values calculated using daily SNOTEL data only

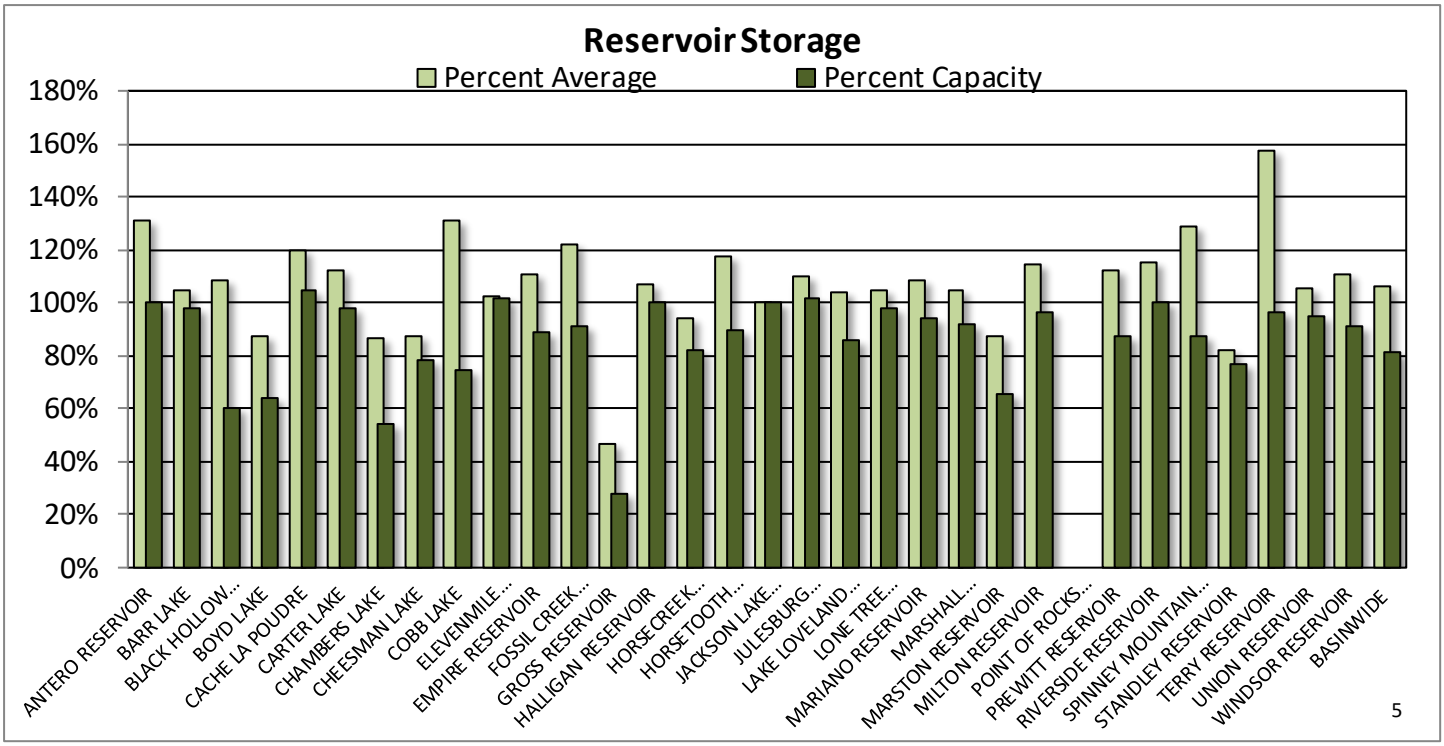




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Big Thompson	3	323	4
Boulder Creek	3	300	49
Cache La Poudre	2	180	23
Clear Creek	2	285	15
Saint Vrain	1		
Upper South Platte	6	20650	50
Basin-Wide Total	17	392	20

*SWE values calculated using first of month SNOTEL data and snow course measurements



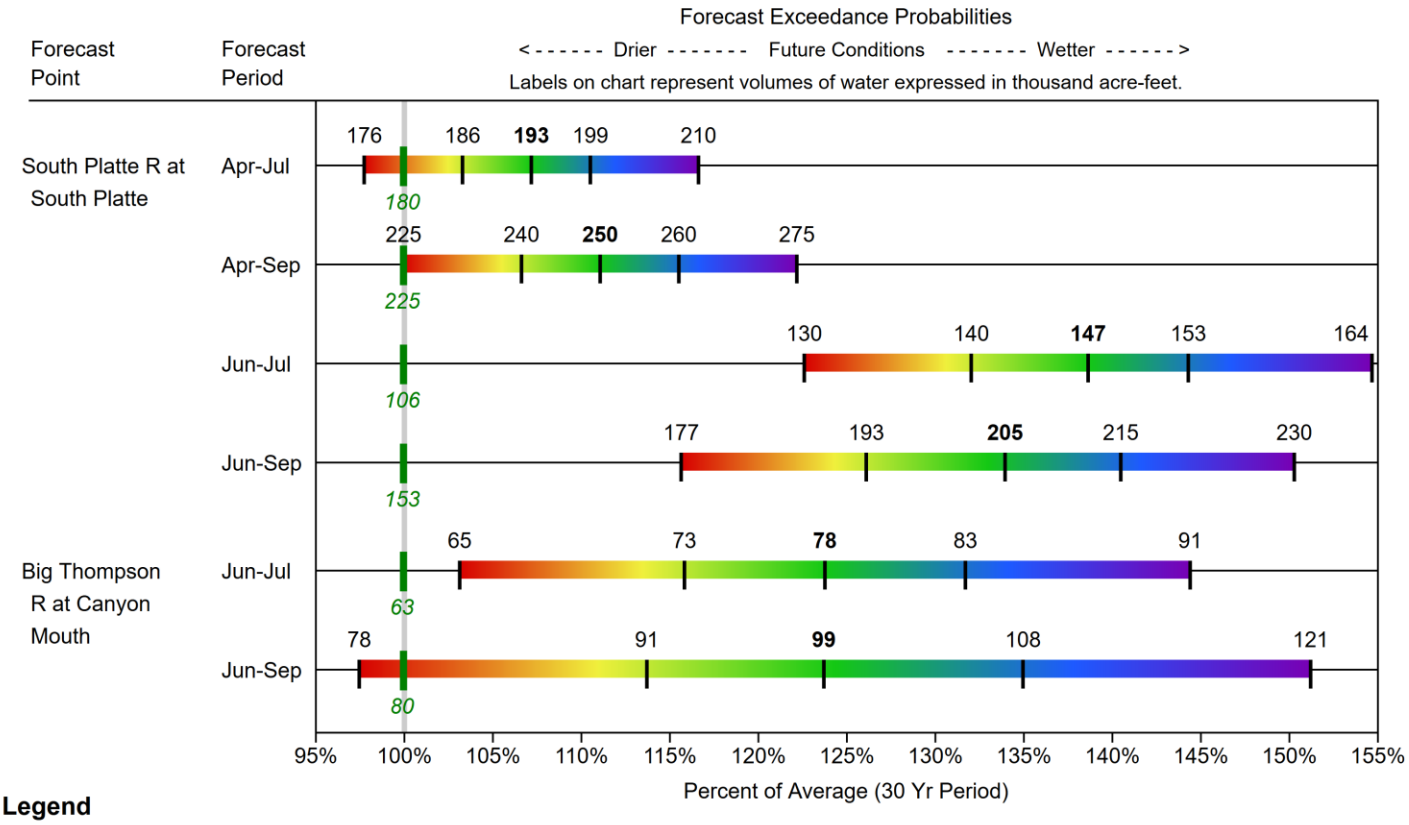
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ANTERO RESERVOIR	19.9	20.1	15.2	19.9
BARR LAKE	29.4	29.9	28.2	30.1
BLACK HOLLOW RESERVOIR	3.9	4.2	3.6	6.5
BOYD LAKE	30.9	47.9	35.4	48.4
CACHE LA POUDRE	10.6	10.2	8.8	10.1
CARTER LAKE	107.0	107.2	95.2	108.9
CHAMBERS LAKE	4.8	8.4	5.5	8.8
CHEESMAN LAKE	61.6	73.5	70.3	79.0
COBB LAKE	16.5	20.1	12.6	22.3
ELEVENMILE CANYON RESERVOIR	99.8	99.5	97.3	98.0
EMPIRE RESERVOIR	32.5	36.5	29.4	36.5
FOSSIL CREEK RESERVOIR	10.1	10.1	8.3	11.1
GROSS RESERVOIR	8.3	28.1	17.6	29.8
HALLIGAN RESERVOIR	6.4	6.4	6.0	6.4
HORSECREEK RESERVOIR	12.1	12.1	12.9	14.7
HORSETOOTH RESERVOIR	133.9	124.2	114.2	149.7
JACKSON LAKE RESERVOIR	26.2	26.1	26.1	26.1
JULESBURG RESERVOIR	20.9	20.6	19.0	20.5
LAKE LOVELAND RESERVOIR	8.8	10.6	8.5	10.3
LONE TREE RESERVOIR	8.5	8.6	8.1	8.7
MARIANO RESERVOIR	5.1	5.1	4.7	5.4
MARSHALL RESERVOIR	9.2	9.6	8.8	10.0
MARSTON RESERVOIR	8.5	9.4	9.7	13.0
MILTON RESERVOIR	22.6	22.9	19.8	23.5
POINT OF ROCKS RESERVOIR	71.7	69.6	63.2	70.6
PREWITT RESERVOIR	24.6	24.6	22.0	28.2
RIVERSIDE RESERVOIR	55.8	55.2	48.5	55.8
SPINNEY MOUNTAIN RESERVOIR	42.6	39.5	33.1	49.0
STANDLEY RESERVOIR	32.1	42.0	39.1	42.0
TERRY RESERVOIR	7.7	7.6	4.9	8.0
UNION RESERVOIR	12.4	12.6	11.7	13.0
WINDSOR RESERVOIR	13.8	14.2	12.5	15.2
BASINWIDE	958.1	1016.7	900.2	1079.5
Number of Reservoirs	32	32	32	32

SOUTH PLATTE RIVER BASIN

Water Supply Forecasts

June 1, 2019



Legend

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

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

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

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

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

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

Period of Record Minimum Streamflow KAF (Year)

1981-2010 Normal Streamflow KAF

Observed Streamflow KAF

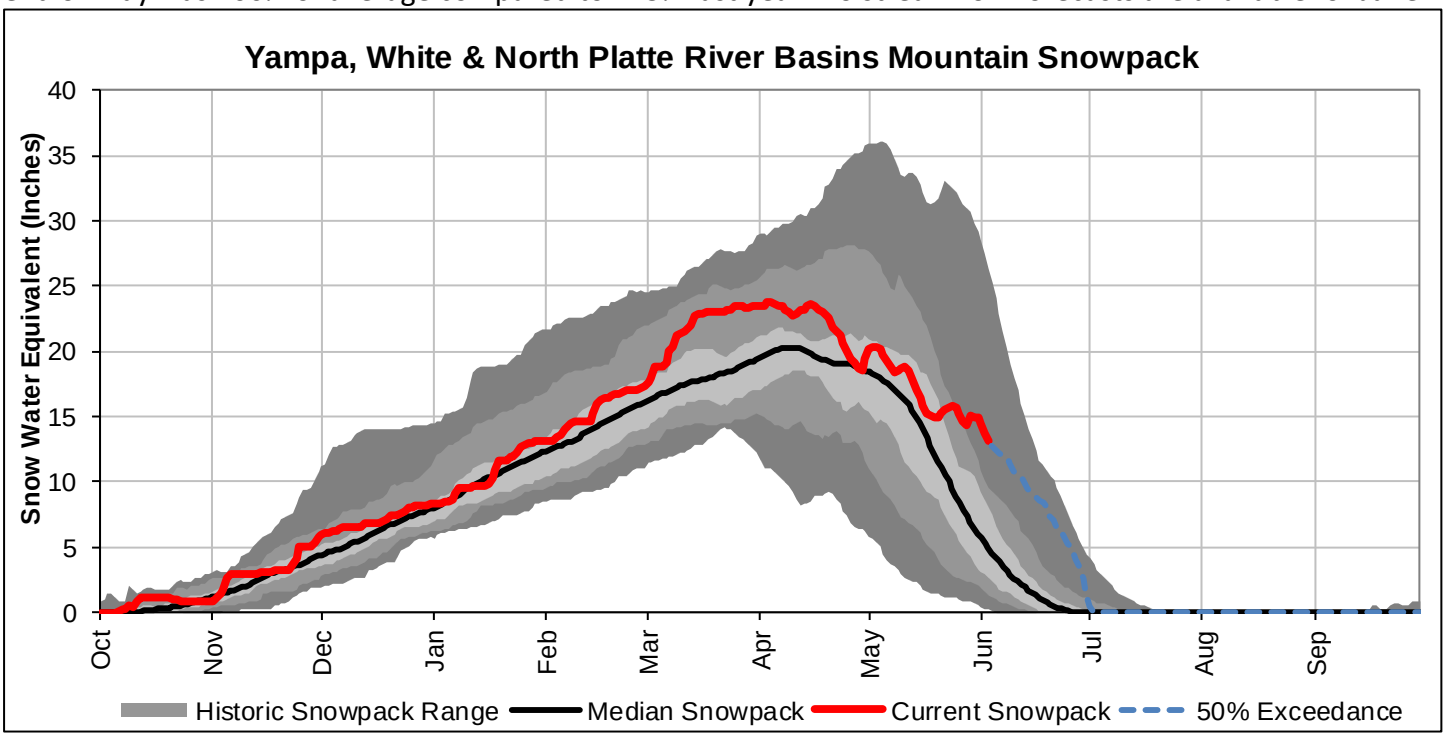
Period of Record Maximum Streamflow KAF (Year)

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

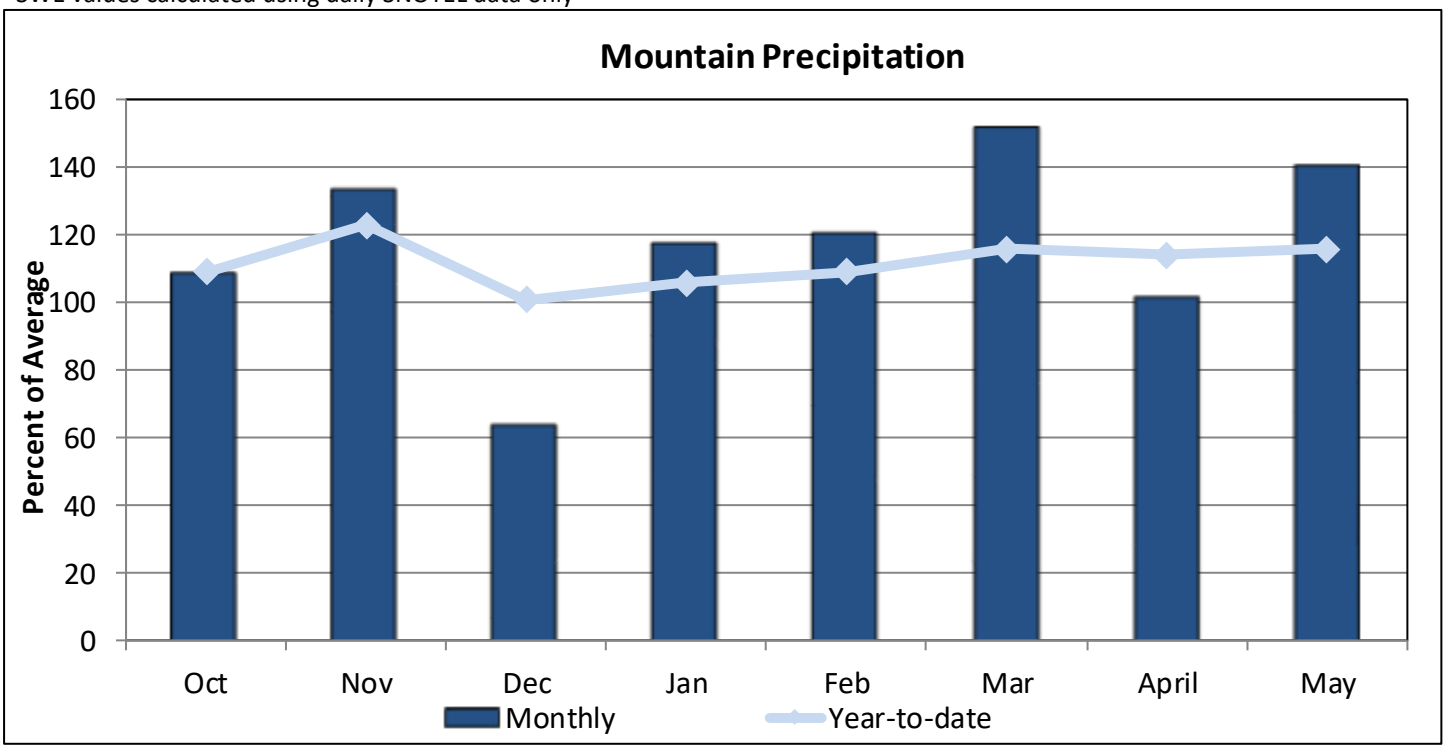
YAMPA, WHITE, NORTH PLATTE, AND LARAMIE RIVER BASINS

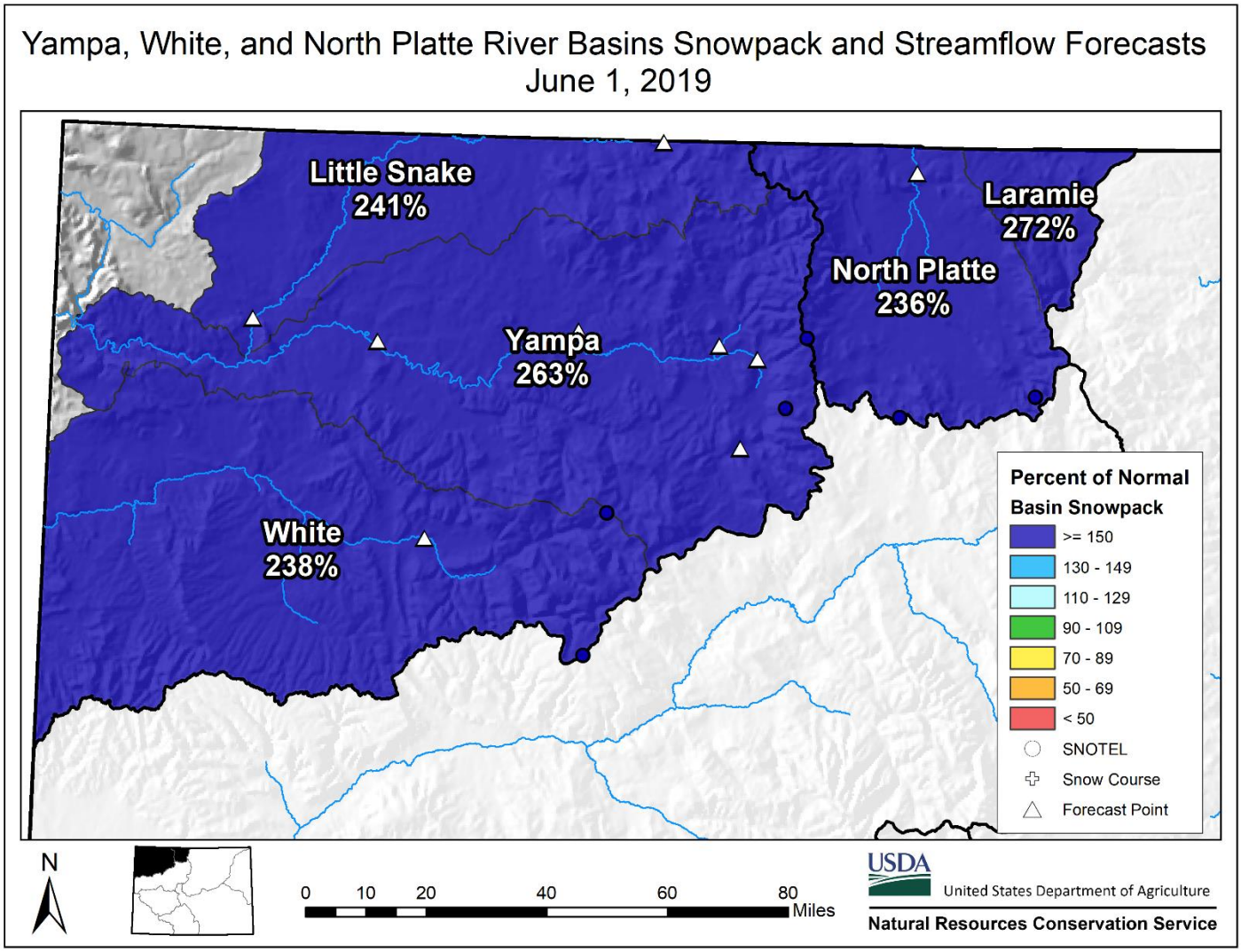
June 1, 2019

Snowpack in the Yampa, White & North Platte basins is above normal at 260% of the median. Precipitation for May was 141% of average and water year-to-date precipitation is 116% of average. Reservoir storage at the end of May was 106% of average compared to 115% last year. No streamflow forecasts are available for June.



*SWE values calculated using daily SNOTEL data only

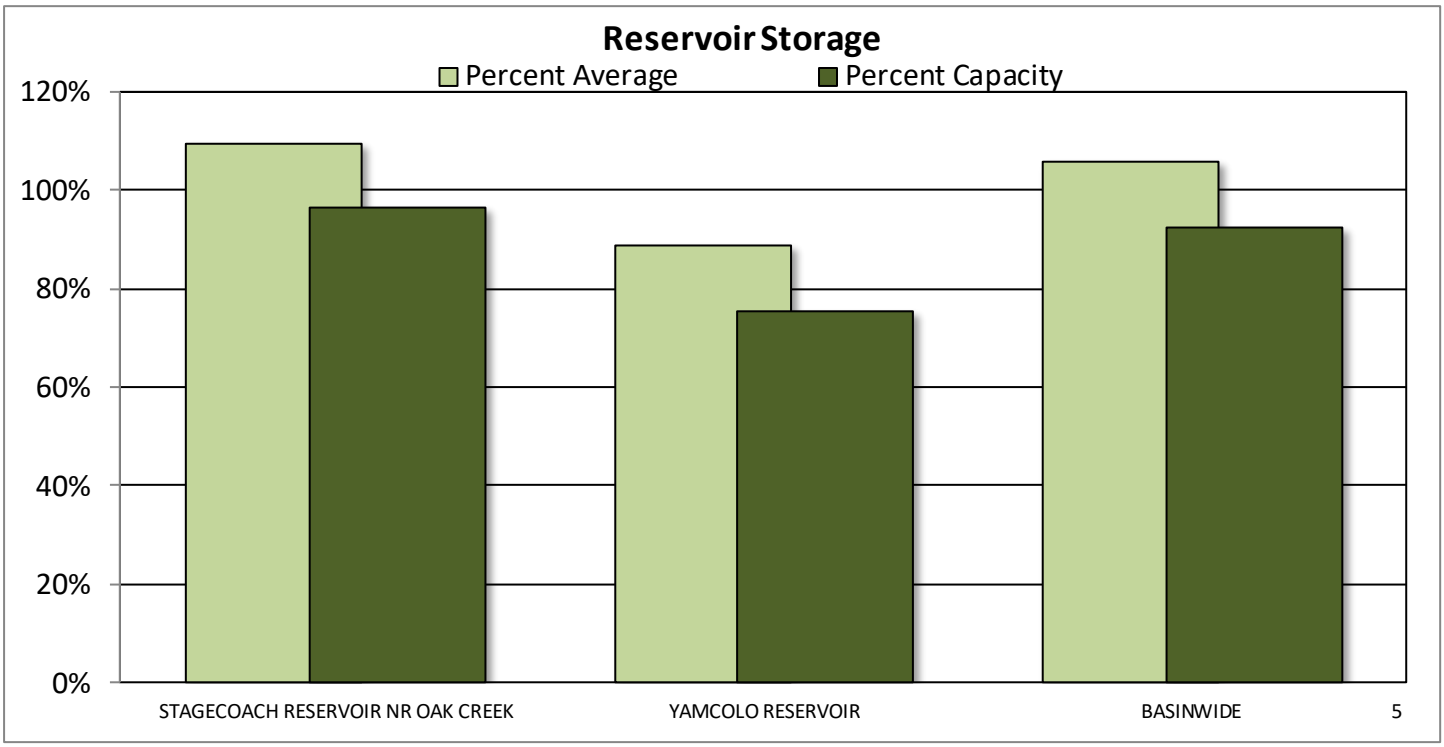




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Laramie	2	272	
North Platte	7	236	48
Total Laramie & North Platte	9	241	41
Elk	2		
Yampa	9	263	40
White	3	238	23
Total Yampa & White	11	240	35
Little Snake	5	241	32
Basin-Wide Total	23	260	34

*SWE values calculated using first of month SNOTEL data and snow course measurements



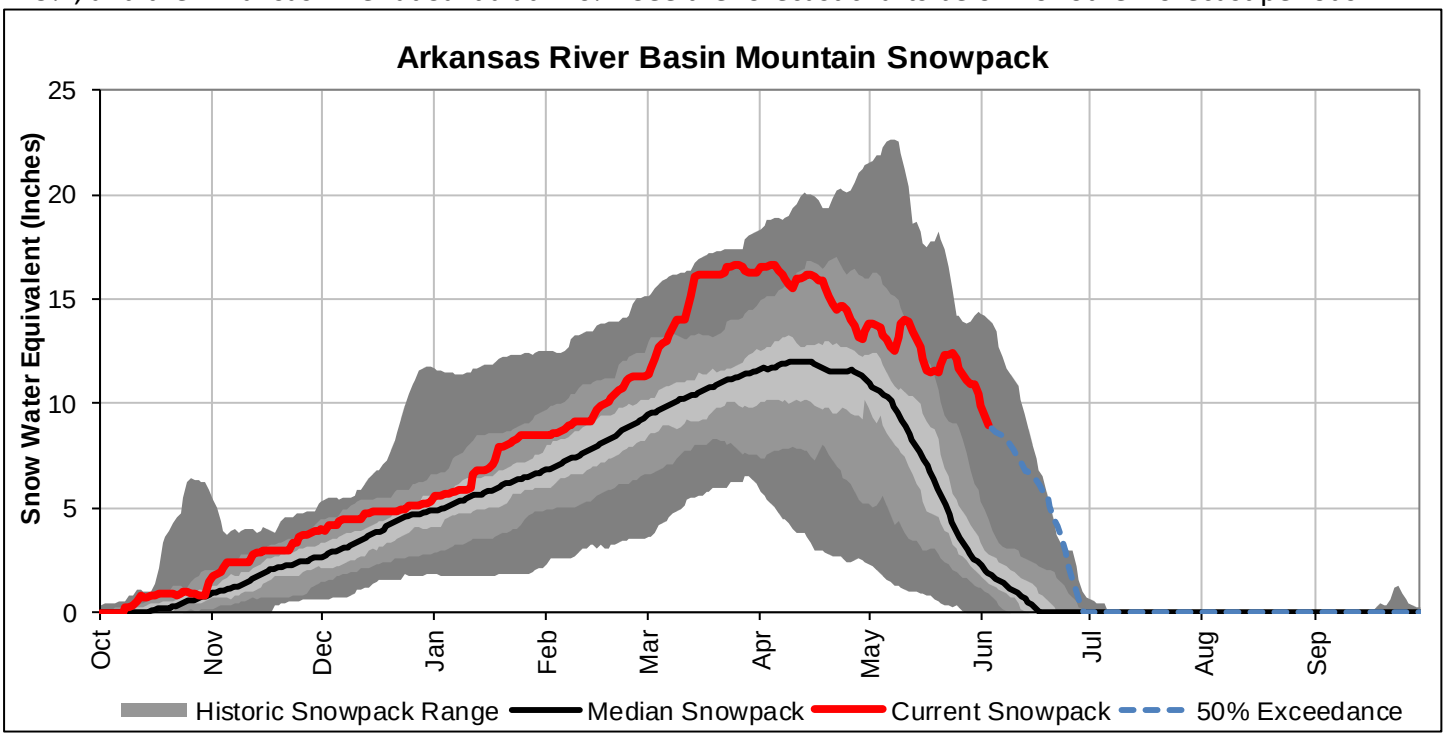
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
STAGECOACH RESERVOIR NR OAK C	35.2	36.4	32.1	36.5
YAMCOLO RESERVOIR	6.6	9.1	7.4	8.7
BASINWIDE	41.8	45.5	39.5	45.2
Number of Reservoirs	2	2	2	2

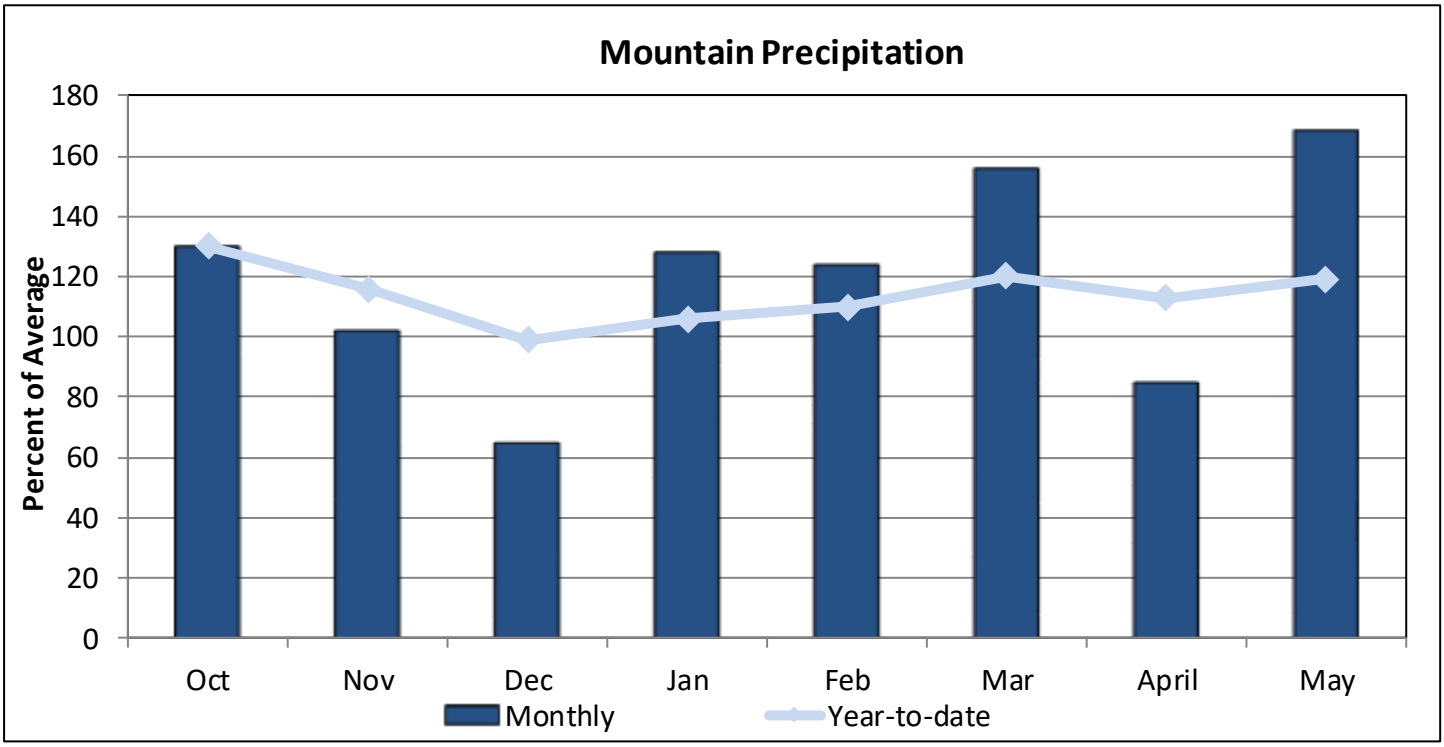
ARKANSAS RIVER BASIN

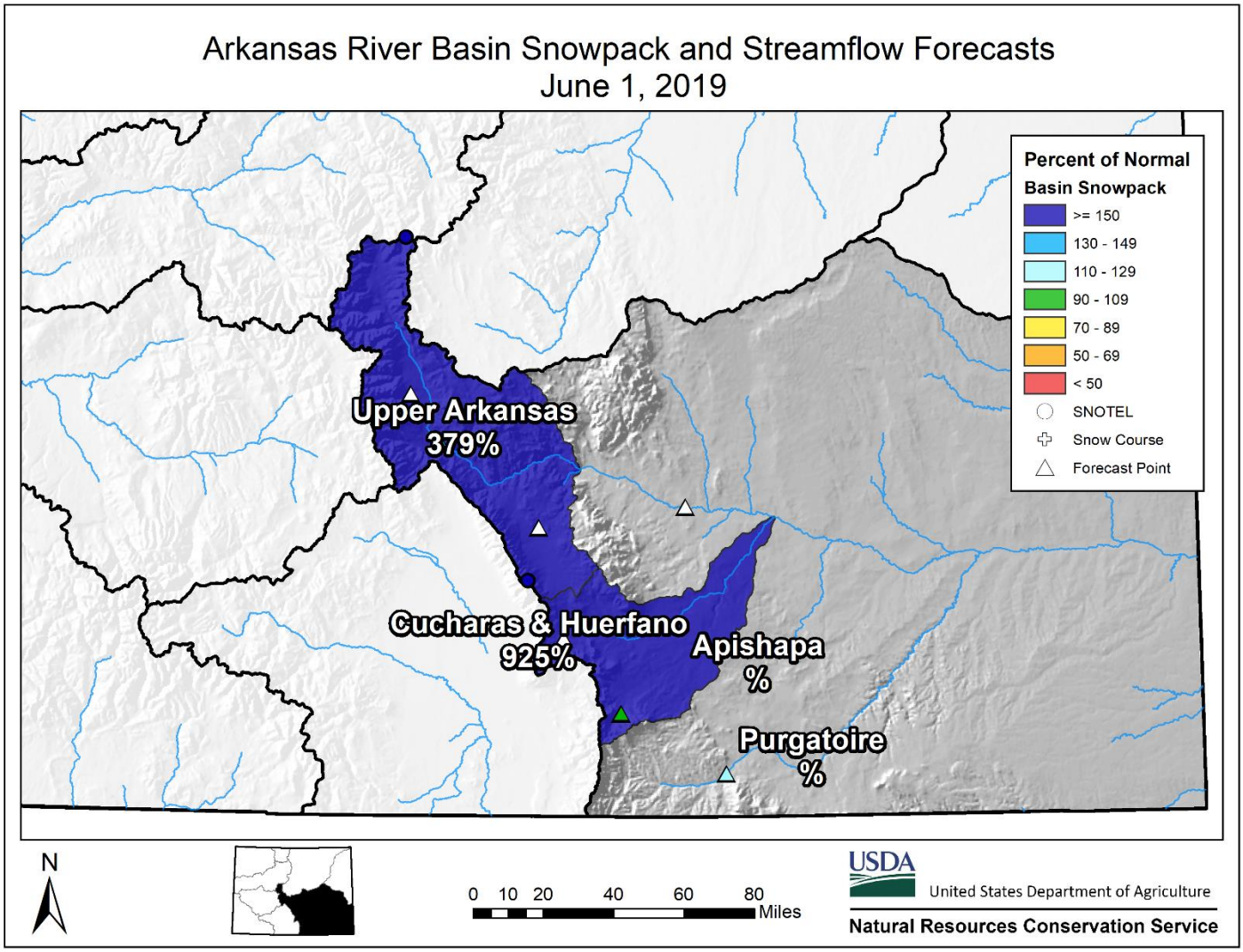
June 1, 2019

Snowpack in the Arkansas River basin is above normal at 439% of the median. Precipitation for May was 168% of average which brings water year-to-date precipitation to 119% of average. Reservoir storage at the end of May was 86% of average compared to 127% last year. Available streamflow forecasts include the Cucharas River near La Veta at 97% of average for the June through July period, the Purgatoire River at Trinidad at 129%, and the Arkansas River at Salida at 170%. See the forecast charts below for other forecast periods.



*SWE values calculated using daily SNOTEL data only

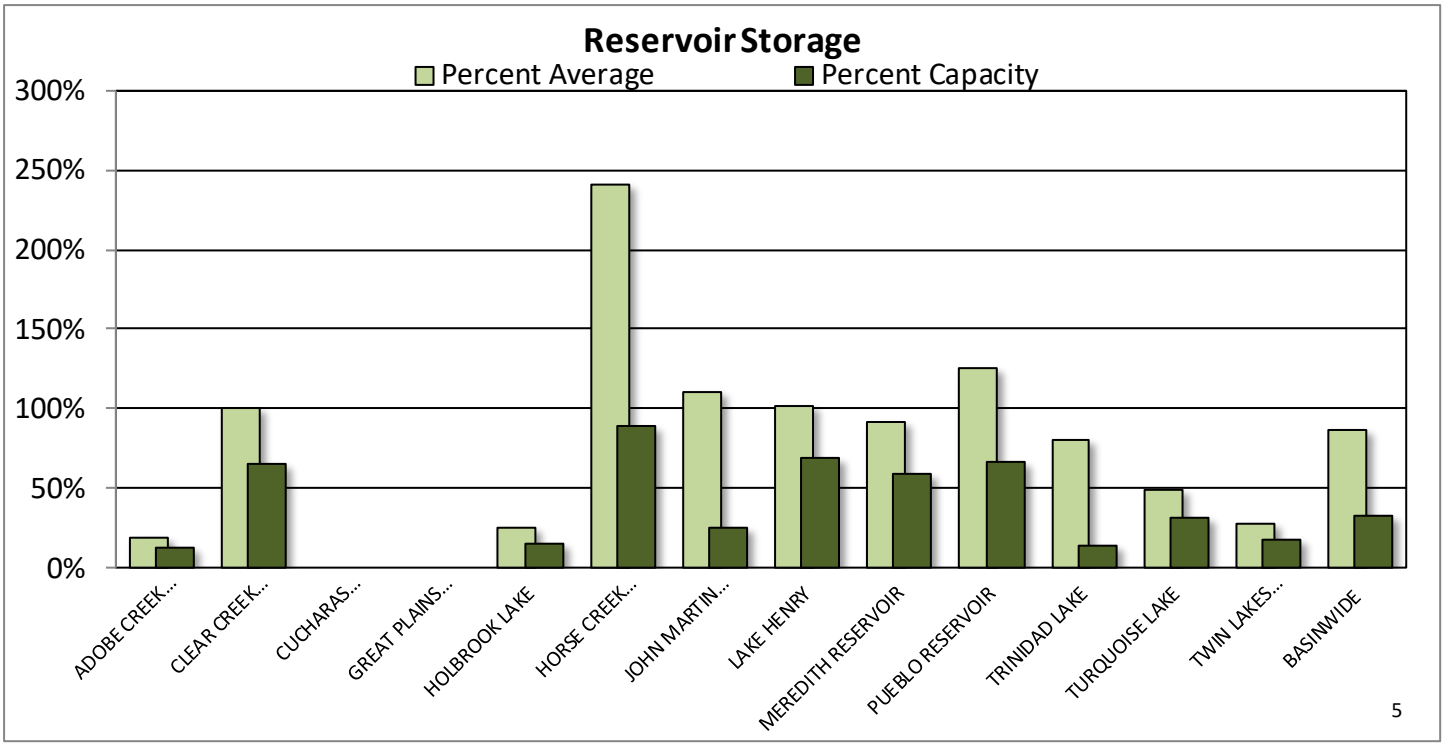




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Upper Arkansas	3	379	67
Cucharas & Huerfano	3	925	
Purgatoire	2		
Basin-Wide Total	8	439	60

*SWE values calculated using first of month SNOTEL data and snow course measurements



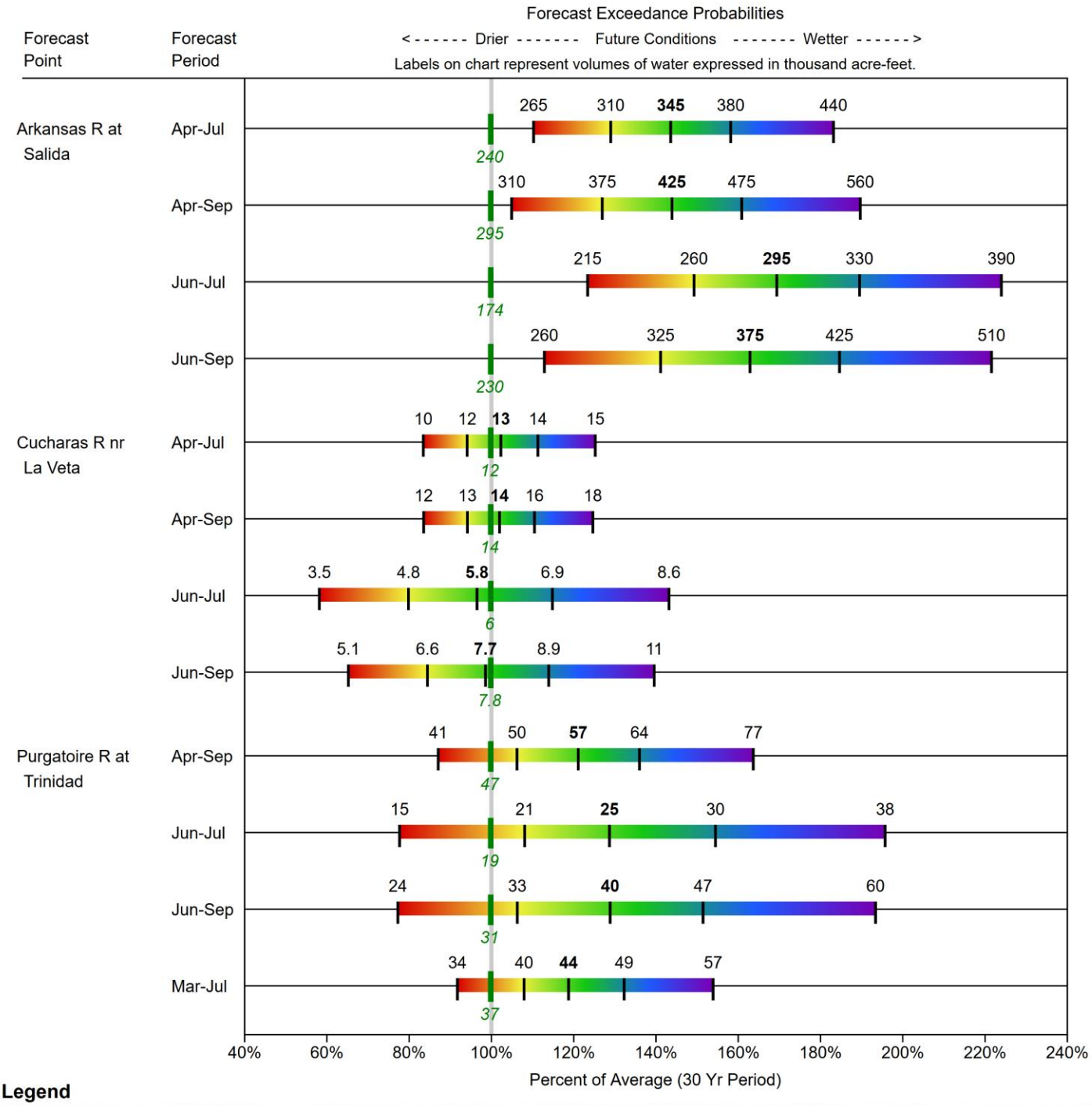
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ADOBE CREEK RESERVOIR	7.8	39.4	41.4	62.0
CLEAR CREEK RESERVOIR	7.5	8.0	7.5	11.4
CUCHARAS RESERVOIR				40.0
GREAT PLAINS RESERVOIR				150.0
HOLBROOK LAKE	1.0	3.8	4.1	7.0
HORSE CREEK RESERVOIR	23.9	24.7	9.9	27.0
JOHN MARTIN RESERVOIR	157.1	268.8	141.9	616.0
LAKE HENRY	6.4	8.0	6.3	9.4
MEREDITH RESERVOIR	24.5	30.5	26.8	42.0
PUEBLO RESERVOIR	234.3	236.1	186.4	354.0
TRINIDAD LAKE	23.6	30.3	29.3	167.0
TURQUOISE LAKE	40.4	96.4	82.3	127.0
TWIN LAKES RESERVOIR	15.1	52.9	54.9	86.0
BASINWIDE	541.4	798.9	590.8	1698.8
Number of Reservoirs	11	11	11	13

ARKANSAS RIVER BASIN

Water Supply Forecasts

June 1, 2019



Legend

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

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

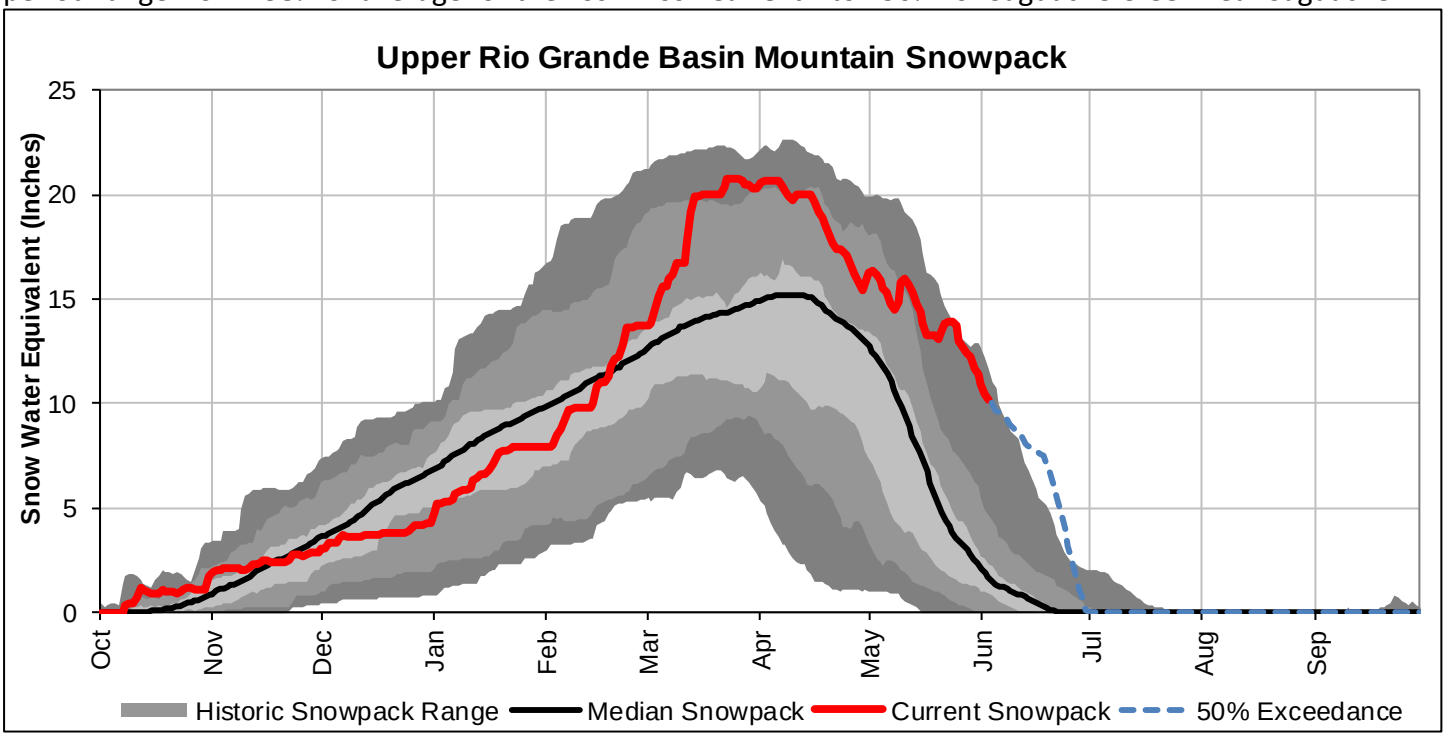
Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

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

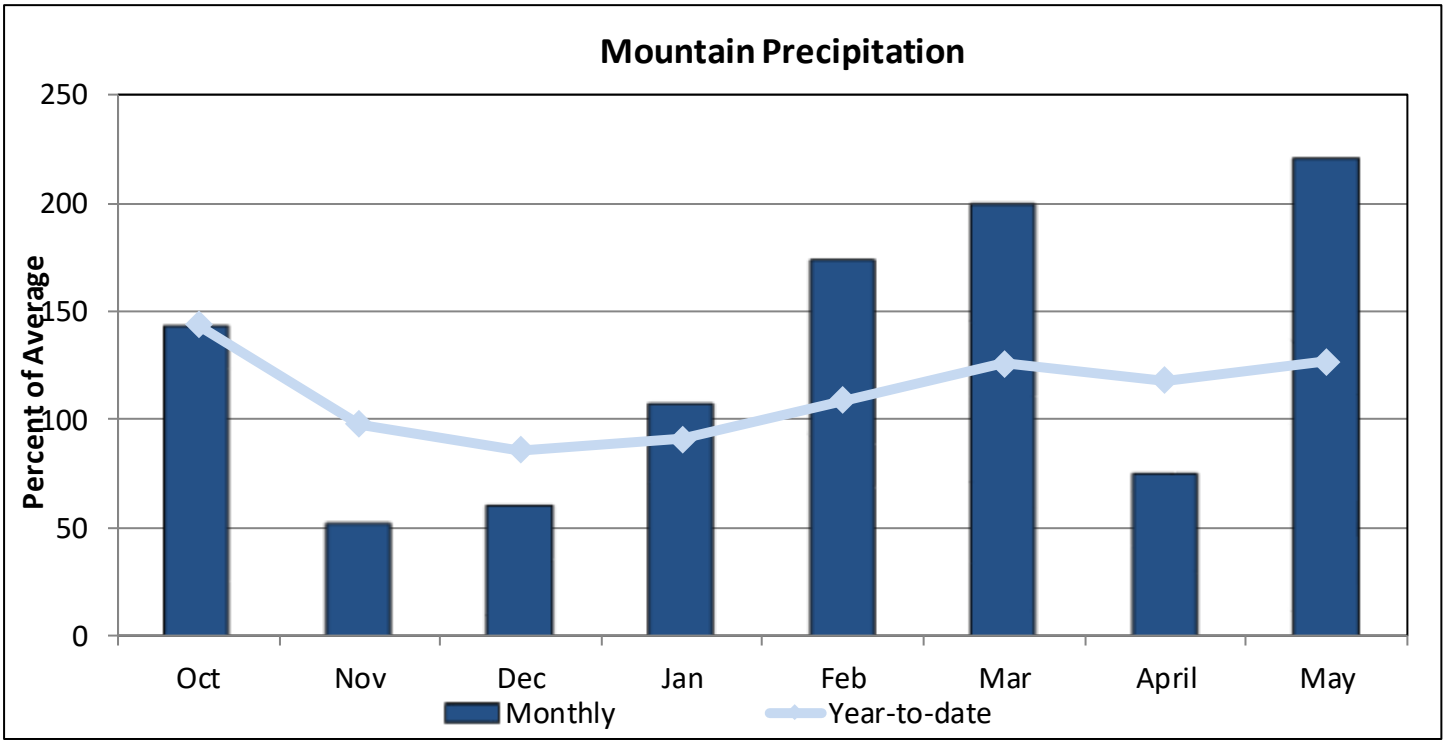
UPPER RIO GRANDE RIVER BASIN

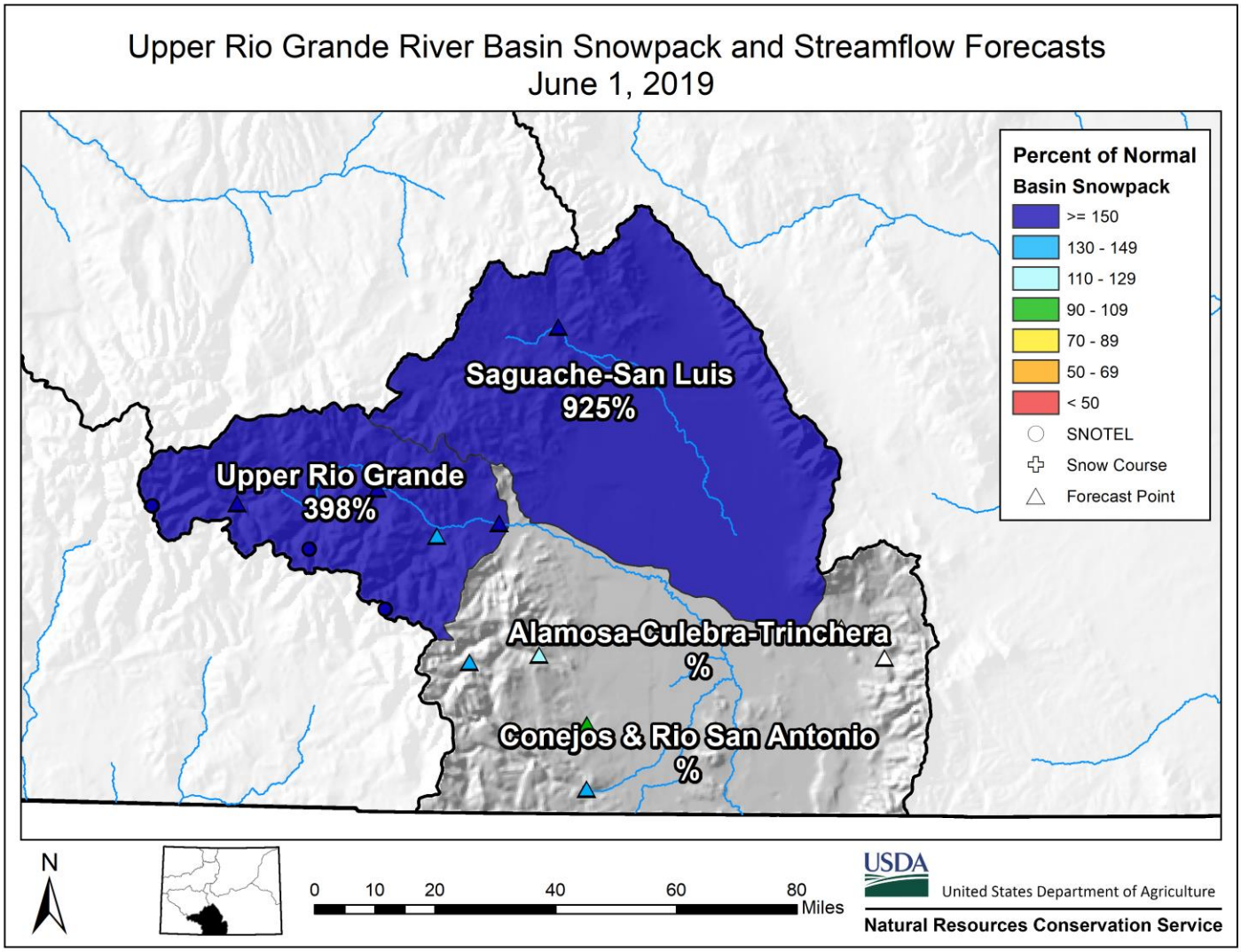
June 1, 2019

Snowpack in the Upper Rio Grande River basin is above normal at 516% of median. Precipitation for May was 221% of average which brings water year-to-date precipitation to 127% of average. Reservoir storage at the end of May was 68% of average compared to 90% last year. The June through July streamflow forecast for the Rio Grande near Lobatos is 314% of average. Other streamflow forecasts for the June through September period range from 158% of average for the Los Pinos near Ortiz to 250% for Saguache Creek near Saguache.



*SWE values calculated using daily SNOTEL data only

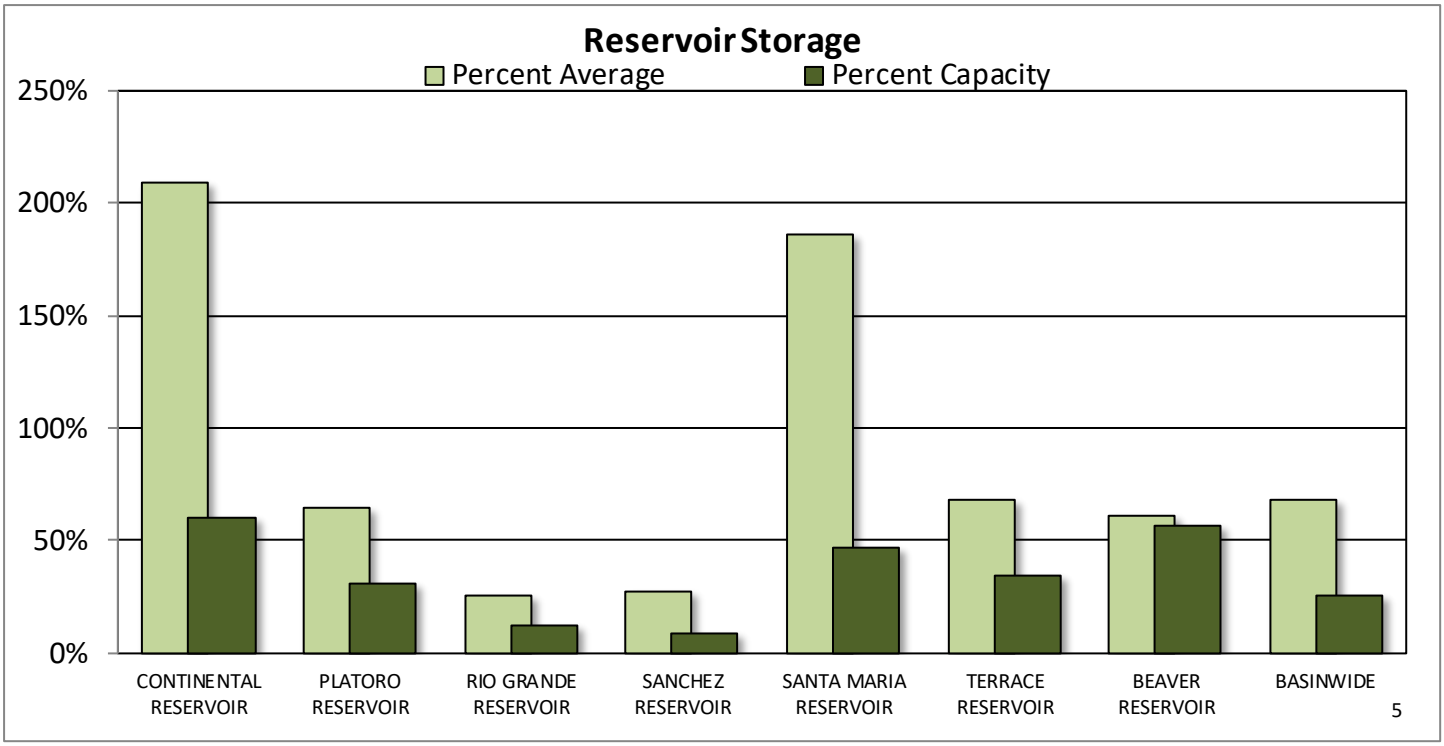




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Alamosa Creek	1		
Conejos & Rio San Antonio	2		
Culebra & Trinchera Creek	3		
Upper Rio Grande	5	398	
Basin-Wide Total	11	516	

*SWE values calculated using first of month SNOTEL data and snow course measurements



5

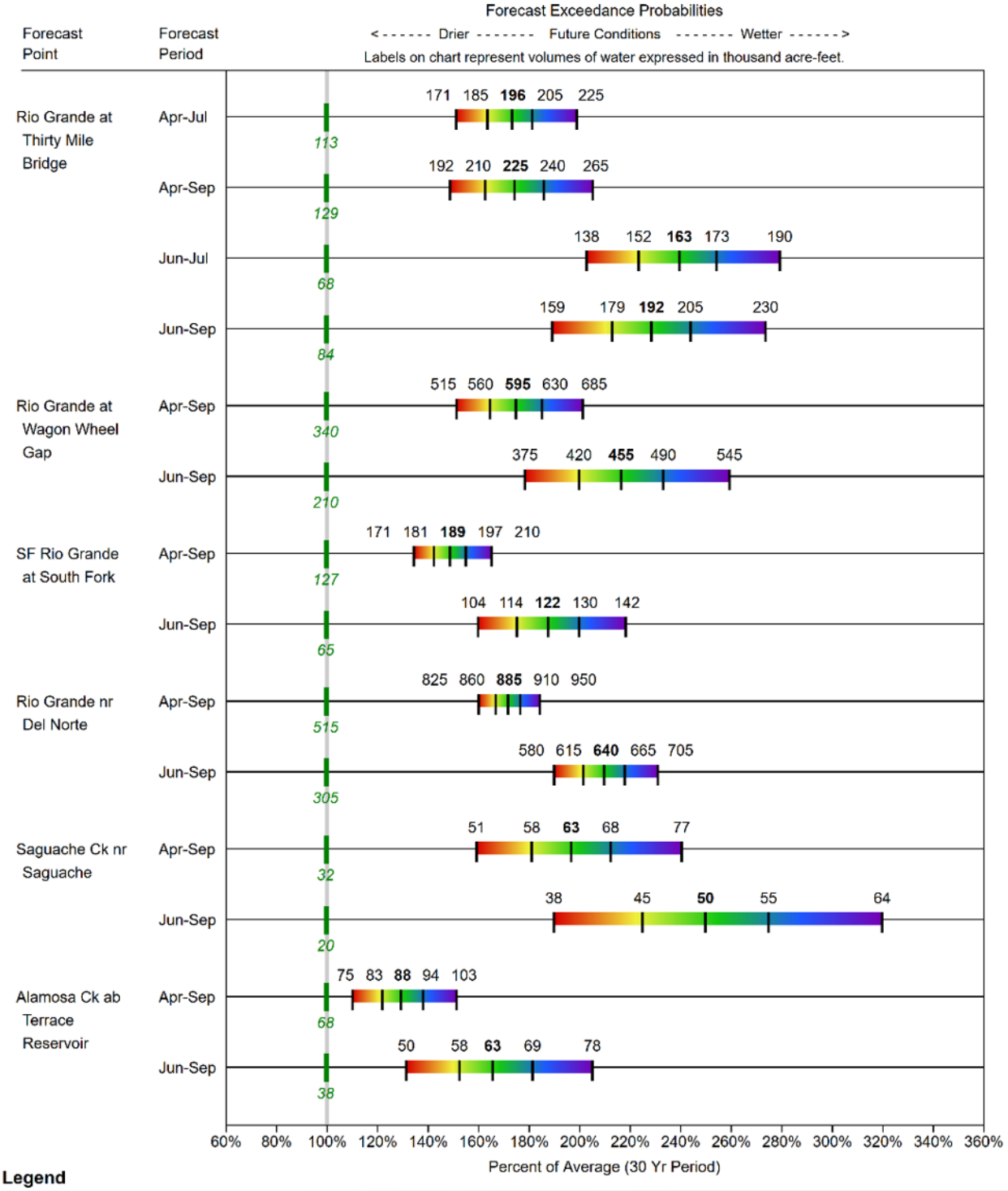
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
CONTINENTAL RESERVOIR	16.1	15.8	7.7	27.0
PLATORO RESERVOIR	18.6	24.9	28.7	60.0
RIO GRANDE RESERVOIR	6.2	12.0	23.9	51.0
SANCHEZ RESERVOIR	8.4	16.8	30.8	103.0
SANTA MARIA RESERVOIR	21.0	21.4	11.3	45.0
TERRACE RESERVOIR	6.2	9.7	9.1	18.0
BEAVER RESERVOIR	2.6	3.7	4.2	4.5
BASINWIDE	79.0	104.1	115.7	308.5
Number of Reservoirs	7	7	7	7

UPPER RIO GRANDE BASIN

Water Supply Forecasts

June 1, 2019



Legend

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

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

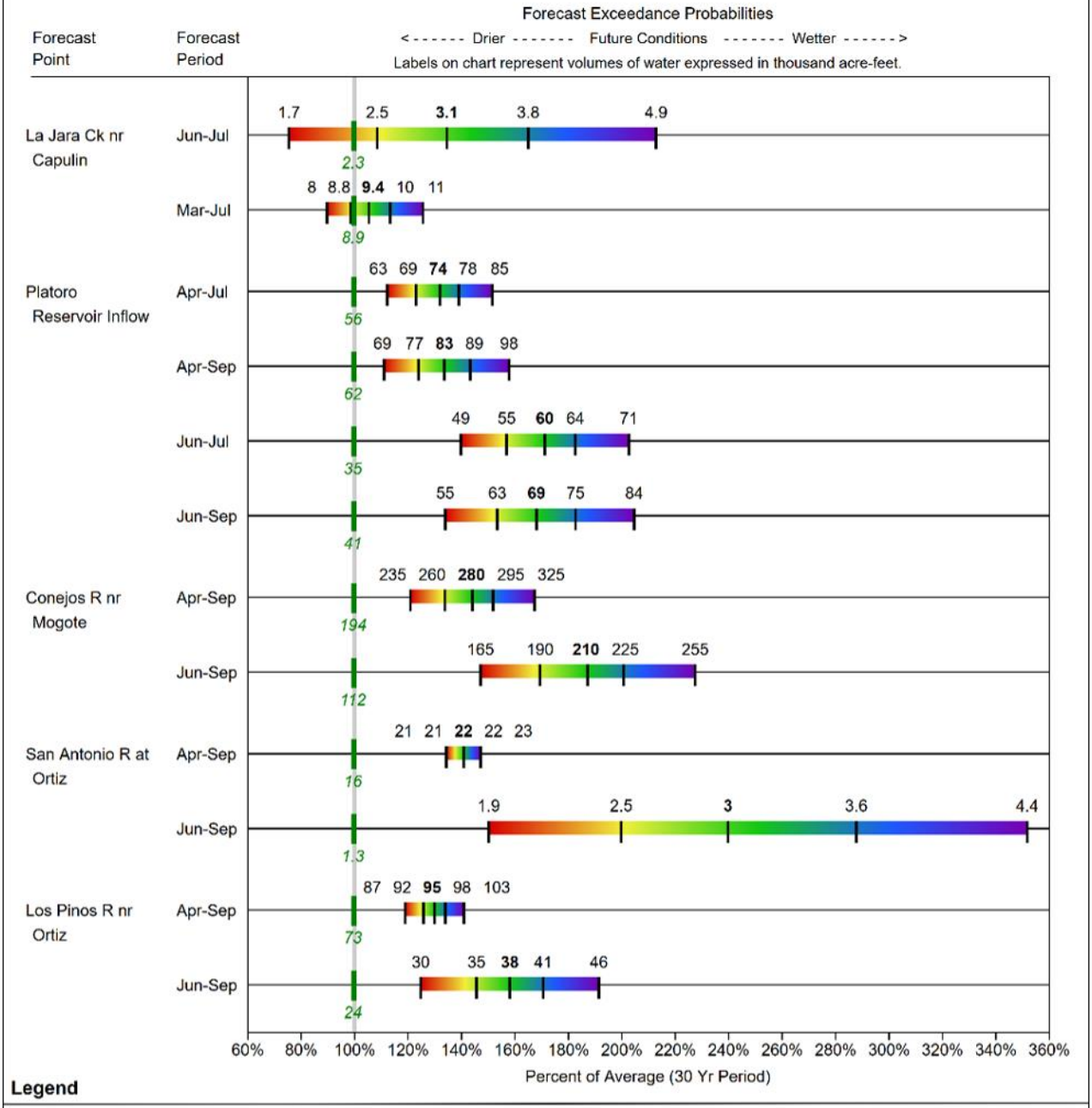
Period of Record Minimum Streamflow KAF (Year)	*1981-2010 Normal Streamflow KAF*	*Observed Streamflow KAF*	*Period of Record Maximum Streamflow KAF (Year)*

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

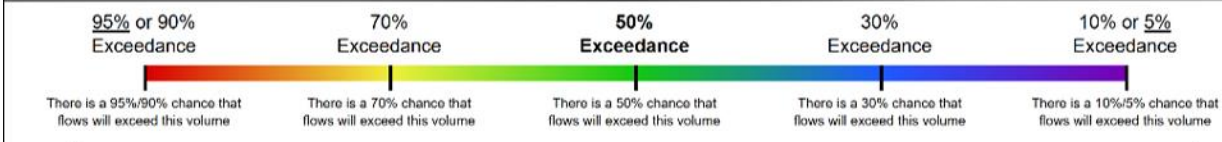
UPPER RIO GRANDE BASIN

Water Supply Forecasts

June 1, 2019



Legend



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

Period of Record Minimum Streamflow KAF (Year)

1981-2010 Normal Streamflow KAF

Observed Streamflow KAF

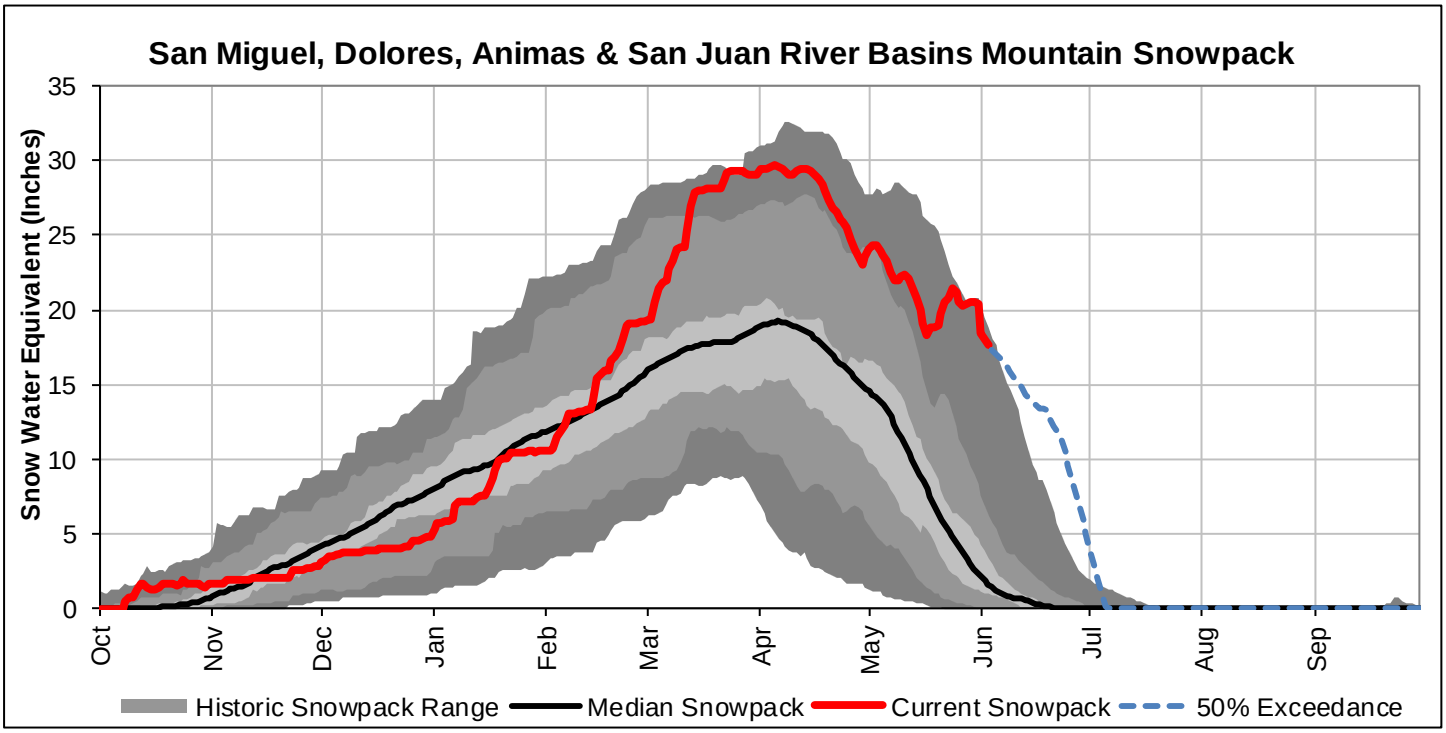
Period of Record Maximum Streamflow KAF (Year)

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

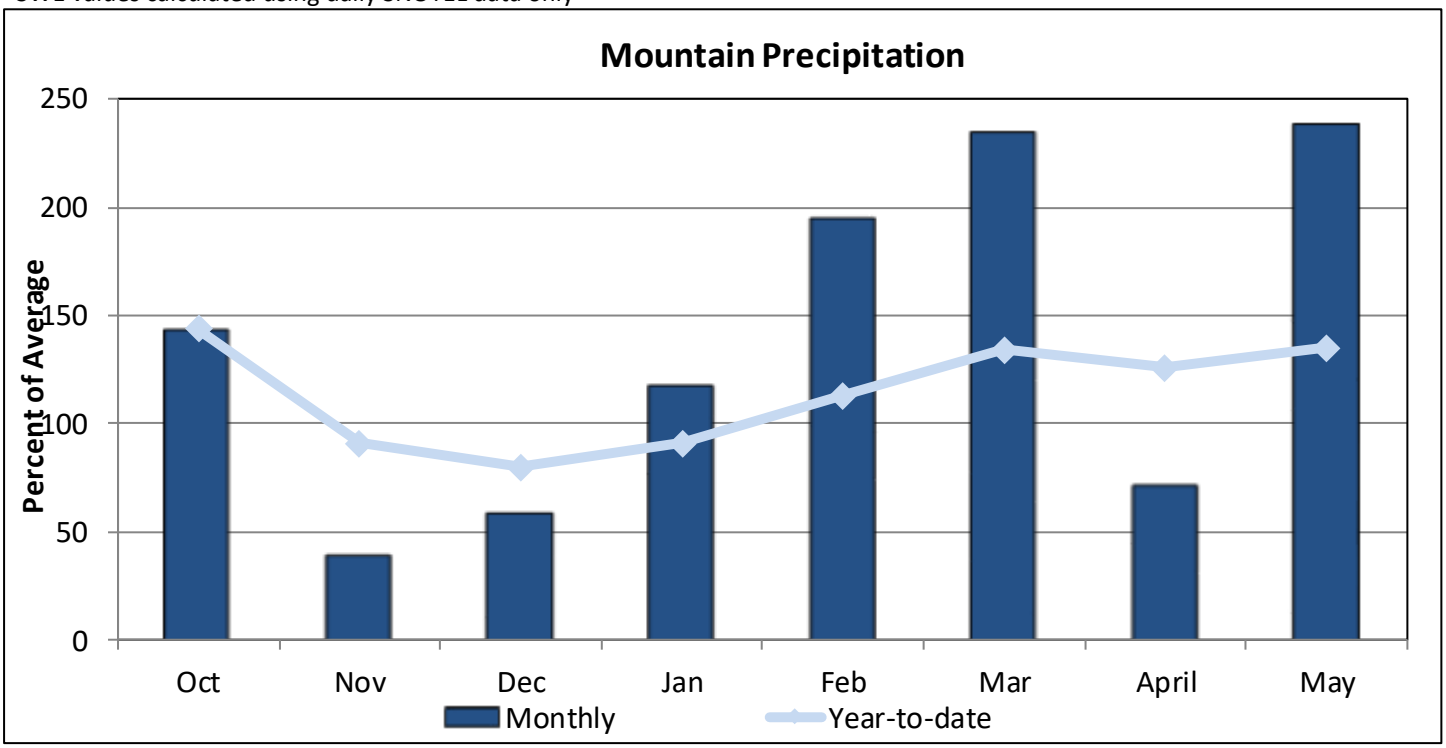
SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS

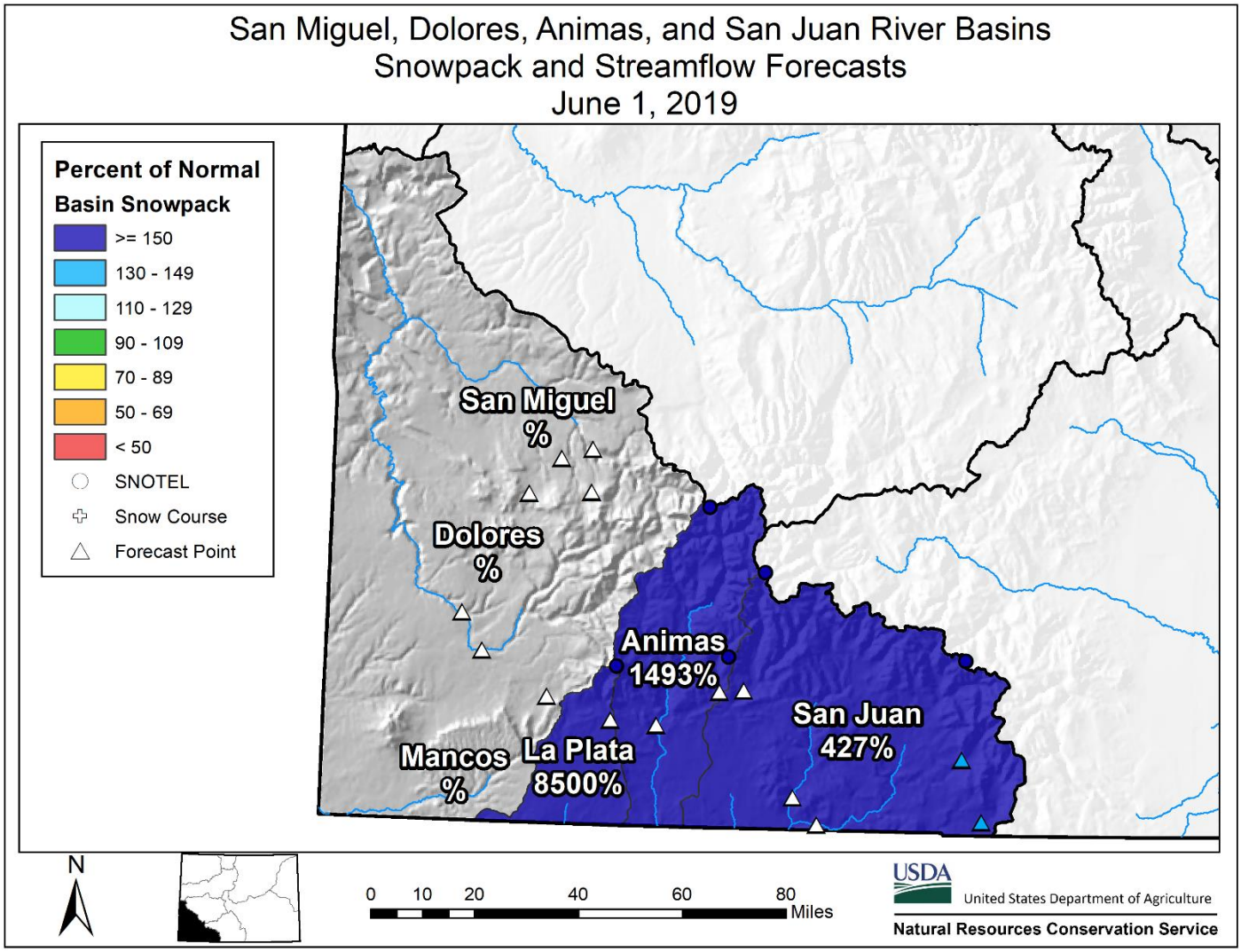
June 1, 2019

Snowpack in the combined southwest river basins is above normal at 1002% of median. Precipitation for May was 238% of average which brings water year-to-date precipitation to 135% of average. Reservoir storage at the end of May was 88% of average compared to 75% last year. Available streamflow forecasts include the Navajo River at Oso Diversion which is 190% of average for the June through July period and Rio Blanco at Blanco Diversion at 213%.



*SWE values calculated using daily SNOTEL data only

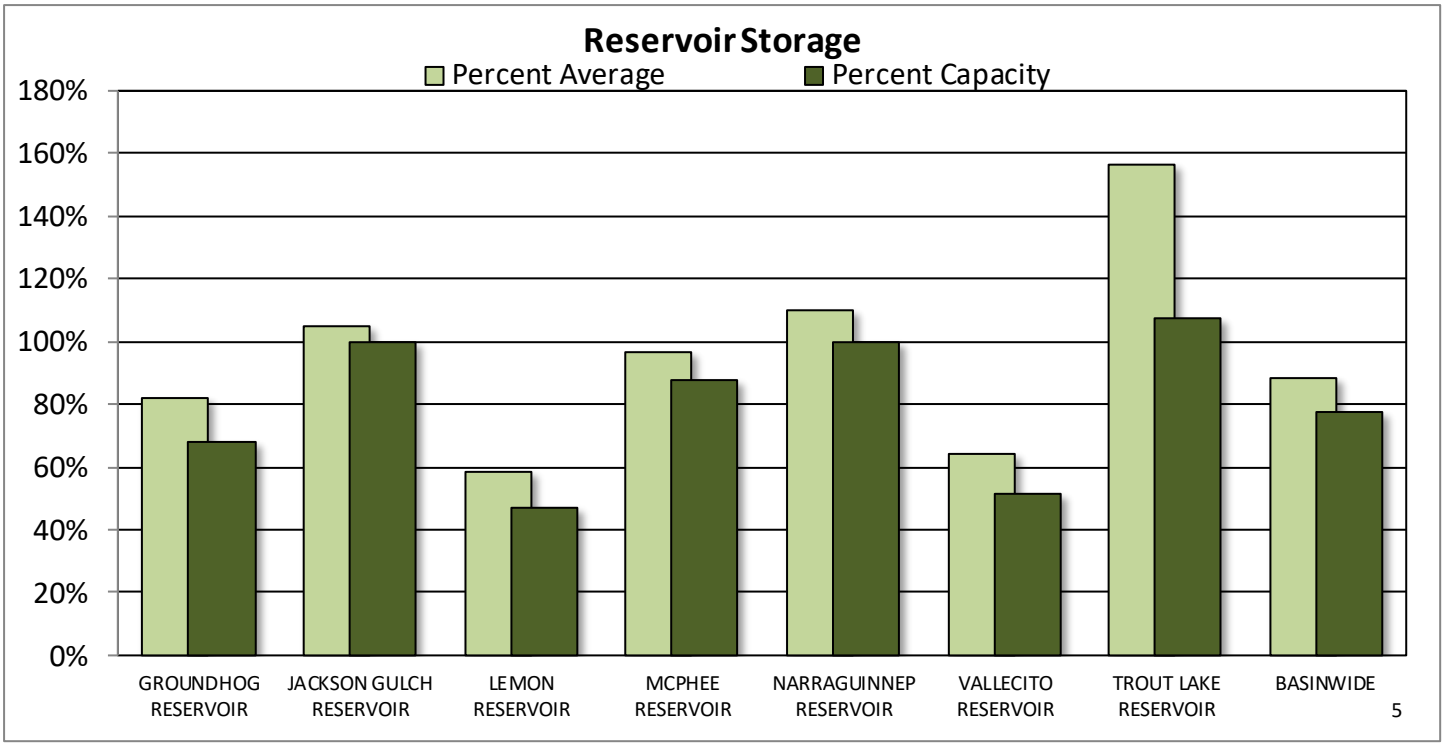




Watershed Snowpack Analysis June 1st, 2019

Sub-Basin	# of Sites	% Median	Last Year % Median
Animas	9	1493	
Dolores	5		
San Miguel	3		
San Juan	3	427	
Basin-Wide Total	19	1002	

*SWE values calculated using first of month SNOTEL data and snow course measurements



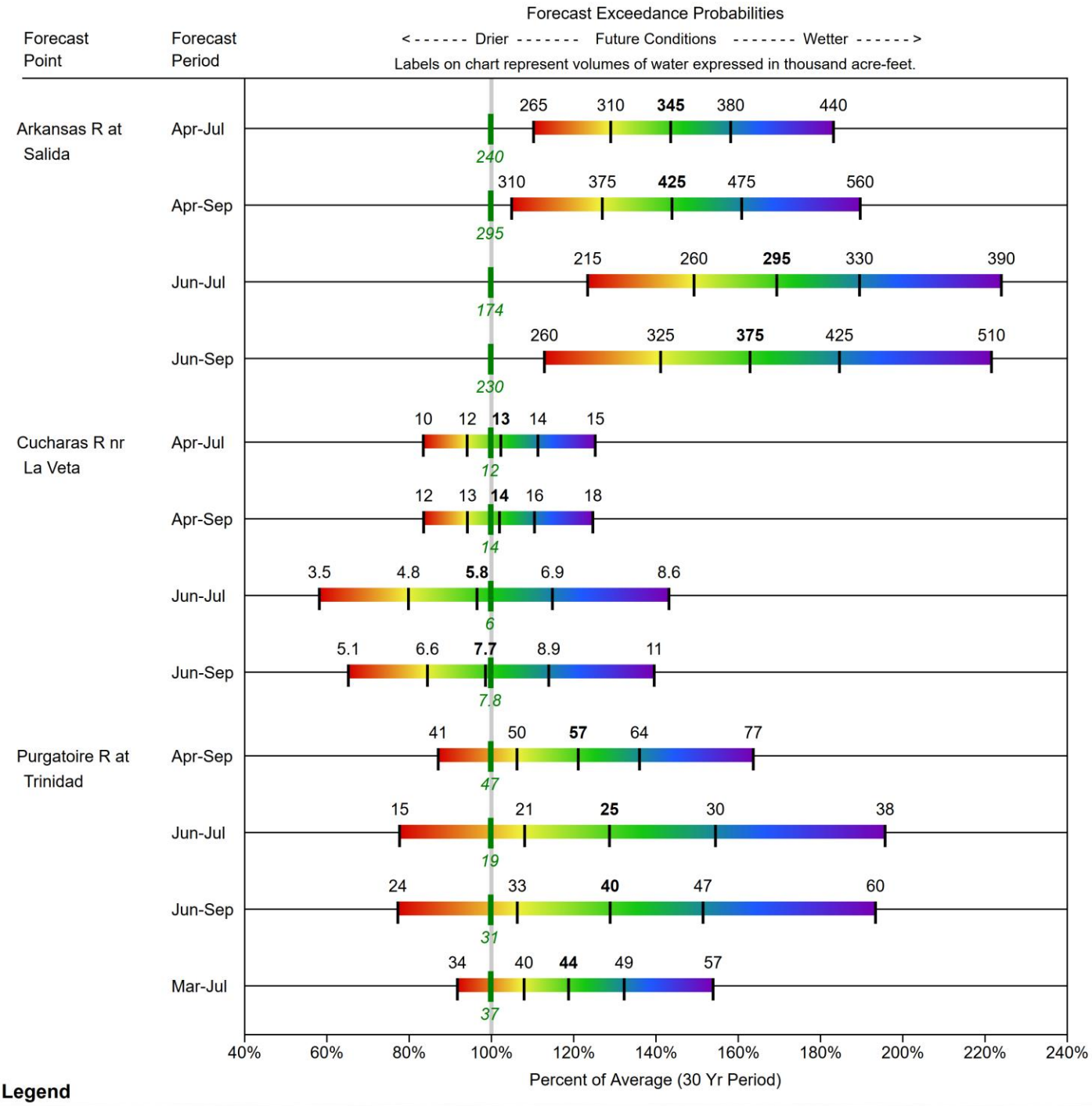
Reservoir Storage End of May 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
GROUNDHOG RESERVOIR	14.9	13.4	18.2	22.0
JACKSON GULCH RESERVOIR	10.0	5.2	9.5	10.0
LEMON RESERVOIR	18.9	18.5	32.1	40.0
MCPHEE RESERVOIR	333.7	257.2	344.7	381.0
NARRAGUINNEP RESERVOIR	19.0	10.9	17.3	19.0
VALLECITO RESERVOIR	64.5	84.4	100.7	126.0
TROUT LAKE RESERVOIR	3.4	2.8	2.2	3.2
BASINWIDE	464.3	392.3	524.7	601.2
Number of Reservoirs	7	7	7	7

ARKANSAS RIVER BASIN

Water Supply Forecasts

June 1, 2019



Legend

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

How to Read Snowpack Graphs

The graphs show snow water equivalent (SWE) (in inches), using daily SNOTEL data. for the October 1 through September 30 water year. Basin "observed" SWE values are computed using SNOTEL sites which are characteristic of the snowpack of the particular basin. The SWE observations at these sites are averaged and normalized to produce these basin snowpack graphs.

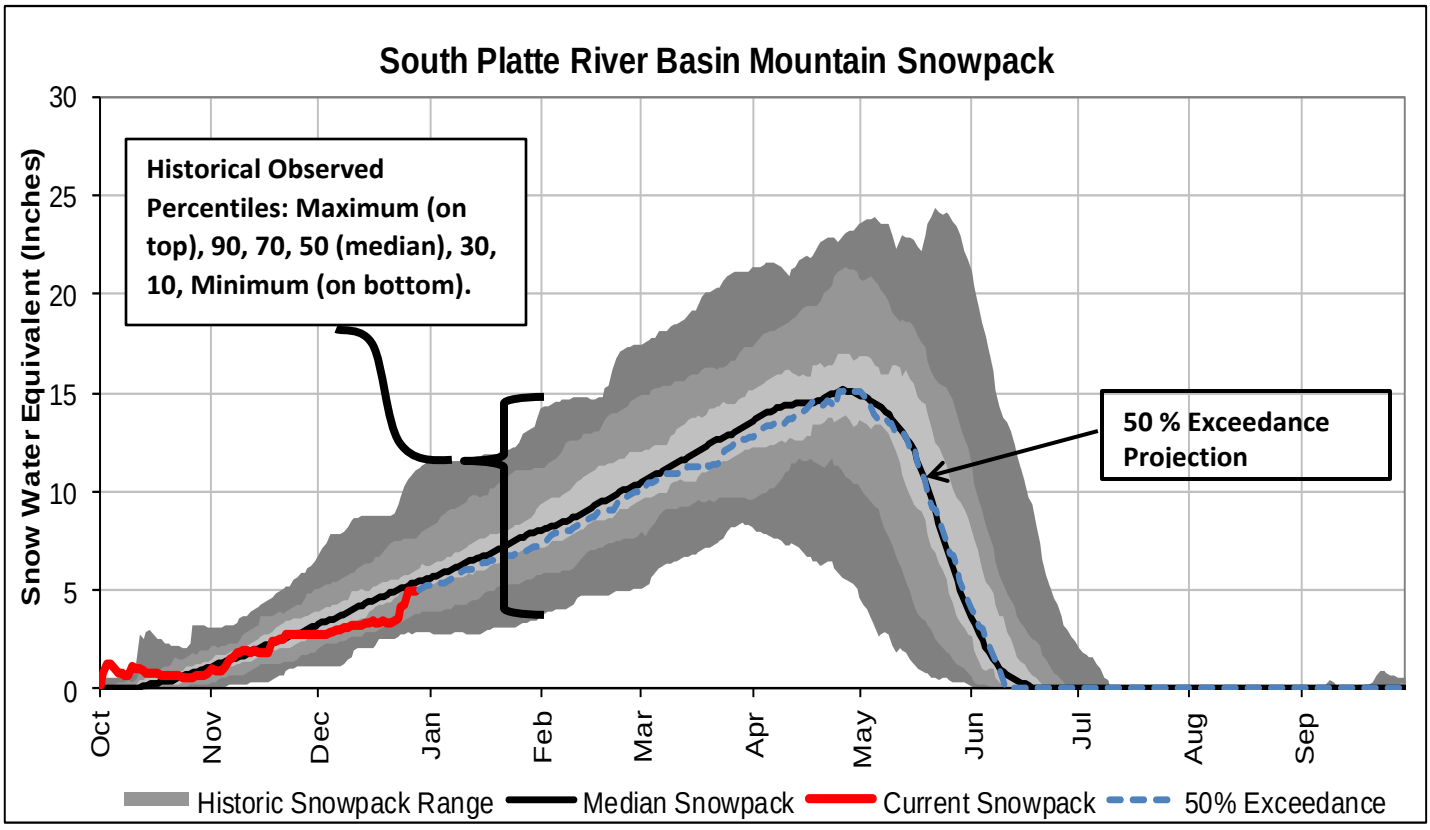
Current water year is represented by the heavy red line terminating on the last day the graphic was updated.

Historical observed percentile range is shown as a gray background area on the graph. Shades of gray indicate maximum, 90 percentile, 70 percentile, 50 percentile (solid black line), 30 percentile, 10 percentile, and minimum for the period of record.

50 % Exceedance Projection: The most probabilistic snowpack projection, based on the median snowpack is projected forward from the end of the current period to the end of the current water year.

For more detailed information on these graphs visit:

http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_062291.pdf



How Forecasts Are Made

For more water supply and resource management information, contact:

Brian Domonkos
Snow Survey Supervisor
USDA, Natural Resources Conservation Service
Denver Federal Center, Bldg 56, Rm 2604
PO Box 25426
Denver, CO 80225-0426
Phone (720) 544-2852
Website: http://www.nrcs.usda.gov/wps/portal/nrcs/main/co/snow/

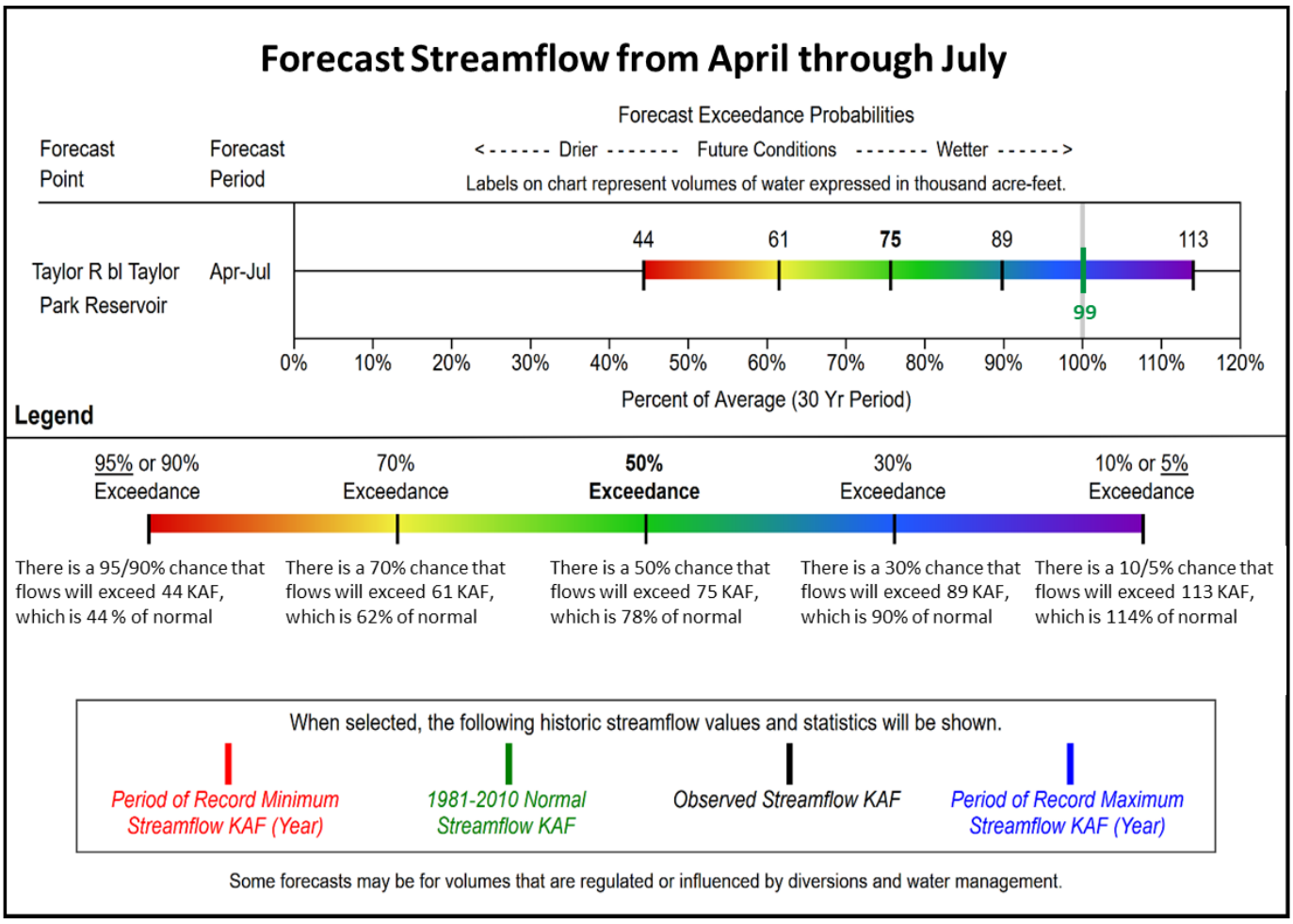
Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized 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.

Interpreting the Forecast Graphics

These graphics provide a new way to visualize the range of streamflows represented by the forecast exceedance probabilities for each forecast period. The colors in the bar for each forecast point indicate the exceedance probability of the forecasts and the vertical lines on the bar signify the five published forecast exceedance probabilities. The numbers displayed above the color scale represent the actual forecasted streamflow volume (in KAF) for the given exceedance probability. The horizontal axis provides the percent of average represented by each forecast and the gray line centered above 100% represents the 1981-2010 historical average streamflow. The position of the gray line relative to the color scale provides a benchmark for considering future streamflows. If the majority of the forecast range is to the right of the gray line, there is a higher likelihood of above average streamflow volumes during the provided forecast period. Conversely, if the majority of the color bar is to the left of the average mark, below average volumes are more likely. The horizontal span of the forecasts offers an indication of the uncertainty in a given forecast: when the bar spans a large horizontal range, the forecast skill is low and uncertainty is high; when the bar is narrow in width, the forecast skill is higher and uncertainty lower. These charts are available online here: https://www.nrcs.usda.gov/wps/portal/wcc/home/quickLinks/ForecastCharts/#state=CO&basin=GUNNISON%20RIVER%20BASIN&year=2019&pubDate=1-1&period=all



Denver Federal Center, Bldg 56, Rm 2604
PO Box 25426
Denver, CO 80225-0426

In addition to the water supply outlook reports, water supply forecast information for the Western United States is available from the Natural Resources Conservation Service and the National Weather Service monthly, January through June. The information may be obtained from the Natural Resources Conservation Service web page at http://www.wcc.nrcs.usda.gov/wsf/westwide.html

Issued by

Matthew J. Lohr
Chief, Natural Resources Conservation Service
Farm Production and Conservation Mission Area
U.S. Department of Agriculture

Released by

Clint Evans
State Conservationist
Natural Resources Conservation Service
Lakewood, Colorado

Colorado
Water Supply Outlook Report
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