

Colorado

Water Supply Outlook Report

April 1, 2018



Bill Ketterhagen, of the Gunnison Conservation District, collects snowpack data along the Crested Butte snow course under sunny skies in late March. Bill measured a course average of 6.2 inches of snow water equivalent, which is only 46 percent of normal for April 1st and the fourth lowest snowpack observed since the course was established in 1936. As a whole, snowpack in the Gunnison River basin was at 58 percent of normal on April 1st.

Photo By: Andrew Breibart Date: March 30, 2018

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.

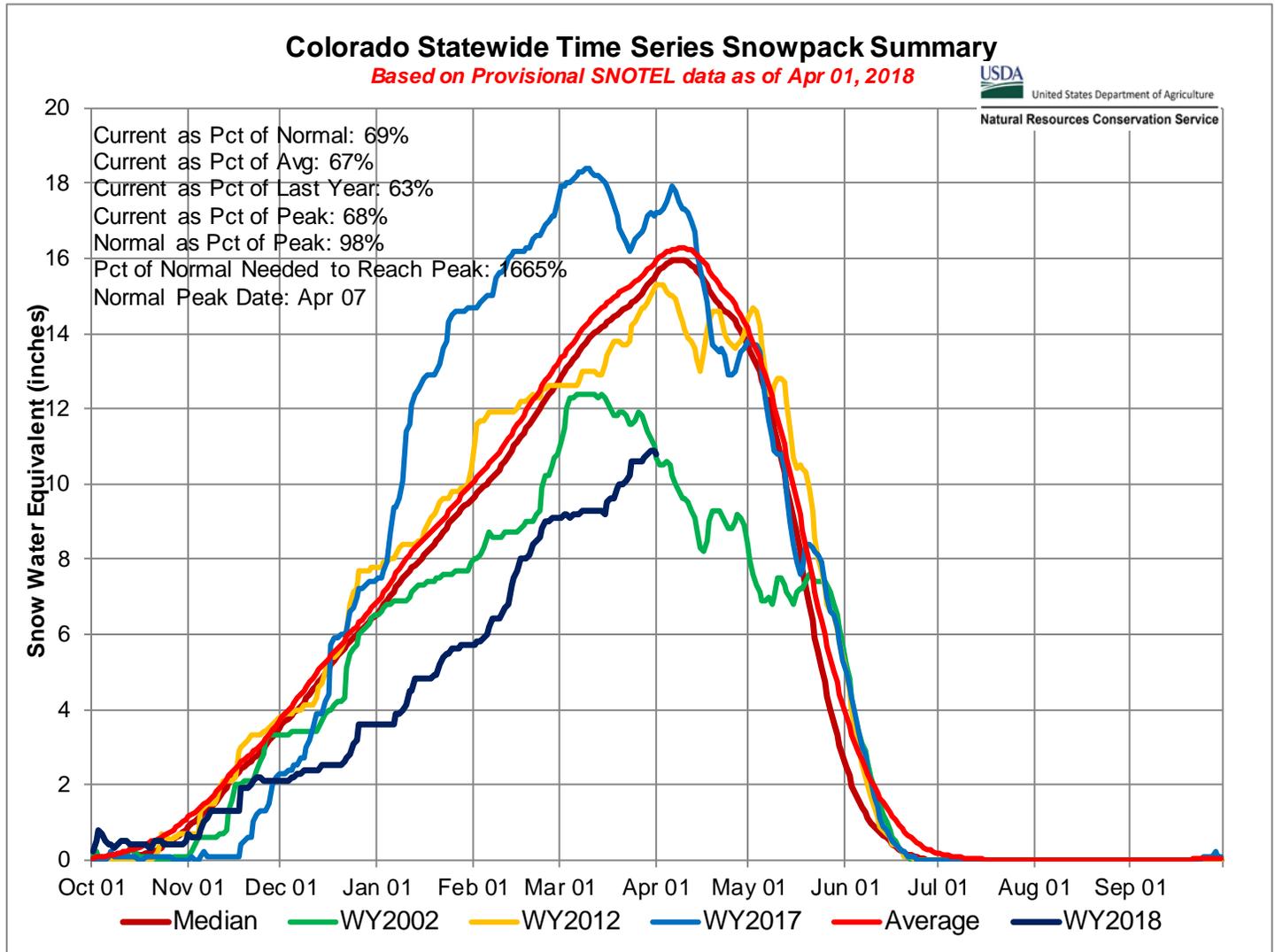
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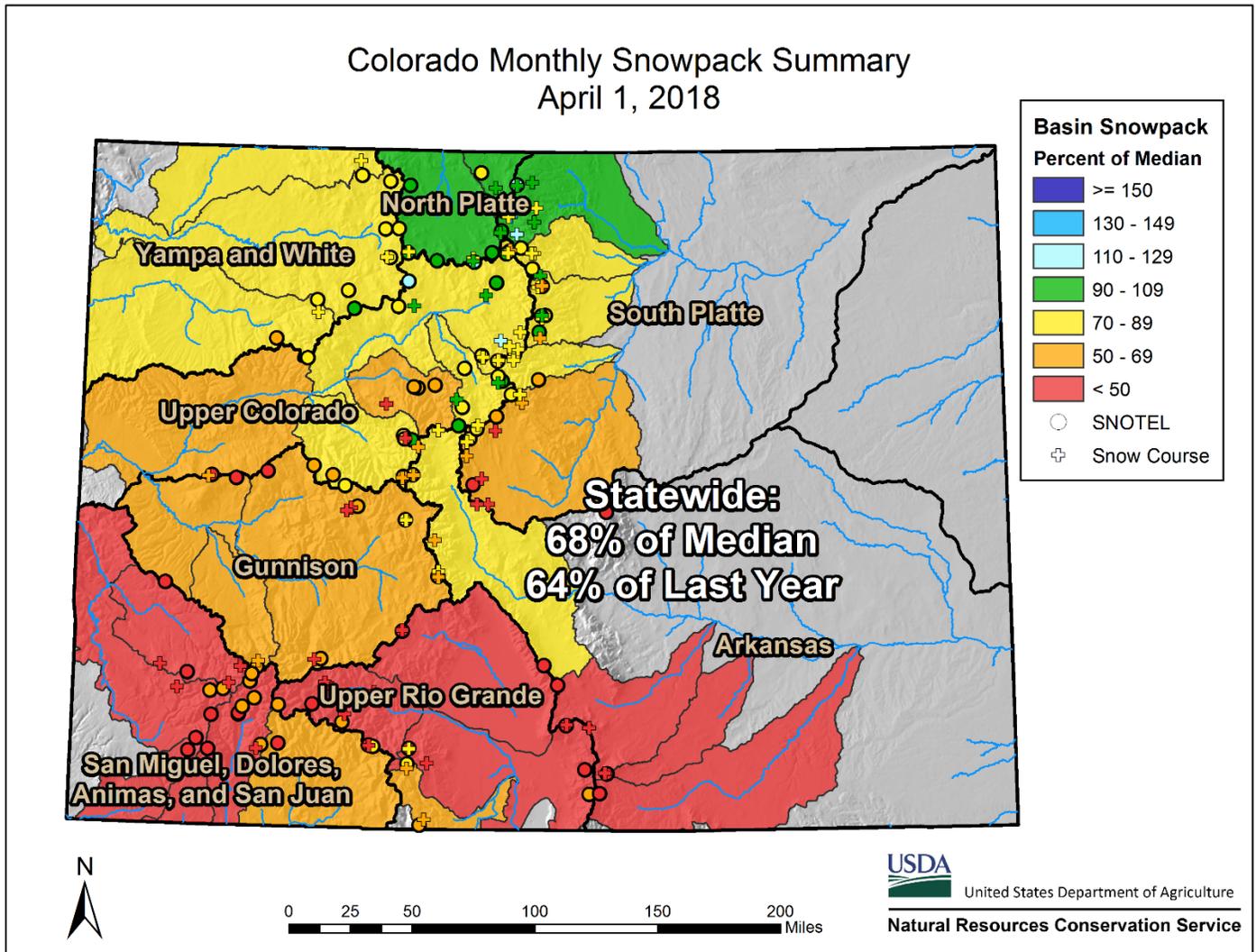
Colorado Statewide Water Supply Conditions

Summary



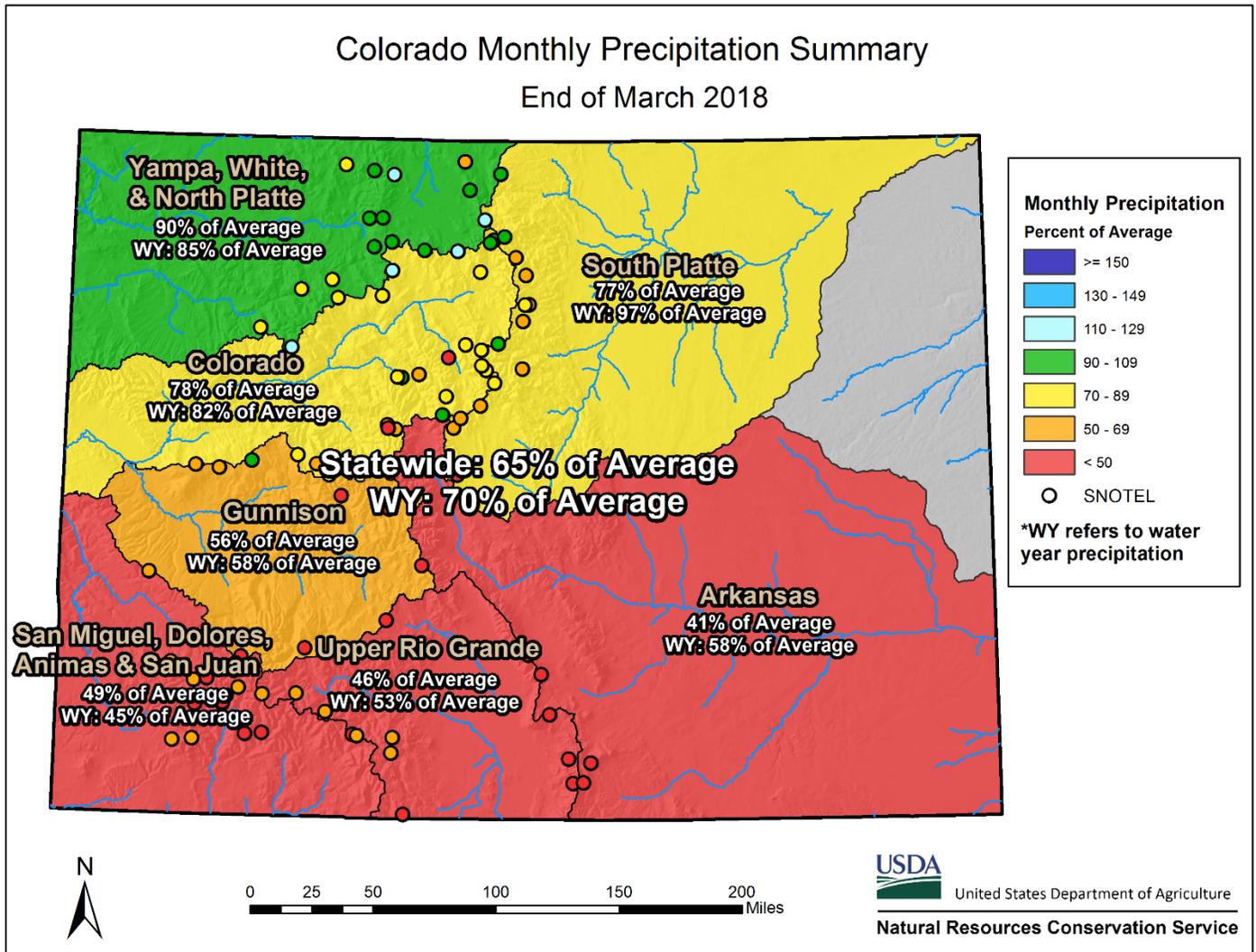
As we near the end of the primary snowpack accumulation season, the snowpack and streamflow forecast situation varies widely across Colorado but both are below normal across the board. Snowpack in the mountains of southern Colorado is less than 50 percent of normal which is also reflected in the volumetric streamflow forecasts for the spring and summer. The snowpack generally improves as you move north across the state with the Colorado, Yampa, and South Platte basins ranging between 80-83 percent of median, and the North Platte at 95 percent. Although this is substantially better than southern Colorado, there are still currently no streamflow forecasts in the state for above average seasonal volumes. While relatively meager streamflows are expected statewide, the good news going into this summer is that every major basin in the state is still holding above average reservoir storage. Statewide storage is currently 114 percent of average, with individual basins ranging from 101 percent in the combined San Miguel, Dolores, Animas, and San Juan basins to a high of 131 in the Arkansas. The water currently held in Colorado's reservoirs may help buffer the low streamflows anticipated this summer, but reservoirs must also be managed for a variety of purposes, so storage volumes will likely be a closely watched and managed resource. There is still some uncertainty in how future weather will impact Colorado's water supply, but it should be noted that the [Three Month Outlook](#) issued by the NOAA Climate Prediction Center suggests a continuing trend of above average temperatures and below average precipitation so it is advisable to plan for water resource use accordingly.

Snowpack



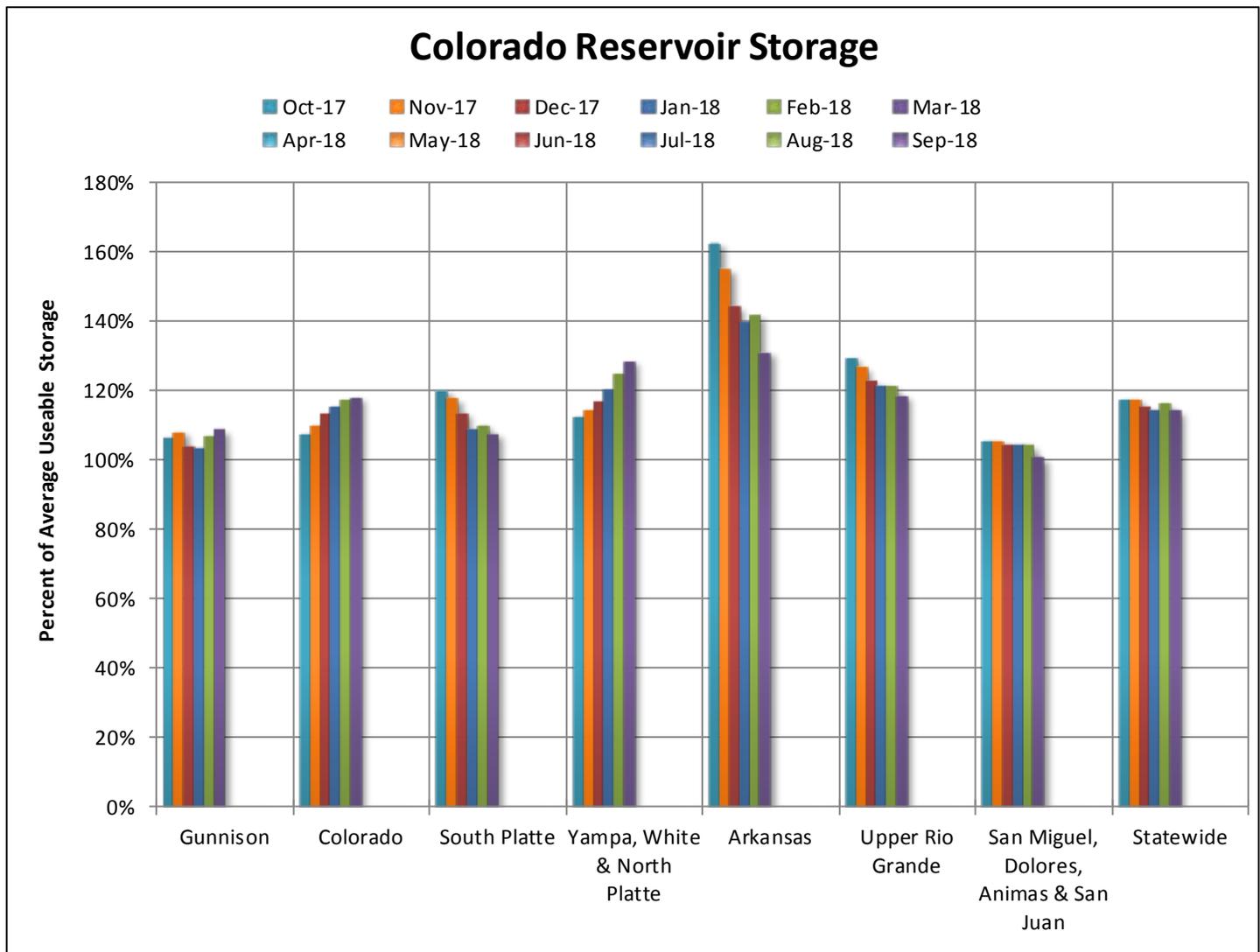
March storms failed to deliver the abundant snowfall that Colorado has been waiting for to boost mountain snowpack. Last month's snowpack accumulations were below normal at all but about a quarter of Colorado's snow monitoring locations. The southern river basins, still enduring the snow drought that has impacted the southwest this winter, experienced an increase in snowpack that was less than 50 percent of the accumulations normally seen in March. The Upper Rio Grande and combined San Miguel, Animas, Dolores, and San Juan River basins continue to hold the lowest overall snowpack in the state at 48 and 47 percent of median respectively. The Arkansas and Gunnison River basins have only slightly more improved snowpacks at 55 and 58 percent of normal respectively. With the exception of the North Platte River basin and some isolated sub-basins, Colorado's northern river basins all have snowpack near 80 percent of normal with the Colorado, Yampa and White, and South Platte basins at 80, 81, and 83 percent of normal respectively. The North Platte River basin has the best snowpack in the state at 95 percent of normal. Collectively, mountain snowpack in Colorado is at 68 percent of average, the worst April 1 statewide snowpack reported since 2012. We are approaching the time of the year when the mountains in most of the state's major river basins typically reach their maximum snowpack levels. Accordingly, the percent of peak snowpack for the major river basins generally mirror their respective overall snowpack percent of normal. With all basins expected to have total accumulations for the season below normal, we can only hope for cool spring temperatures to moderate the melt of Colorado's mountain snowpack and sustain runoff for as long as possible.

Precipitation



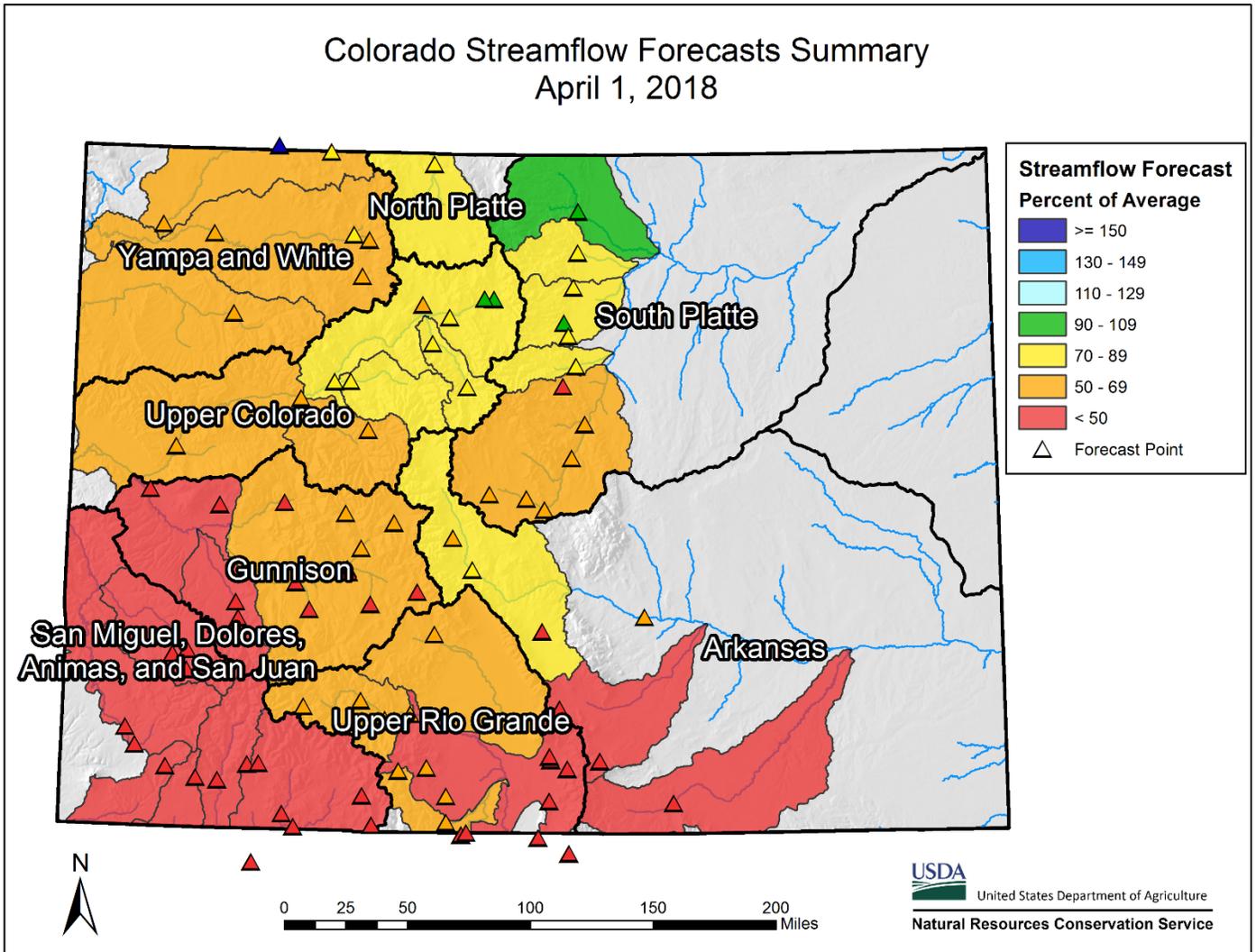
While better than the fall months, mountain precipitation during March was the worst experienced in most of Colorado’s river basins this calendar year. That state’s southern river basins generally received less than 50 percent of normal March precipitation and 31 SNOTEL sites are reporting the lowest water year precipitation experienced in over twenty years. In the Arkansas River basin, precipitation for the month was only 41 percent of average, while conditions were equally poor in the Upper Rio Grande and the combined San Miguel, Animas, Dolores, and San Juan River basins, which were at 46 and 49 percent of average for the month respectively. Slightly better than half of normal values, the Gunnison River basin received 56 percent of normal precipitation for the month. The South Platte and Colorado River basins had respective March accumulations of 77 and 78 percent of average while the combined Yampa, White, and North Platte River basins experienced the most precipitation for the month with accumulations reaching 90 percent of average. The precipitation falling during March did little to affect the total water year precipitation across Colorado, and most basins experienced either no change or a slight drop in the percent of average water year precipitation. The South Platte River basin remains the nearest to normal for the water year, at 97 percent of average while the other basins continue to be below 90 percent of average. The San Miguel, Dolores, Animas, and San Juan River basins have had the lowest overall precipitation this water year, and the combined basin is at 45 percent of average. With half of the water year remaining, Statewide precipitation accumulations are at 70 percent of normal.

Reservoir Storage



While there was a slight drop in total statewide reservoir storage over the last month, reservoir levels still remain above normal at 114 percent of average. The most substantial declines were seen in the Arkansas River basin, but at 131 percent of average reservoirs in this basin are still holding the highest amount of storage in the state, relative to normal. The combined Yampa, White, and North Platte basins have the next highest percent of average storage in the state, at 129 percent which is a slight increase over last month. The Upper Rio Grande and Colorado River basins are also well above normal holding 119 and 118 percent of average, respectively. This above average storage will be particularly beneficial to the Rio Grande basin this summer where snowpack and streamflow forecasts are currently very low. Getting closer to average storage values are the Gunnison basin which has 109 percent of average and the South Platte River basin at 106 percent. After holding quite steady for the water year, reservoir storage in the combined San Miguel, Dolores, Animas, and San Juan basins dropped about four percent since last month to reside just above normal at 101 percent of average. With the primary snowpack accumulation season nearing its end and extremely low snowpacks across all of southern Colorado, the water stored in reservoirs will likely become a valuable resource this summer and further down the road depending on future precipitation and next year's snow accumulations.

Streamflow

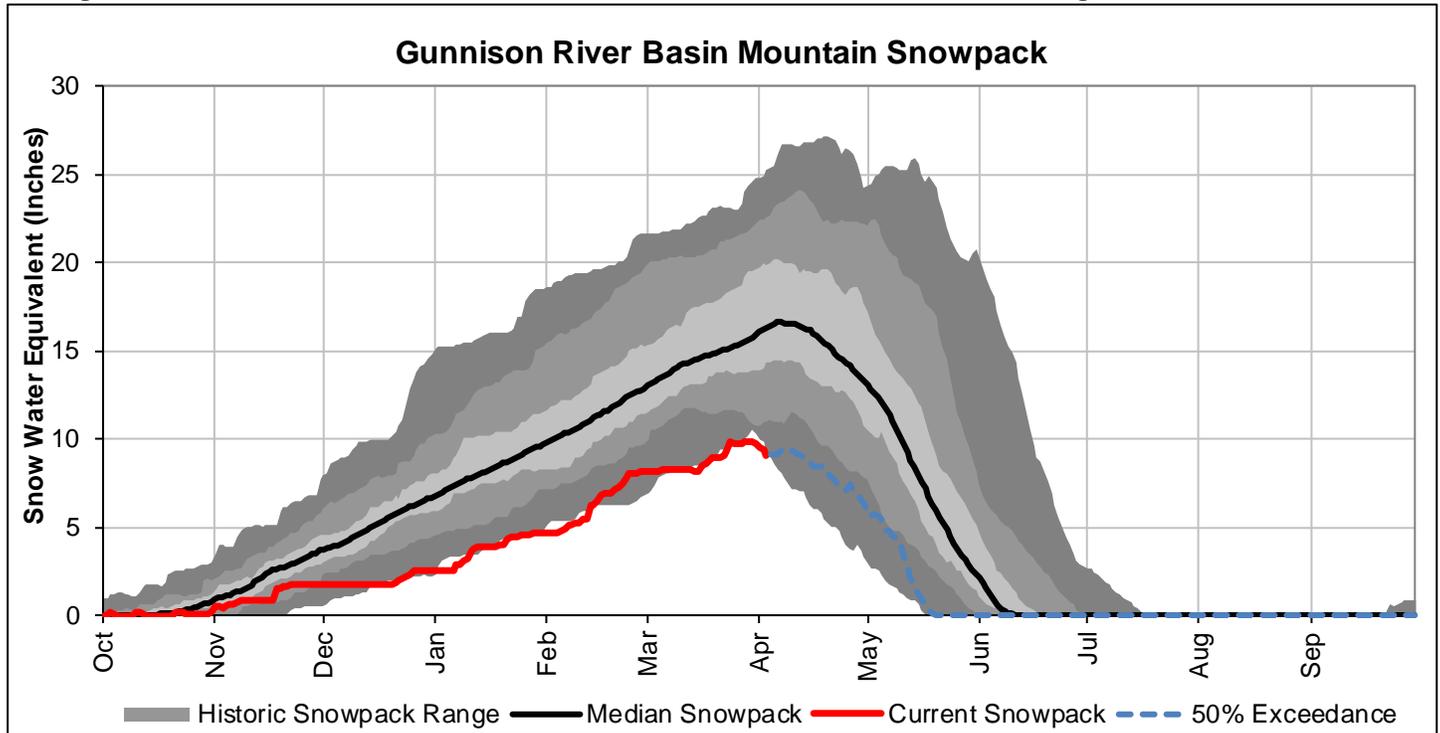


After a rather dry March, streamflow forecasts across the state showed notable declines since a month ago. This is most evident looking at some of the major forecast points in southern and western Colorado. The Gunnison River at Grand Junction is forecasted to have only 33 percent of average streamflow which is the same for the Animas at Durango, and only slightly less than the San Miguel at Placerville. Some streams in the Colorado River headwaters are forecasted to be closer to normal (but none above), which improves the outlook for that basin as a whole. However, downstream the Colorado at Cameo is still forecasted for only 64 percent of average volume, which is a 12 percent drop from last month. The Yampa at Maybell is forecasted for 61 percent of average. The forecast for total inflow into Lake Powell is a mere 38 percent of average, a deficit of over 4.4 million acre-feet of water compared to the 30-year average. Most streamflow forecasts in the Upper Rio Grande basin are for near 50 percent of average seasonal volumes but they get dramatically lower the further south you look. In the Arkansas basin, the upper main stem does not look great but is better than the basins to the west. Streamflow volumes for the Arkansas River are forecasted for 64 percent of average at Pueblo but the southern tributaries are looking to be extremely dry this summer, as low as 20 percent of average for the Purgatoire at Trinidad. Forecasts across the South Platte vary widely with a strong trend of lower forecasts in the southern end of the basin and increasing to more promising forecasts along the northern Front Range. These span from lows near 50 percent of average for the inflow to Antero Reservoir and Bear Creek at Evergreen to a high of 96 percent for the Cache la Poudre, the highest streamflow forecast in the state.

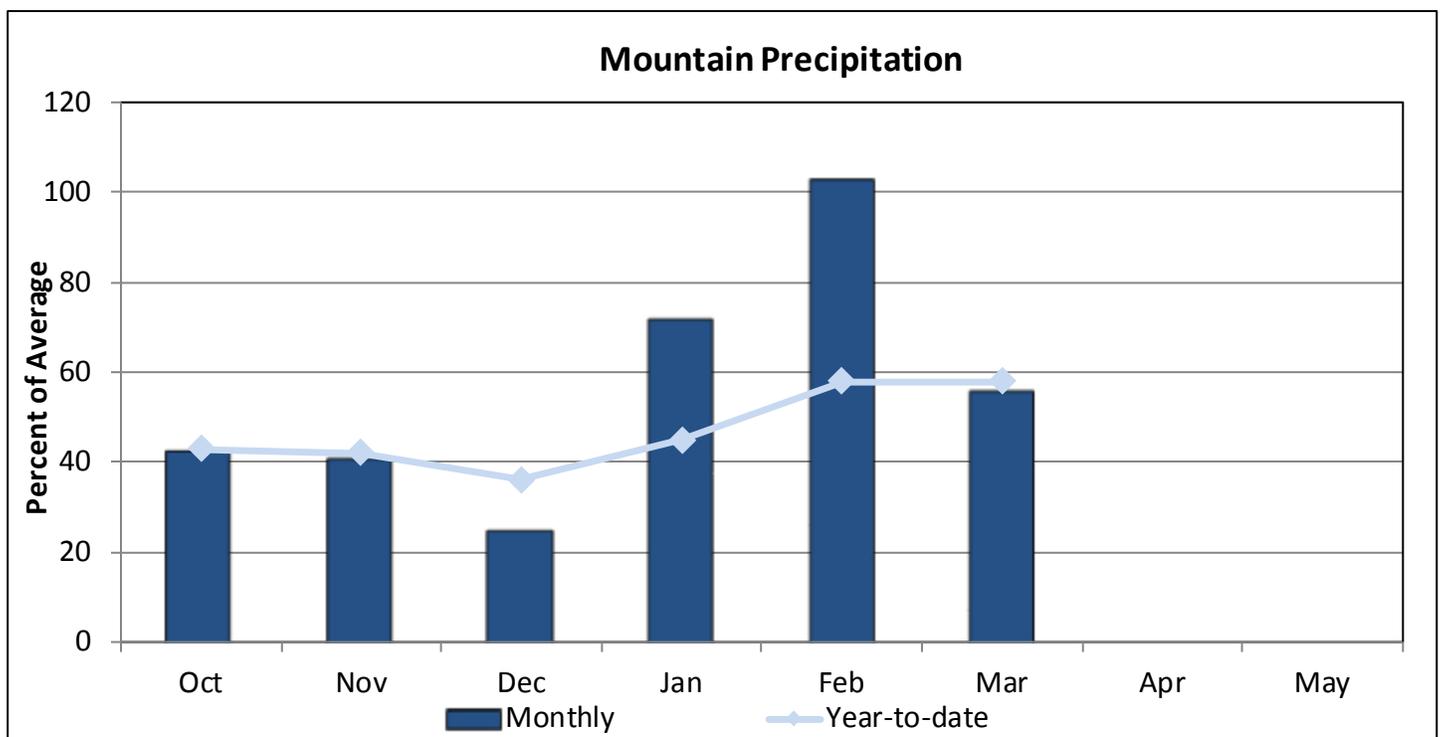
GUNNISON RIVER BASIN

April 1, 2018

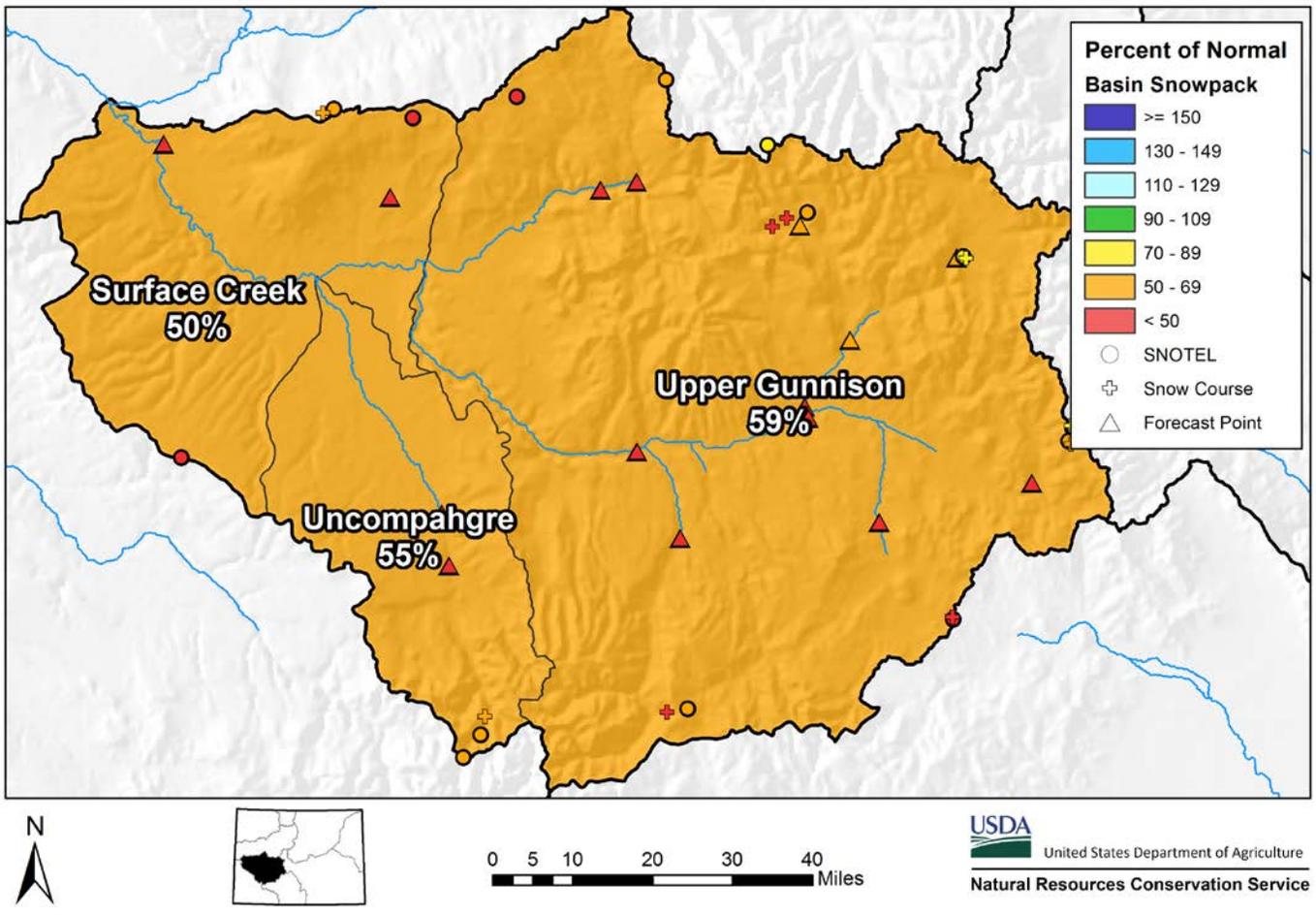
Snowpack in the Gunnison River basin is below normal at 58% of the median. Precipitation for March was 56% of average which brings water year-to-date precipitation to 58% of average. Reservoir storage at the end of March was 109% of average compared to 116% last year. Current streamflow forecasts range from 63% of average for the Slate River near Crested Butte to 25% for Surface Creek at Cedaredge.



*SWE values calculated using daily SNOTEL data only



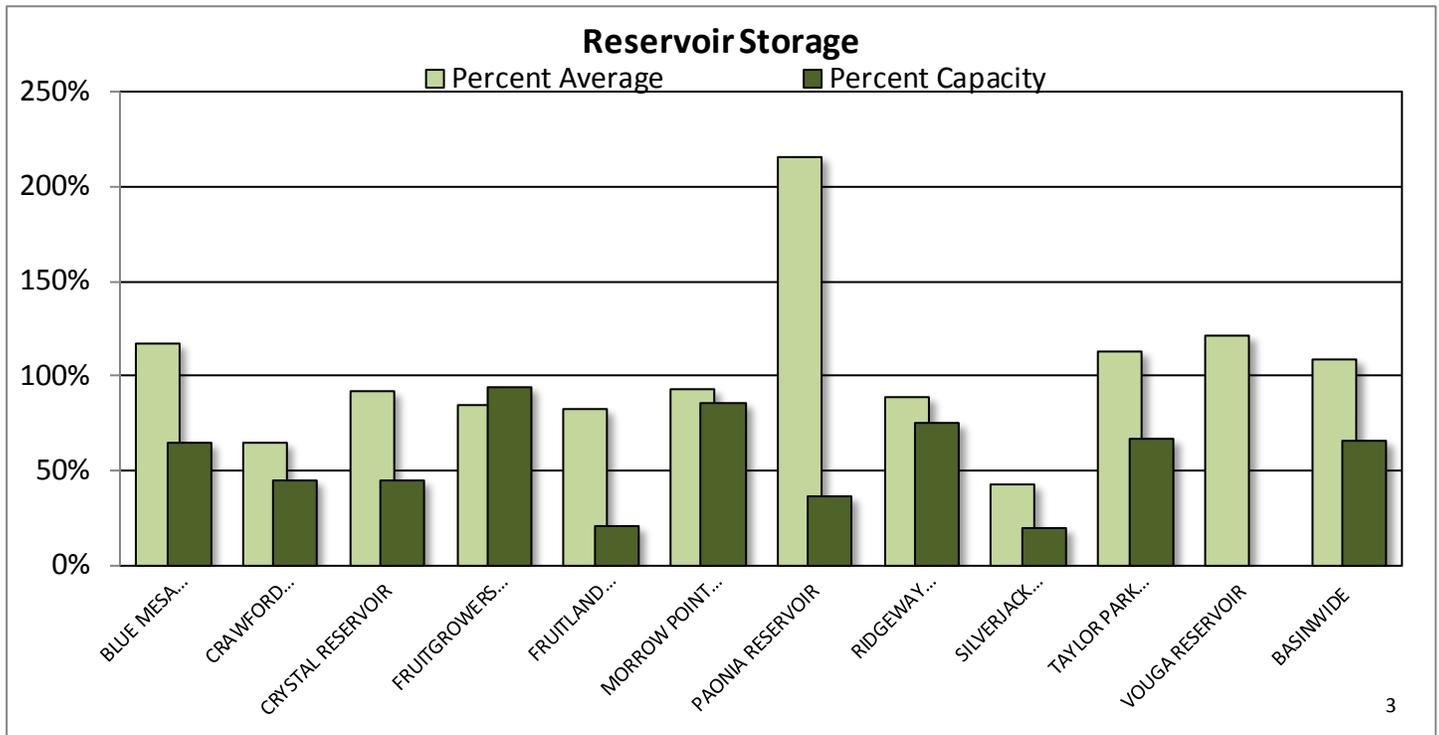
Gunnison River Basin Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			% Median	Median
Upper Gunnison	18	59		128
Surface Creek	3	50		108
Uncompahgre	4	55		114
Basin-Wide Total	22	58		125

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
BLUE MESA RESERVOIR	533.5	571.4	454.9	830.0
CRAWFORD RESERVOIR	6.2	10.6	9.7	14.0
CRYSTAL RESERVOIR	7.8	9.0	8.5	17.5
FRUITGROWERS RESERVOIR	3.4	3.6	4.0	3.6
FRUITLAND RESERVOIR	1.9	3.4	2.3	9.2
MORROW POINT RESERVOIR	103.7	108.3	111.7	121.0
PAONIA RESERVOIR	5.6	2.6	2.6	15.4
RIDGEWAY RESERVOIR	62.4	65.6	70.0	83.0
SILVERJACK RESERVOIR	2.5	3.5	6.0	12.8
TAYLOR PARK RESERVOIR	70.7	68.7	62.4	106.0
VOUGA RESERVOIR	0.9	0.6	0.8	0.9
BASINWIDE	798.7	847.2	732.9	1213.4
Number of Reservoirs	11	11	11	11

GUNNISON RIVER BASIN

Water Supply Forecasts

April 1, 2018

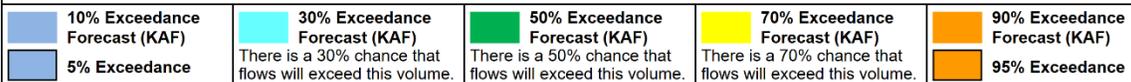
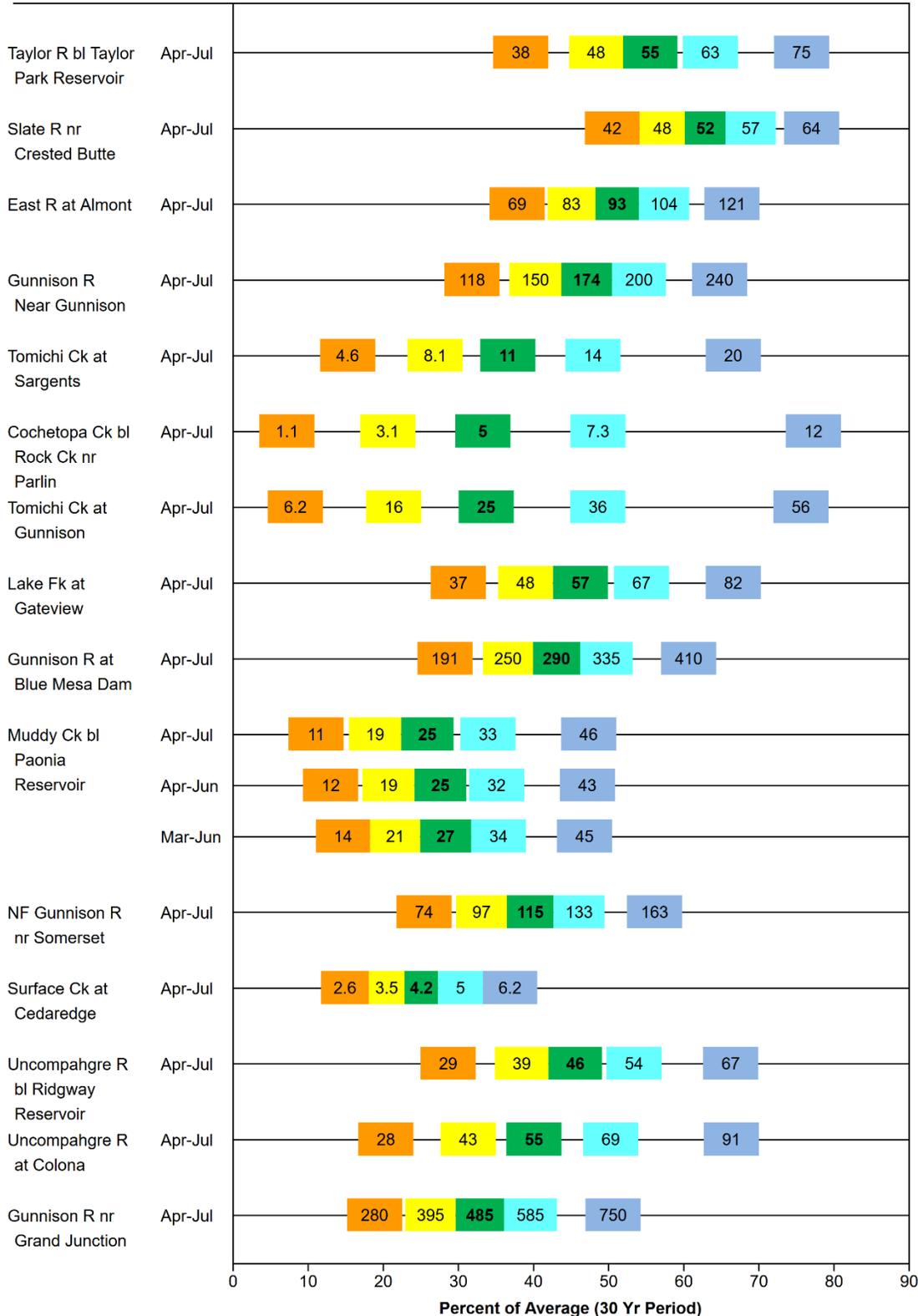
Forecast Exceedance Probabilities and Volumes

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

Forecast Point

Forecast Period

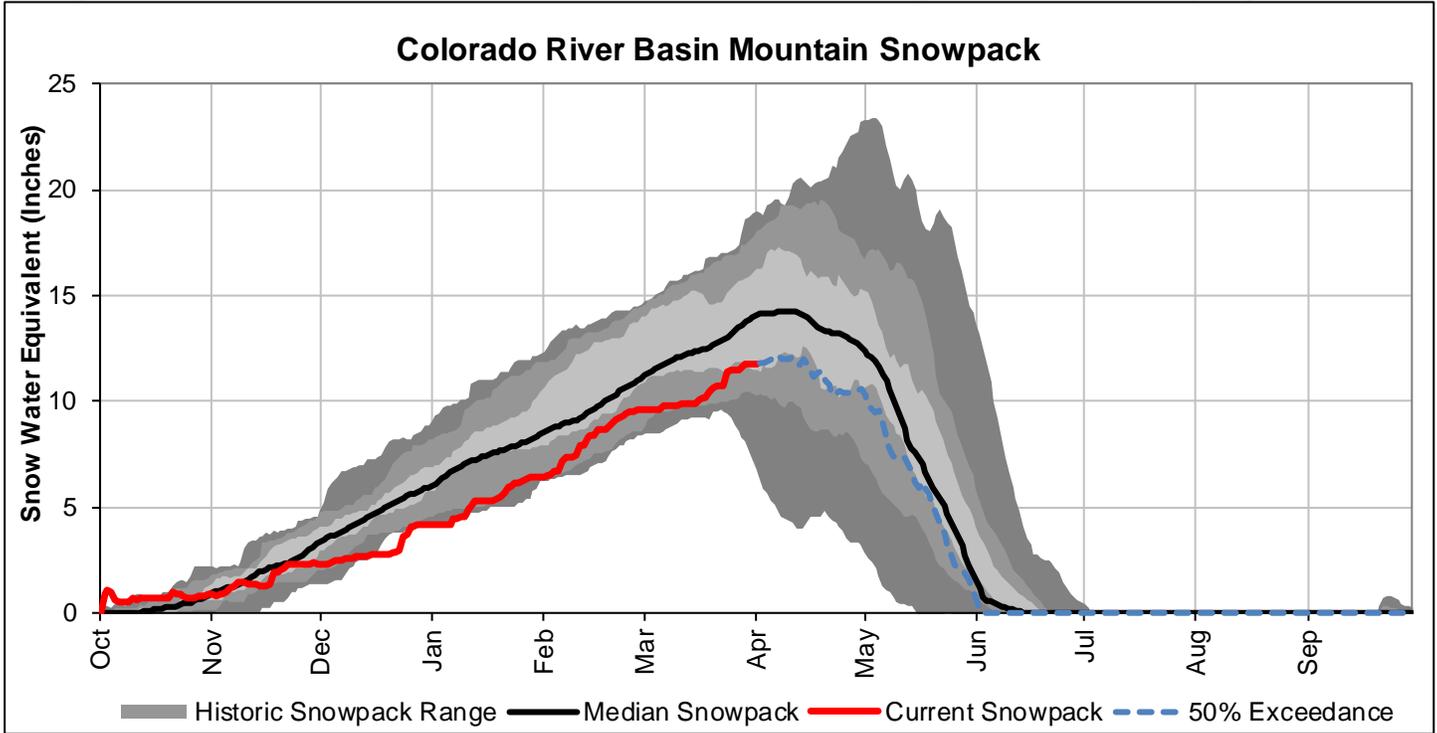
Box labels on chart are volumes of water in thousand acre-feet.



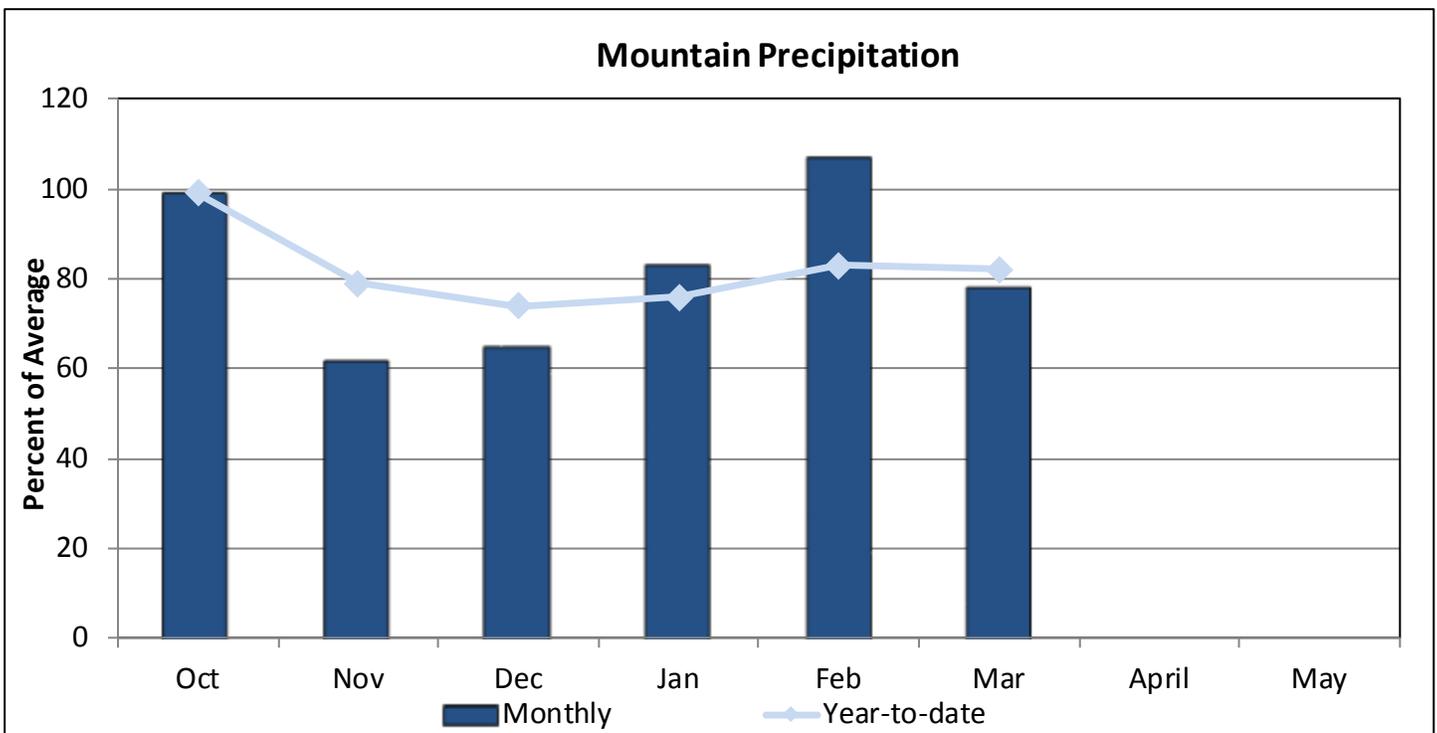
UPPER COLORADO RIVER BASIN

April 1, 2018

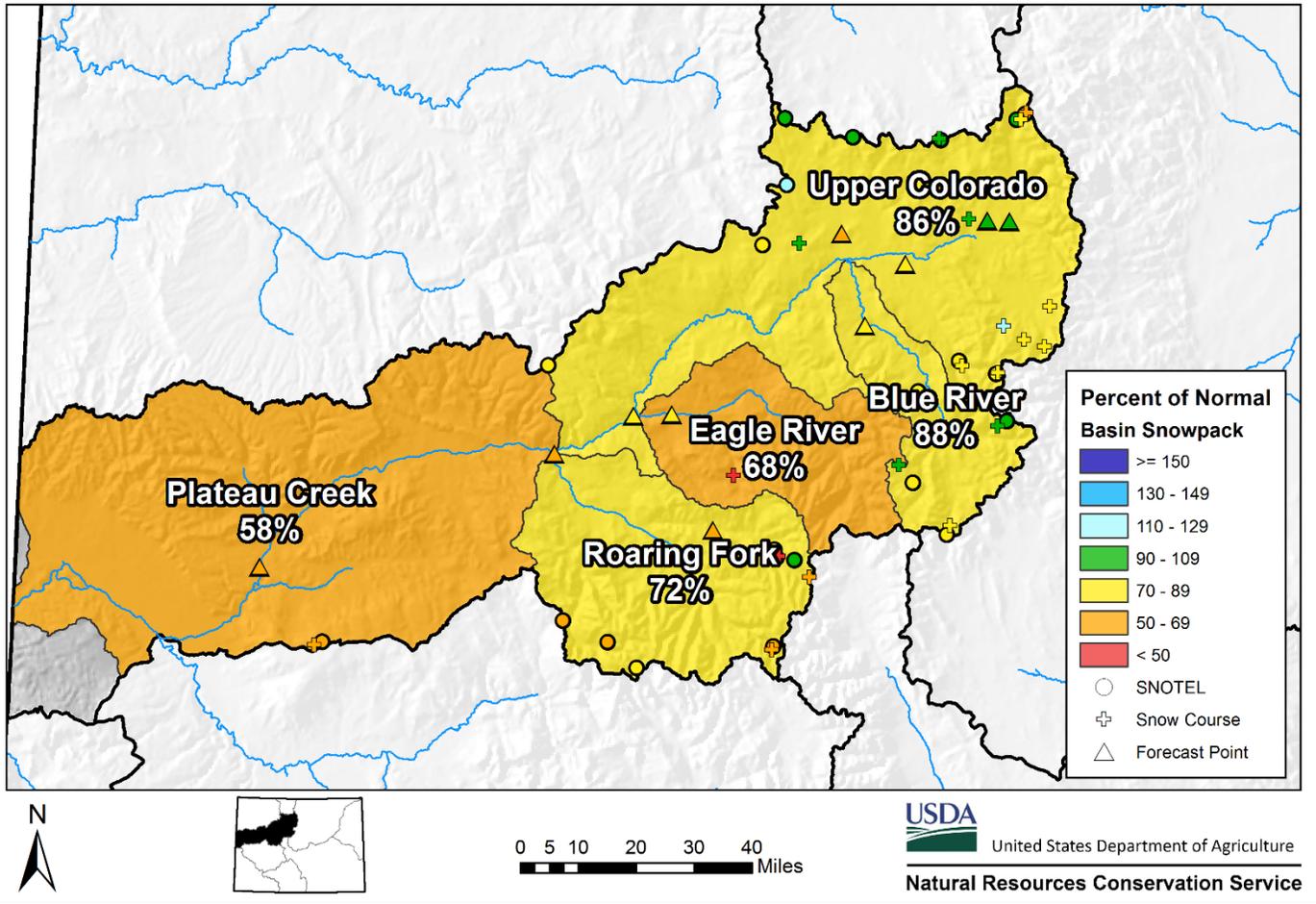
Snowpack in the Colorado River basin is below normal at 80% of the median. Precipitation for March was 78% of average which brings water year-to-date precipitation to 82% of average. Reservoir storage at the end of March was 118% of average compared to 108% last year. Current streamflow forecasts range from 94% of average for the inflow to Willow Creek Reservoir to 53% for the Roaring Fork at Glenwood Springs.



*SWE values calculated using daily SNOTEL data only



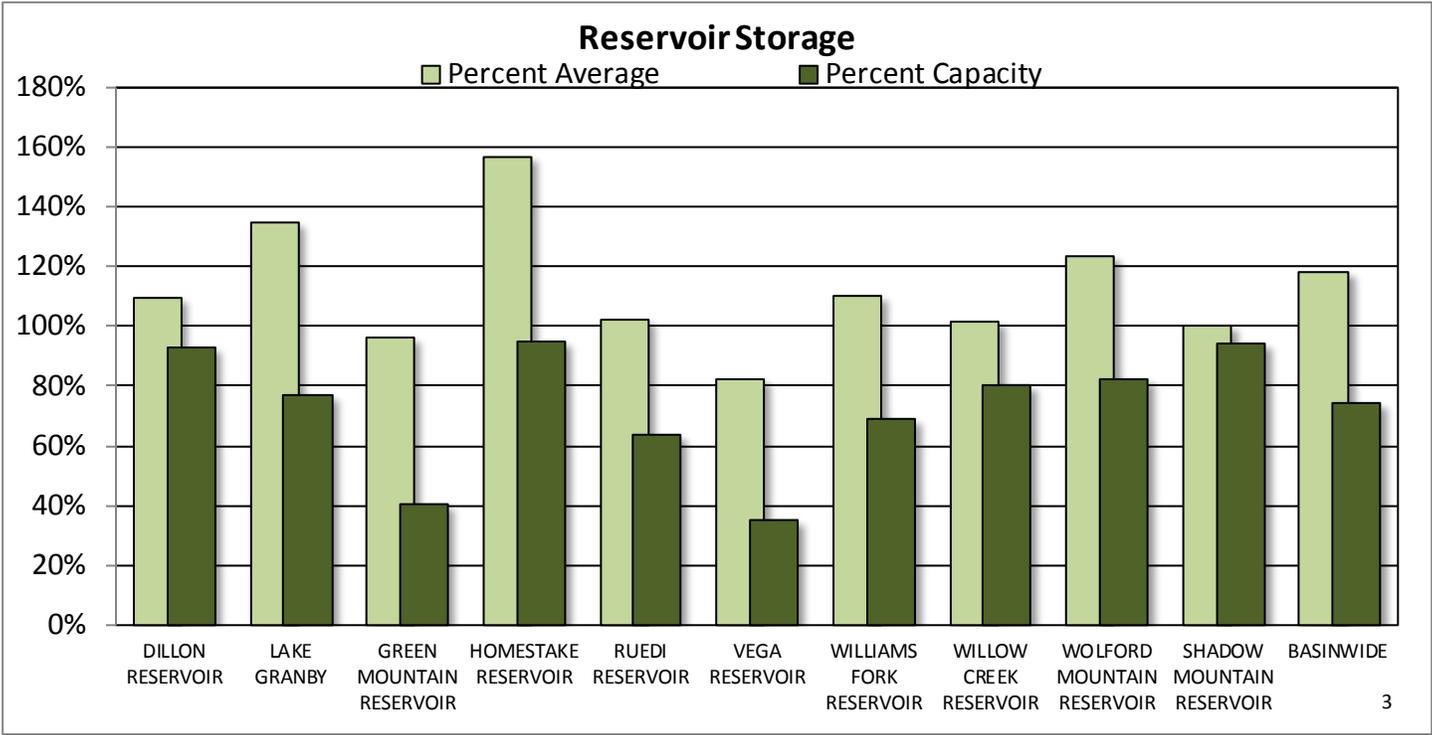
Upper Colorado River Basin Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			Median	Median
Blue River	8	88	114	100
Upper Colorado	34	86	103	100
Muddy Creek	4	105	102	100
Eagle River	5	68	80	100
Plateau Creek	6	58	102	100
Roaring Fork	10	72	92	100
Williams Fork	5	80	138	101
Willow Creek	4	100		
Basin-Wide Total	47	80		

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
DILLON RESERVOIR	231.2	209.1	210.7	249.1
LAKE GRANBY	357.6	307.0	265.0	465.6
GREEN MOUNTAIN RESERVOIR	58.9	57.1	61.2	146.8
HOMESTAKE RESERVOIR	40.9	32.4	26.1	43.0
RUEDI RESERVOIR	64.7	66.2	63.2	102.0
VEGA RESERVOIR	11.5	13.7	14.0	32.9
WILLIAMS FORK RESERVOIR	66.9	73.2	60.8	97.0
WILLOW CREEK RESERVOIR	7.3	5.8	7.2	9.1
WOLFORD MOUNTAIN RESERVOIR	54.0	52.0	43.7	65.9
SHADOW MOUNTAIN RESERVOIR	17.3	17.4	17.3	18.4
BASINWIDE	910.4	833.9	769.2	1229.8
Number of Reservoirs	10	10	10	10

UPPER COLORADO RIVER BASIN

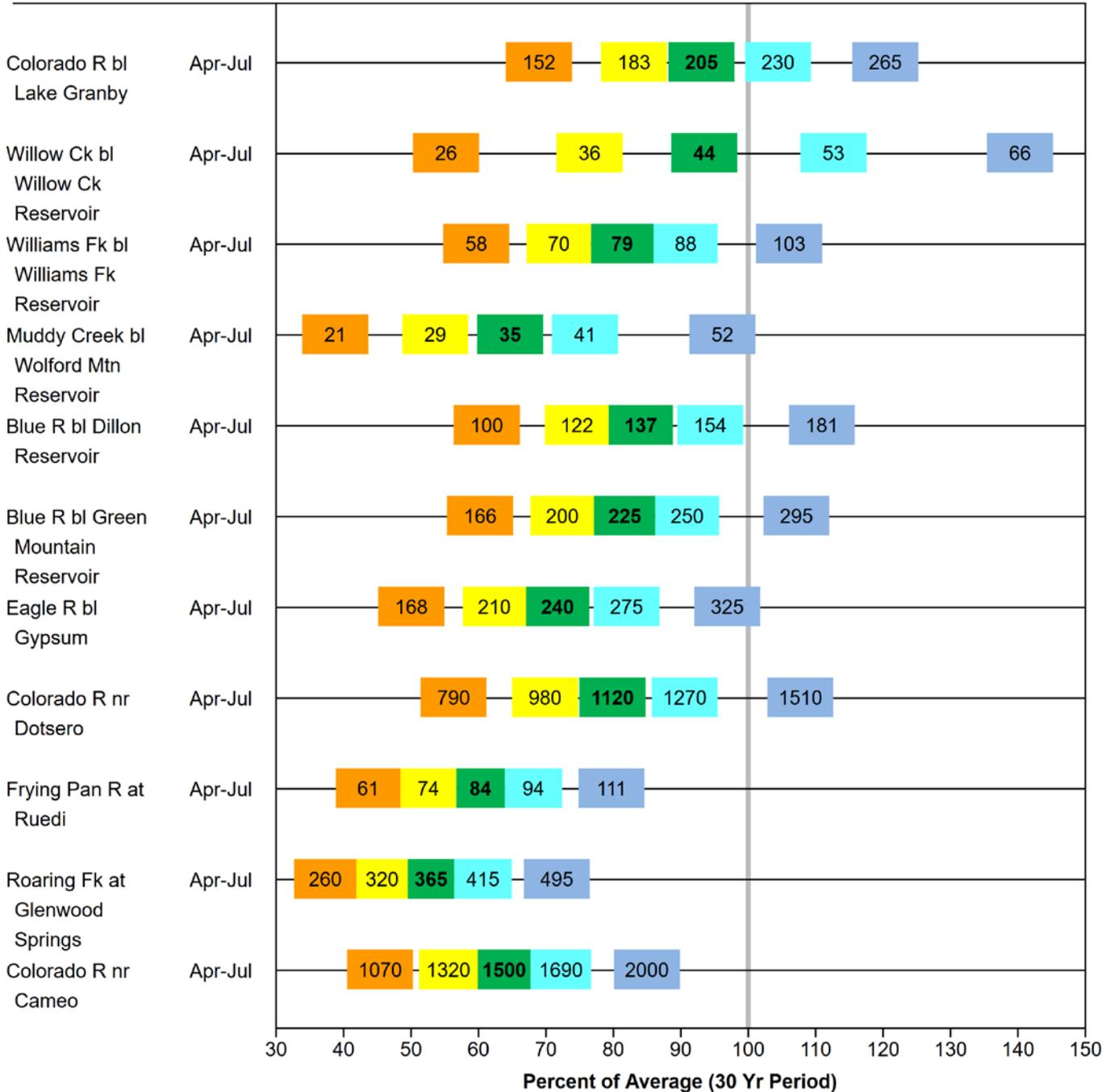
Water Supply Forecasts

April 1, 2018

Forecast Exceedance Probabilities and Volumes

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

Box labels on chart are volumes of water in thousand acre-feet.

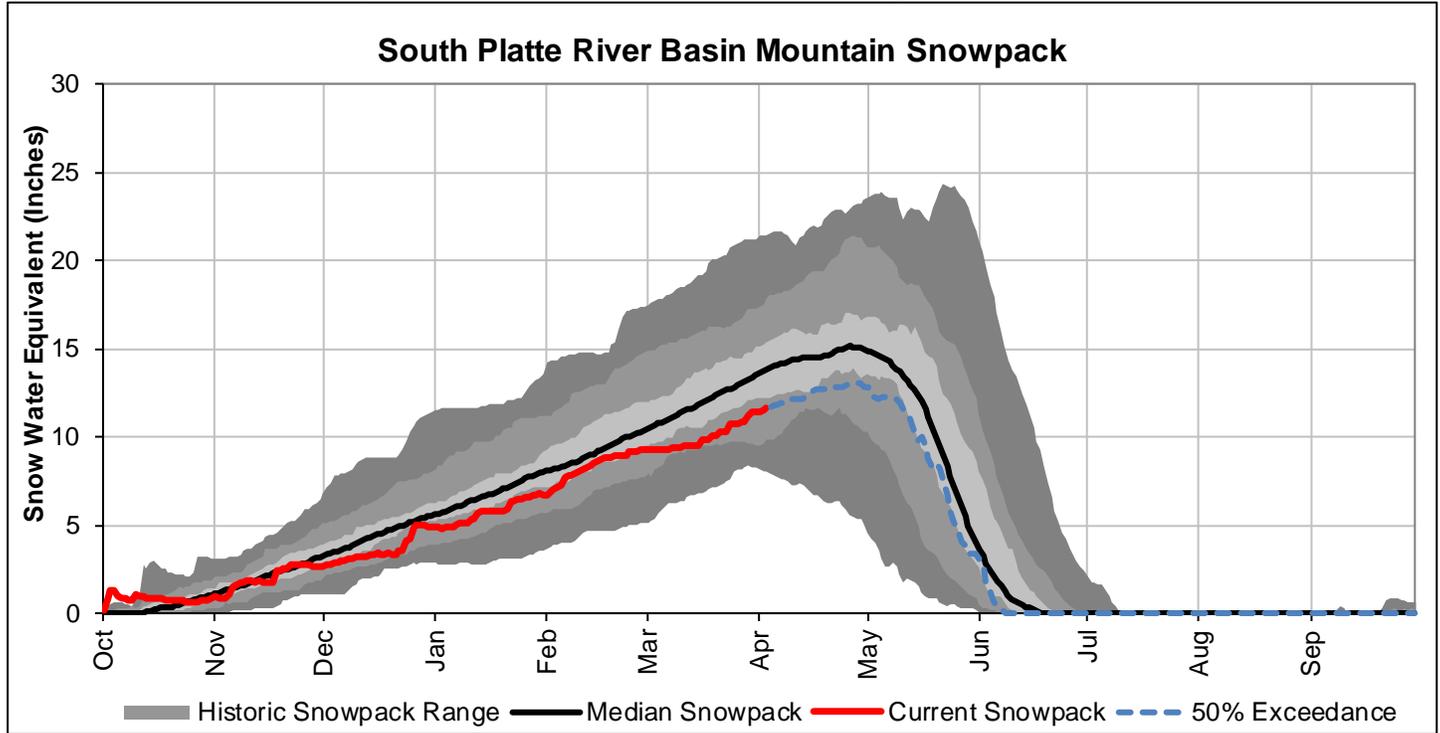


10% Exceedance Forecast (KAF)	30% Exceedance Forecast (KAF) There is a 30% chance that flows will exceed this volume.	50% Exceedance Forecast (KAF) There is a 50% chance that flows will exceed this volume.	70% Exceedance Forecast (KAF) There is a 70% chance that flows will exceed this volume.	90% Exceedance Forecast (KAF) 95% Exceedance
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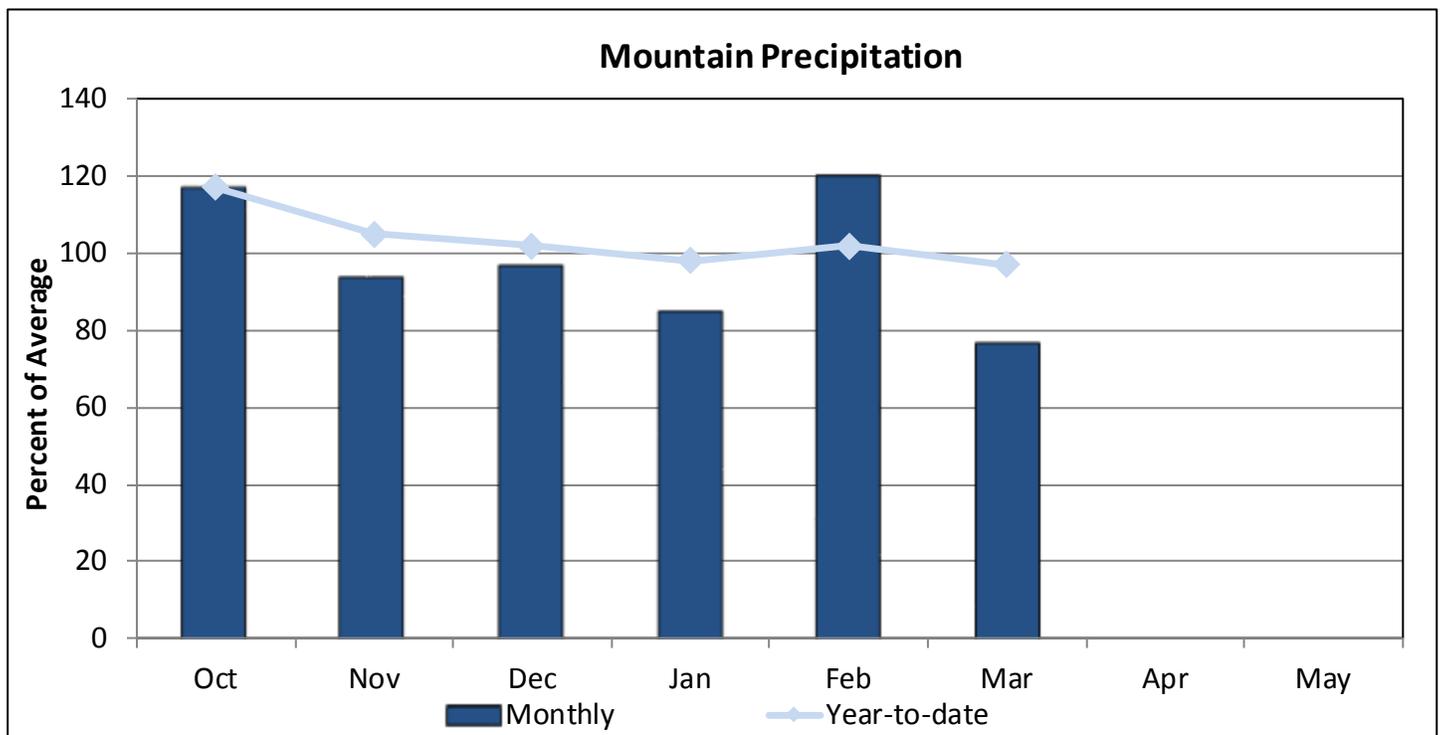
SOUTH PLATTE RIVER BASIN

April 1, 2018

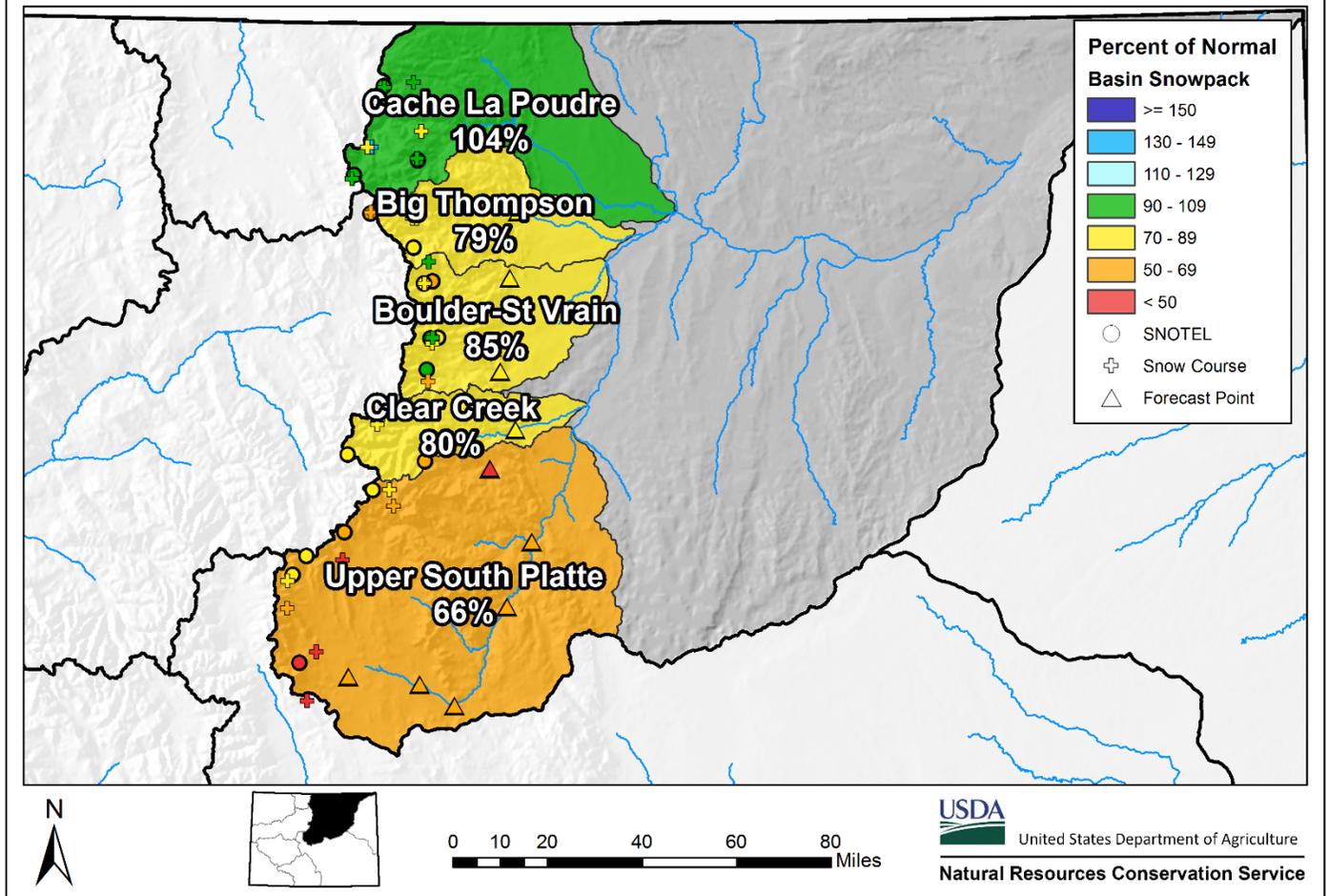
Snowpack in the South Platte River basin is below normal at 83% of the median. Precipitation for March was 77% of average which brings water year-to-date precipitation down to 97%. Reservoir storage at the end of March was 106% of average compared to 106% last year. Streamflow forecasts range from 96% of average for the Cache La Poudre at Canyon Mouth to 49% for Bear Creek at Evergreen.



*SWE values calculated using daily SNOTEL data only



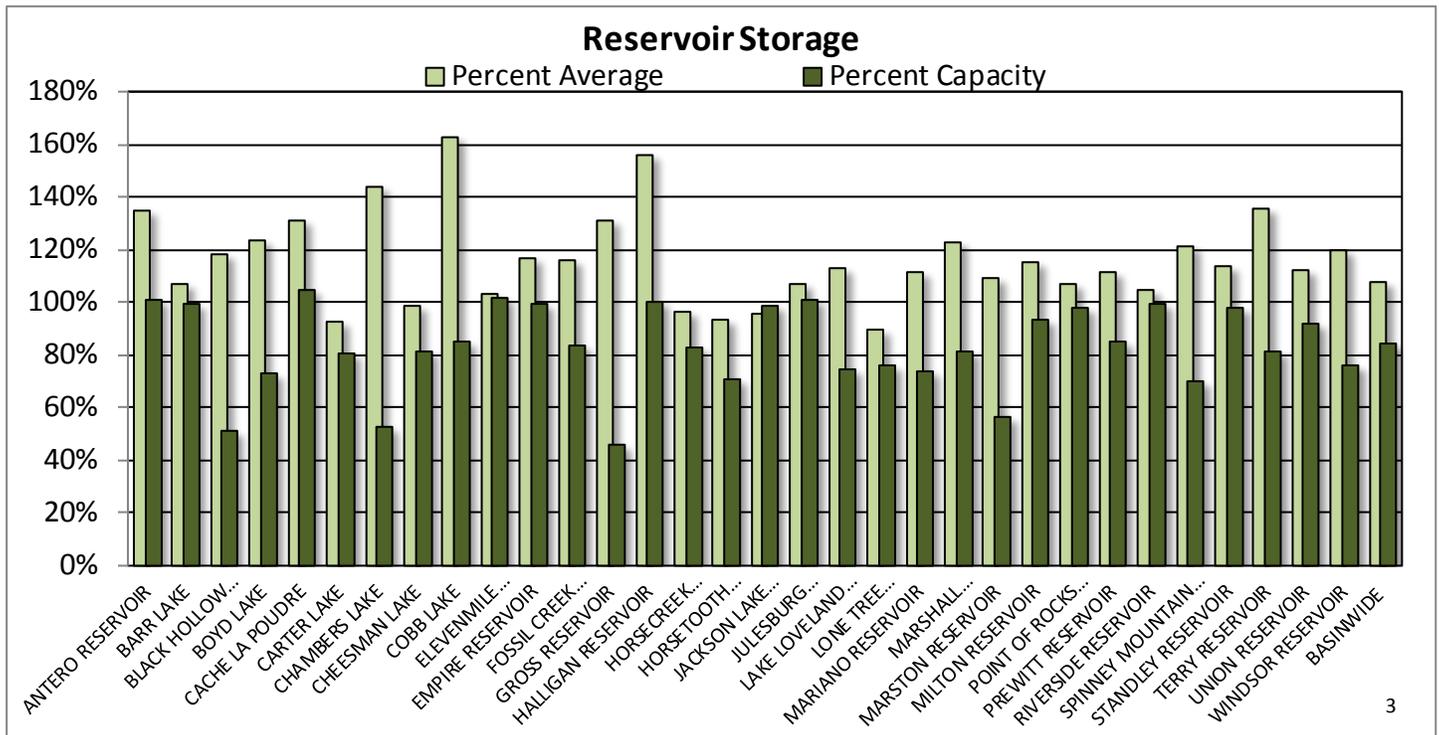
South Platte River Basin Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			% Median	Median
Big Thompson	7	79		112
Boulder Creek	6	88		110
Cache La Poudre	10	104		101
Clear Creek	4	80		103
Saint Vrain	3	65		76
Upper South Platte	16	66		96
Basin-Wide Total	46	83		103

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ANTERO RESERVOIR	20.1	15.4	14.9	19.9
BARR LAKE	29.8	29.6	27.8	30.1
BLACK HOLLOW RESERVOIR	3.3	3.2	2.8	6.5
BOYD LAKE	35.5	27.5	28.7	48.4
CACHE LA POUFRE	10.6	10.0	8.1	10.1
CARTER LAKE	87.6	101.0	94.9	108.9
CHAMBERS LAKE	4.6	2.4	3.2	8.8
CHEESMAN LAKE	64.2	73.5	65.1	79.0
COBB LAKE	18.9	16.9	11.6	22.3
ELEVENMILE CANYON RESERVOIR	99.6	99.5	96.4	98.0
EMPIRE RESERVOIR	36.4	36.5	31.2	36.5
FOSSIL CREEK RESERVOIR	9.3	9.6	8.0	11.1
GROSS RESERVOIR	13.6	10.0	10.4	29.8
HALLIGAN RESERVOIR	6.4	6.4	4.1	6.4
HORSECREEK RESERVOIR	12.2	11.1	12.7	14.7
HORSETOOTH RESERVOIR	105.8	129.7	113.7	149.7
JACKSON LAKE RESERVOIR	25.8	26.0	26.9	26.1
JULESBURG RESERVOIR	20.7	20.6	19.4	20.5
LAKE LOVELAND RESERVOIR	7.7	3.5	6.8	10.3
LONE TREE RESERVOIR	6.6	8.6	7.4	8.7
MARIANO RESERVOIR	4.0	1.1	3.6	5.4
MARSHALL RESERVOIR	8.1	7.4	6.6	10.0
MARSTON RESERVOIR	7.3	8.6	6.7	13.0
MILTON RESERVOIR	22.0	22.7	19.1	23.5
POINT OF ROCKS RESERVOIR	69.0	69.3	64.4	70.6
PREWITT RESERVOIR	23.9	23.9	21.4	28.2
RIVERSIDE RESERVOIR	55.4	52.6	53.1	55.8
SPINNEY MOUNTAIN RESERVOIR	34.2	31.1	28.2	49.0
STANDLEY RESERVOIR	41.2	31.1	36.2	42.0
TERRY RESERVOIR	6.5	4.4	4.8	8.0
UNION RESERVOIR	11.9	8.5	10.6	13.0
WINDSOR RESERVOIR	11.6	11.0	9.7	15.2
BASINWIDE	913.9	912.8	858.5	1079.5
Number of Reservoirs	32	32	32	32

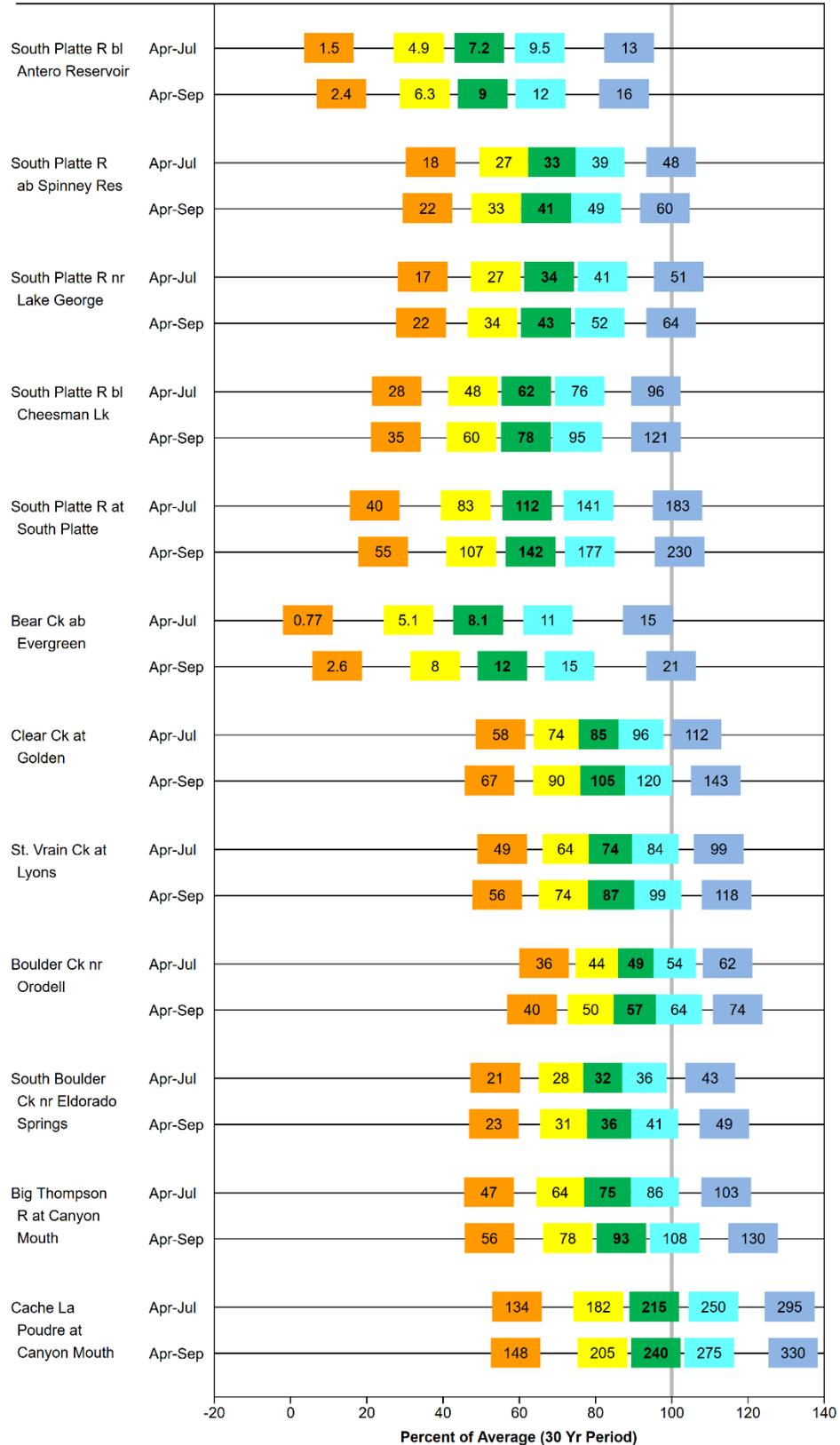
SOUTH PLATTE RIVER BASIN

Water Supply Forecasts

April 1, 2018

Forecast Exceedance Probabilities and Volumes

Forecast Point Forecast Period <----- Drier -----> Future Conditions ----- Wetter ----->
 Box labels on chart are volumes of water in thousand acre-feet.

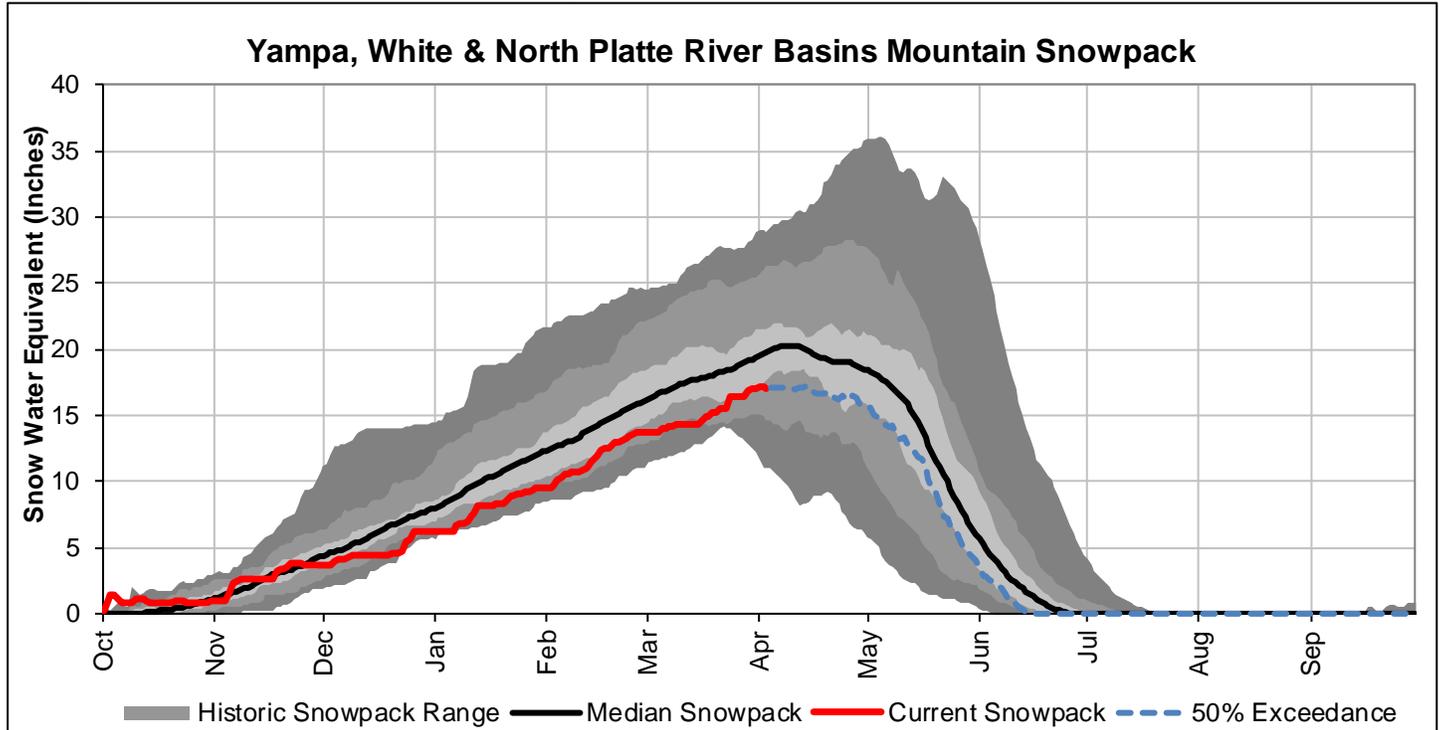


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5% Exceedance	95% Exceedance			

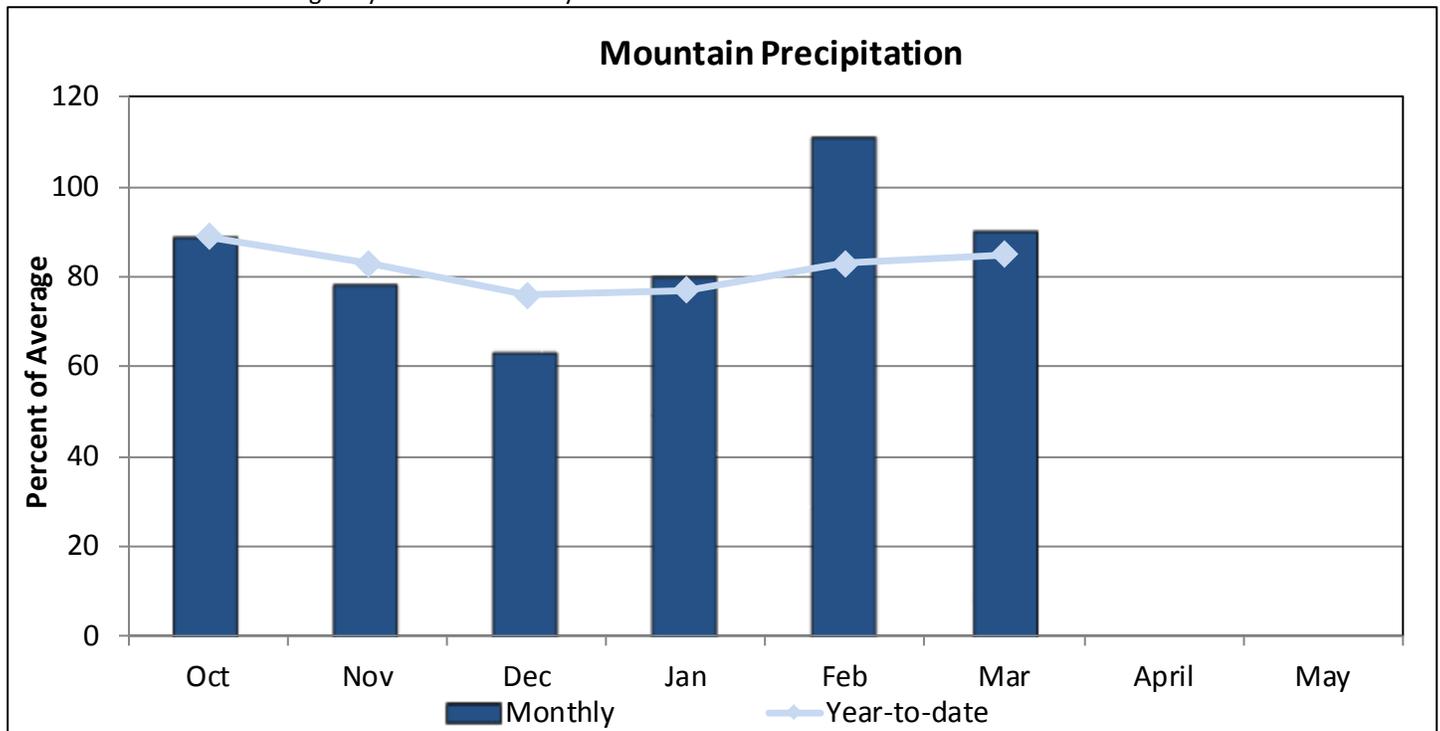
YAMPA, WHITE, NORTH PLATTE, AND LARAMIE RIVER BASINS

April 1, 2018

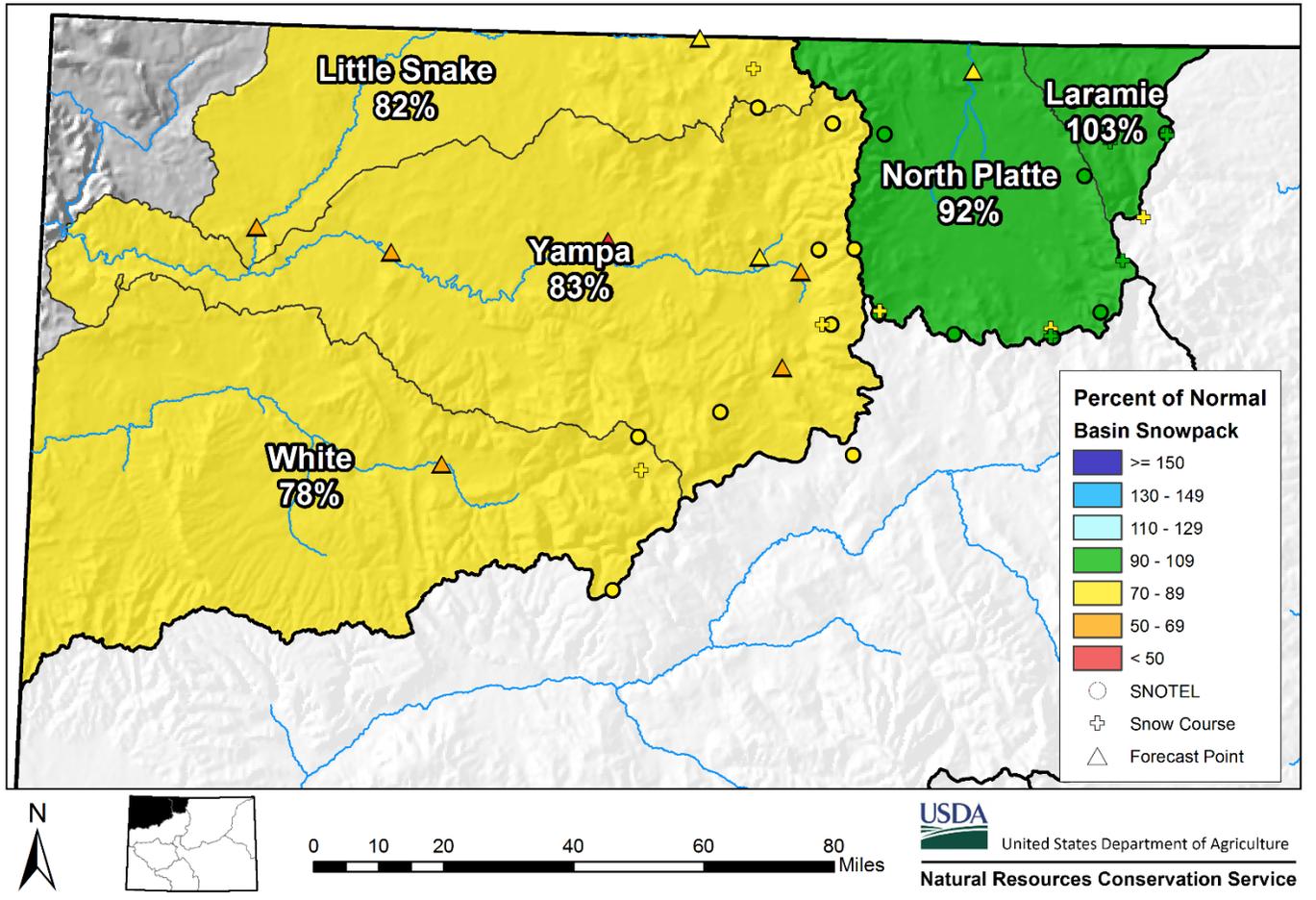
Snowpack in the Yampa, White & North Platte basins is below normal at 87% of the median. Precipitation for March was 90% of average and water year-to-date precipitation is 85% of average. Reservoir storage at the end of March was 129% of average compared to 122% last year. Streamflow forecasts range from 93% of average for Laramie River at Woods Landing to 47% for Elkhead Creek above Long Gulch.



*SWE values calculated using daily SNOTEL data only



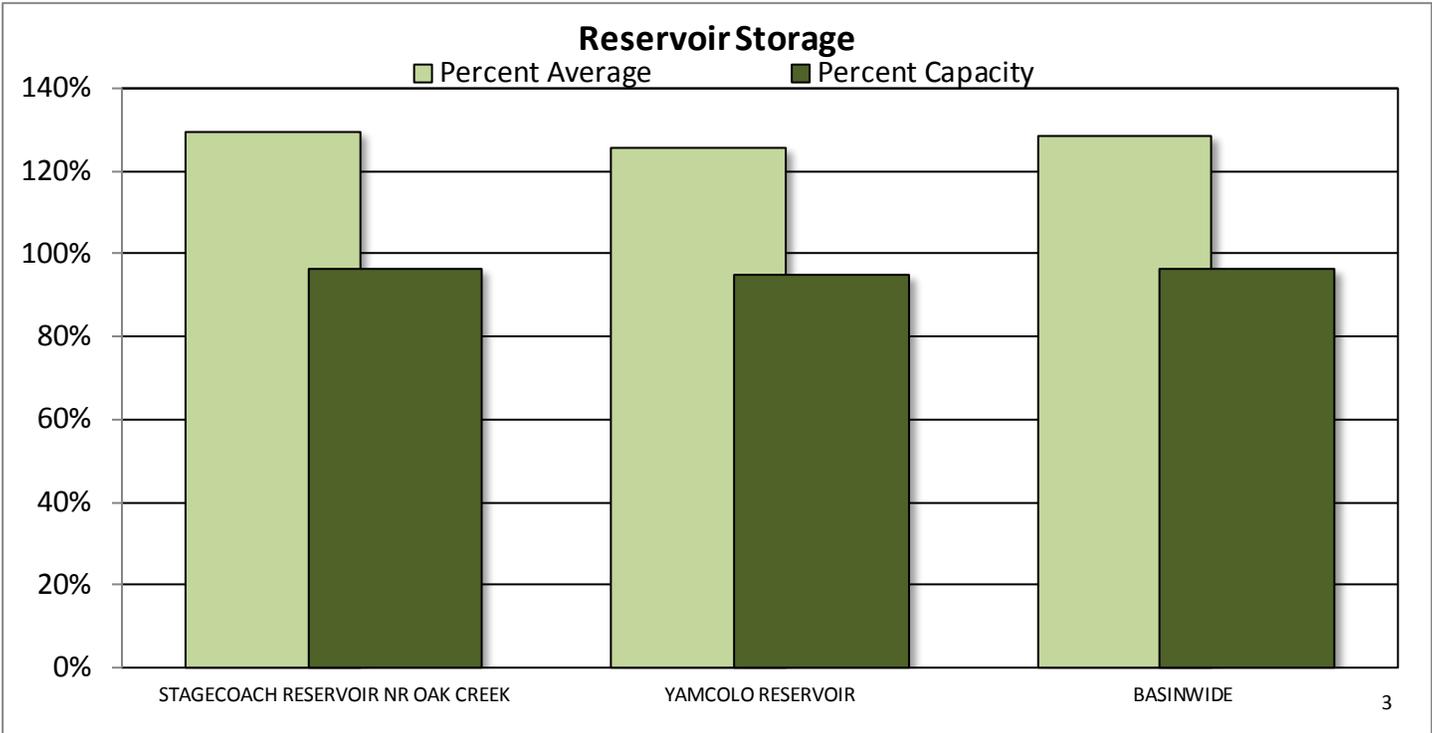
Yampa, White, and North Platte River Basins Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			% Median	Median
Laramie	5	103		114
North Platte	12	92		104
Total Laramie & North Platte	17	95		106
Elk	2	79		91
Yampa	11	83		86
White	4	78		97
Total Yampa & White	14	81		86
Little Snake	9	82		92
Basin-Wide Total	36	87		97

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
STAGECOACH RESERVOIR NR OAK C	35.2	33.4	27.2	36.5
YAMCOLO RESERVOIR	8.3	7.9	6.6	8.7
BASINWIDE	43.5	41.3	33.8	45.2
Number of Reservoirs	2	2	2	2

YAMPA-WHITE-NORTH PLATTE RIVER BASINS

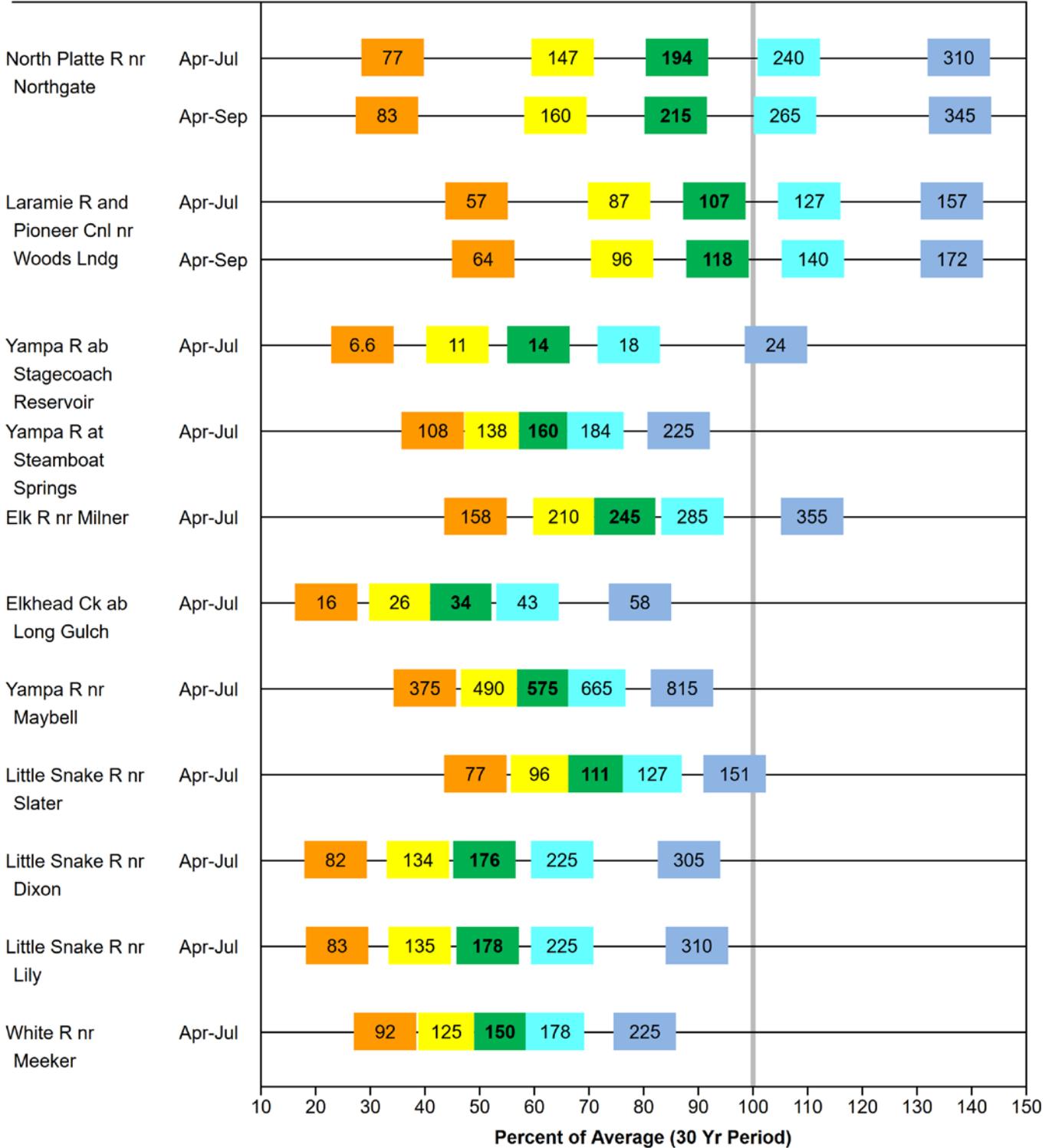
Water Supply Forecasts

April 1, 2018

Forecast Exceedance Probabilities and Volumes

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

Box labels on chart are volumes of water in thousand acre-feet.



10% Exceedance Forecast (KAF)
5% Exceedance

30% Exceedance Forecast (KAF)
There is a 30% chance that flows will exceed this volume.

50% Exceedance Forecast (KAF)
There is a 50% chance that flows will exceed this volume.

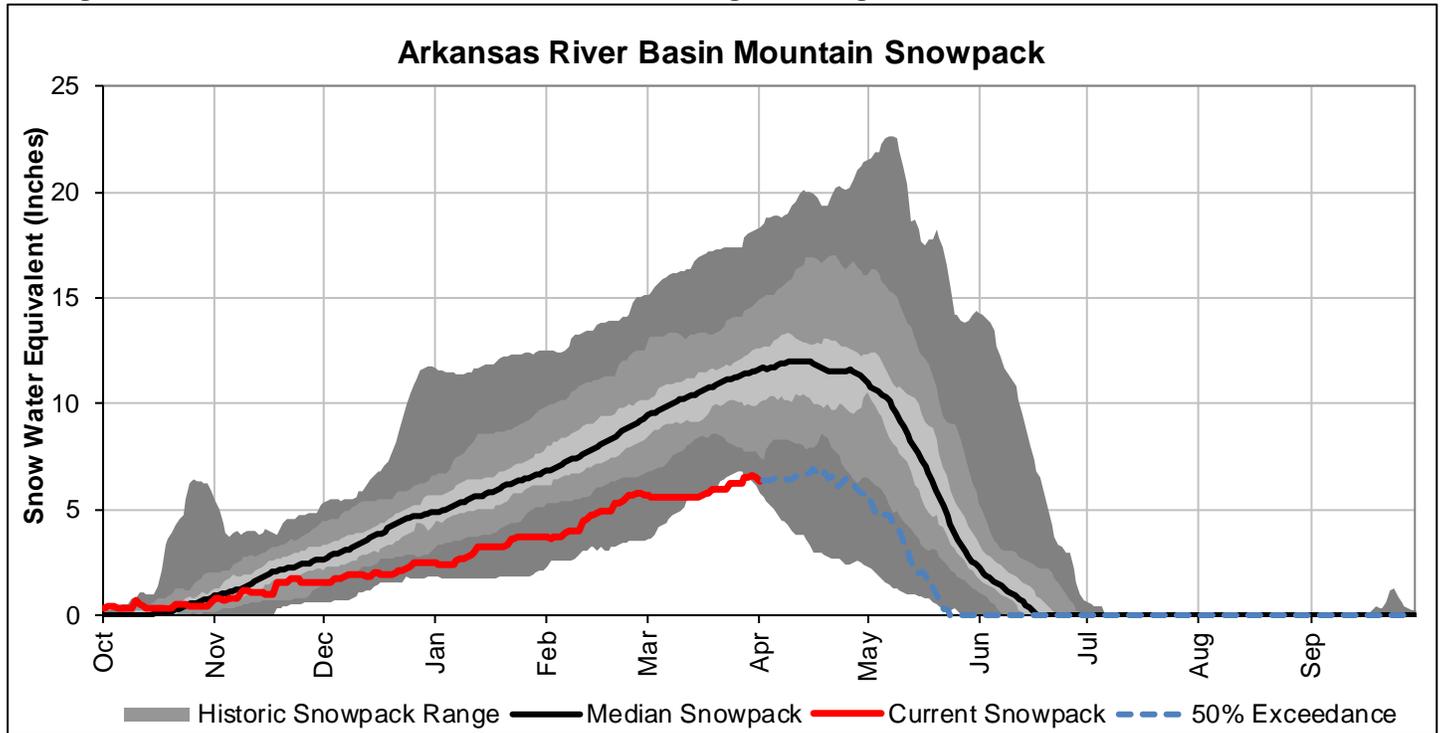
70% Exceedance Forecast (KAF)
There is a 70% chance that flows will exceed this volume.

90% Exceedance Forecast (KAF)
95% Exceedance

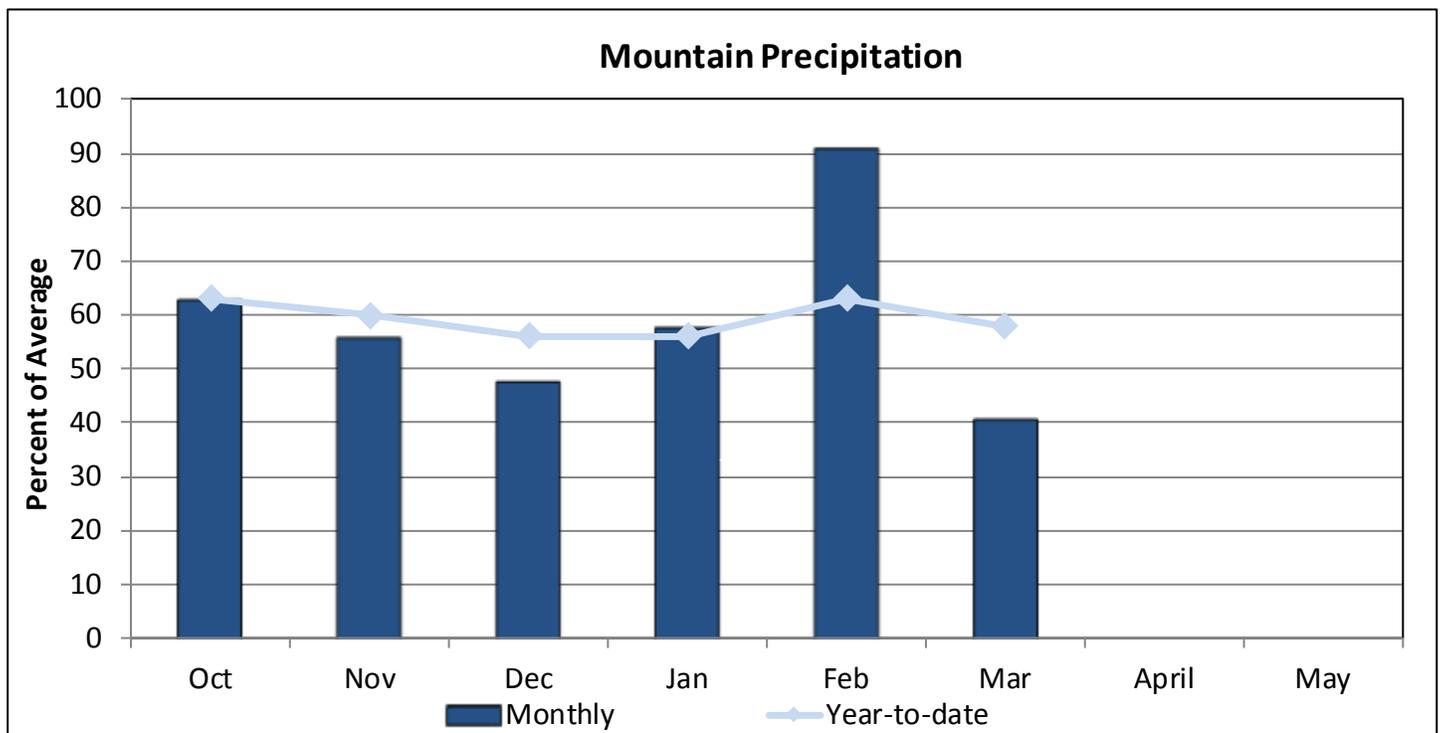
ARKANSAS RIVER BASIN

April 1, 2018

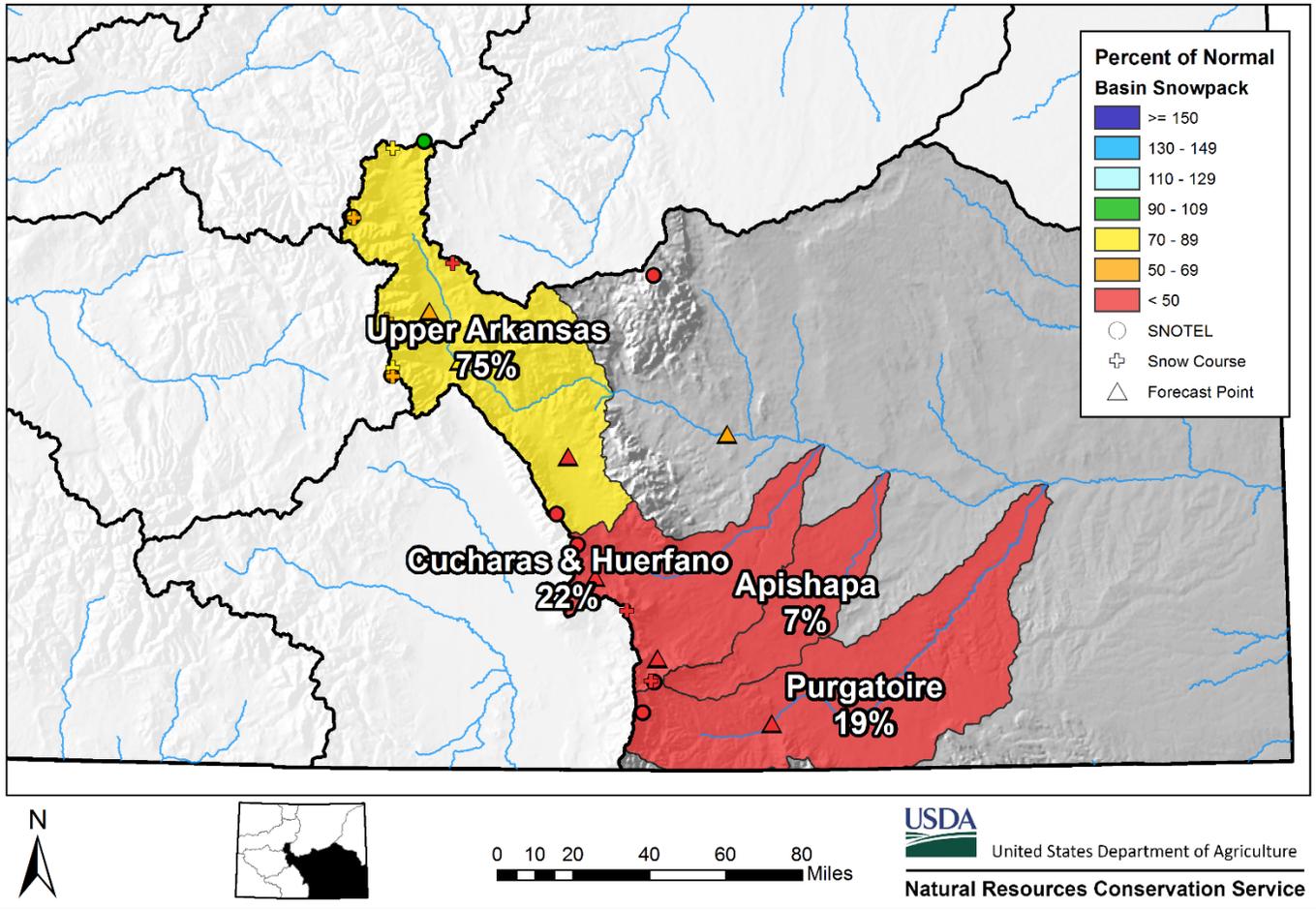
Snowpack in the Arkansas River basin is below normal at 55% of the median. Precipitation for March was 41% of average which brings water year-to-date precipitation to 58% of average. Reservoir storage at the end of March was 131% of average compared to 101% last year. Current streamflow forecasts range from 69% of average for the Arkansas River at Salida to 20% of average for Purgatoire River at Trinidad.



*SWE values calculated using daily SNOTEL data only



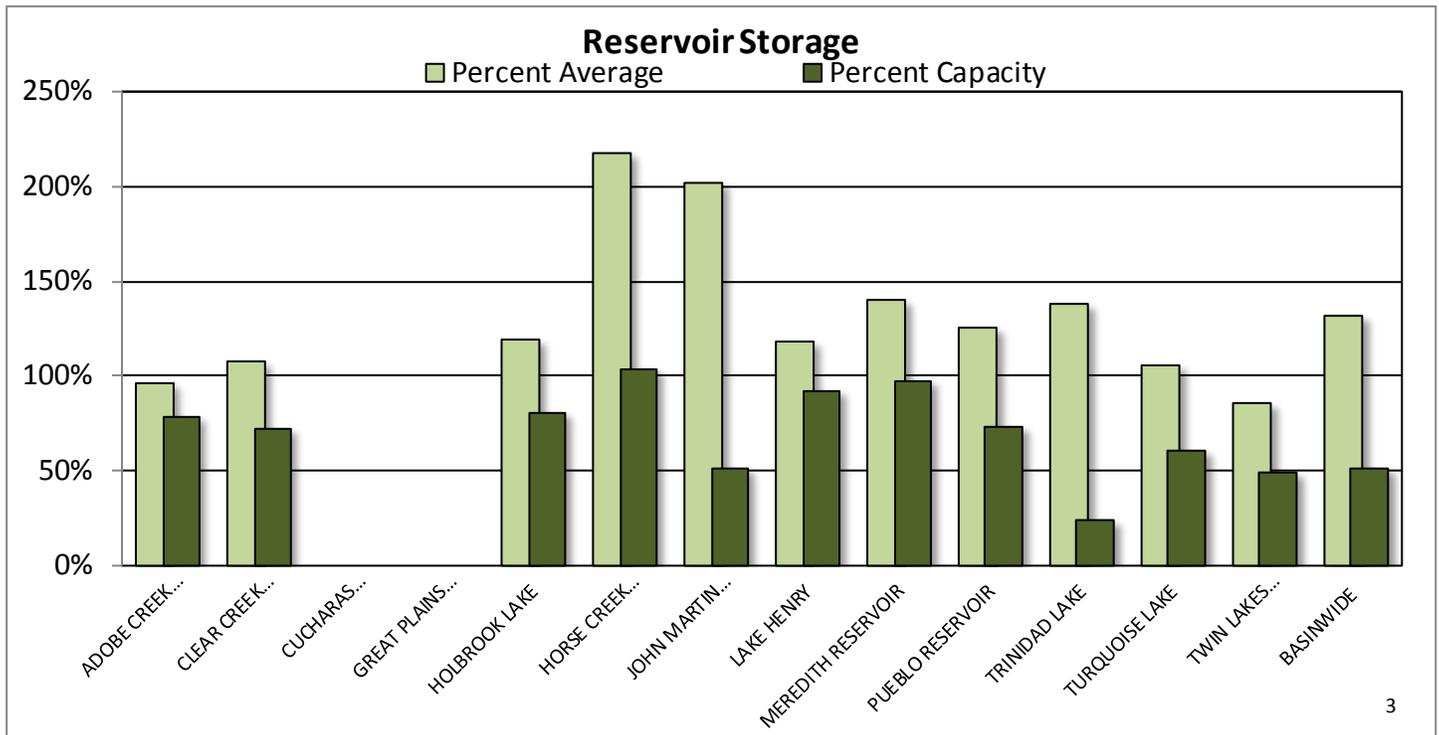
Arkansas River Basin Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			% Median	Median
Upper Arkansas	9	75		132
Cucharas & Huerfano	5	22		95
Purgatoire	2	19		113
Basin-Wide Total	16	55		118

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ADOBE CREEK RESERVOIR	48.3	52.4	50.4	62.0
CLEAR CREEK RESERVOIR	8.2	8.1	7.6	11.4
CUCHARAS RESERVOIR				40.0
GREAT PLAINS RESERVOIR				150.0
HOLBROOK LAKE	5.6	5.8	4.7	7.0
HORSE CREEK RESERVOIR	27.9	24.7	12.8	27.0
JOHN MARTIN RESERVOIR	312.1	131.5	155.0	616.0
LAKE HENRY	8.6	8.0	7.3	9.4
MEREDITH RESERVOIR	40.9	37.1	29.2	42.0
PUEBLO RESERVOIR	257.4	253.0	205.8	354.0
TRINIDAD LAKE	39.2	27.0	28.5	167.0
TURQUOISE LAKE	77.3	41.5	73.5	127.0
TWIN LAKES RESERVOIR	42.3	41.2	49.6	86.0
BASINWIDE	867.8	630.3	624.4	1698.8
Number of Reservoirs	11	11	11	13

ARKANSAS RIVER BASIN

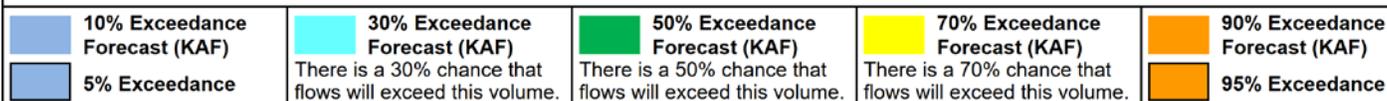
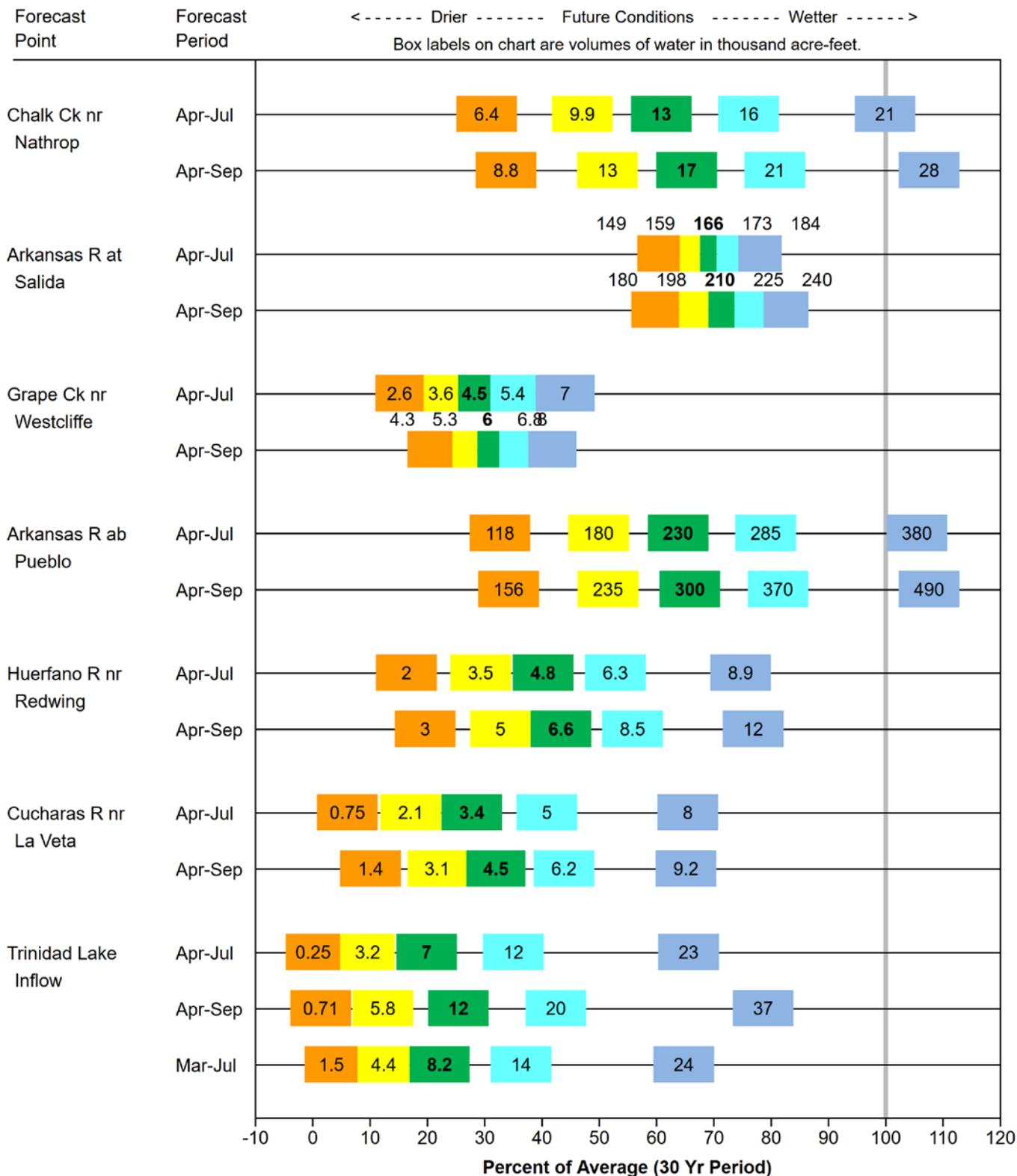
Water Supply Forecasts

April 1, 2018

Forecast Exceedance Probabilities and Volumes

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

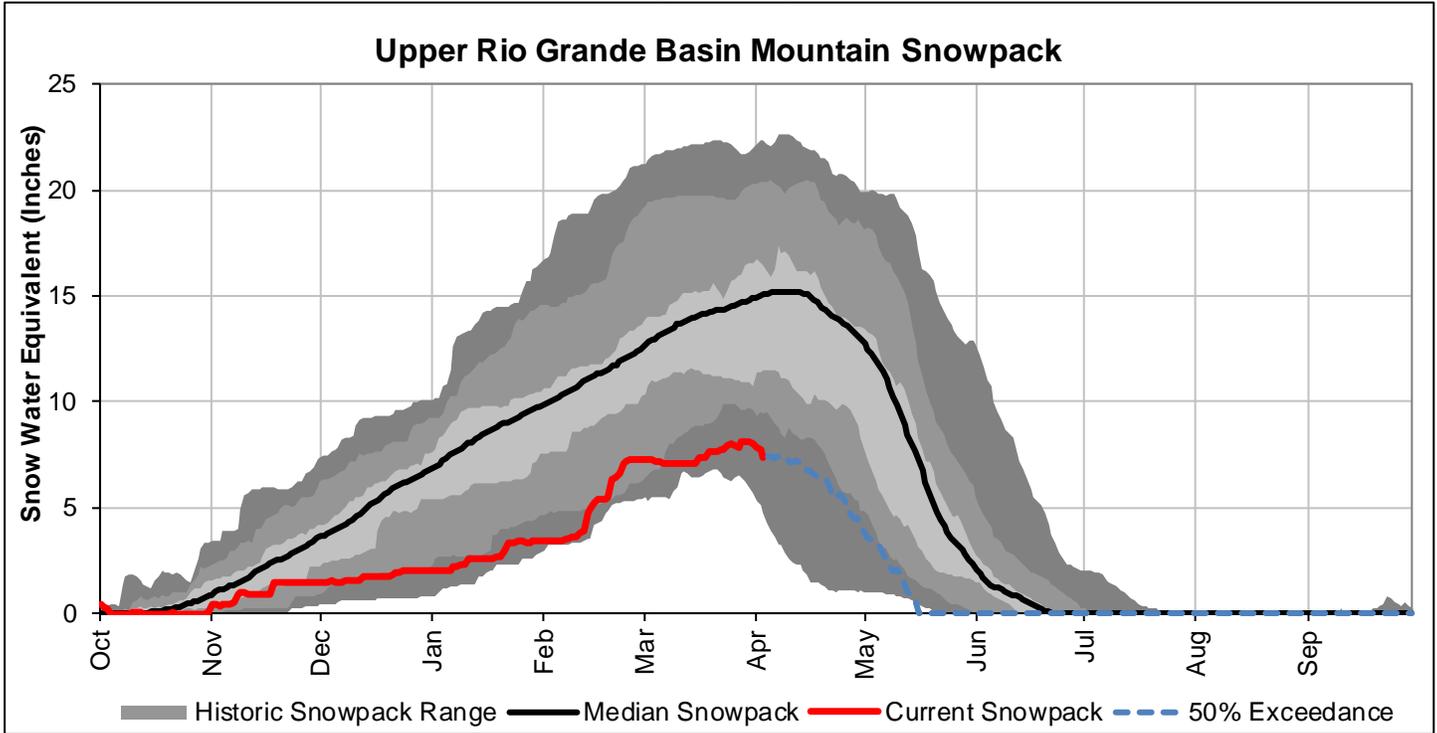
Box labels on chart are volumes of water in thousand acre-feet.



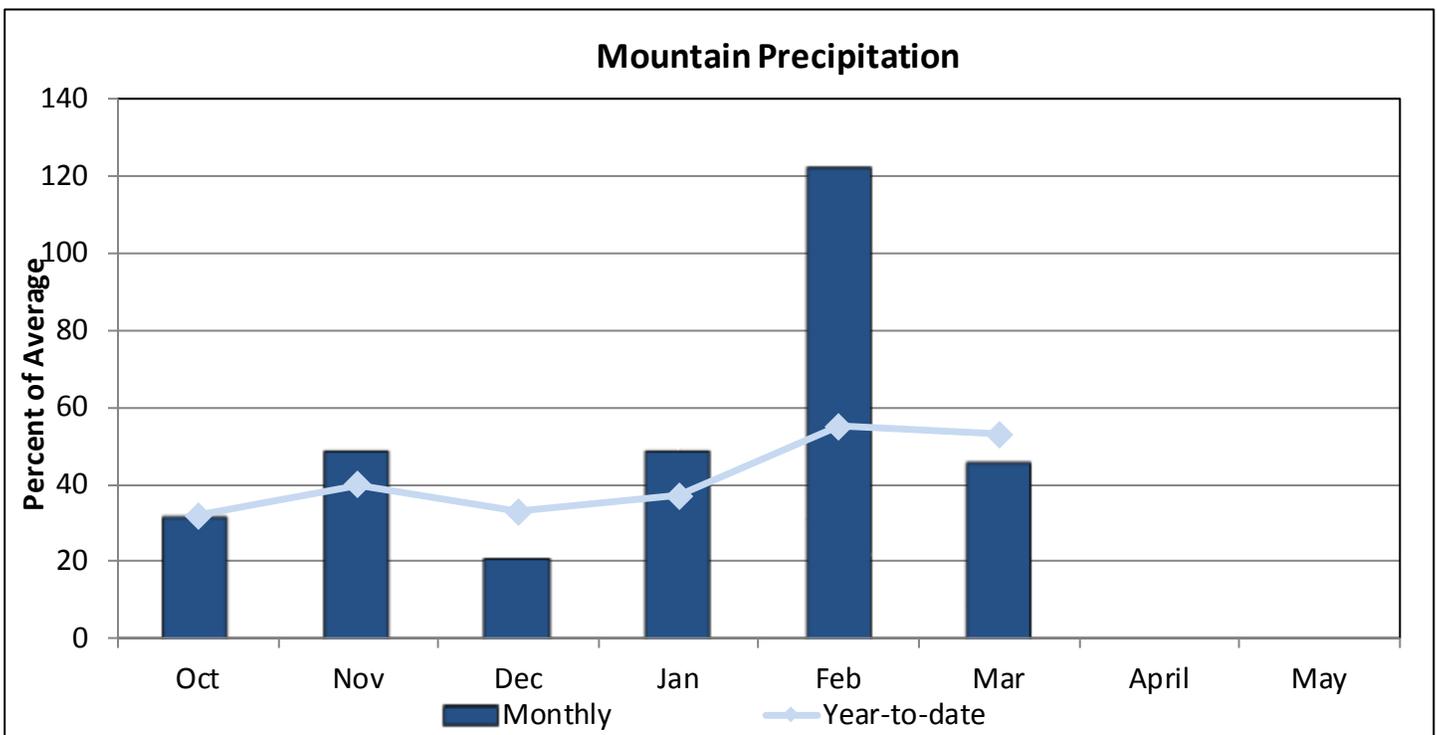
UPPER RIO GRANDE RIVER BASIN

April 1, 2018

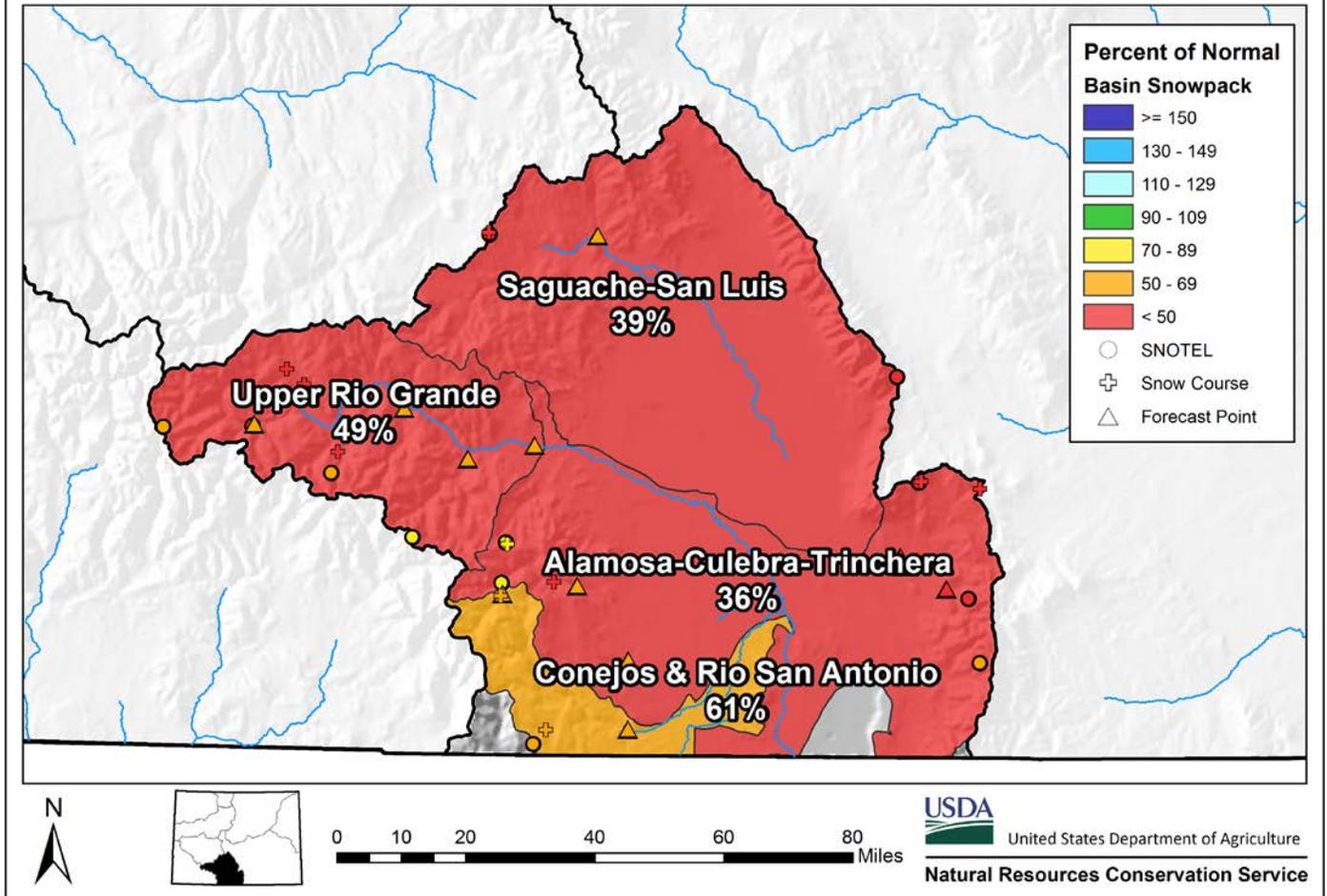
Snowpack in the Upper Rio Grande River basin is below normal at 48% of median. Precipitation for March was 46% of average which brings water year-to-date precipitation to 53% of average. Reservoir storage at the end of March was 119% of average compared to 99% last year. Streamflow forecasts range from 59% of average for the inflow to Platoro Reservoir to 15% of average for Sangre de Cristo Creek.



*SWE values calculated using daily SNOTEL data only



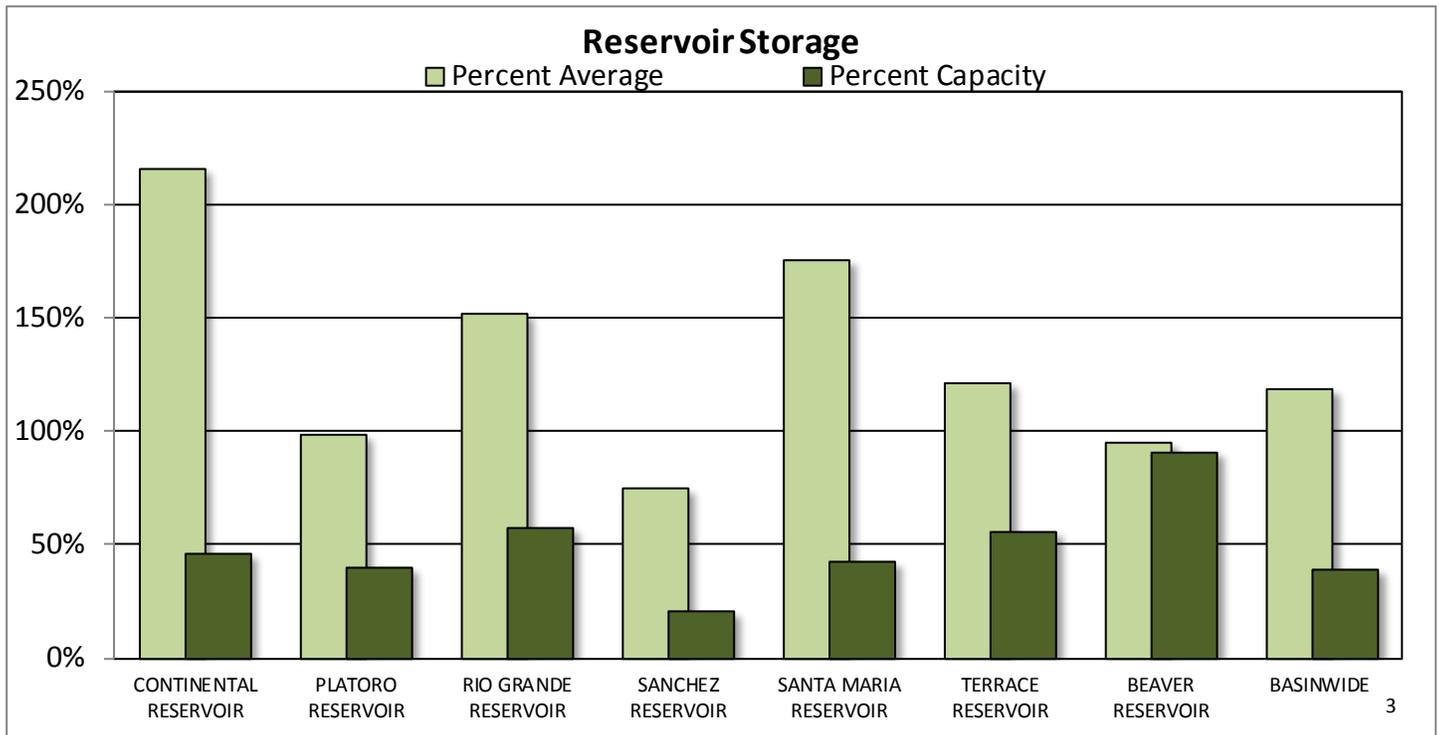
Upper Rio Grande River Basin Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			% Median	Median
Alamosa Creek	3	55		91
Conejos & Rio San Antonio	4	61		130
Culebra & Trinchera Creek	5	30		112
Upper Rio Grande	12	49		99
Basin-Wide Total	23	48		109

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
CONTINENTAL RESERVOIR	12.5	10.6	5.8	27.0
PLATORO RESERVOIR	23.8	15.3	24.2	60.0
RIO GRANDE RESERVOIR	29.1	31.8	19.1	51.0
SANCHEZ RESERVOIR	21.0	10.6	28.1	103.0
SANTA MARIA RESERVOIR	19.1	17.2	10.9	45.0
TERRACE RESERVOIR	10.0	9.8	8.2	18.0
BEAVER RESERVOIR	4.1	4.1	4.3	4.5
BASINWIDE	119.5	99.4	100.6	308.5
Number of Reservoirs	7	7	7	7

UPPER RIO GRANDE BASIN

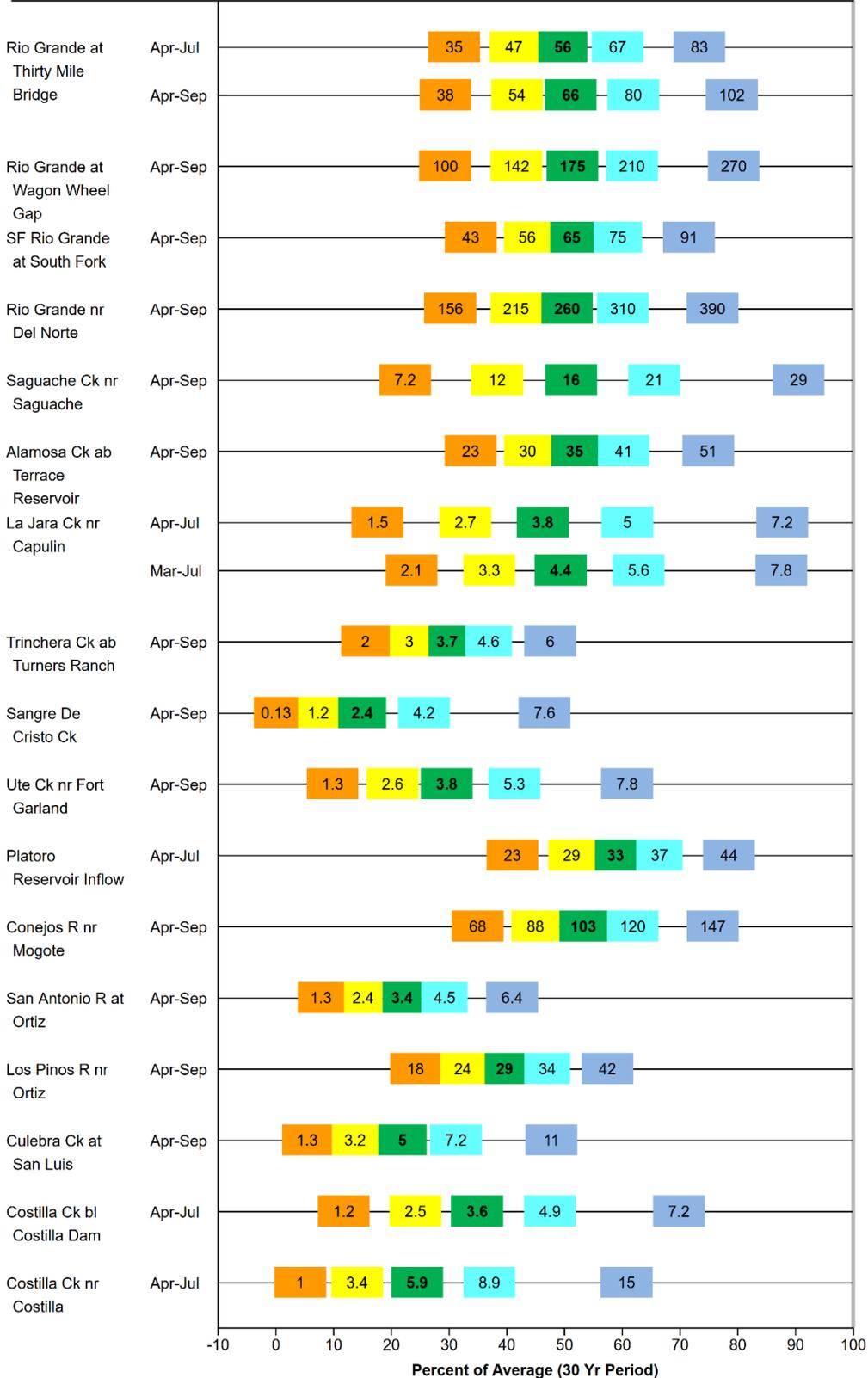
Water Supply Forecasts

April 1, 2018

Forecast Exceedance Probabilities and Volumes

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

Box labels on chart are volumes of water in thousand acre-feet.

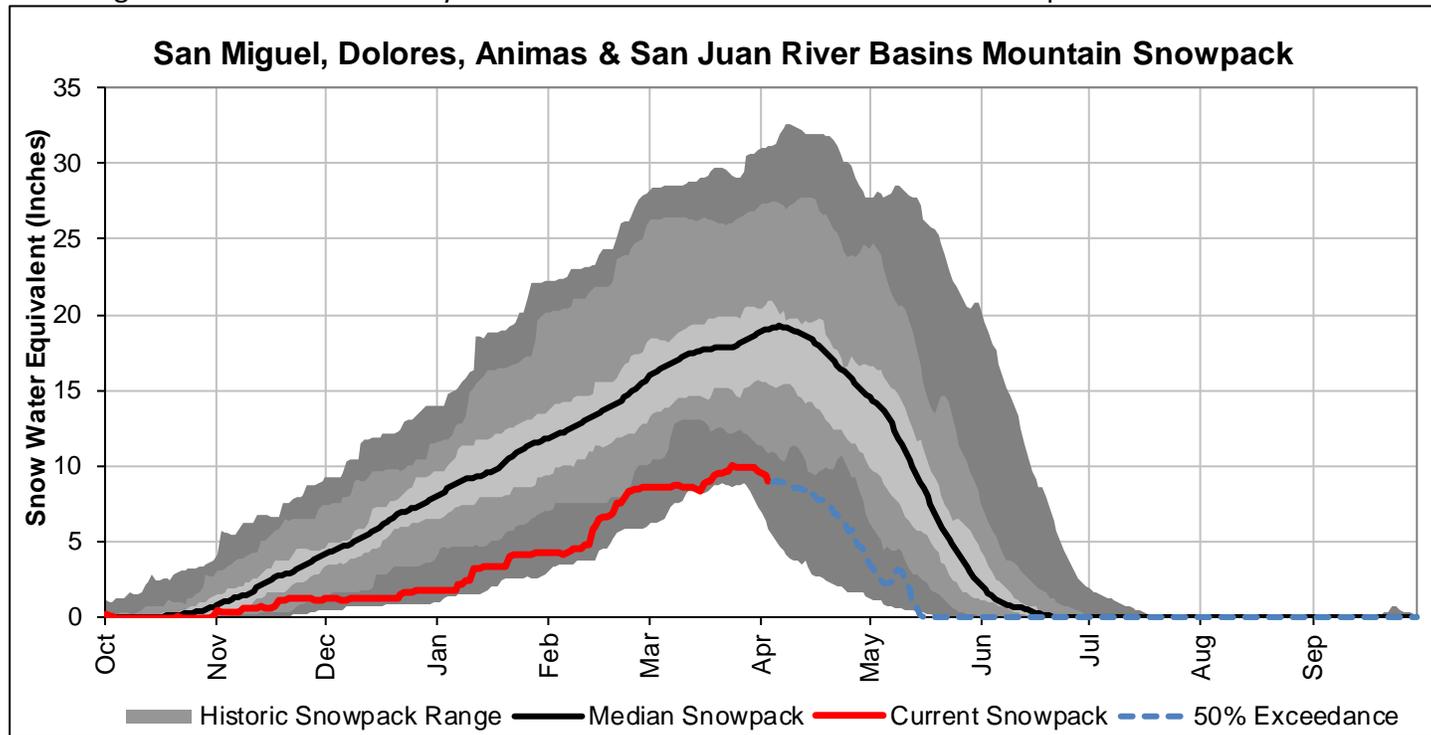


10% Exceedance Forecast (KAF)	30% Exceedance Forecast (KAF)	50% Exceedance Forecast (KAF)	70% Exceedance Forecast (KAF)	90% Exceedance Forecast (KAF)
5% Exceedance	There is a 30% chance that flows will exceed this volume.	There is a 50% chance that flows will exceed this volume.	There is a 70% chance that flows will exceed this volume.	95% Exceedance

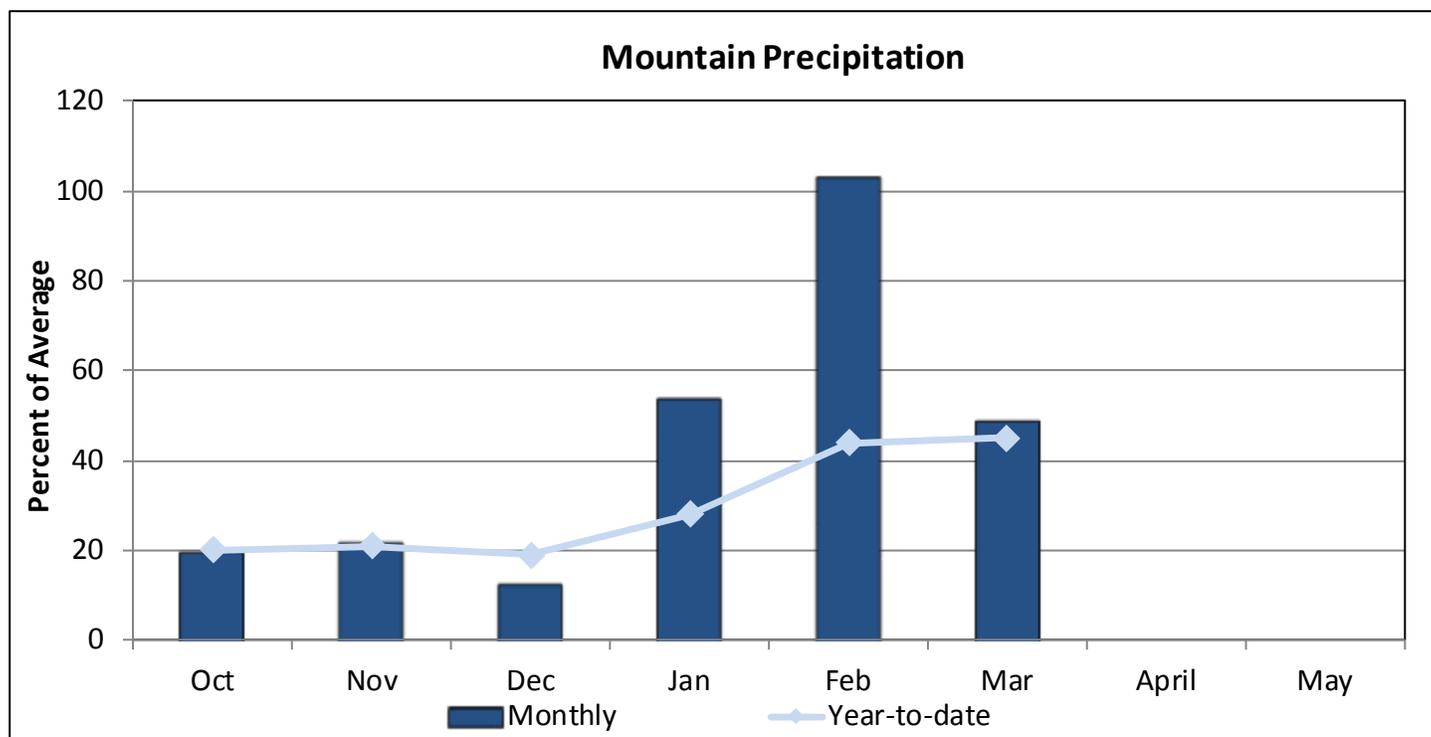
SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS

April 1, 2018

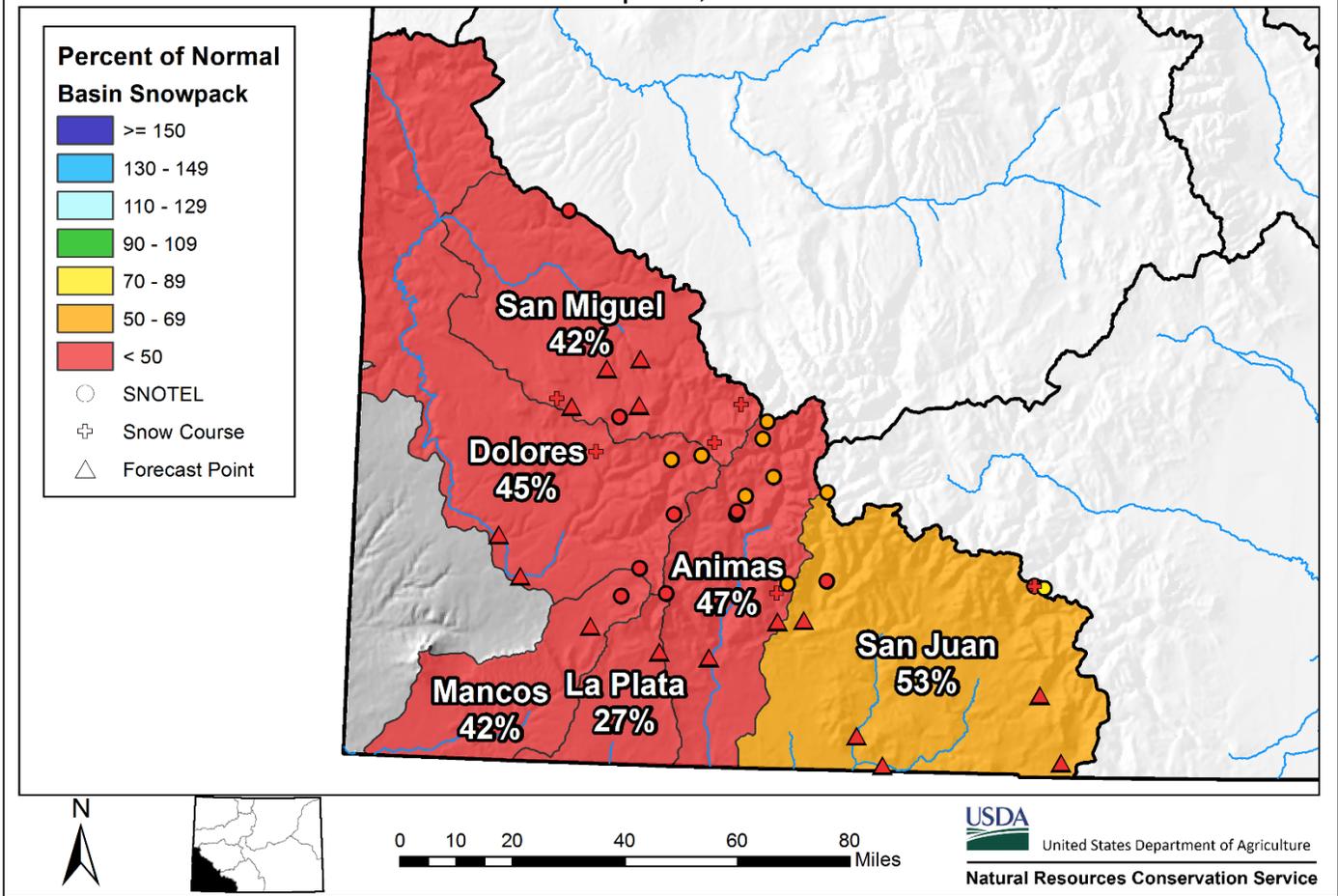
Snowpack in the combined southwest river basins is below normal at 47% of median. Precipitation for March was 49% of average which brings water year-to-date precipitation to 45% of average. Reservoir storage at the end of March was 101% of average compared to 123% last year. Current streamflow forecasts range from 49% of average for the inflow to Gurley Reservoir to 26% for the La Plata River at Hesperus.



*SWE values calculated using daily SNOTEL data only



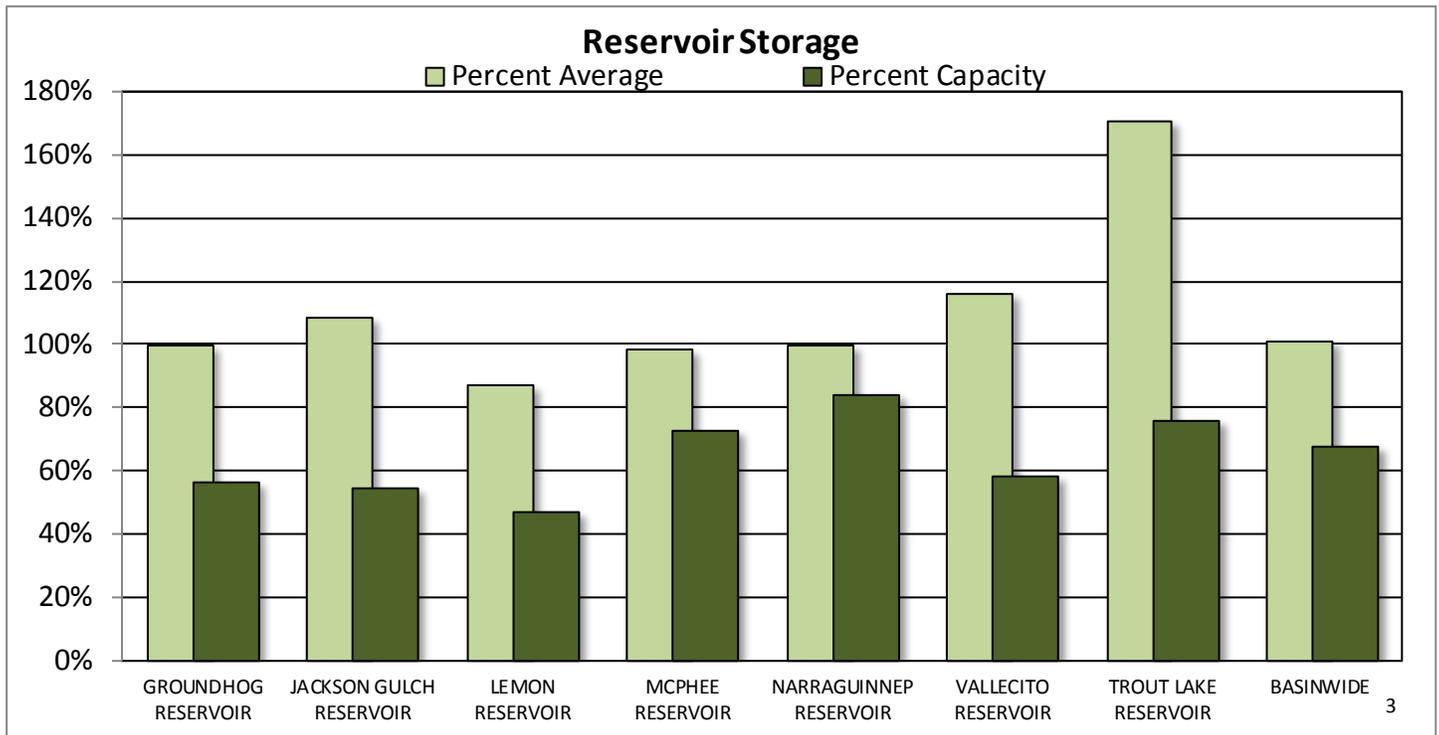
San Miguel, Dolores, Animas, and San Juan River Basins Snowpack and Streamflow Forecasts April 1, 2018



Watershed Snowpack Analysis April 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			% Median	Median
Animas	10	47	119	
Dolores	7	45	133	
San Miguel	6	42	114	
San Juan	4	53	118	
Basin-Wide Total	25	47	121	

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



Reservoir Storage End of March 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
GROUNDHOG RESERVOIR	12.5	19.7	12.5	22.0
JACKSON GULCH RESERVOIR	5.4	6.8	5.0	10.0
LEMON RESERVOIR	18.9	24.5	21.7	40.0
MCPHEE RESERVOIR	277.4	347.1	282.2	381.0
NARRAGUINNEP RESERVOIR	16.0	18.9	16.1	19.0
VALLECITO RESERVOIR	73.3	77.0	63.3	126.0
TROUT LAKE RESERVOIR	2.4	2.1	1.4	3.2
BASINWIDE	405.9	496.0	402.2	601.2
Number of Reservoirs	7	7	7	7

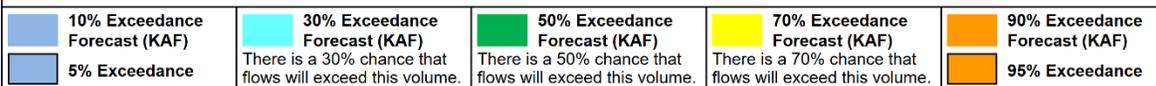
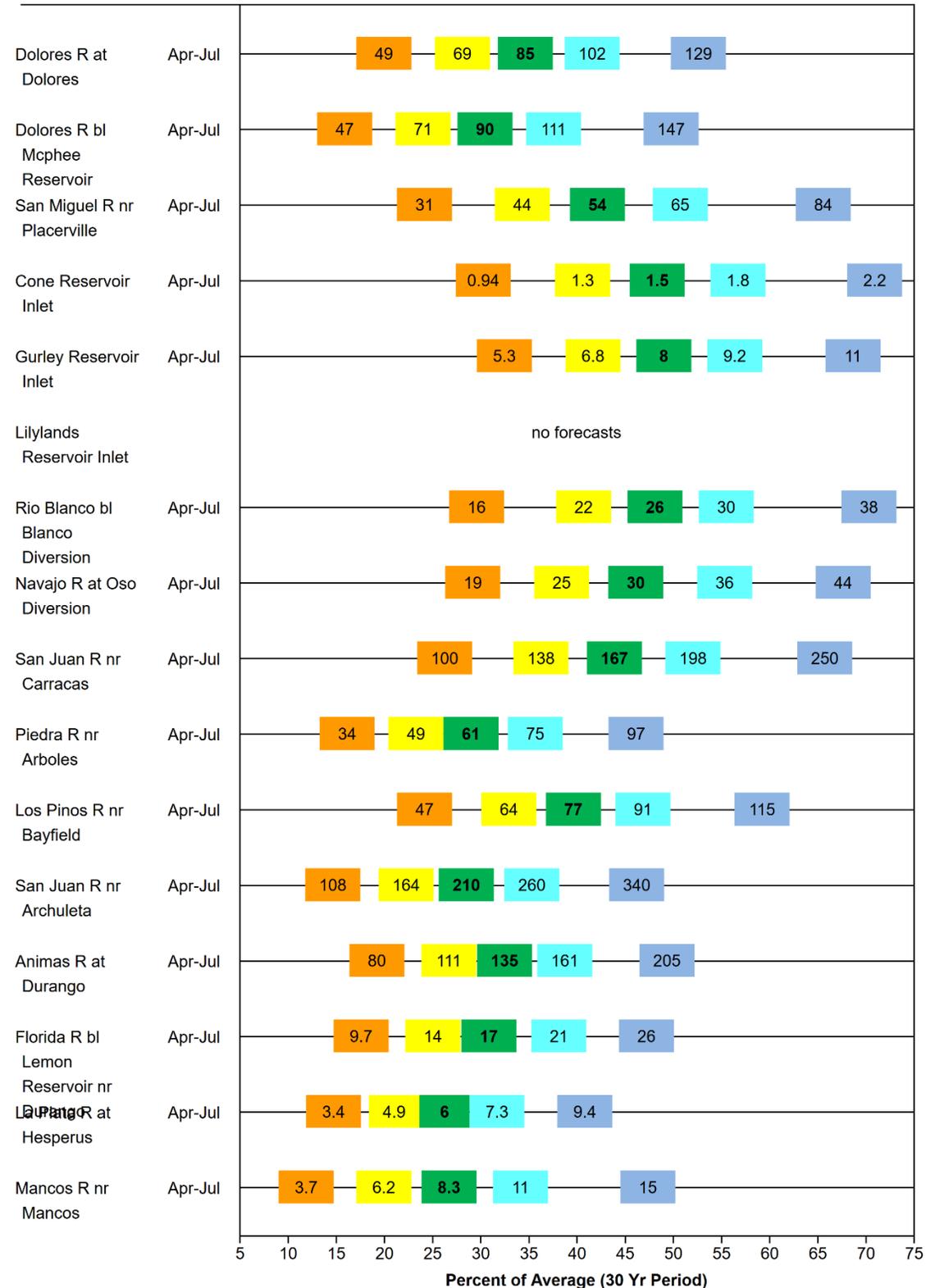
SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN RIVER BASINS

Water Supply Forecasts April 1, 2018

Forecast Exceedance Probabilities and Volumes

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

Box labels on chart are volumes of water in thousand acre-feet.



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.

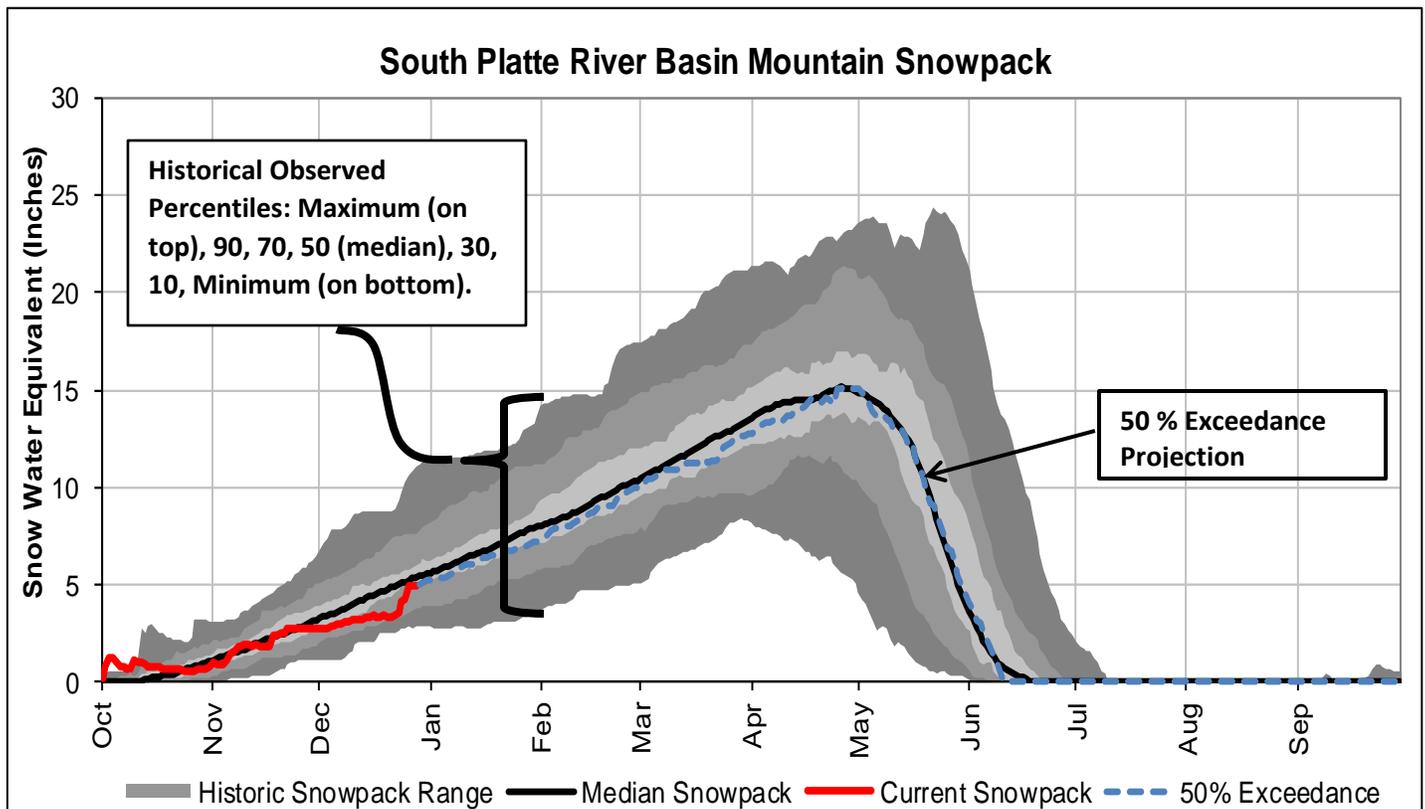
Current water year is represented by the heavy red line terminating on the last day the graphic was updated.

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:

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PO Box 25426

Denver, CO 80225-0426

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Website: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/co/snow/>

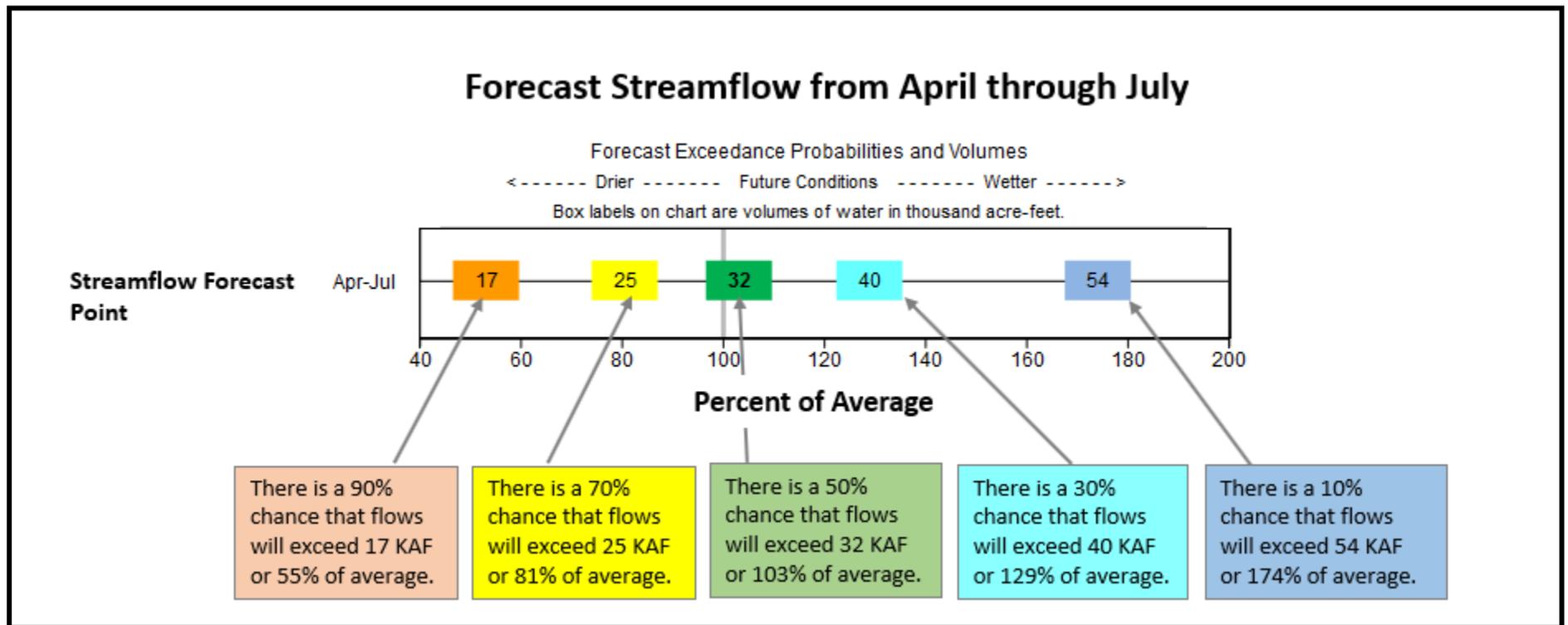
Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual 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 the same information that was contained in the previously published basin forecast tables, but provide a new way to visualize the range of streamflows represented by the forecast exceedance probabilities for each forecast period. The numbers displayed in the box represent the actual forecasted streamflow volume (in KAF) for the given exceedance probability, and the horizontal position of the box represents the percent of average of that streamflow volume. The spread of the forecasts offers an indication of the uncertainty in a given forecast; when the colored boxes are spread far a part, the forecast skill is low and uncertainty is high; when the boxes are close together, the forecast skill is higher and uncertainty lower.





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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>

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Colorado
Water Supply Outlook Report
Natural Resources Conservation Service
Lakewood, CO