

# Colorado

## Water Supply Outlook Report

### May 1, 2018



Dan Olson, NRCS District Conservationist out of Gunnison, collects snowpack data along the Grayback snow course and collocated SNOTEL site. Grayback is one of many snow measuring locations in Colorado that has experienced considerable tree mortality due to recent insect infestations. Although there was no snow present at the SNOTEL site for the May 1<sup>st</sup> survey, the Grayback snow course is one of the few monitoring locations in the Rio Grande basin with measurable snow at this time. Although, with 4.2 inches of snow water equivalent, this snow course is at only 26 percent of median for May 1<sup>st</sup>.

Photo By: Beau Temple

Date: April 26, 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.

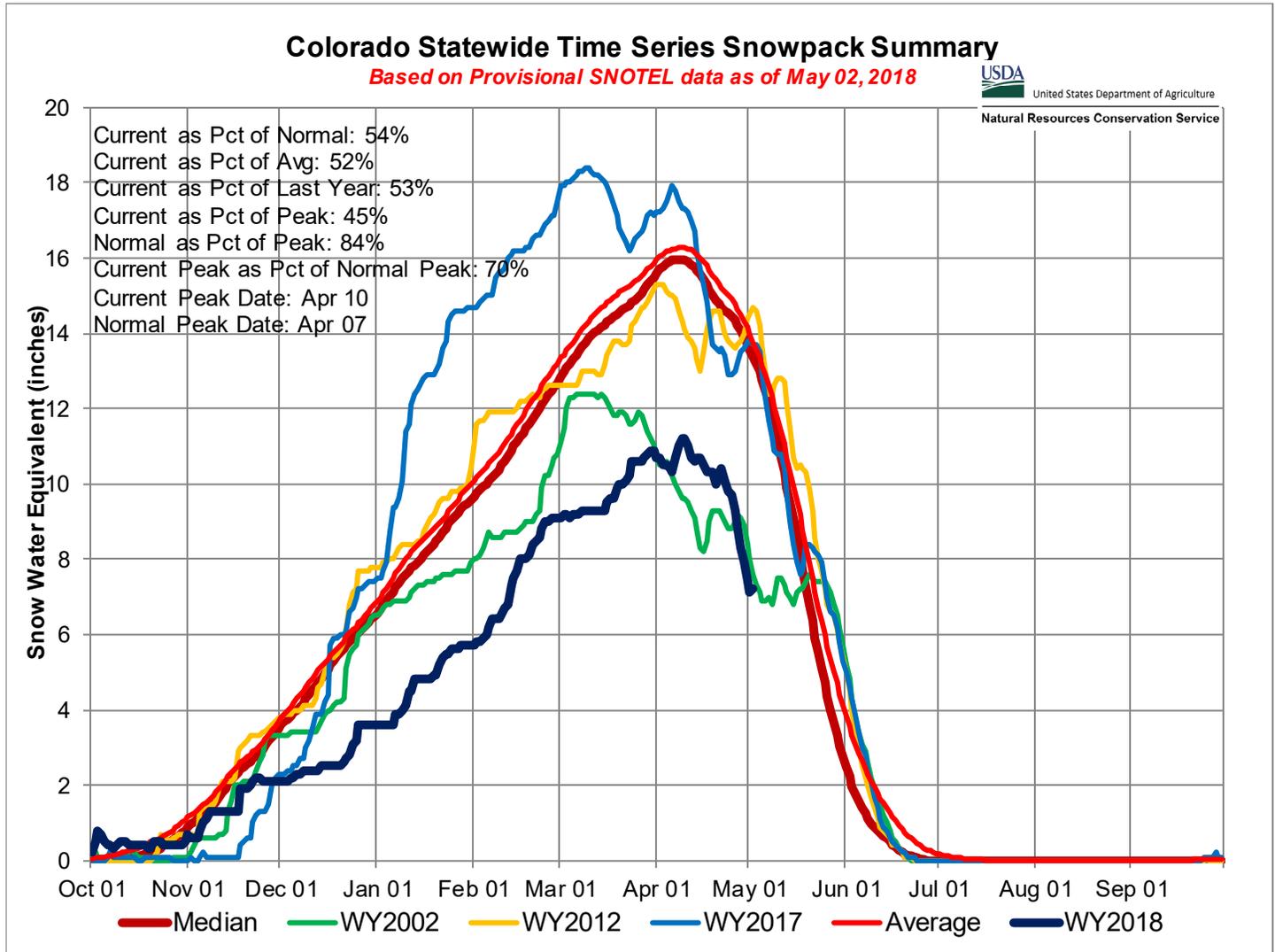
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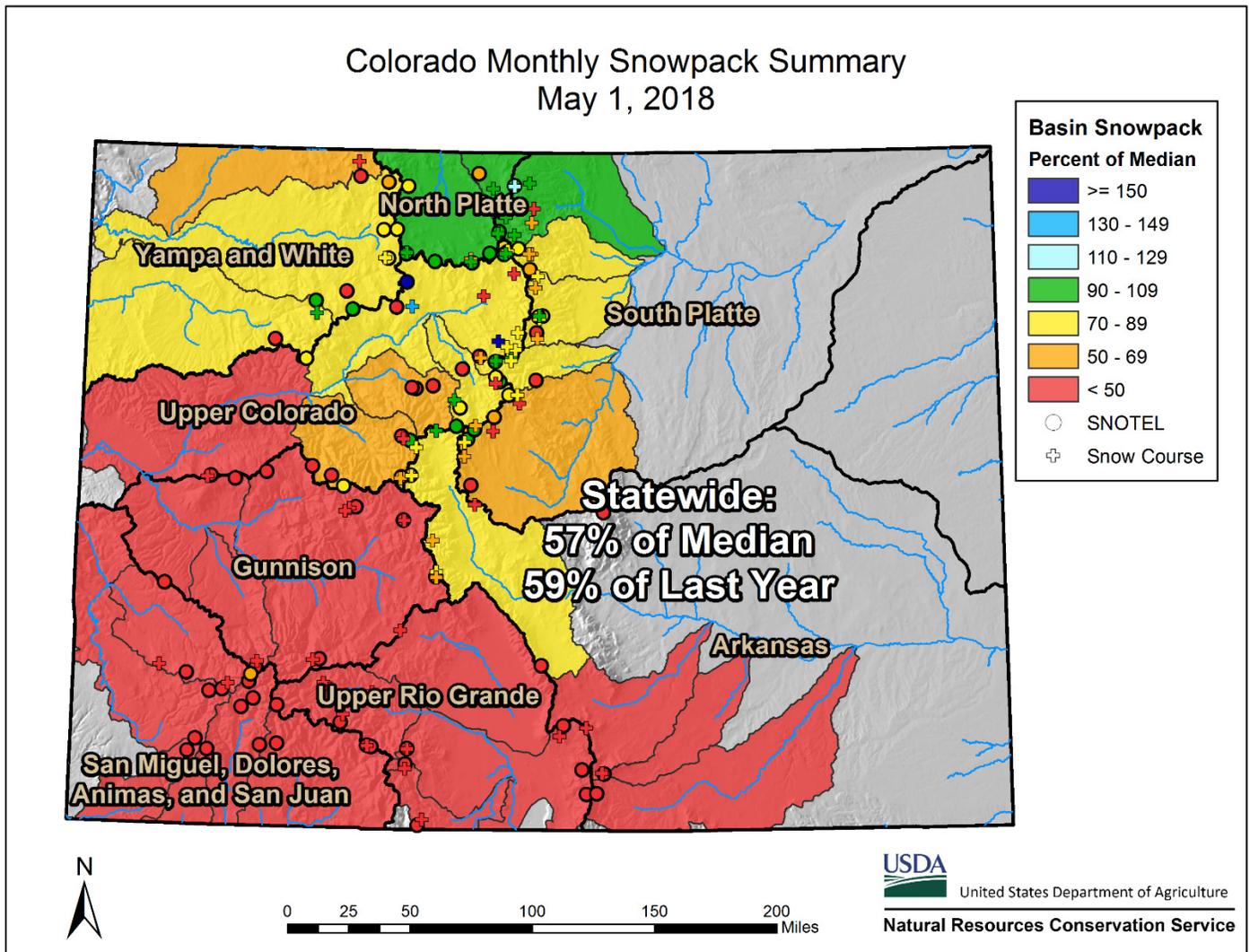
# Colorado Statewide Water Supply Conditions

## Summary



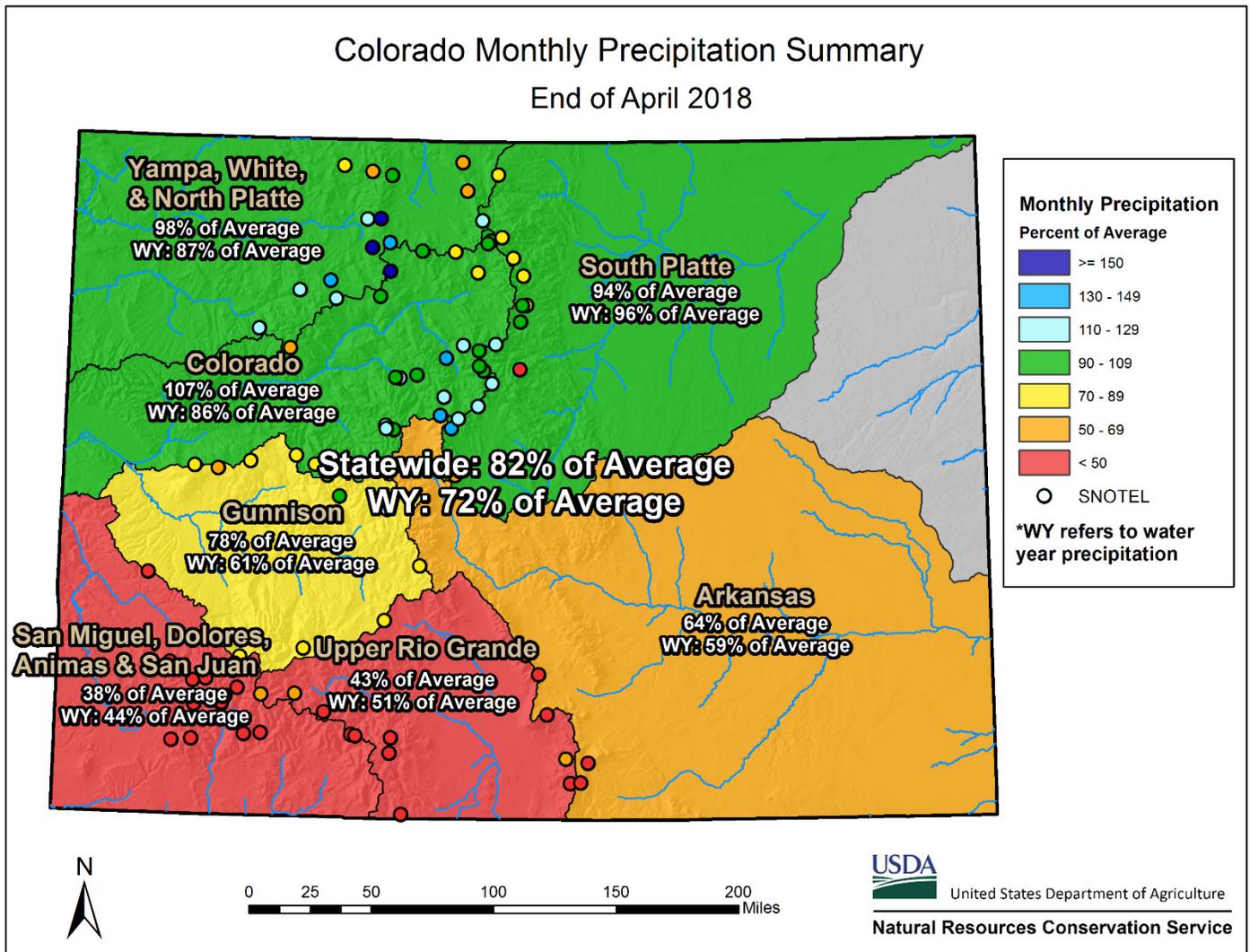
The forecasted water supply situation for the upcoming summer season varies widely across Colorado. This winter season exhibited what is considered a typical signal of a La Niña weather pattern. This pattern has led the southern Rocky Mountains to be warmer and drier than normal and the northern Rockies cooler and wetter. Colorado is right on the cusp of that transition. Except for February, all of southern Colorado consistently received notably less precipitation and snowpack accumulation than the northern basins. Meager snowpack combined with warmer than usual temperatures has led many, if not most, of the SNOTEL sites in southern Colorado to melt out as much as three weeks (or more) earlier than normal. Those sites that have not yet melted may still be on track to melt early depending on future weather. The resulting streamflow forecasts across southern Colorado reflect these trends with most calling for well below 50 percent of normal streamflows. While no major basin in the state had consistently above normal snowpack and precipitation this year, conditions generally improved across central and northern Colorado. The most plentiful snowpack was held in the mountains of the Front Range feeding the North Platte, South Platte, and Upper Colorado rivers. While the snowpack was notably more abundant in northern and parts of central Colorado than in the south and far western portions of the state, at no point this season were there any streamflow forecasts for above average volumes anywhere in the state. While streamflows are projected to be below normal, we are entering runoff season with above average statewide reservoir storage, as has been held throughout the season.

## Snowpack



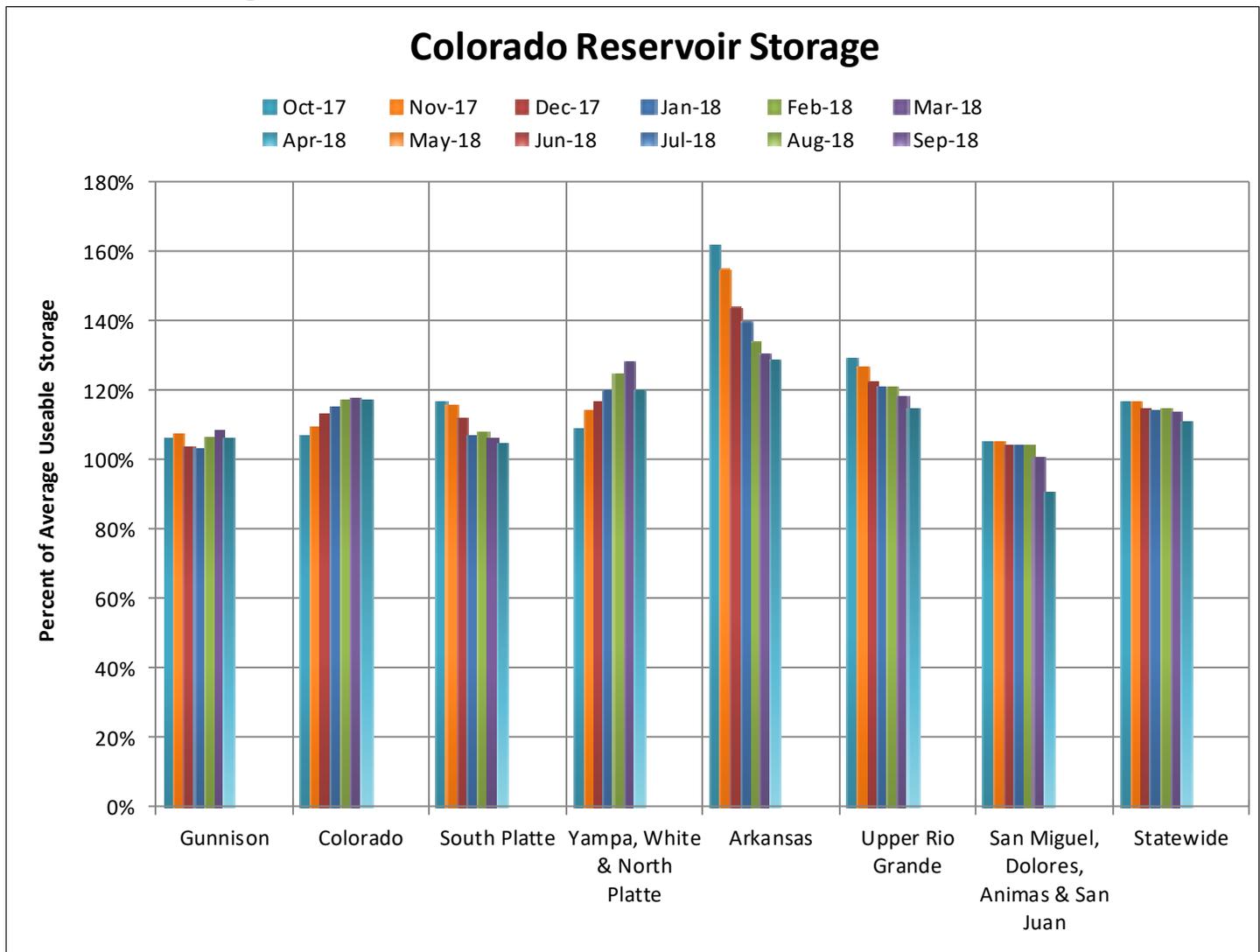
Snowpack conditions deteriorated across the state during April. New snow accumulations were prevalent especially in the first few days of April, but this did little to offset the melt that has begun to occur at all of Colorado's SNOTEL sites, leaving the state at 57 percent of median on May 1<sup>st</sup>. Thanks to periods of unseasonably warm temperatures, all of what little snow that had accumulated at low elevations has reached advanced stages of melt, or disappeared entirely. This is particularly pronounced in the southern river basins where only the highest elevation snow monitoring locations continue to hold any snowpack at all. In the Upper Rio Grande and combined San Miguel, Animas, Dolores, and San Juan basins only 18 of the 50 SNOTEL sites or snow courses still have snow, when normally only 10 sites would be snow-free. The majority of these locations are reporting the lowest or second lowest snowpack on record since monitoring began, in the late 1970s for SNOTEL and as early as the late 1930s for snow courses. The lack of seasonal snow accumulation and early snowpack peak dates have left these two river basins both at 12 percent of median snowpack, the worst since 2002. The southern sub-basins of the Arkansas River basin are equally dismal and the basin-wide percent of median (52 percent) is only bolstered by the Upper Arkansas sub-basin, which is at 73 percent of median. The Gunnison River basin is only marginally better, at 38 percent of median, and like the southern basins, snowpack this water year has flirted with being the lowest on record. Conditions improve drastically in the northern river basins. The Colorado River and Yampa-White River basins are at 76 and 79 percent of median respectively, with the headwater reaches of these basins even closer to normal. The South Platte and North Platte basins are at 81 and 91 percent of median, respectively. These basins reached peak accumulations within 90 percent of normal and have only just begun to experience melting of their seasonal snowpack.

## Precipitation



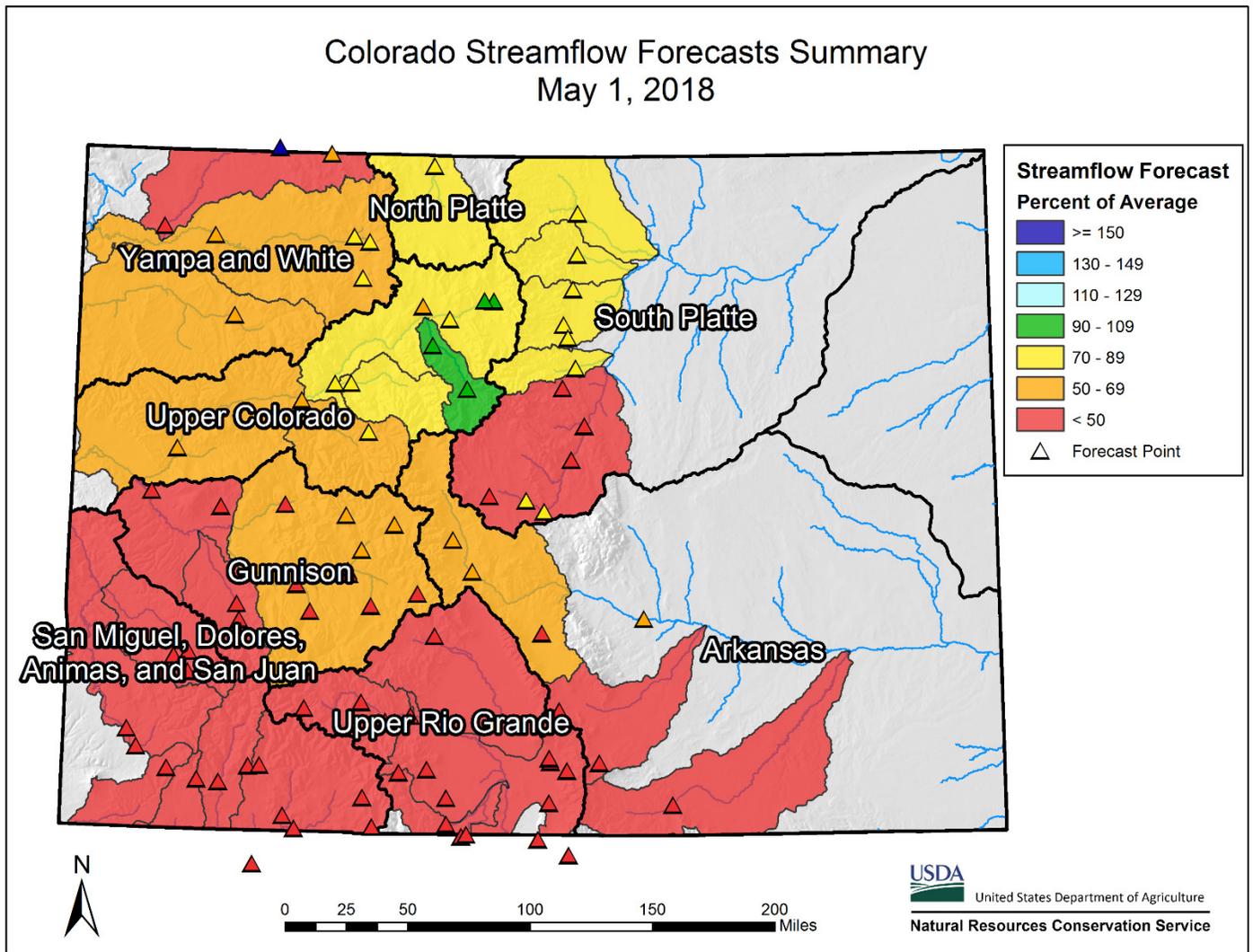
Taken collectively, Colorado's percent of normal precipitation during April was second only to February's. The 82 percent of average monthly accumulations averaged across the state boosted Colorado's water year-to-date precipitation to 72 percent of average. However, these improvements were only realized in the northern half of the state and the southern river basins remain extremely dry. The combined San Miguel, Dolores, Animas, and San Juan River basins received only 38 percent of average precipitation last month and every SNOTEL site located within these basins is reporting record low precipitation. At 44 percent of normal precipitation for the water year, these southwestern basins are on track to have the worst annual precipitation since the SNOTEL network was established. At 43 percent of average, the Upper Rio Grande River basin also received little moisture last month and has only accumulated about half of the normal water year precipitation. April precipitation was better in the Arkansas and Gunnison River basins at 64 and 78 percent of average respectively. Although these amounts are still well below average and the Gunnison River basin is currently indicating record low water year precipitation. In stark contrast, the Colorado, combined Yampa, White, North Platte, and the South Platte River basins all experienced near to above normal accumulations during April. At 107 percent of average, the Colorado River basin received the most abundant precipitation during the month, which boosted water year-to-date precipitation to 86 percent of average. The South Platte and combined Yampa, White, and North Platte River basins are now at 96 and 87 percent of average precipitation for the water year after near normal monthly accumulations during April.

## Reservoir Storage



With the end of the primary snowpack accumulation season and the start of snowmelt runoff upon us, reservoir storage across the state will likely be watched closely throughout the summer, particularly in southern Colorado where far below normal seasonal streamflows are being forecast. Reservoir storage across Colorado dropped slightly over the last month, relative to normal values, dropping from 114 to 111 percent of average statewide. The largest decline was observed in the combined San Miguel, Dolores, Animas, and San Juan basins of southwest Colorado from 101 percent of average down to 91 percent. This makes those combined basins the only part of the state with below average storage going into May. At slightly above normal values, the South Platte and Gunnison basins are holding 105 and 107 percent of average storage, respectively. The Upper Rio Grande basin, which currently has some of the lowest streamflow forecasts in the state, has 115 percent of average reservoir storage. Storage in the Upper Colorado basin remained relatively steady since a month ago and resides at 118 percent of average reservoir storage which is just behind the combined Yampa, White, and North Platte basins that are holding 121 percent of average. Currently the Arkansas River basin is holding the most reservoir storage in Colorado, relative to normal, at 129 percent. While reservoir storage across the basins of Colorado is generally near to above normal there is a wide range of streamflow forecasts, resulting from dramatically different snowpacks, across the state which may lead to diverse and challenging water resource management issues for this year and likely going forward.

## Streamflow

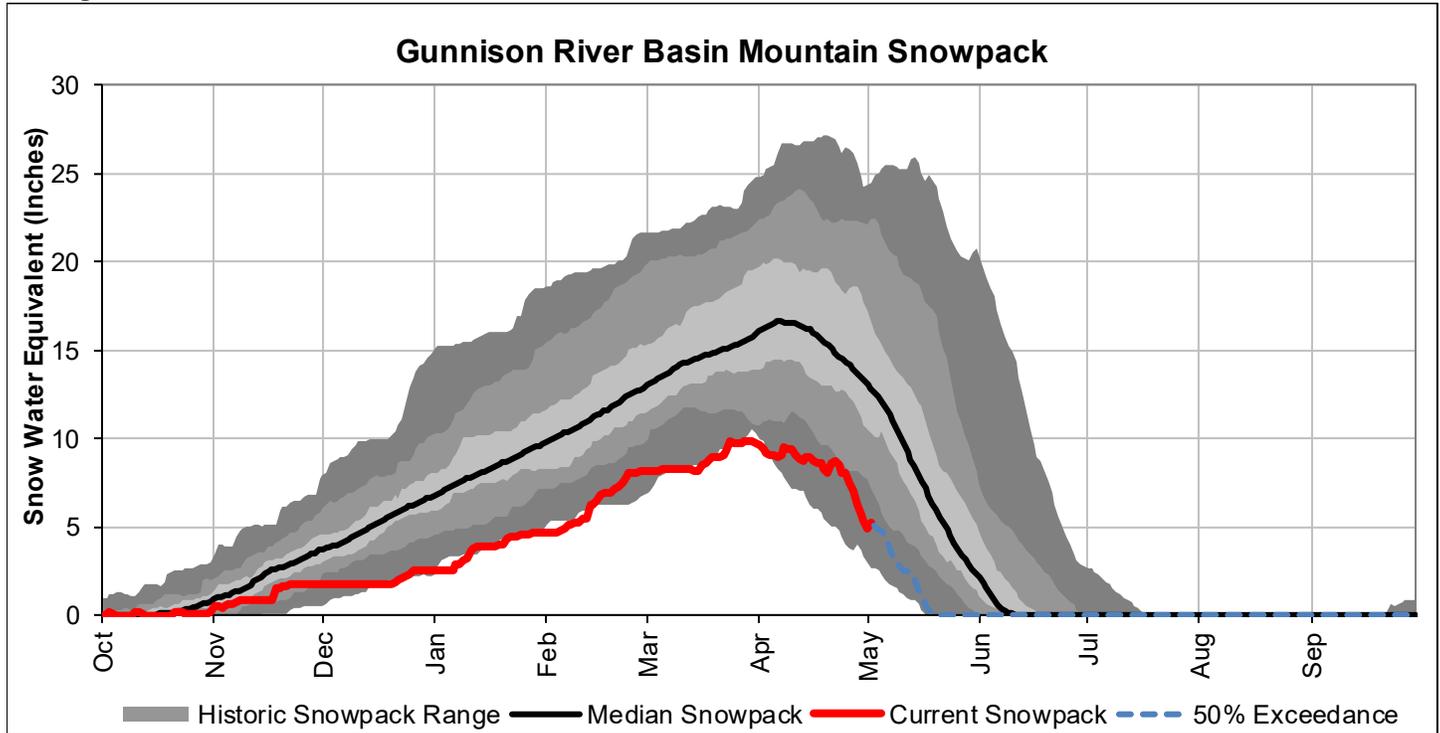


Streamflow forecasts for Colorado's streams are generally showing further decreases from those issued last month. There are a few streams across the state with slight increases in the anticipated runoff volume at the 50 percent exceedance level, but overall, the precipitation and snowpack conditions during April did little to improve the runoff outlook. Forecast points in the Rio Grande and combined San Miguel, Dolores, Animas, and San Juan River basins have again experienced the largest decreases in anticipated streamflow volumes. Forecasts for streams in these regions range from only 3 percent to 36 percent of average streamflow for the May to July period, with the average of all forecasts in the basins being near 20 percent of normal. Additionally, several forecast points across southwest Colorado may experience record low flows this summer. The anticipated runoff is also extremely low for most forecast points in the Gunnison and Arkansas River basins where the average of the forecasts across the basins is only around 35 percent of normal. Without a deluge of precipitation in the coming months, these basins are unlikely to see considerable improvement in their runoff prospects. The expected streamflow volumes are higher in the northern river basins, however there are no forecast points expected to hit normal flows given the current snowpack and precipitation conditions. Forecasts for streams in the Yampa and White River basins range from 32 to 73 percent of average, while in the North Platte and South Platte River basins, forecasts are slightly higher ranging from 37 percent to 86 percent of average. Currently, the streams most likely to achieve normal runoff volumes are those located in the Colorado River Headwaters where the inflow to Dillon Reservoir is the highest in the state at 95 percent of normal.

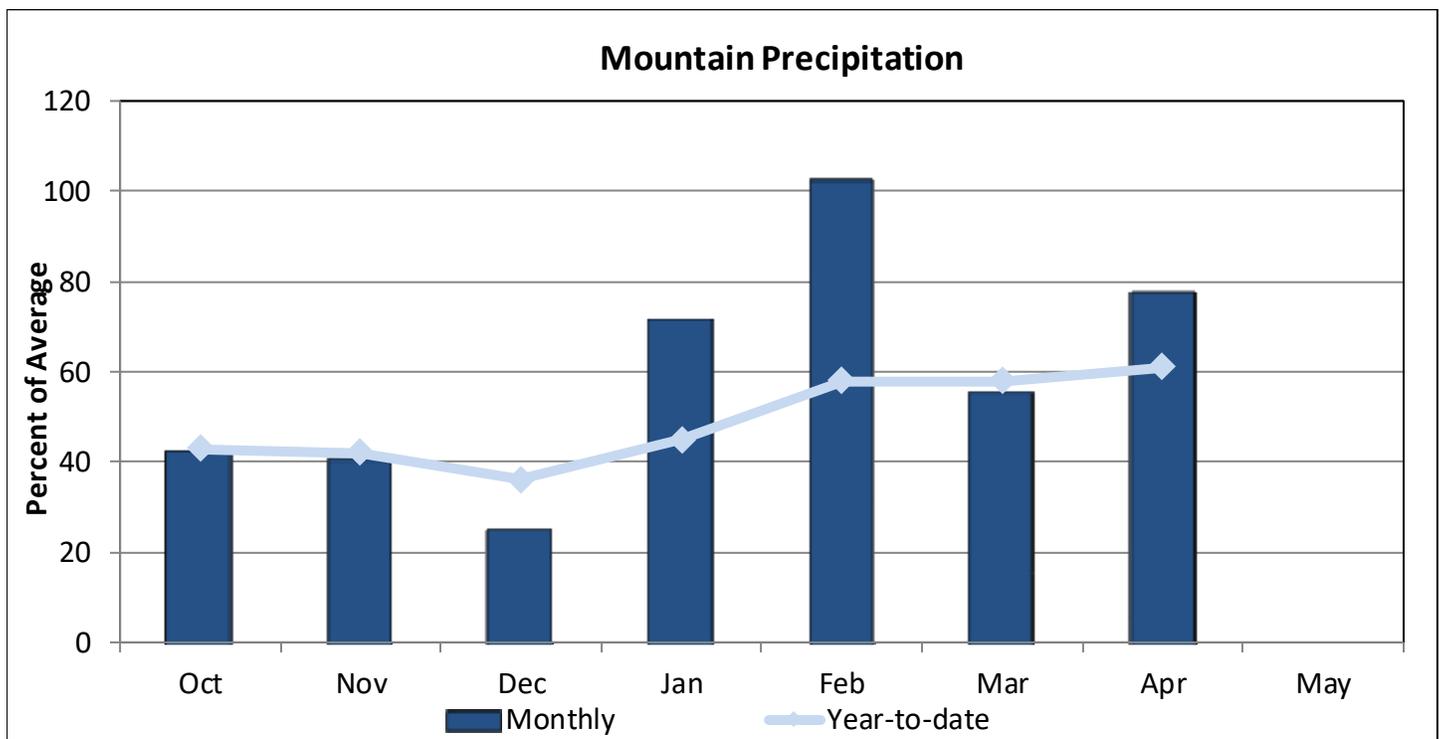
# GUNNISON RIVER BASIN

May 1, 2018

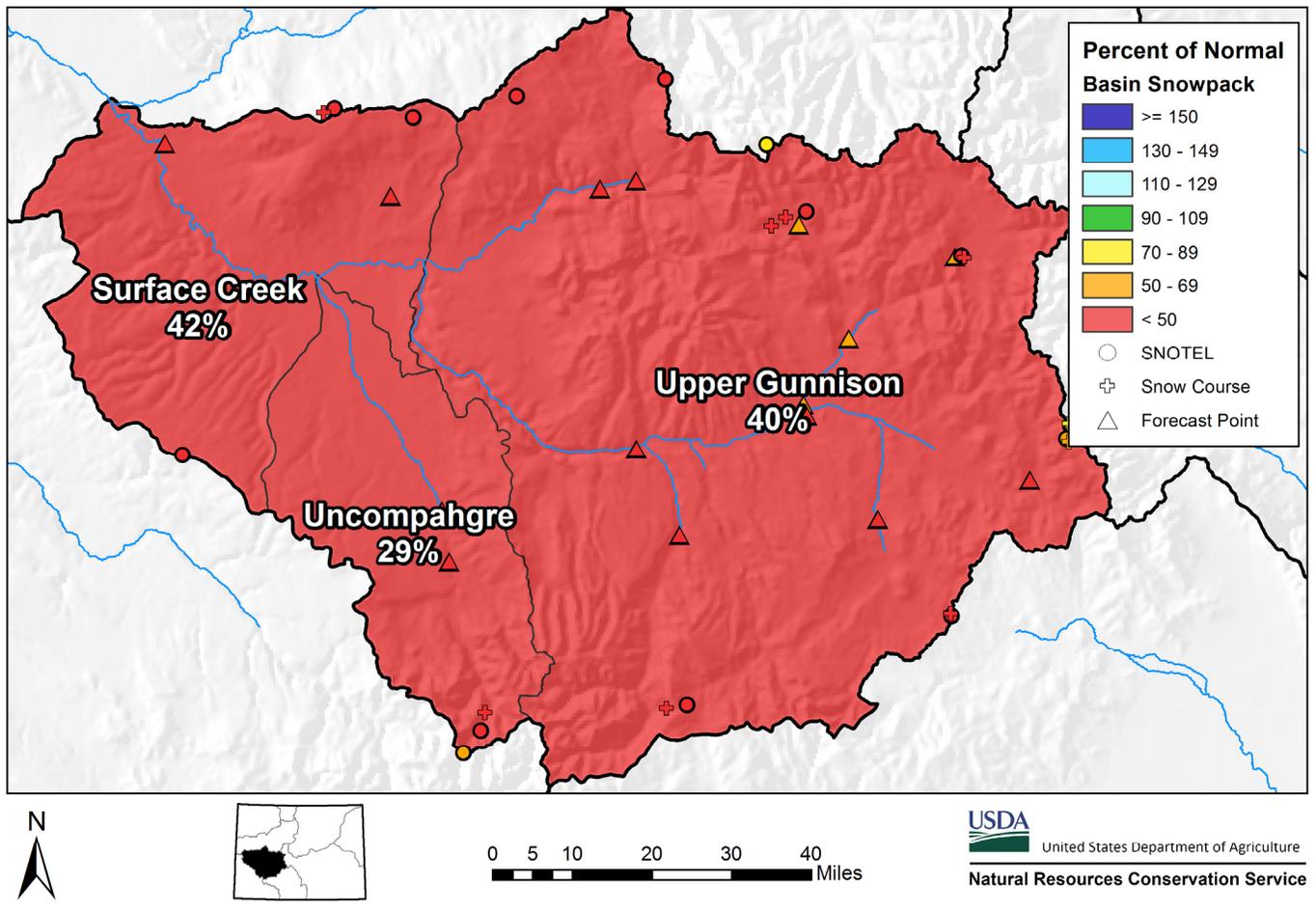
Snowpack in the Gunnison River basin is below normal at 38% of the median. Precipitation for April was 78% of average which brings water year-to-date precipitation to 61% of average. Reservoir storage at the end of April was 107% of average compared to 128% last year. Current streamflow forecasts range from 65% of average for the Slate River near Crested Butte to 15% for the inflow to Paonia Reservoir.



\*SWE values calculated using daily SNOTEL data only



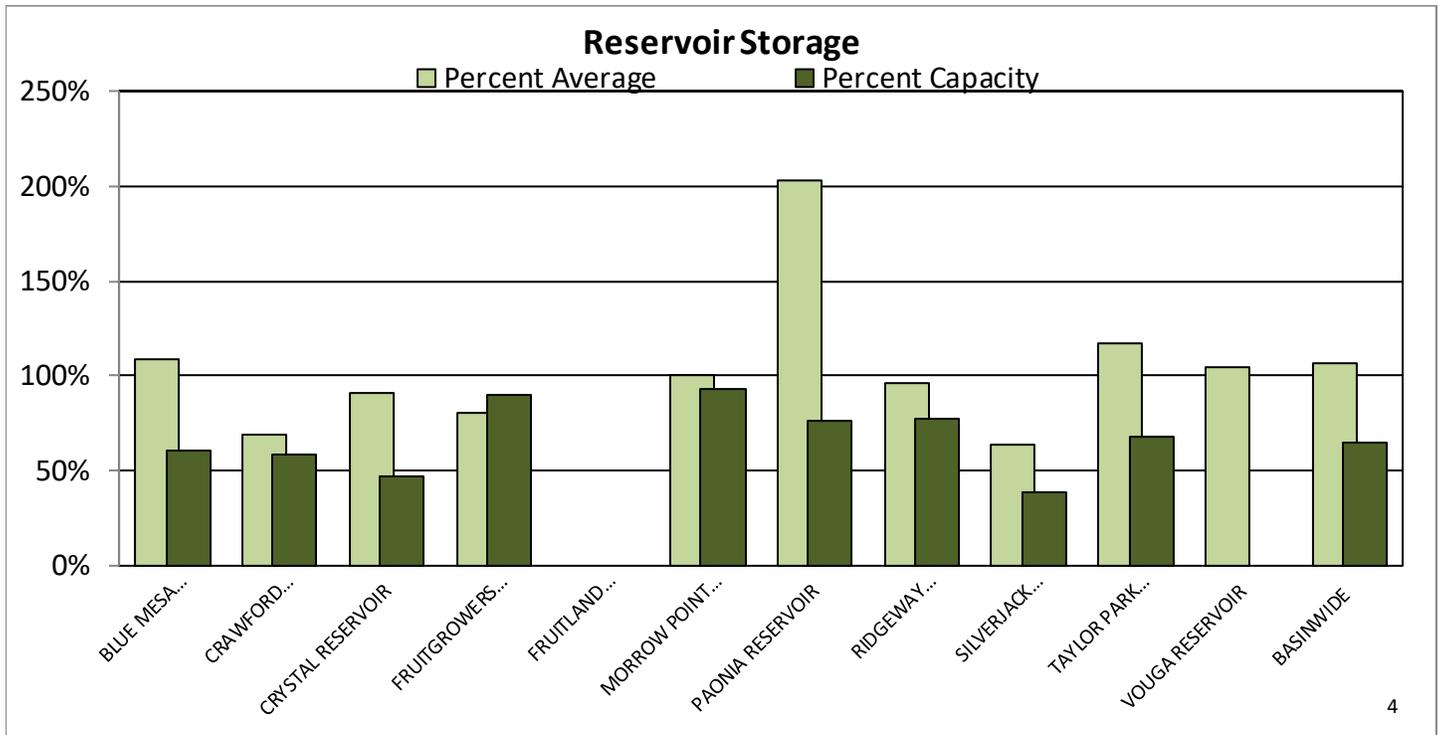
## Gunnison River Basin Snowpack and Streamflow Forecasts May 1, 2018



### Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
				Median
Upper Gunnison	18	40		280
Surface Creek	3	42		19
Uncompahgre	4	29		95
<b>Basin-Wide Total</b>	22	38		109

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



### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
BLUE MESA RESERVOIR	498.3	657.7	457.1	830.0
CRAWFORD RESERVOIR	8.1	14.5	11.8	14.0
CRYSTAL RESERVOIR	8.2	8.9	9.0	17.5
FRUITGROWERS RESERVOIR	3.2	3.5	4.0	3.6
FRUITLAND RESERVOIR		7.0		9.2
MORROW POINT RESERVOIR	112.5	108.8	111.8	121.0
PAONIA RESERVOIR	11.8	2.2	5.8	15.4
RIDGEWAY RESERVOIR	64.3	63.0	66.6	83.0
SILVERJACK RESERVOIR	5.0	5.9	7.8	12.8
TAYLOR PARK RESERVOIR	71.8	73.2	61.2	106.0
VOUGA RESERVOIR	0.9	0.7	0.9	0.9
<b>BASINWIDE</b>	<b>784.1</b>	<b>945.3</b>	<b>736.0</b>	<b>1213.4</b>
Number of Reservoirs	10	11	10	11

# GUNNISON RIVER BASIN

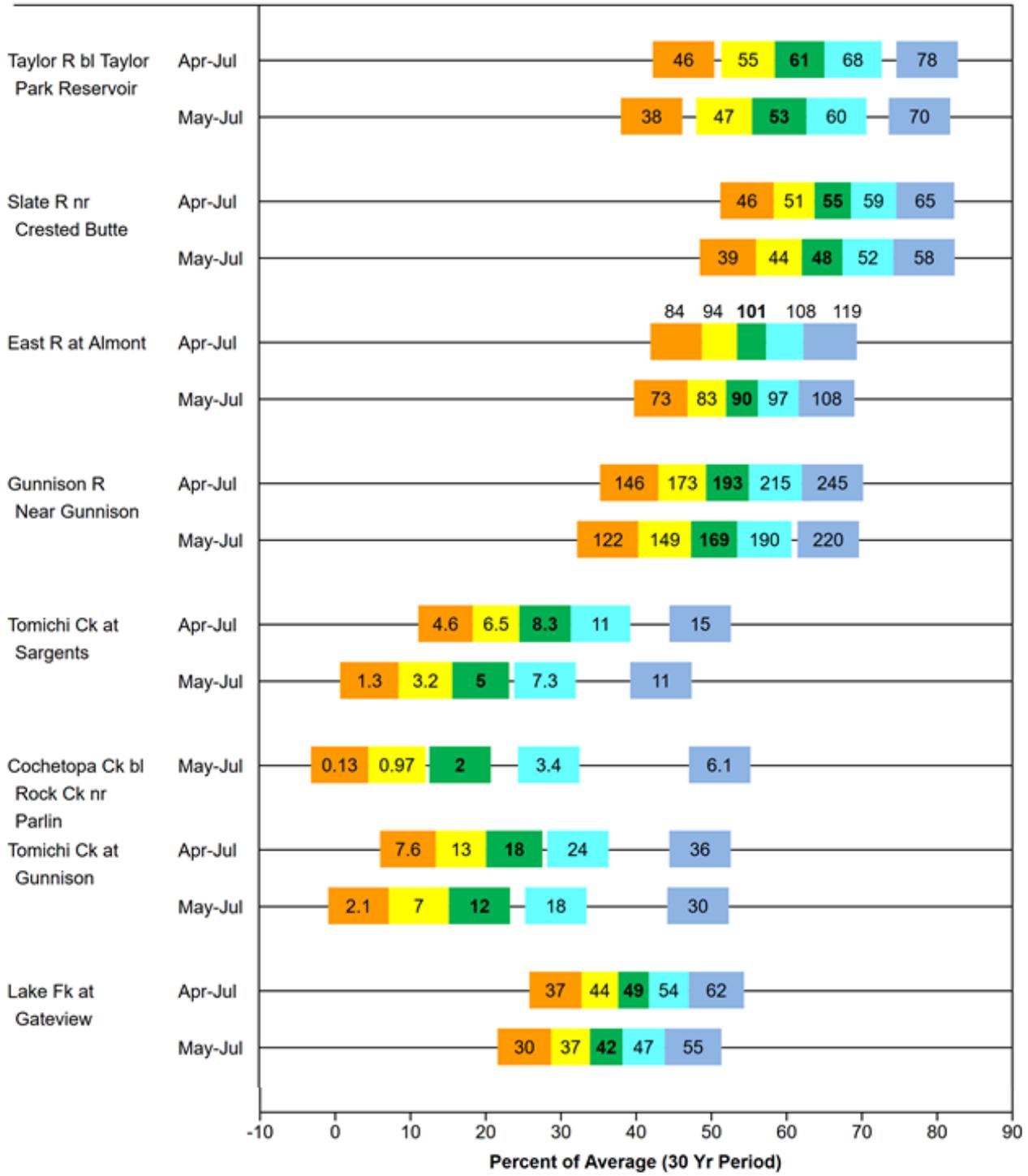
## Water Supply Forecasts

May 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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# GUNNISON RIVER BASIN

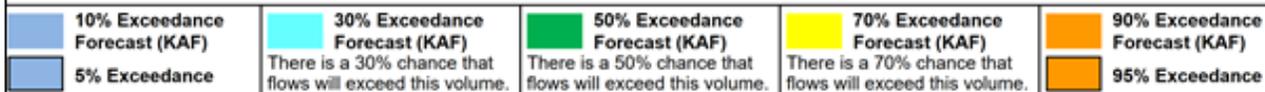
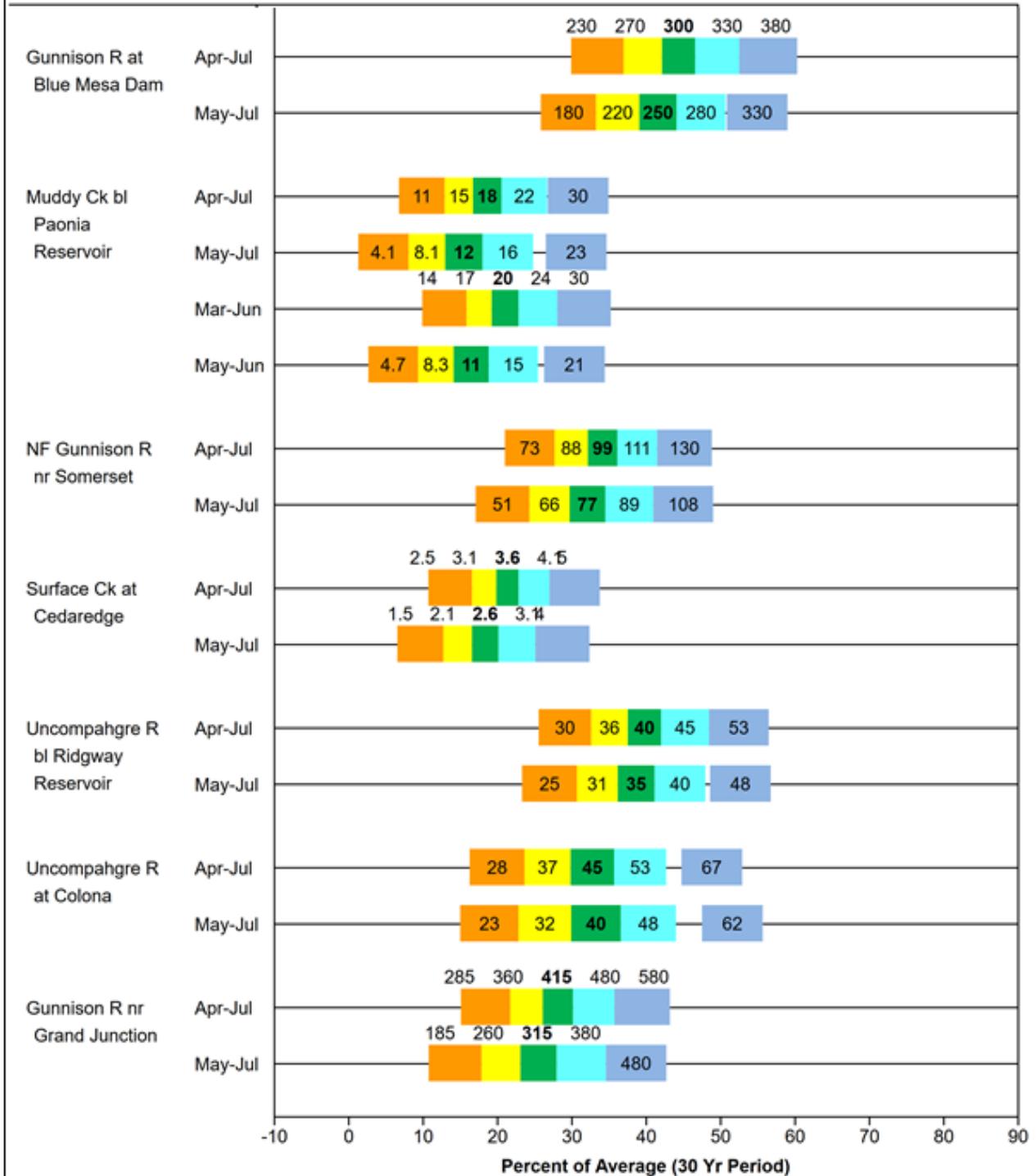
## Water Supply Forecasts

### May 1, 2018

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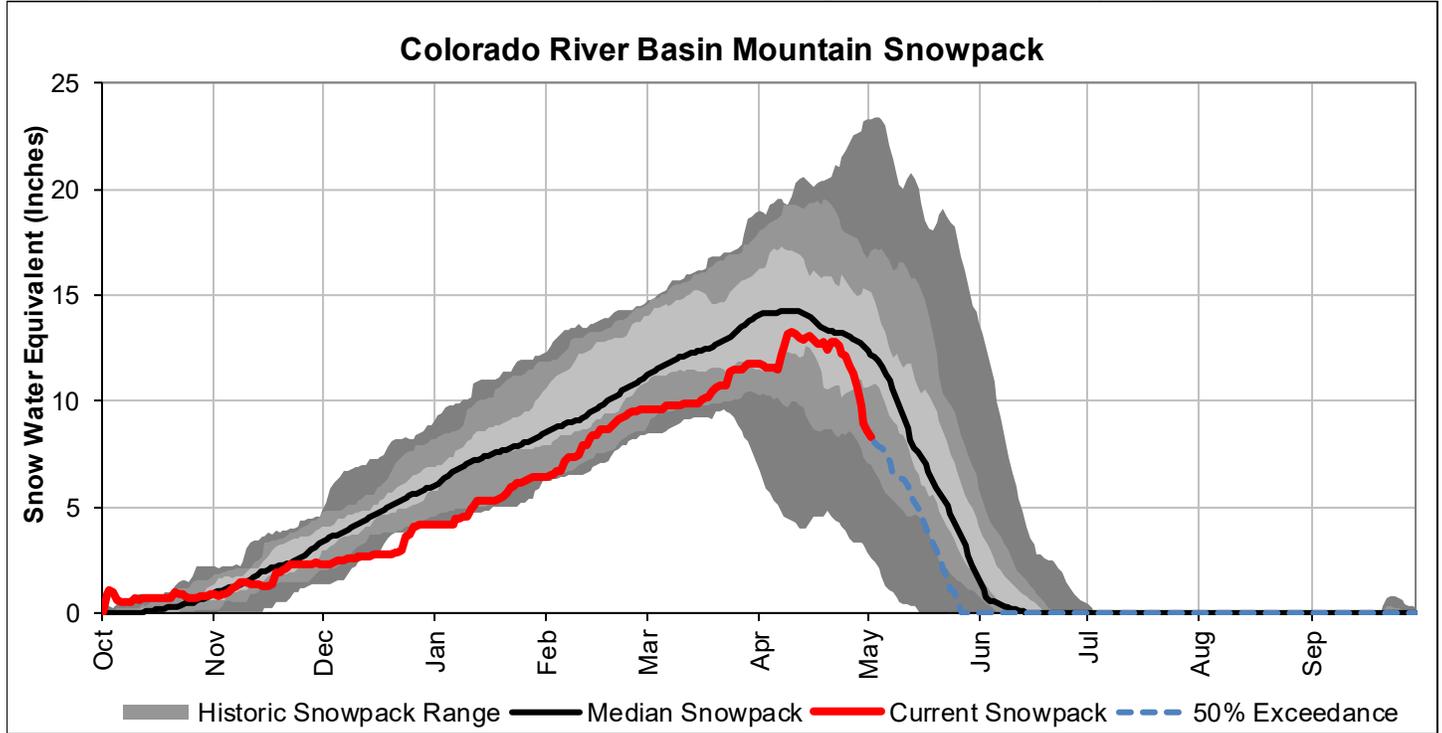
Box labels on chart are volumes of water in thousand acre-feet.



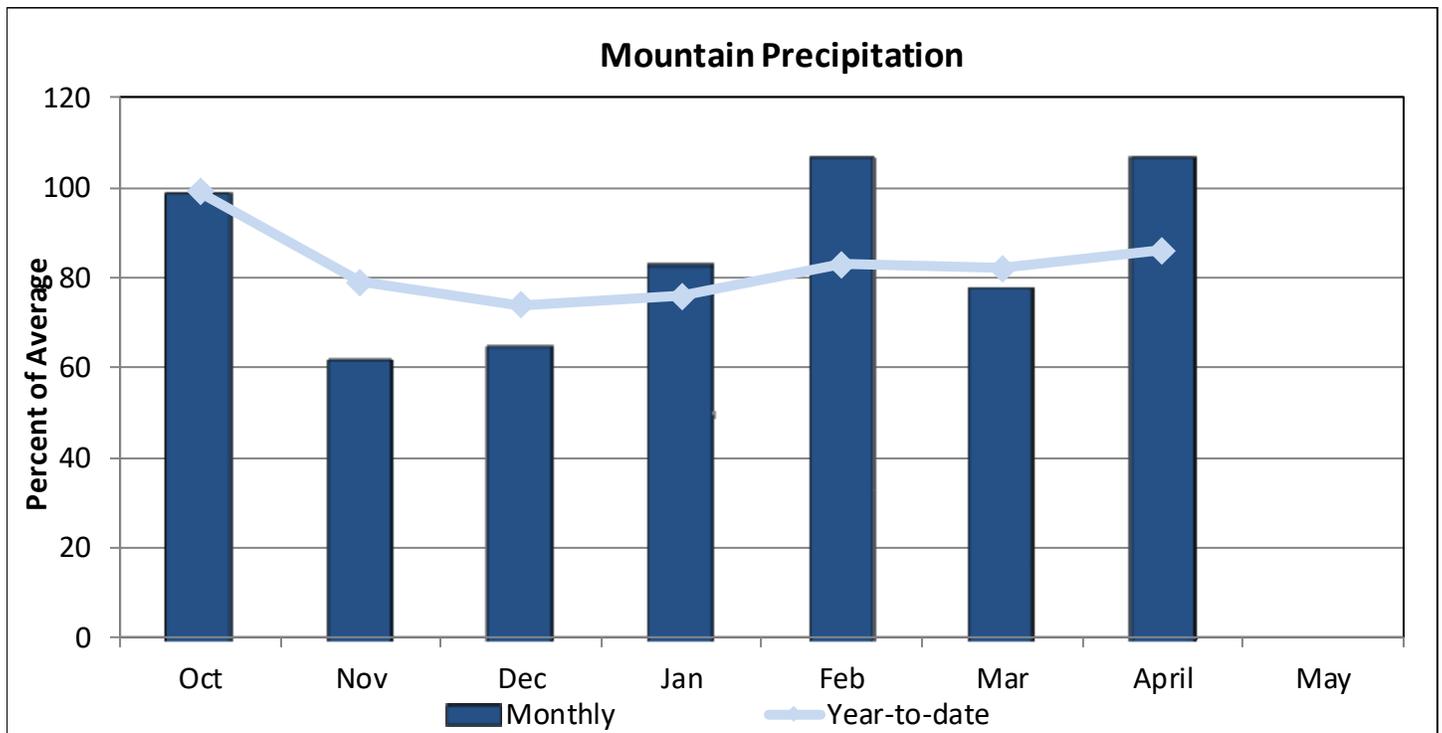
# UPPER COLORADO RIVER BASIN

May 1, 2018

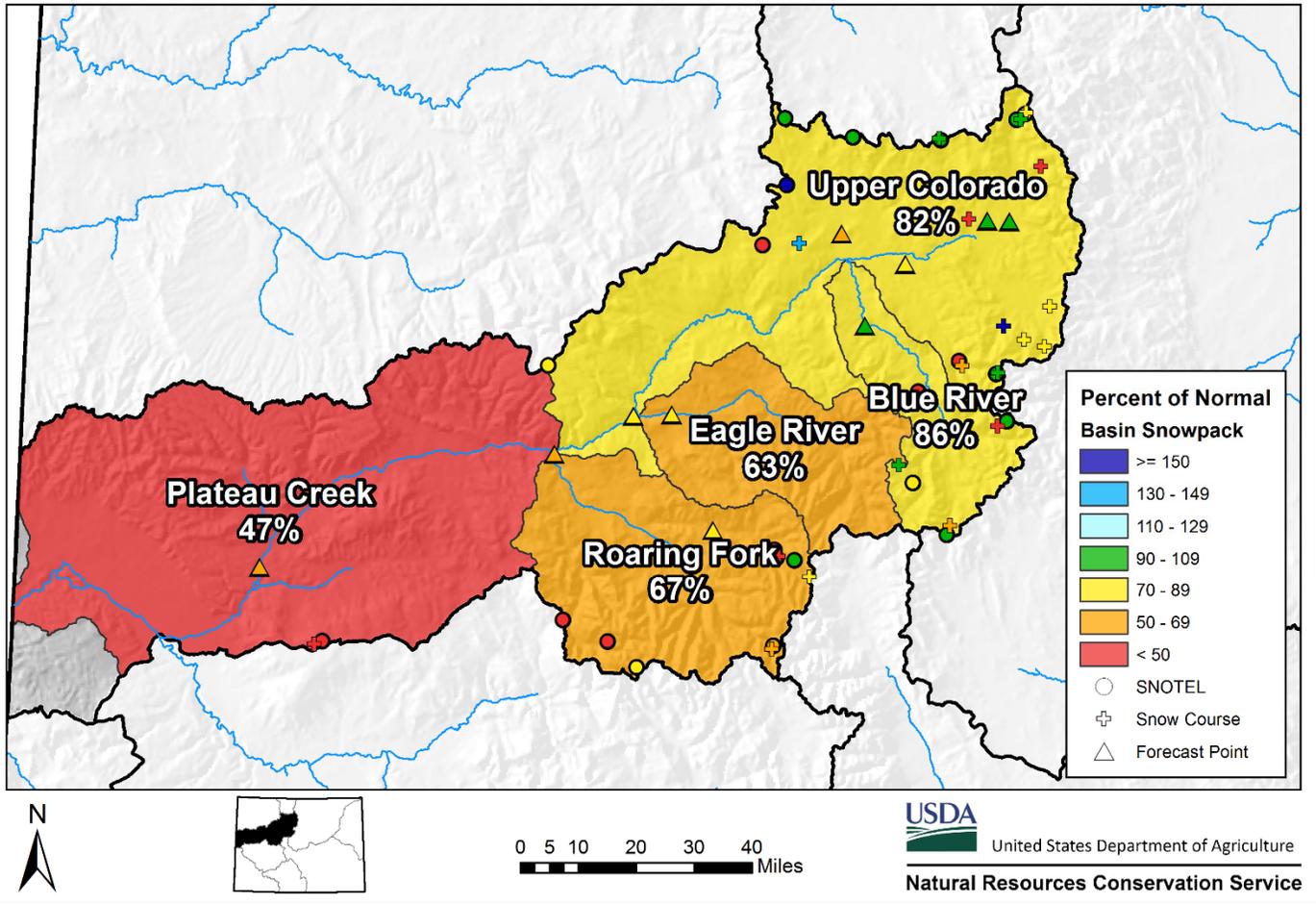
Snowpack in the Colorado River basin is below normal at 76% of the median. Precipitation for April was 107% of average which brings water year-to-date precipitation to 86% of average. Reservoir storage at the end of April was 118% of average compared to 113% last year. Current streamflow forecasts range from 95% of average for the inflow to Dillon Reservoir to 54% for the Roaring Fork at Glenwood Springs.



\*SWE values calculated using daily SNOTEL data only



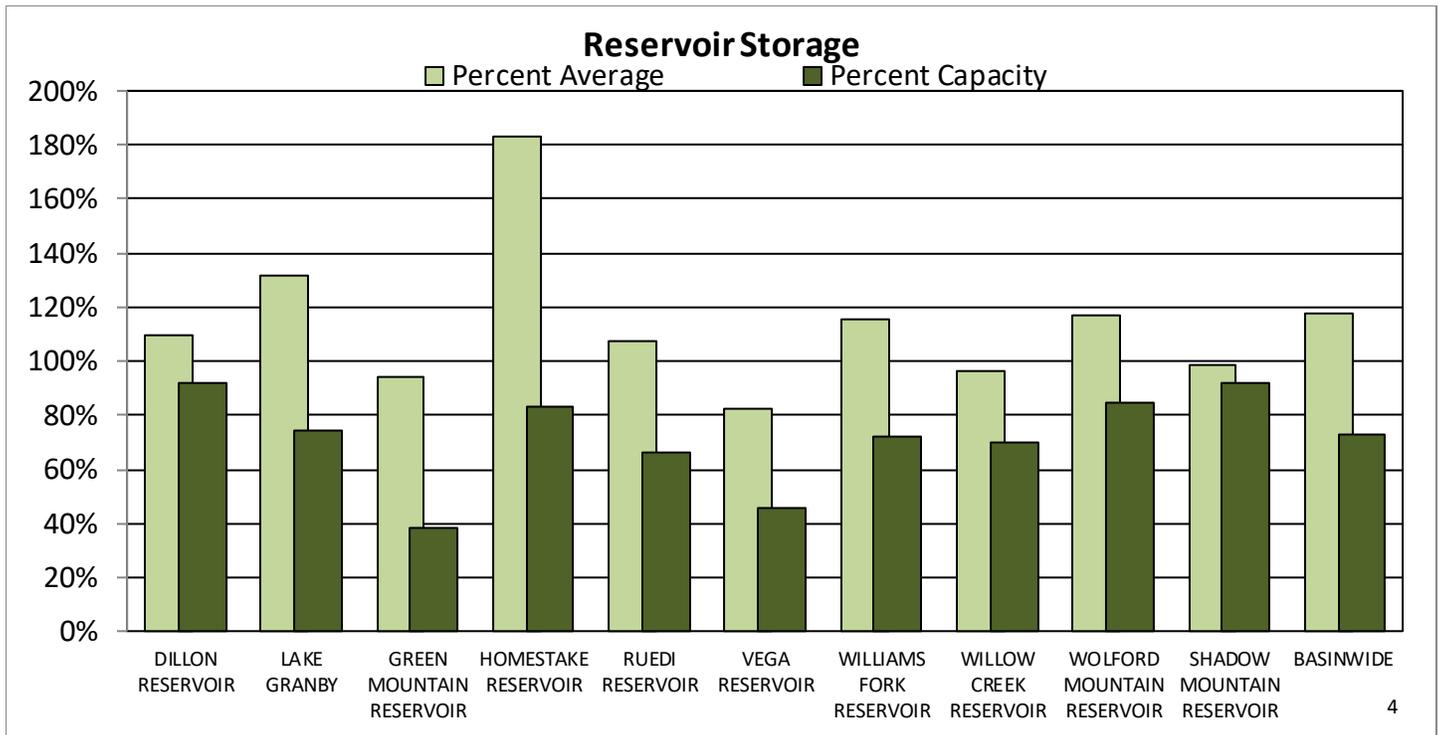
## Upper Colorado River Basin Snowpack and Streamflow Forecasts May 1, 2018



### Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			Median	Median
Blue River	8	86	104	
Upper Colorado	35	82	88	
Muddy Creek	4	109	93	
Eagle River	5	63	74	
Plateau Creek	6	47	90	
Roaring Fork	10	67	110	
Williams Fork	5	74	73	
Willow Creek	4	88	125	
<b>Basin-Wide Total</b>	<b>48</b>	<b>76</b>	<b>94</b>	

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



### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
DILLON RESERVOIR	228.7	210.6	208.7	249.1
LAKE GRANBY	346.2	318.1	262.4	465.6
GREEN MOUNTAIN RESERVOIR	56.2	62.2	59.5	146.8
HOMESTAKE RESERVOIR	35.7	23.7	19.5	43.0
RUEDI RESERVOIR	67.3	68.8	62.6	102.0
VEGA RESERVOIR	15.1	19.5	18.3	32.9
WILLIAMS FORK RESERVOIR	70.2	74.8	60.8	97.0
WILLOW CREEK RESERVOIR	6.4	6.6	6.6	9.1
WOLFORD MOUNTAIN RESERVOIR	56.0	60.5	47.7	65.9
SHADOW MOUNTAIN RESERVOIR	16.9	17.1	17.2	18.4
<b>BASINWIDE</b>	<b>898.7</b>	<b>861.8</b>	<b>763.3</b>	<b>1229.8</b>
Number of Reservoirs	10	10	10	10

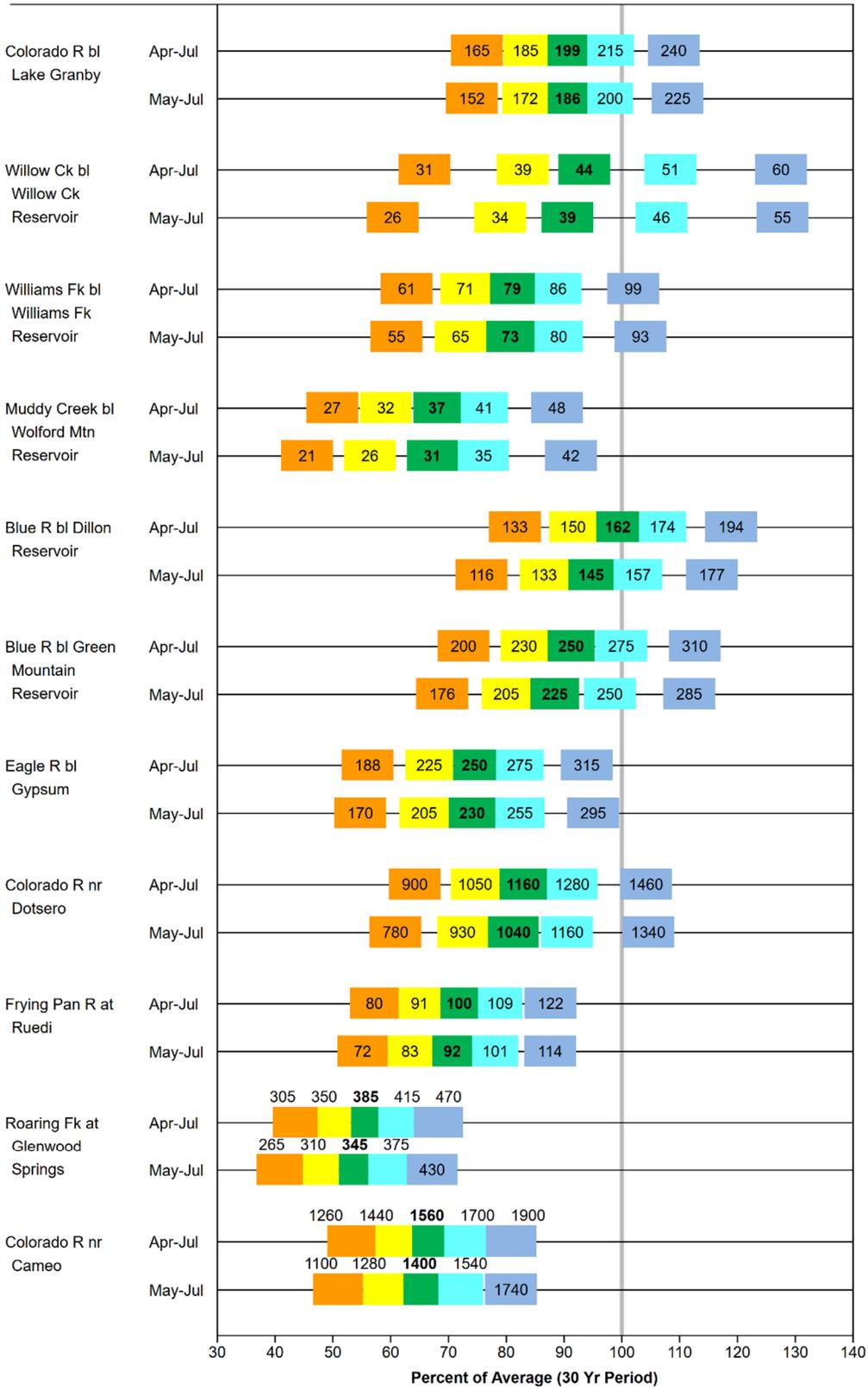
# UPPER COLORADO RIVER BASIN

## Water Supply Forecasts

May 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.

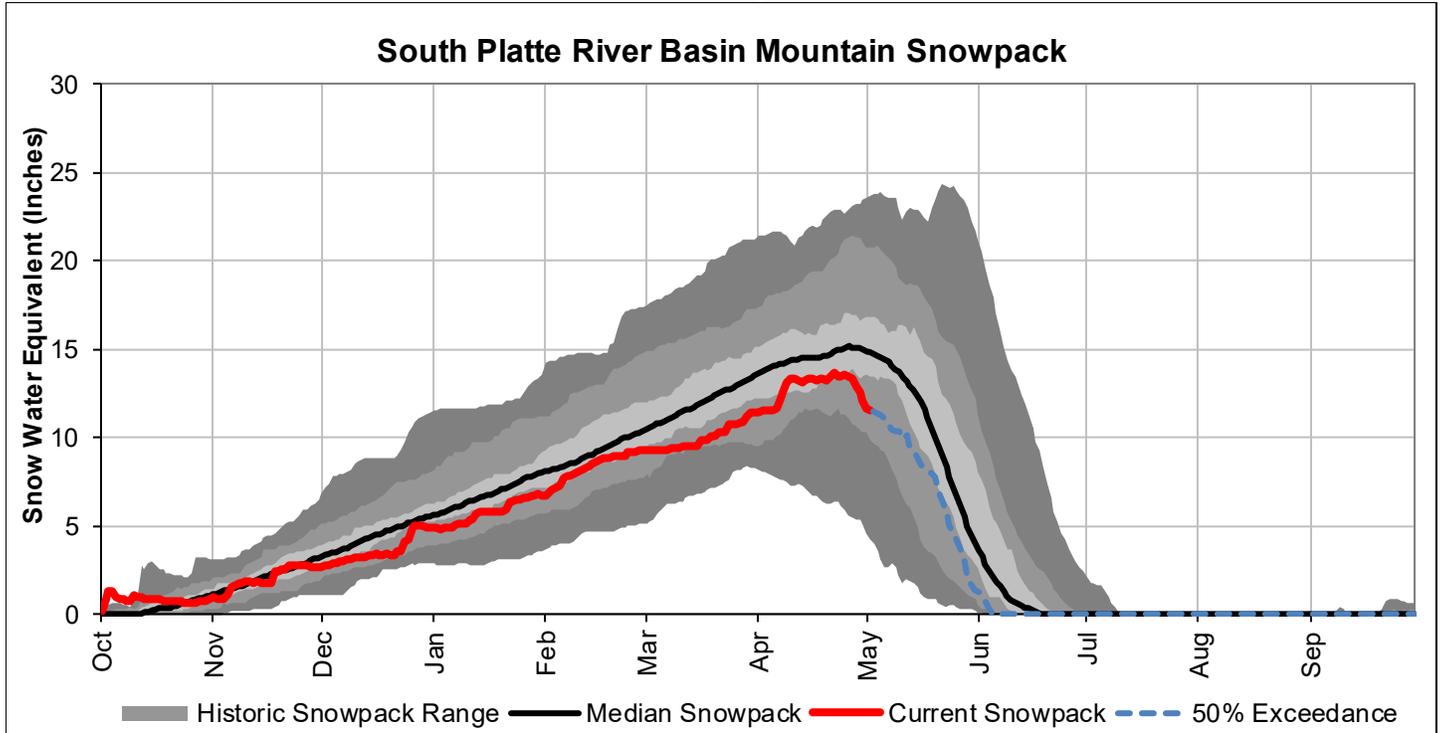


10% Exceedance Forecast (KAF)	30% Exceedance Forecast (KAF) There is a 30% chance that flows will exceed this volume.	50% Exceedance Forecast (KAF) There is a 50% chance that flows will exceed this volume.	70% Exceedance Forecast (KAF) There is a 70% chance that flows will exceed this volume.	90% Exceedance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

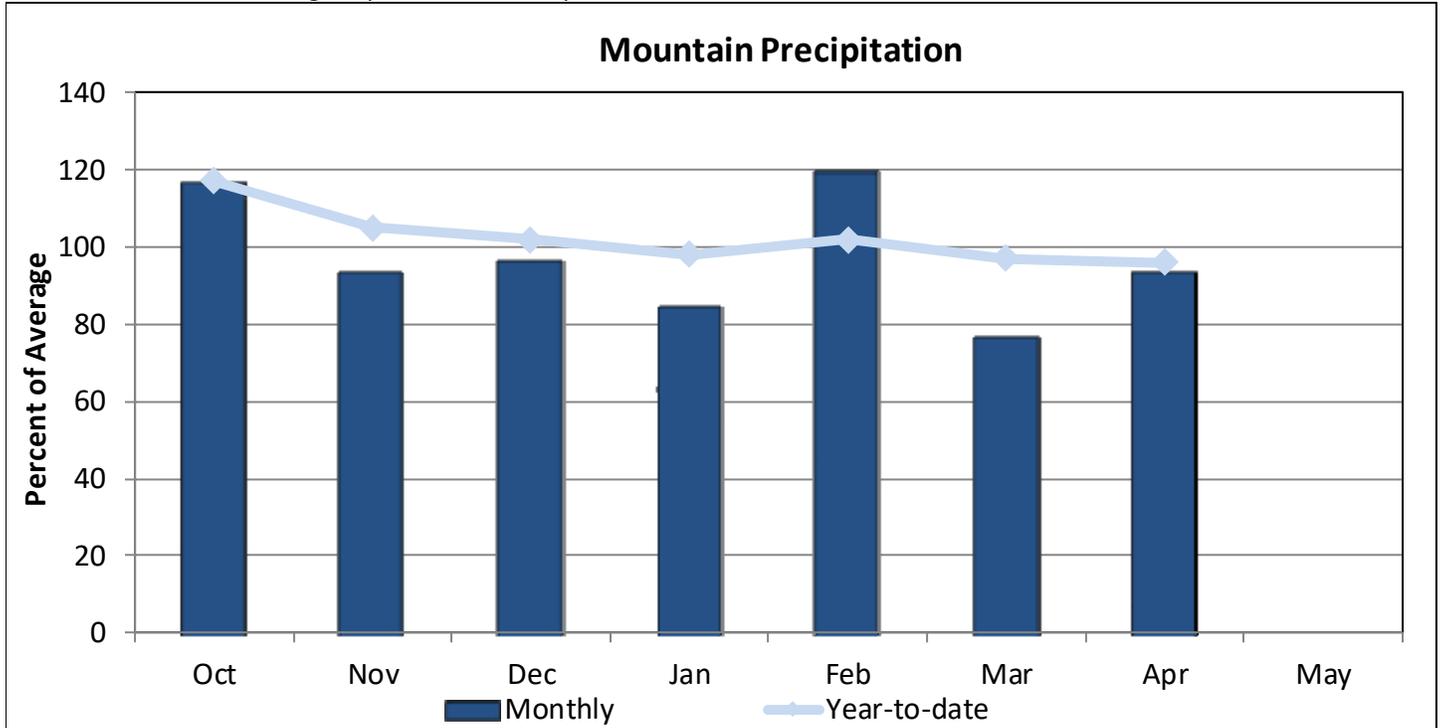
# SOUTH PLATTE RIVER BASIN

May 1, 2018

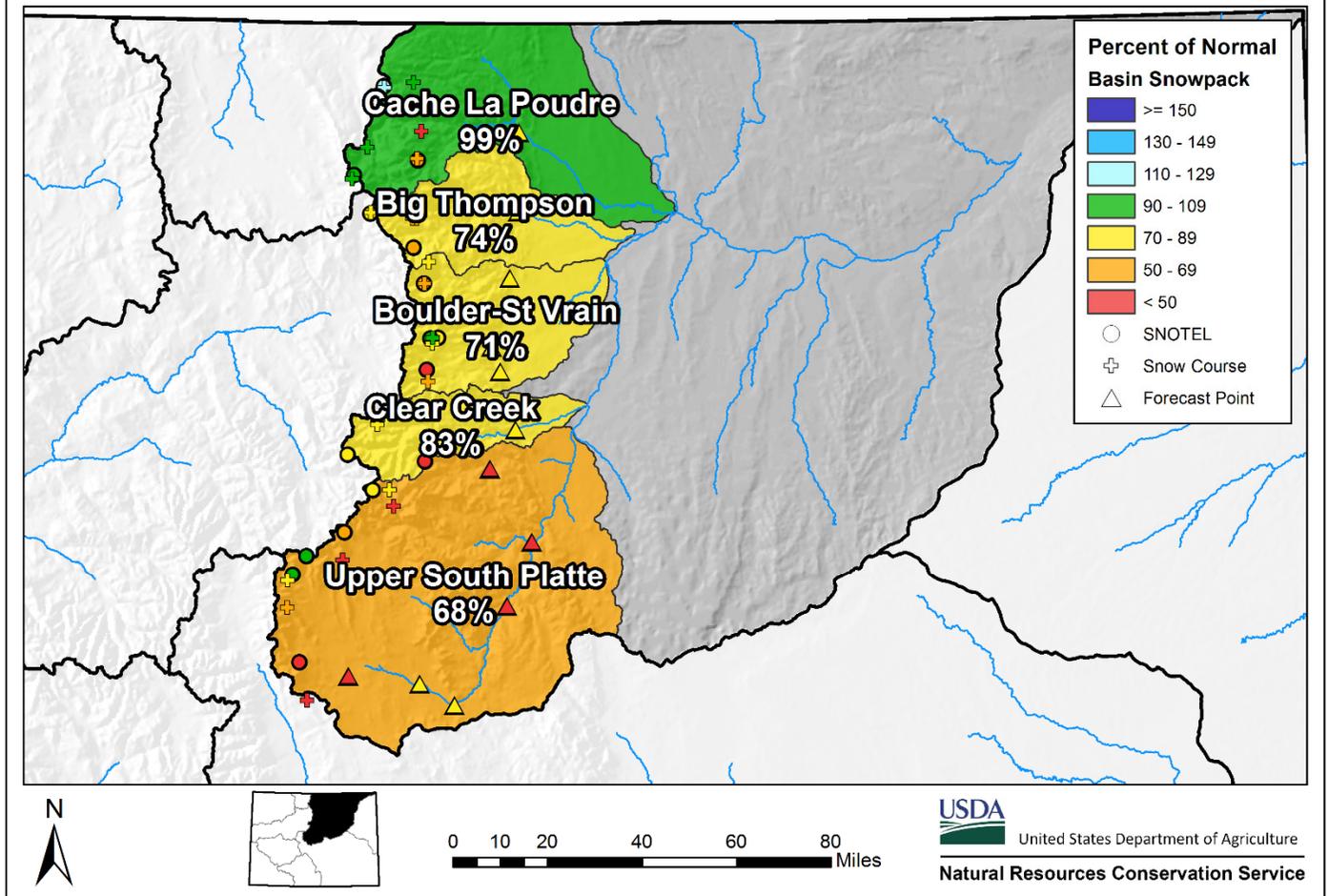
Snowpack in the South Platte River basin is below normal at 81% of the median. Precipitation for April was 94% of average which brings water year-to-date precipitation to 96%. Reservoir storage at the end of April was 105% of average compared to 108% last year. Streamflow forecasts range from 86% of average for the Cache La Poudre at Canyon Mouth to 37% for Bear Creek at Evergreen.



\*SWE values calculated using daily SNOTEL data only



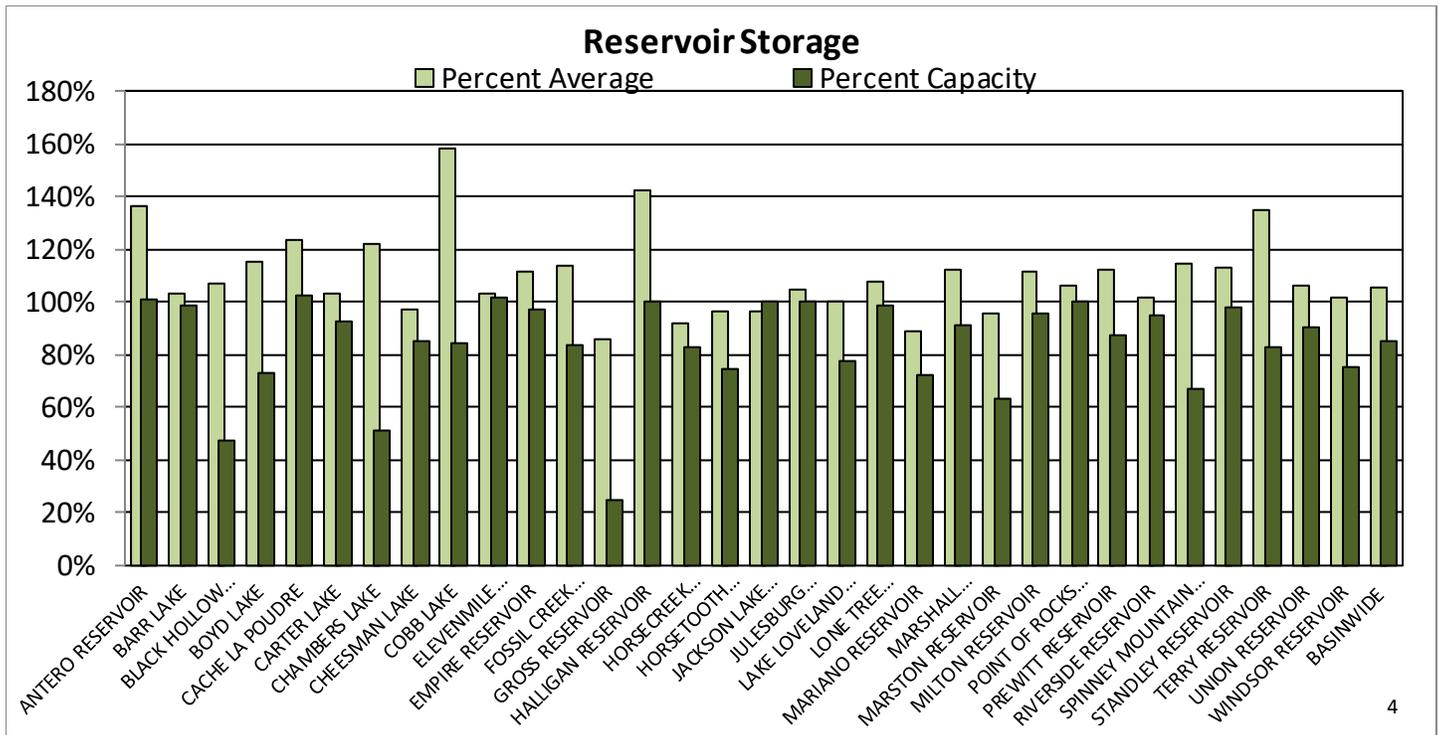
## South Platte River Basin Snowpack and Streamflow Forecasts May 1, 2018



### Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
				Median
Big Thompson	7	74		102
Boulder Creek	6	81		86
Cache La Poudre	10	99		91
Clear Creek	4	83		88
Saint Vrain	2	60		101
Upper South Platte	16	68		92
<b>Basin-Wide Total</b>	<b>45</b>	<b>81</b>		<b>93</b>

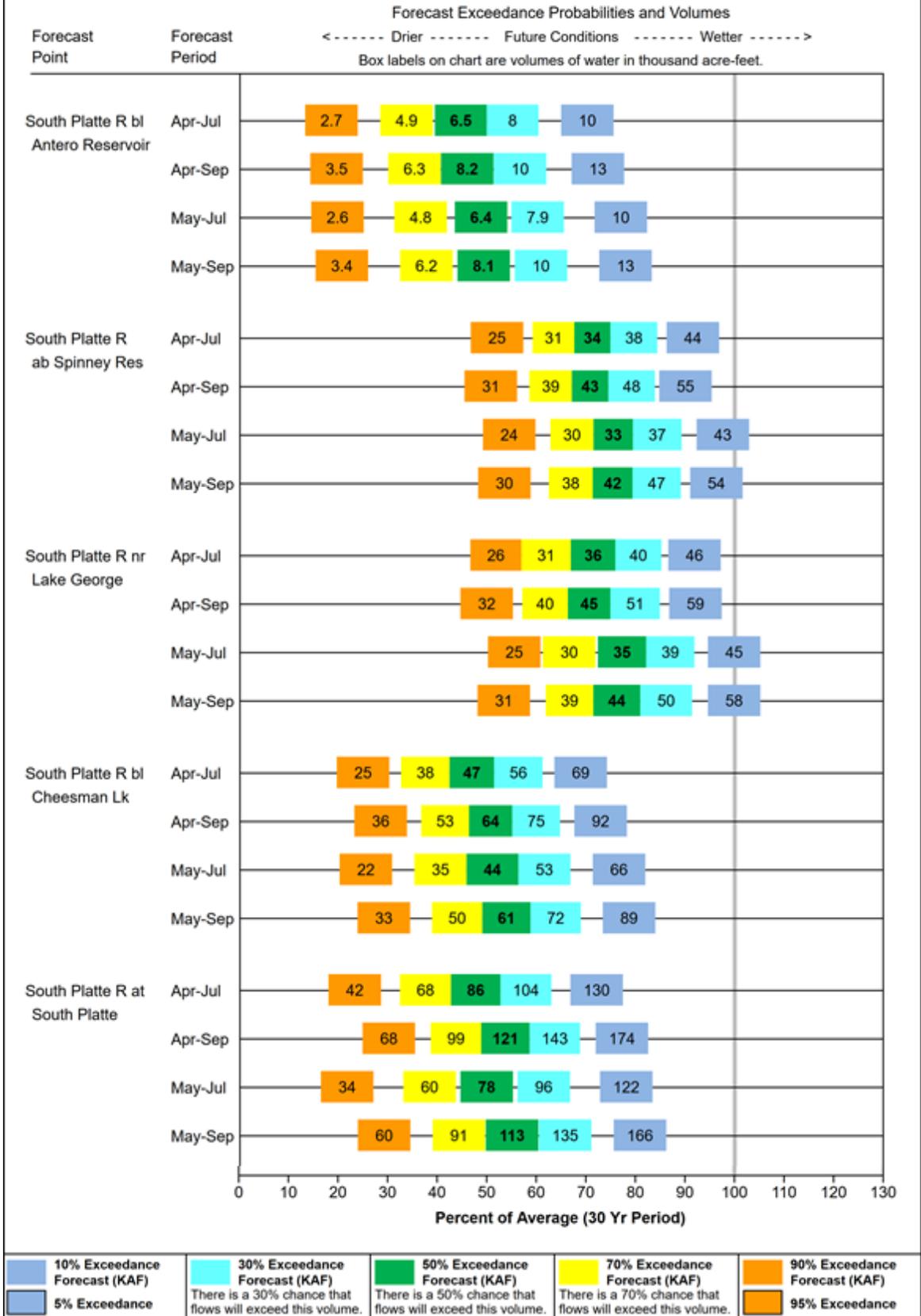
\*SWE values calculated using first of month SNOTEL data and snow course measurements



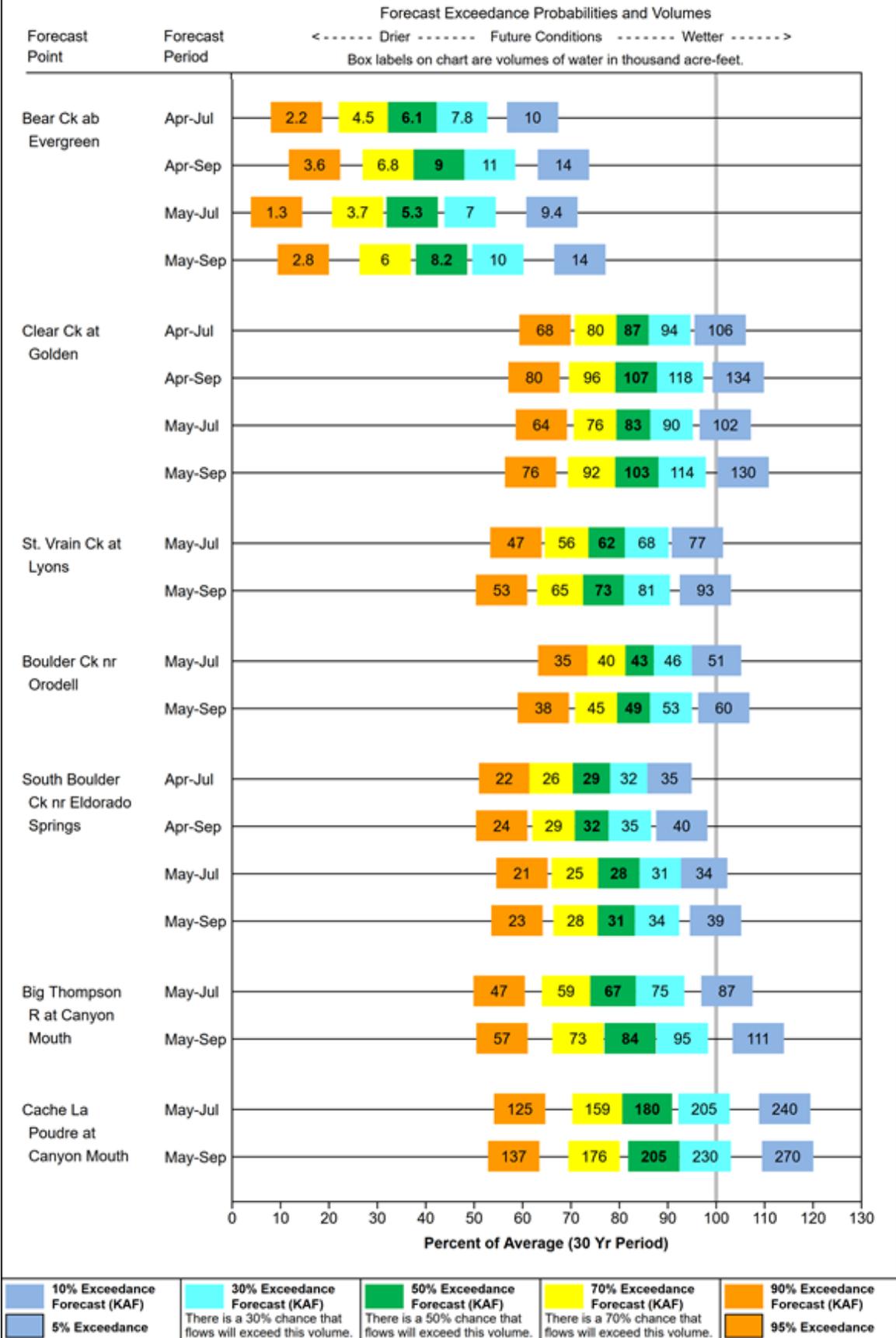
#### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ANTERO RESERVOIR	20.0	15.8	14.7	19.9
BARR LAKE	29.6	28.7	28.8	30.1
BLACK HOLLOW RESERVOIR	3.1	3.1	2.9	6.5
BOYD LAKE	35.5	24.9	30.9	48.4
CACHE LA POUFRE	10.4	9.3	8.4	10.1
CARTER LAKE	100.5	107.1	97.5	108.9
CHAMBERS LAKE	4.5	3.3	3.7	8.8
CHEESMAN LAKE	67.1	74.1	69.0	79.0
COBB LAKE	18.8	16.8	11.9	22.3
ELEVENMILE CANYON RESERVOIR	99.3	99.7	96.6	98.0
EMPIRE RESERVOIR	35.4	35.1	31.7	36.5
FOSSIL CREEK RESERVOIR	9.3	9.4	8.2	11.1
GROSS RESERVOIR	7.3	22.5	8.5	29.8
HALLIGAN RESERVOIR	6.4	6.4	4.5	6.4
HORSECREEK RESERVOIR	12.2	11.7	13.3	14.7
HORSETOOTH RESERVOIR	112.0	140.5	116.6	149.7
JACKSON LAKE RESERVOIR	26.1	26.0	27.1	26.1
JULESBURG RESERVOIR	20.5	20.5	19.6	20.5
LAKE LOVELAND RESERVOIR	8.0	4.2	8.0	10.3
LONE TREE RESERVOIR	8.6	8.6	8.0	8.7
MARIANO RESERVOIR	3.9	4.2	4.4	5.4
MARSHALL RESERVOIR	9.1	8.7	8.1	10.0
MARSTON RESERVOIR	8.2	10.4	8.6	13.0
MILTON RESERVOIR	22.5	22.5	20.2	23.5
POINT OF ROCKS RESERVOIR	70.6	70.3	66.5	70.6
PREWITT RESERVOIR	24.6	24.5	22.0	28.2
RIVERSIDE RESERVOIR	52.8	53.7	52.0	55.8
SPINNEY MOUNTAIN RESERVOIR	32.9	27.7	28.7	49.0
STANDLEY RESERVOIR	41.2	32.1	36.6	42.0
TERRY RESERVOIR	6.6	6.9	4.9	8.0
UNION RESERVOIR	11.7	8.1	11.1	13.0
WINDSOR RESERVOIR	11.4	11.5	11.2	15.2
<b>BASINWIDE</b>	<b>930.1</b>	<b>948.3</b>	<b>884.2</b>	<b>1079.5</b>
Number of Reservoirs	32	32	32	32

## SOUTH PLATTE RIVER BASIN Water Supply Forecasts May 1, 2018



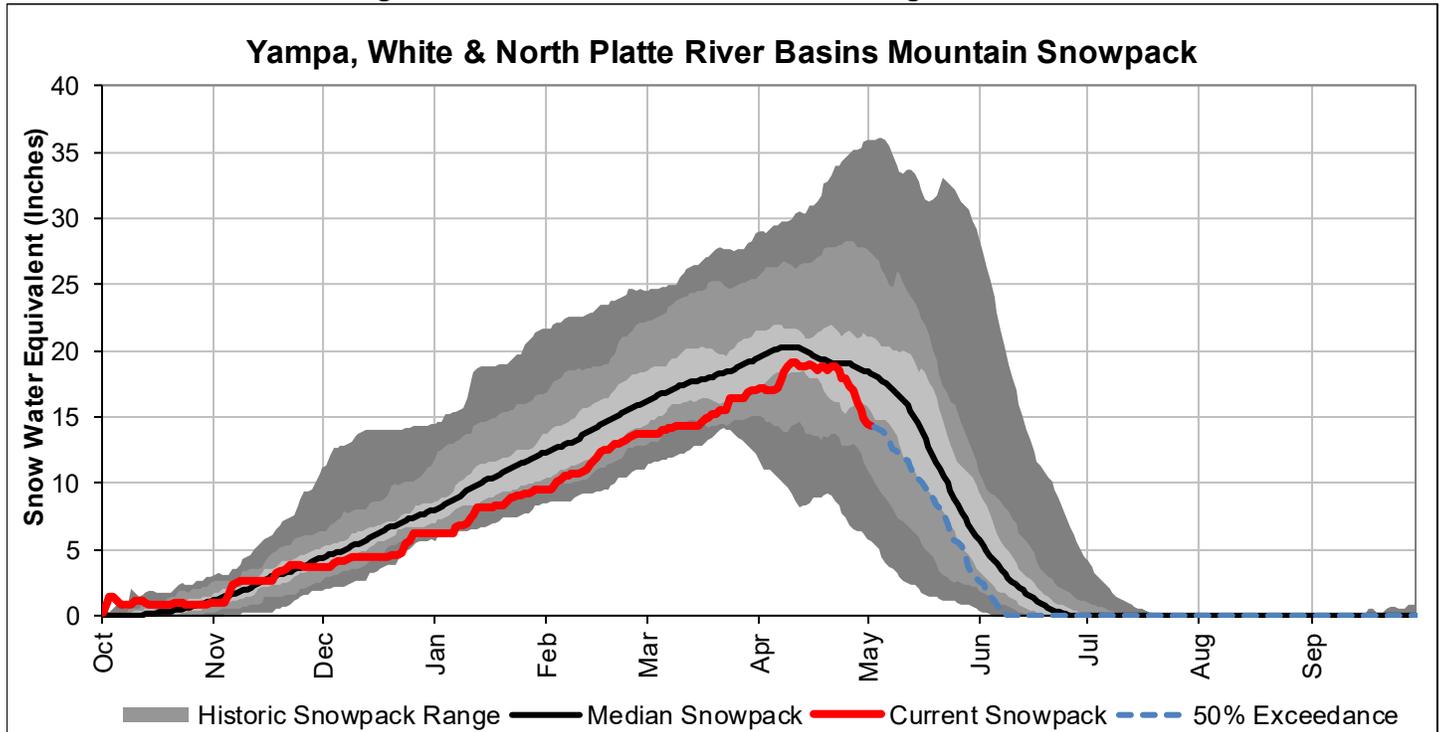
## SOUTH PLATTE RIVER BASIN Water Supply Forecasts May 1, 2018



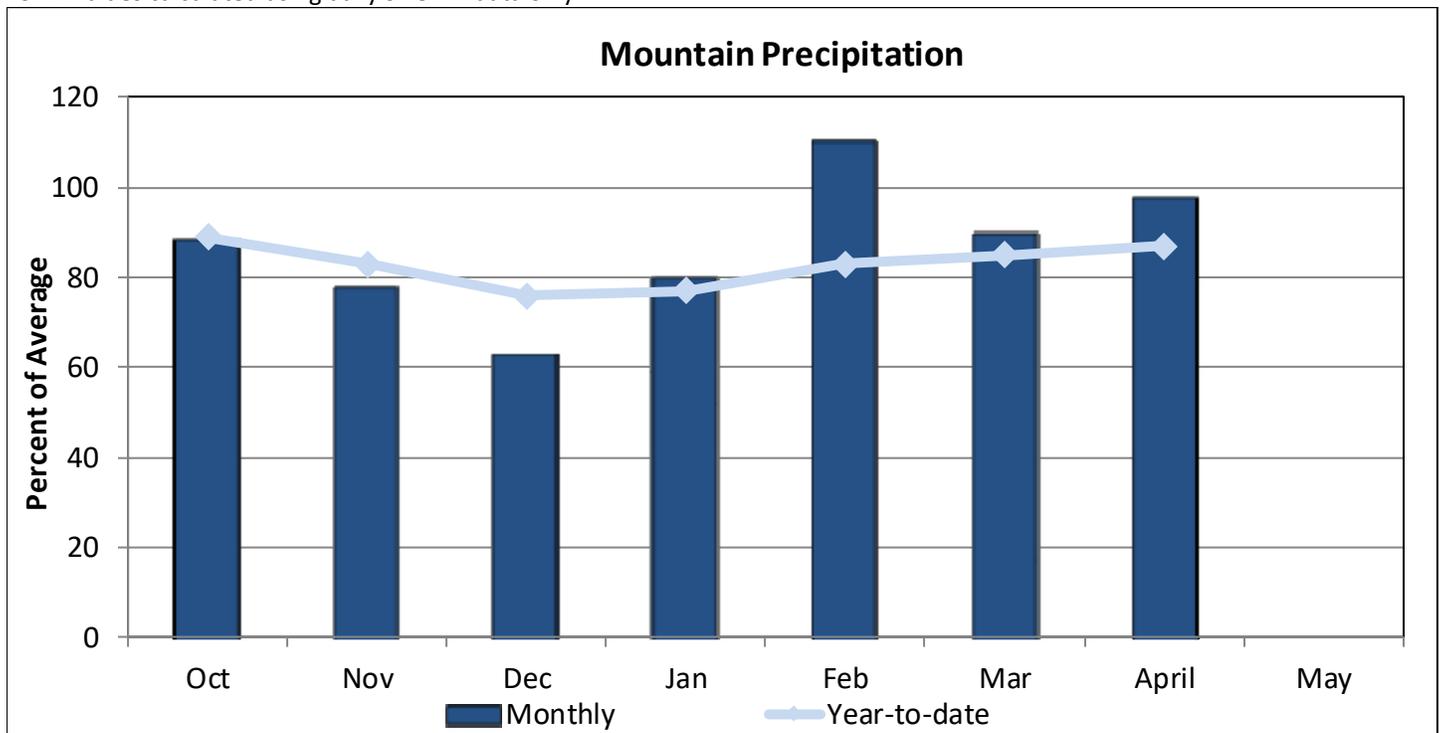
# YAMPA, WHITE, NORTH PLATTE, AND LARAMIE RIVER BASINS

May 1, 2018

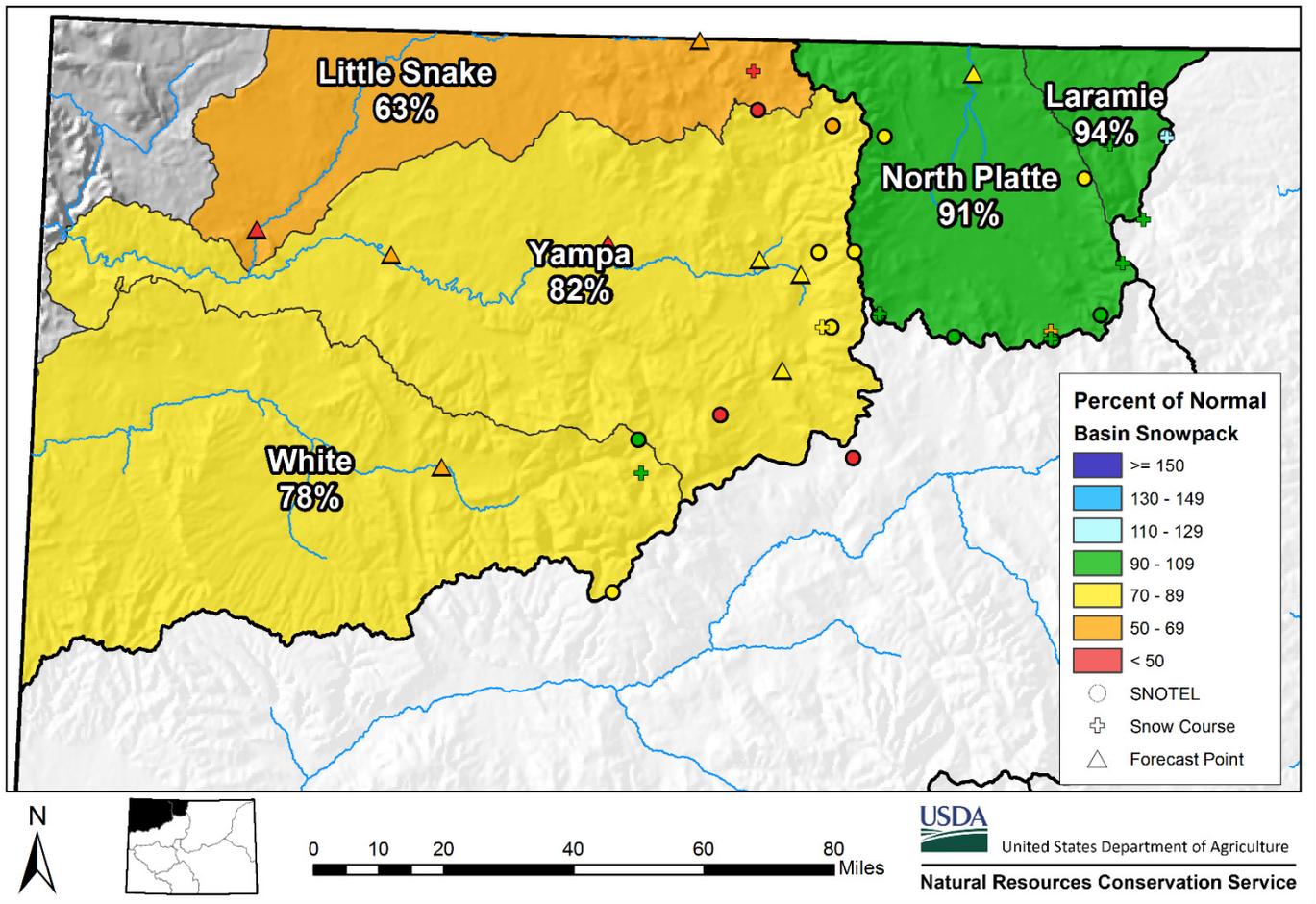
Snowpack in the Yampa, White & North Platte basins is below normal at 80% of the median. Precipitation for April was 98% of average and water year-to-date precipitation is 87% of average. Reservoir storage at the end of April was 121% of average compared to 114% last year. Streamflow forecasts range from 83% of average for the North Platte at Northgate to 32% for Elkhead Creek above Long Gulch.



\*SWE values calculated using daily SNOTEL data only



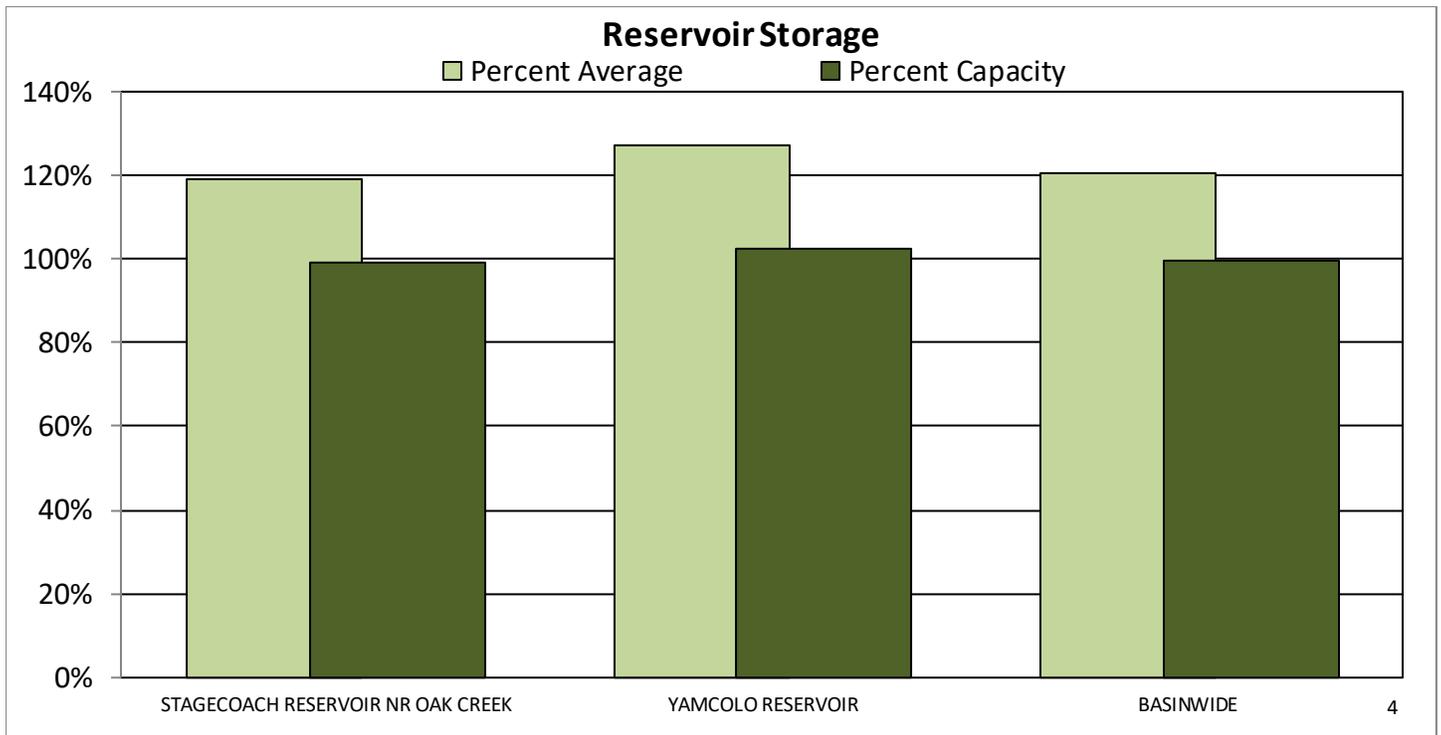
# Yampa, White, and North Platte River Basins Snowpack and Streamflow Forecasts May 1, 2018



## Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
				Median
Laramie	5	94		100
North Platte	12	91		97
Total Laramie & North Platte	17	92		97
Elk	2	51		83
Yampa	11	82		80
White	4	78		89
Total Yampa & White	14	79		79
Little Snake	9	63		86
<b>Basin-Wide Total</b>	<b>36</b>	<b>80</b>		<b>90</b>

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



### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
STAGECOACH RESERVOIR NR OAK C	36.2	34.1	30.4	36.5
YAMCOLO RESERVOIR	8.9	8.5	7.0	8.7
<b>BASINWIDE</b>	45.1	42.6	37.4	45.2
Number of Reservoirs	2	2	2	2

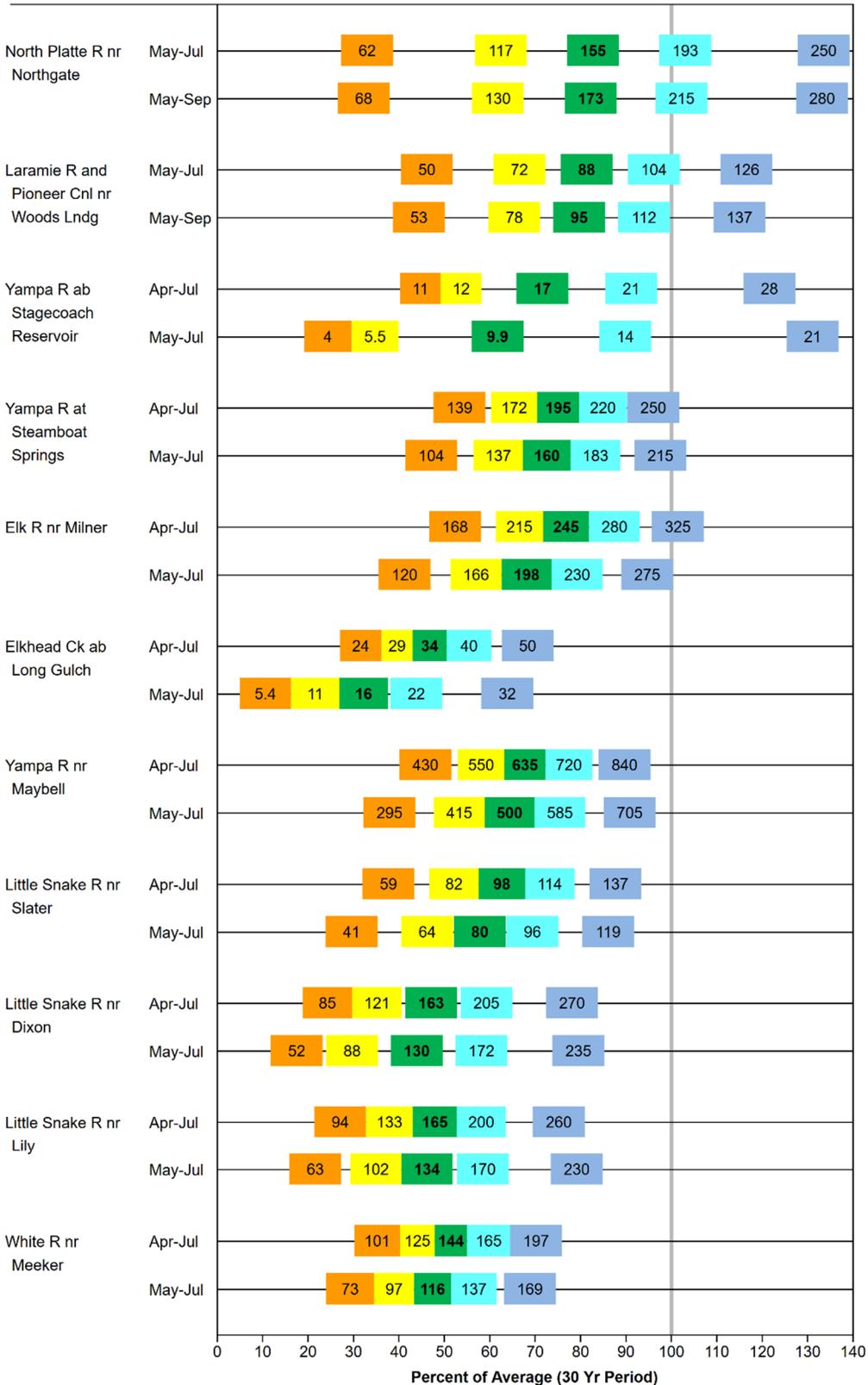
# YAMPA-WHITE-NORTH PLATTE RIVER BASINS

## Water Supply Forecasts

May 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.

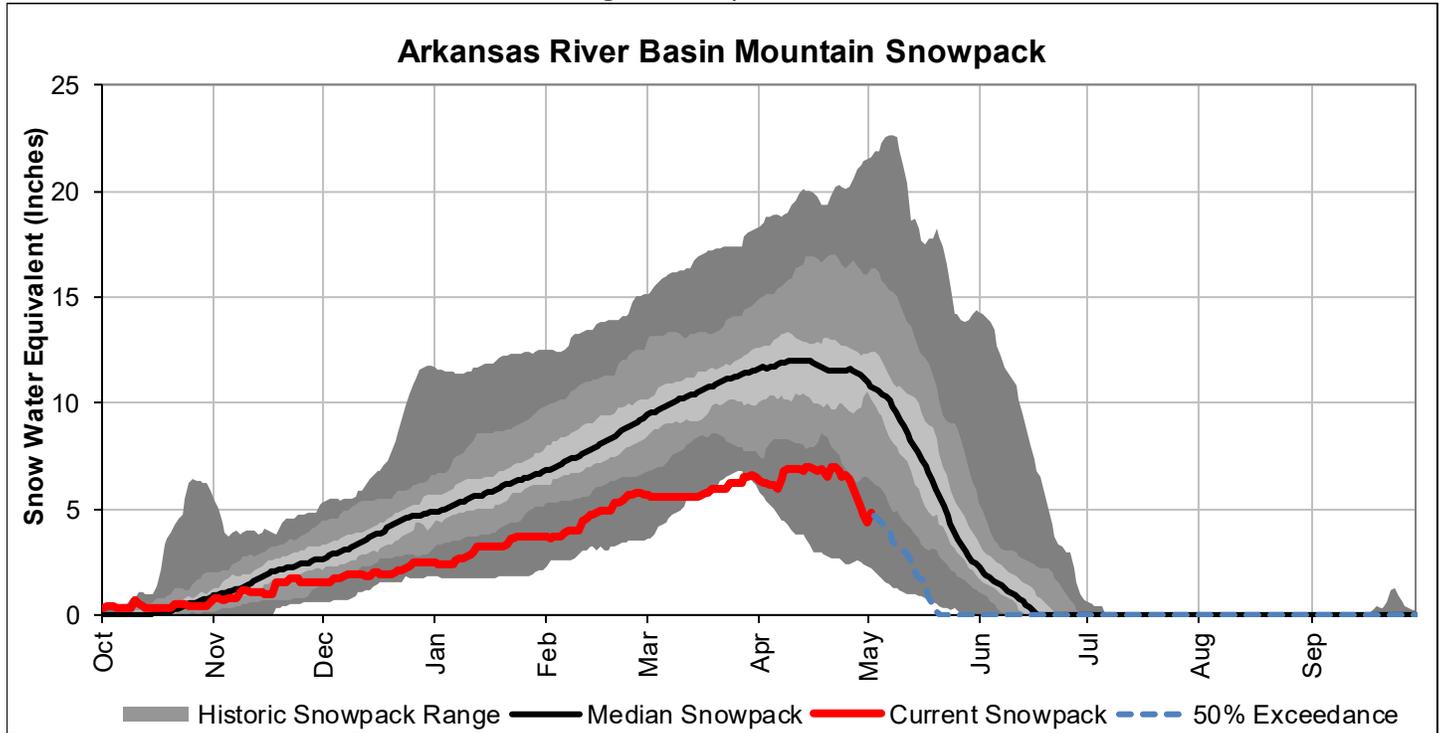


10% Exceedance Forecast (KAF)	30% Exceedance Forecast (KAF)	50% Exceedance Forecast (KAF)	70% Exceedance Forecast (KAF)	90% Exceedance Forecast (KAF)
5% Exceedance	There is a 30% chance that flows will exceed this volume.	There is a 50% chance that flows will exceed this volume.	There is a 70% chance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

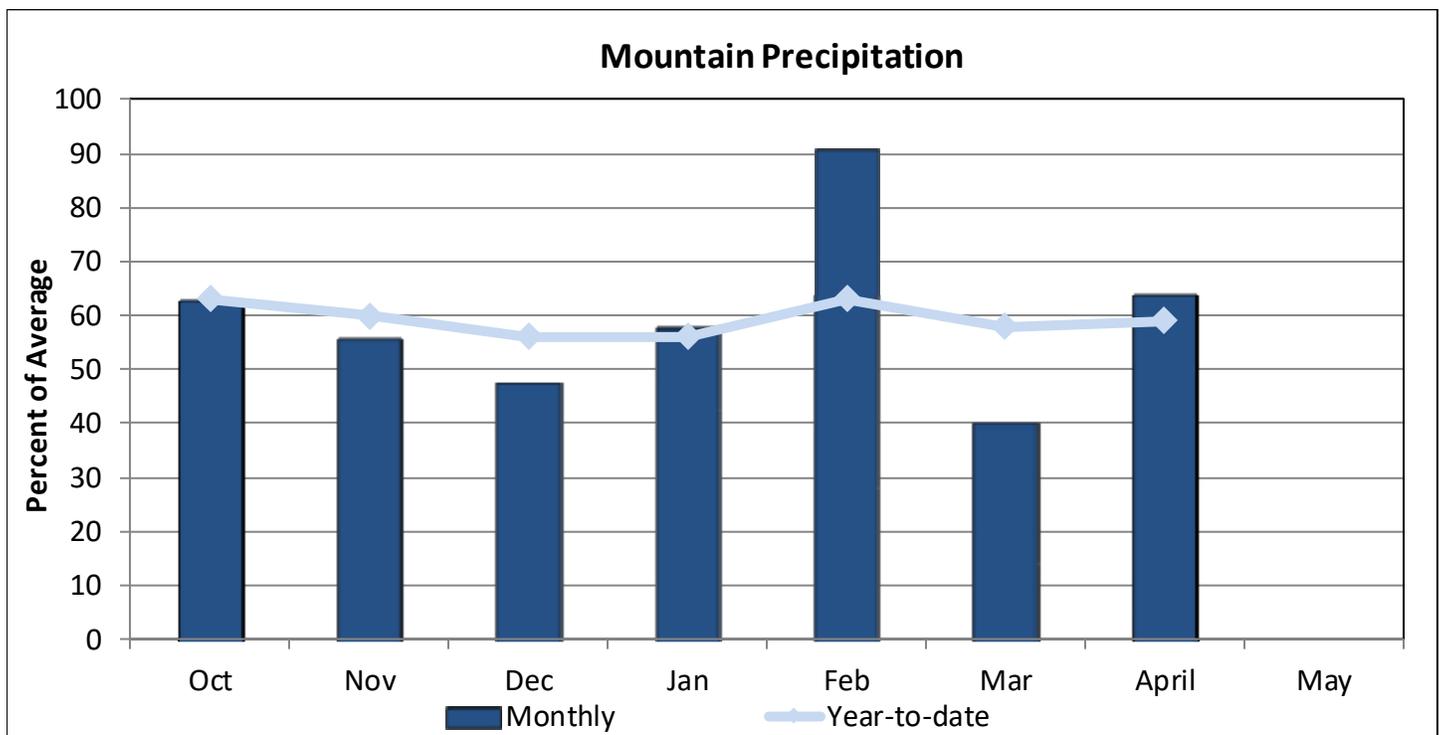
# ARKANSAS RIVER BASIN

May 1, 2018

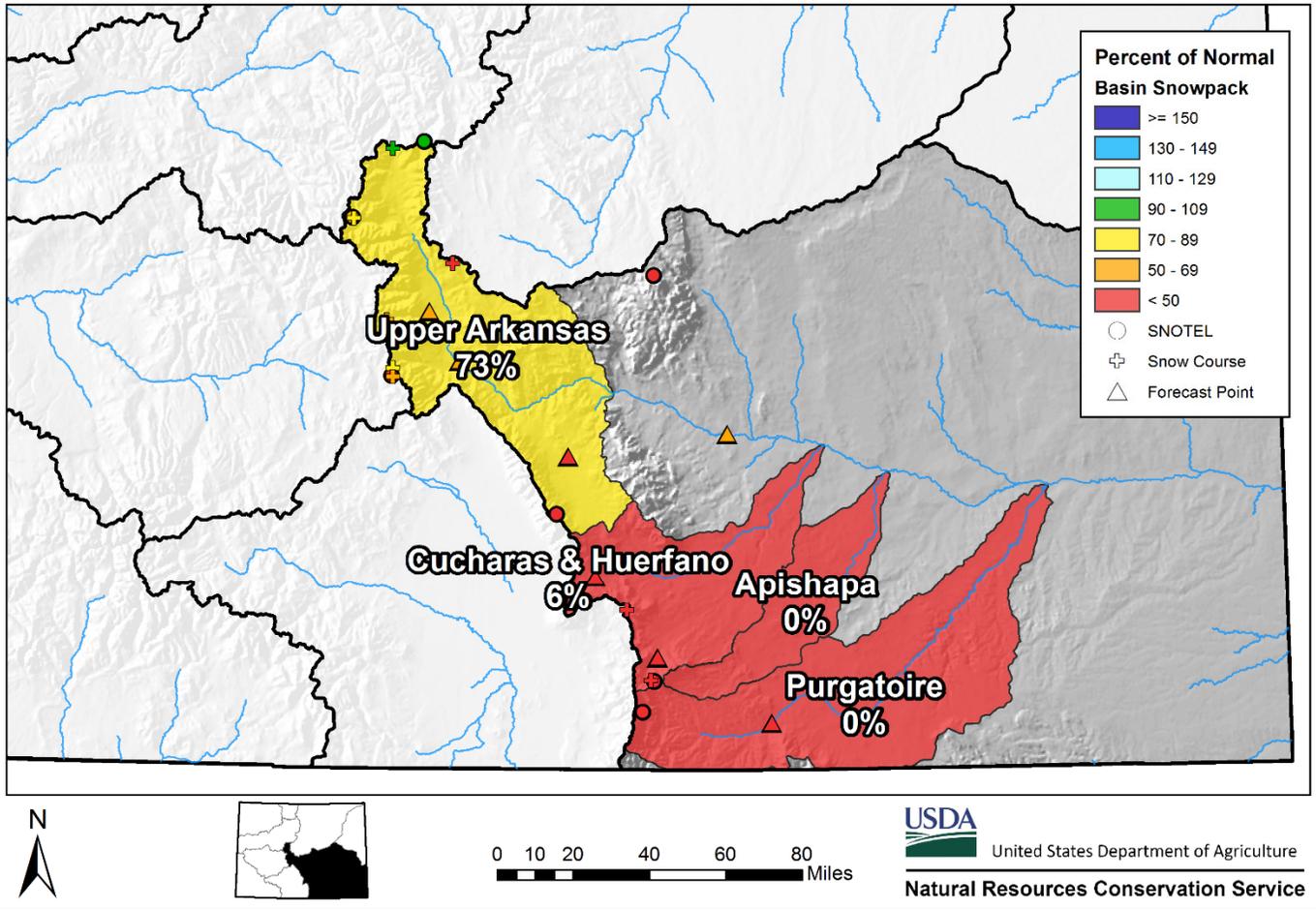
Snowpack in the Arkansas River basin is below normal at 52% of the median. Precipitation for April was 64% of average which brings water year-to-date precipitation to 59% of average. Reservoir storage at the end of April was 129% of average compared to 106% last year. Current streamflow forecasts range from 64% of average for the Arkansas River at Salida to 8% of average for Grape Creek near Westcliffe.



\*SWE values calculated using daily SNOTEL data only



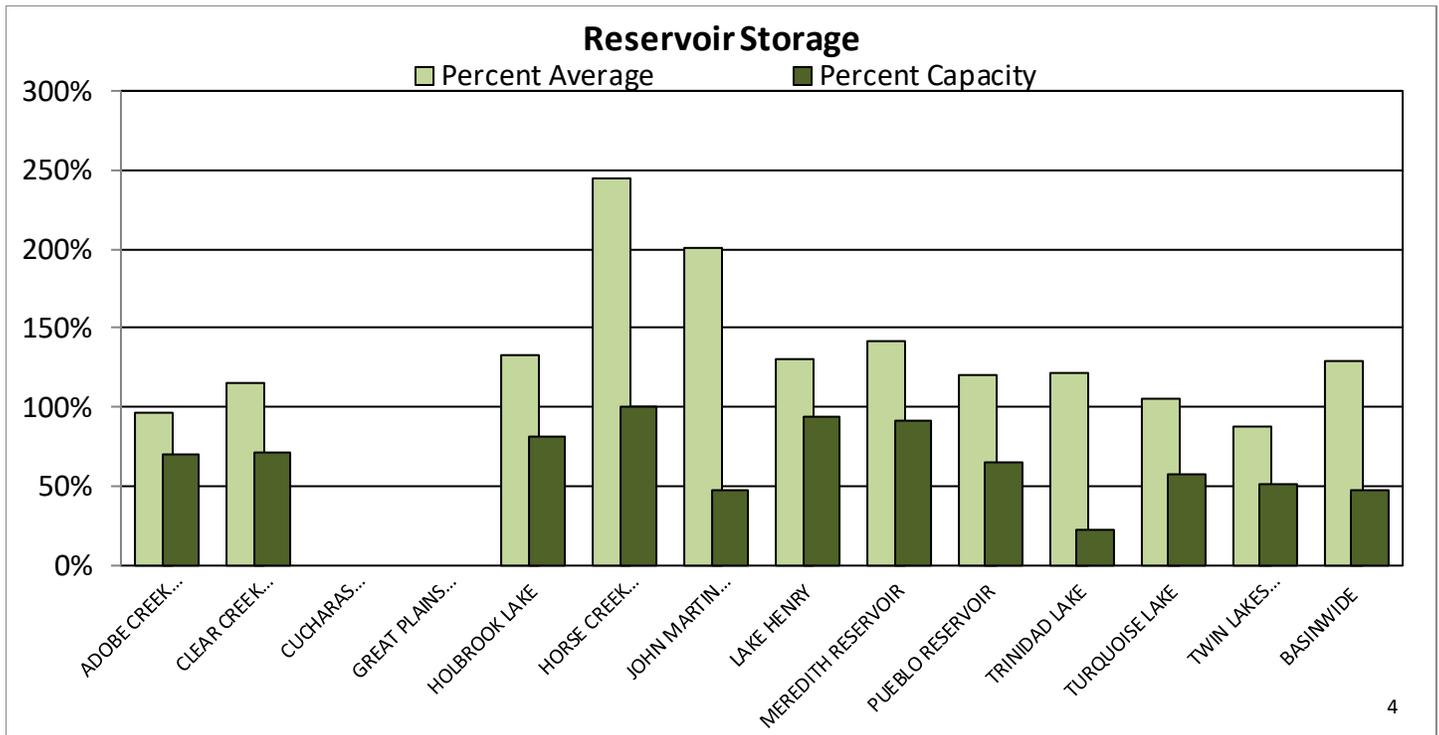
## Arkansas River Basin Snowpack and Streamflow Forecasts May 1, 2018



### Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
				Median
Upper Arkansas	9	73		130
Cucharas & Huerfano	5	6		89
Purgatoire	2	0		110
<b>Basin-Wide Total</b>	<b>16</b>	<b>52</b>		<b>115</b>

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



### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ADOBE CREEK RESERVOIR	43.5	51.5	45.2	62.0
CLEAR CREEK RESERVOIR	8.1	8.0	7.0	11.4
CUCHARAS RESERVOIR				40.0
GREAT PLAINS RESERVOIR				150.0
HOLBROOK LAKE	5.7	6.1	4.3	7.0
HORSE CREEK RESERVOIR	27.1	24.5	11.1	27.0
JOHN MARTIN RESERVOIR	289.5	128.9	143.9	616.0
LAKE HENRY	8.8	8.8	6.8	9.4
MEREDITH RESERVOIR	38.7	40.9	27.3	42.0
PUEBLO RESERVOIR	231.4	231.1	192.4	354.0
TRINIDAD LAKE	36.9	33.7	30.4	167.0
TURQUOISE LAKE	73.9	47.3	70.4	127.0
TWIN LAKES RESERVOIR	43.7	40.8	50.1	86.0
<b>BASINWIDE</b>	<b>807.3</b>	<b>621.7</b>	<b>588.9</b>	<b>1698.8</b>
Number of Reservoirs	11	11	11	13

# ARKANSAS RIVER BASIN

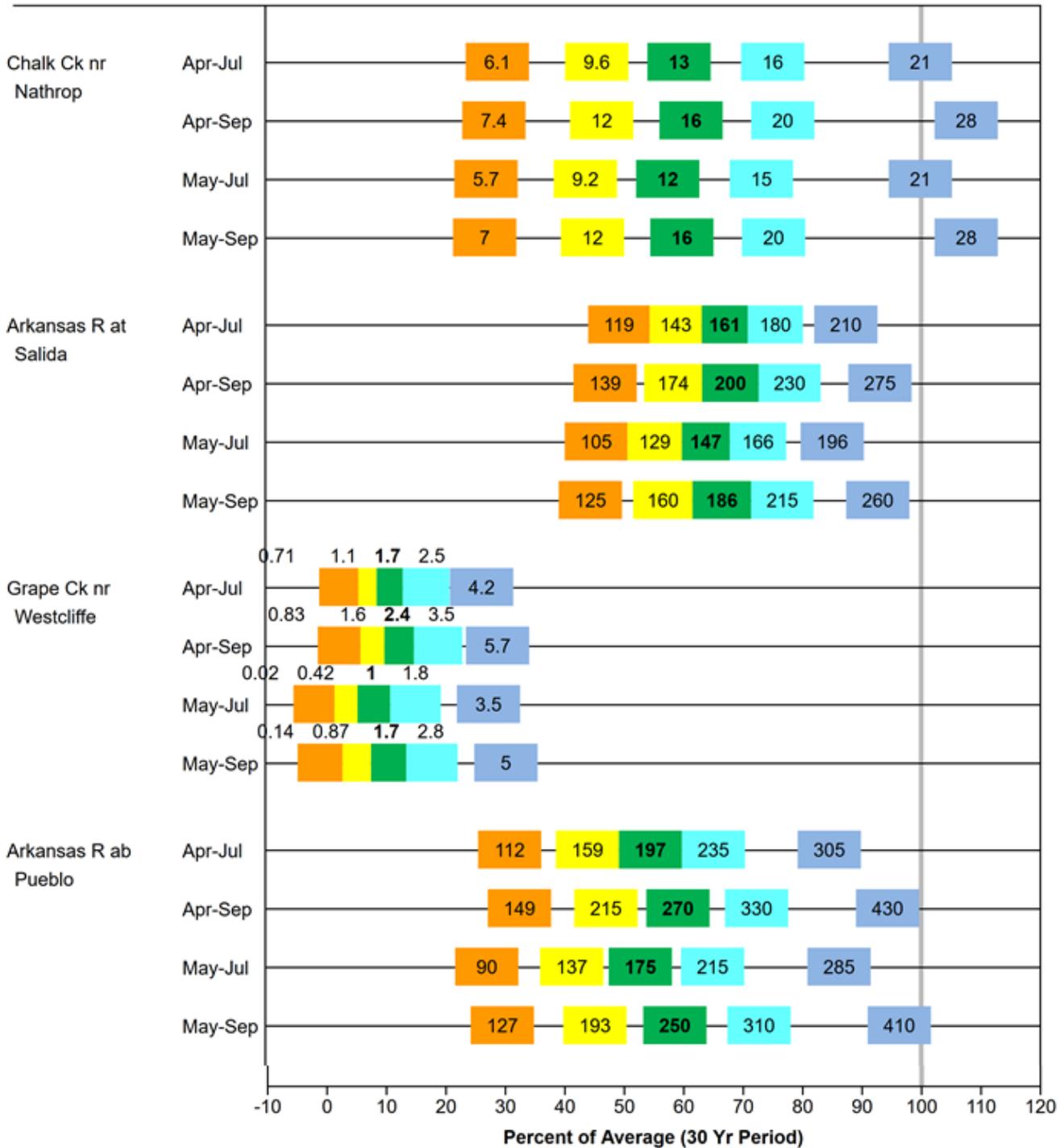
## Water Supply Forecasts

May 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

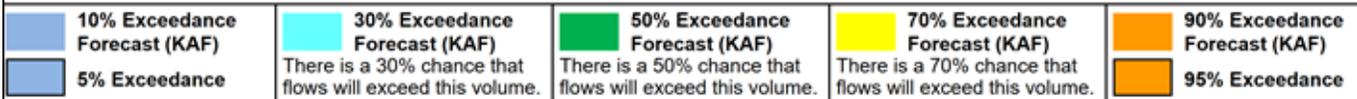
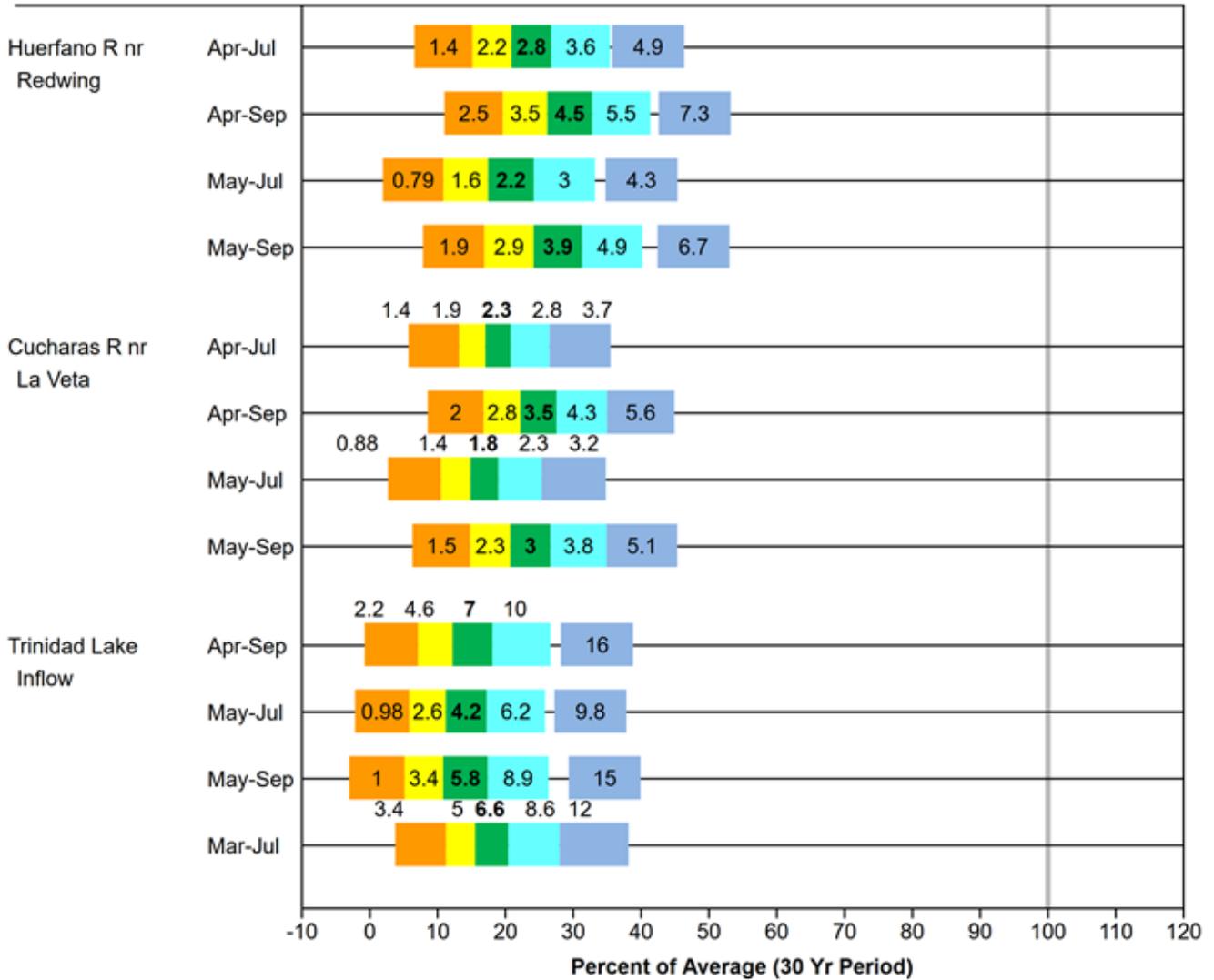
## Water Supply Forecasts

May 1, 2018

### Forecast Exceedance Probabilities and Volumes

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

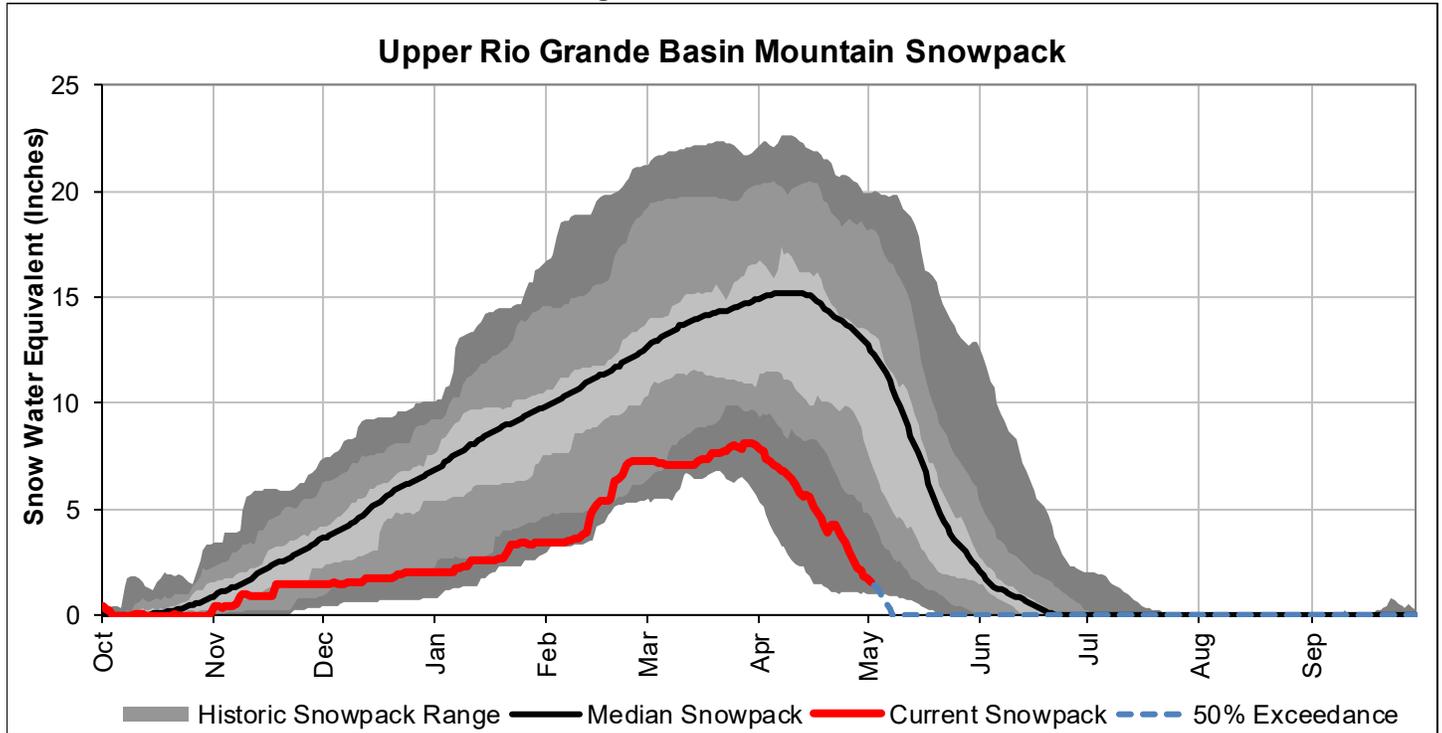
Box labels on chart are volumes of water in thousand acre-feet.



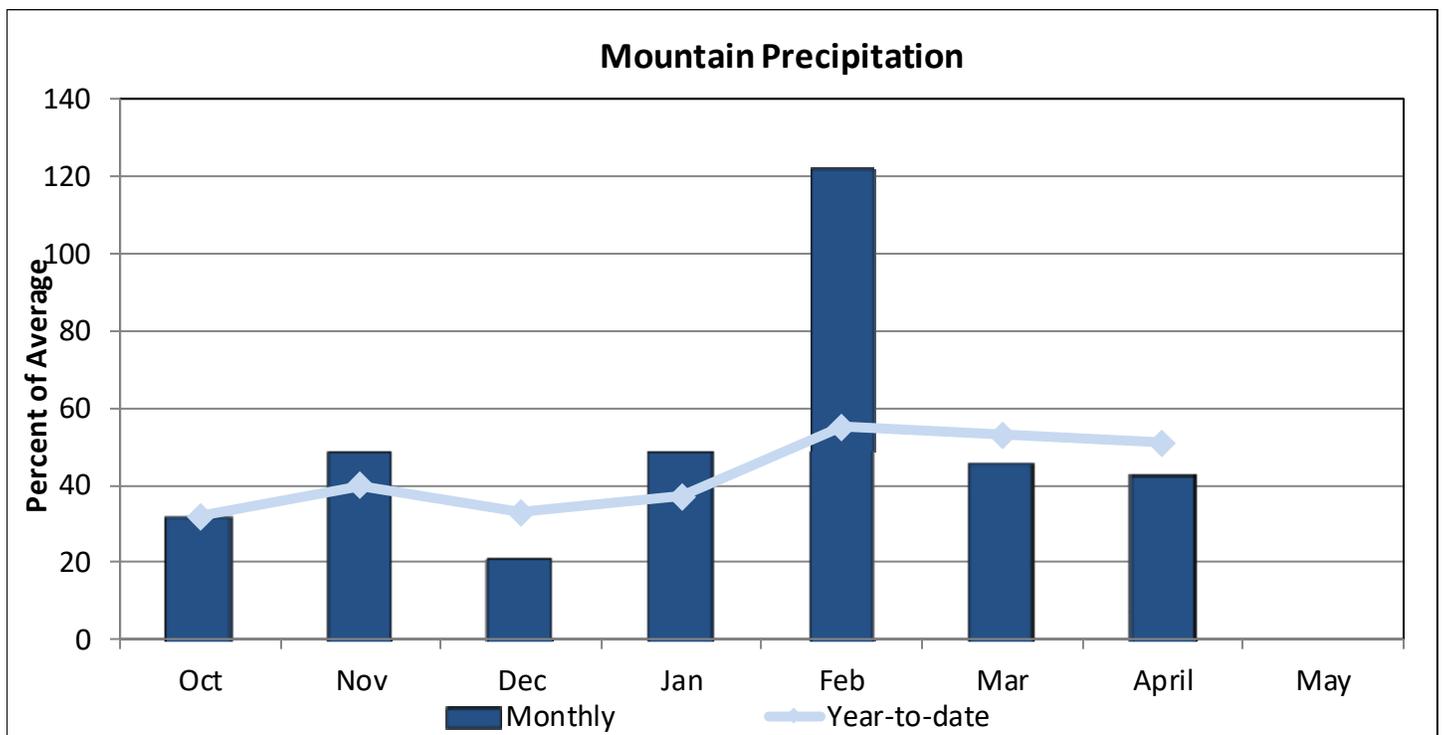
# UPPER RIO GRANDE RIVER BASIN

May 1, 2018

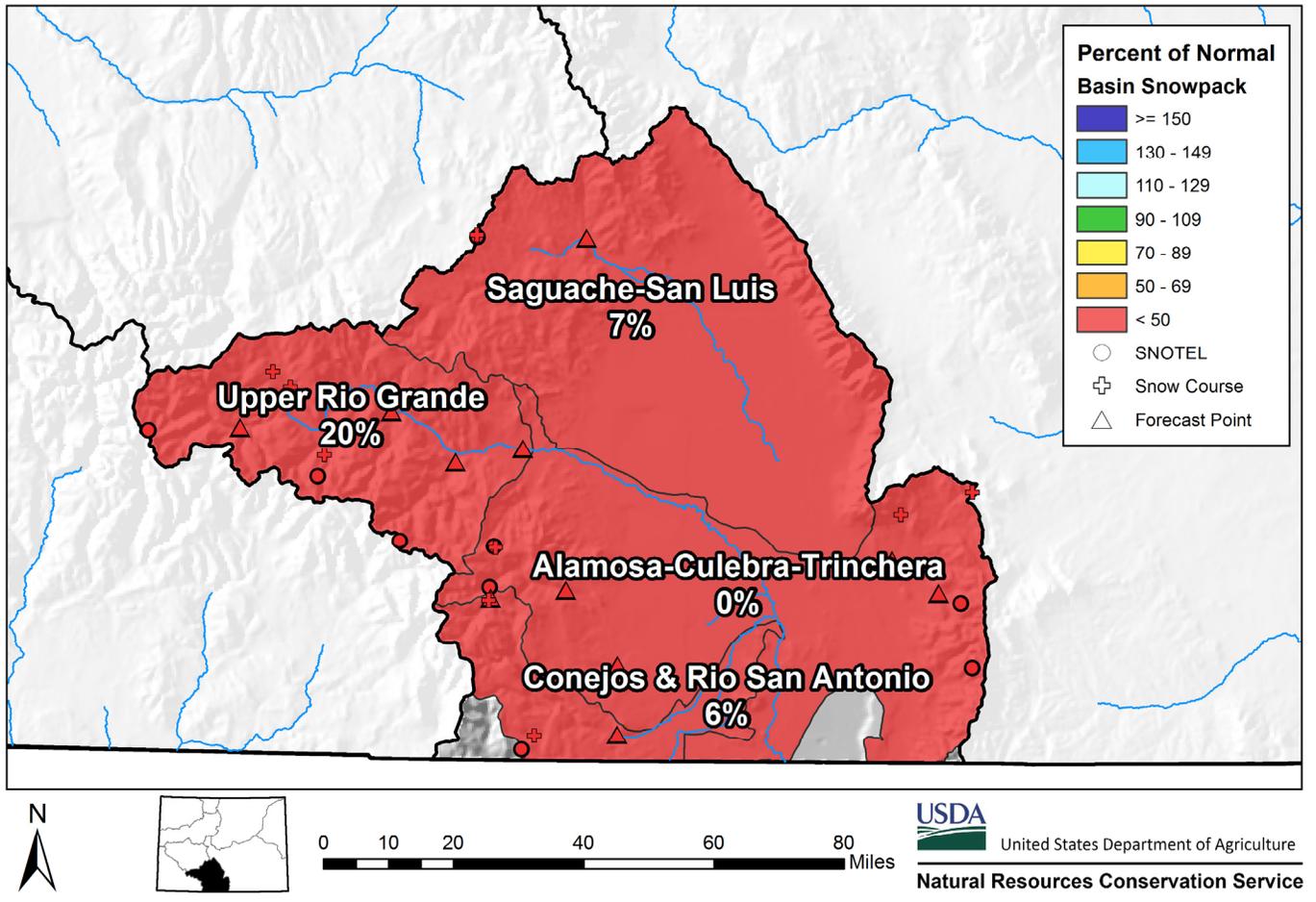
Snowpack in the Upper Rio Grande River basin is below normal at 12% of median. Precipitation for April was 43% of average which brings water year-to-date precipitation to 51% of average. Reservoir storage at the end of April was 115% of average compared to 99% last year. Streamflow forecasts range from 36% of average for the inflow to Platoro Reservoir to 3% of average for the San Antonio River at Ortiz.



\*SWE values calculated using daily SNOTEL data only



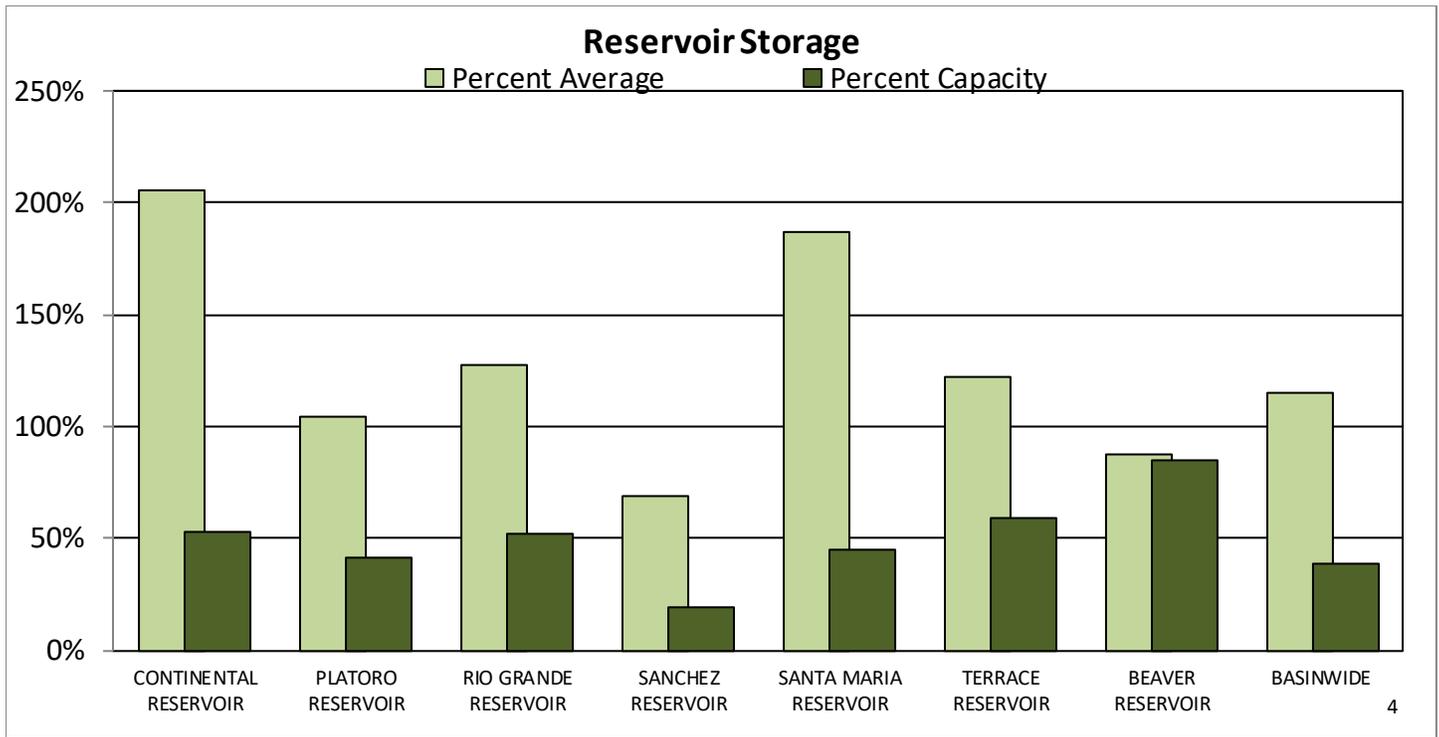
## Upper Rio Grande River Basin Snowpack and Streamflow Forecasts May 1, 2018



### Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
				Median
Alamosa Creek	3	11		59
Conejos & Rio San Antonio	4	6		103
Culebra & Trinchera Creek	5	0		117
Upper Rio Grande	12	20		77
<b>Basin-Wide Total</b>	<b>23</b>	<b>12</b>		<b>91</b>

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



### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
CONTINENTAL RESERVOIR	14.2	13.4	6.9	27.0
PLATORO RESERVOIR	24.5	18.0	23.5	60.0
RIO GRANDE RESERVOIR	26.5	26.7	20.8	51.0
SANCHEZ RESERVOIR	20.1	13.0	29.0	103.0
SANTA MARIA RESERVOIR	20.0	17.5	10.7	45.0
TERRACE RESERVOIR	10.6	10.4	8.7	18.0
BEAVER RESERVOIR	3.8	3.6	4.4	4.5
<b>BASINWIDE</b>	<b>119.7</b>	<b>102.5</b>	<b>104.0</b>	<b>308.5</b>
Number of Reservoirs	7	7	7	7

# UPPER RIO GRANDE BASIN

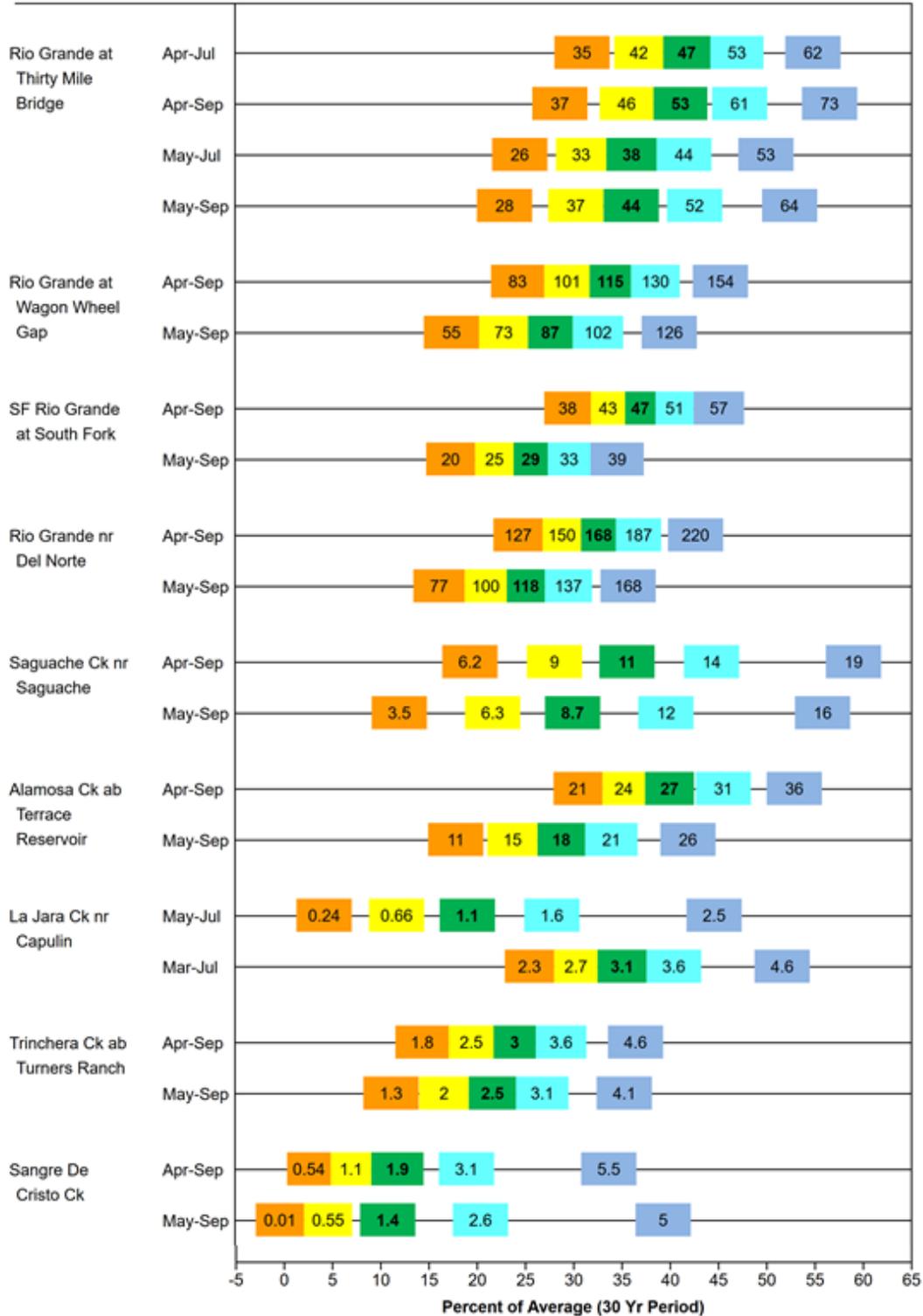
## Water Supply Forecasts

May 1, 2018

Forecast Exceedance Probabilities and Volumes

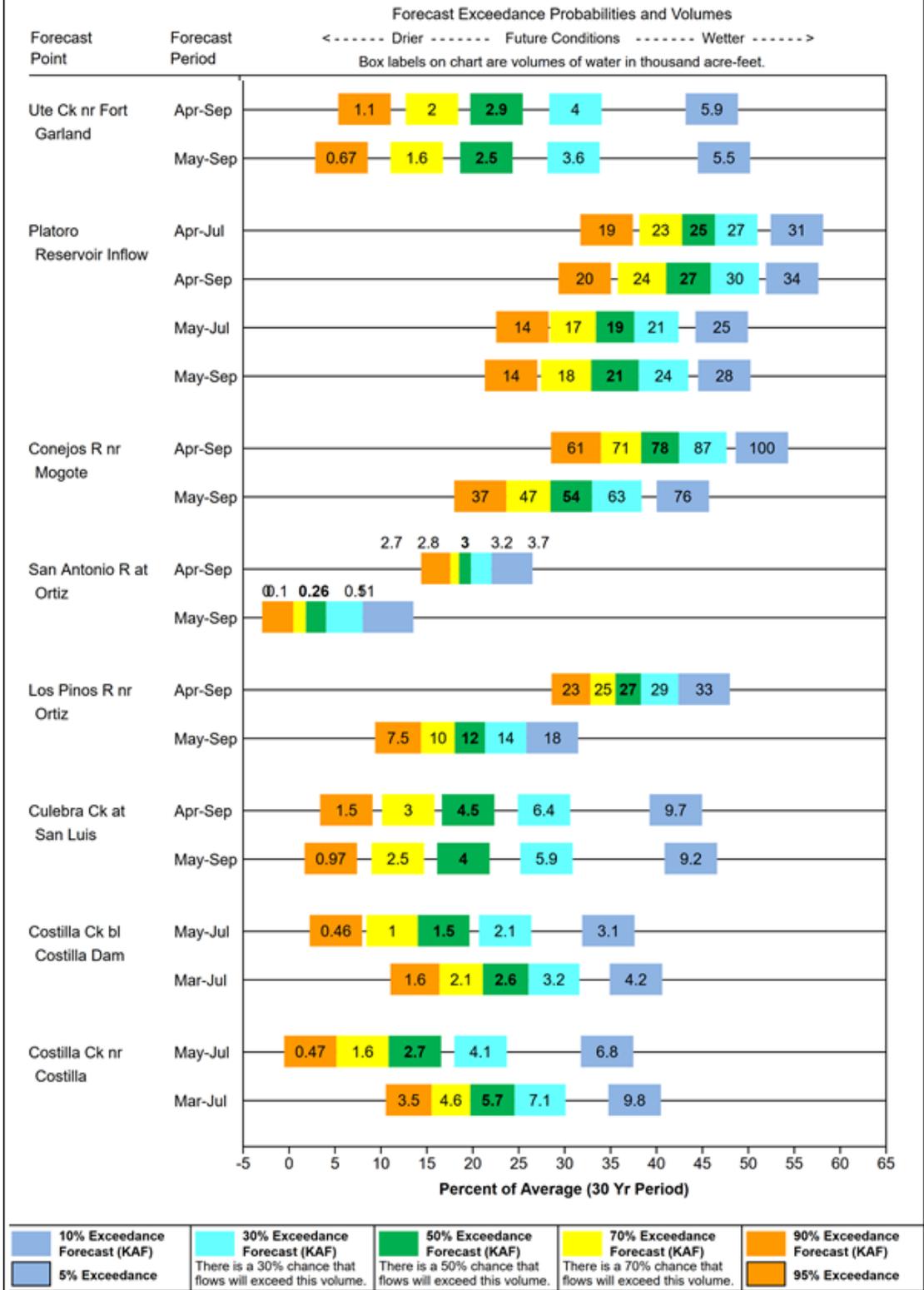
<----- Drier ----- Future Conditions ----- Wetter ----->

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)
5% Exceedance				95% Exceedance

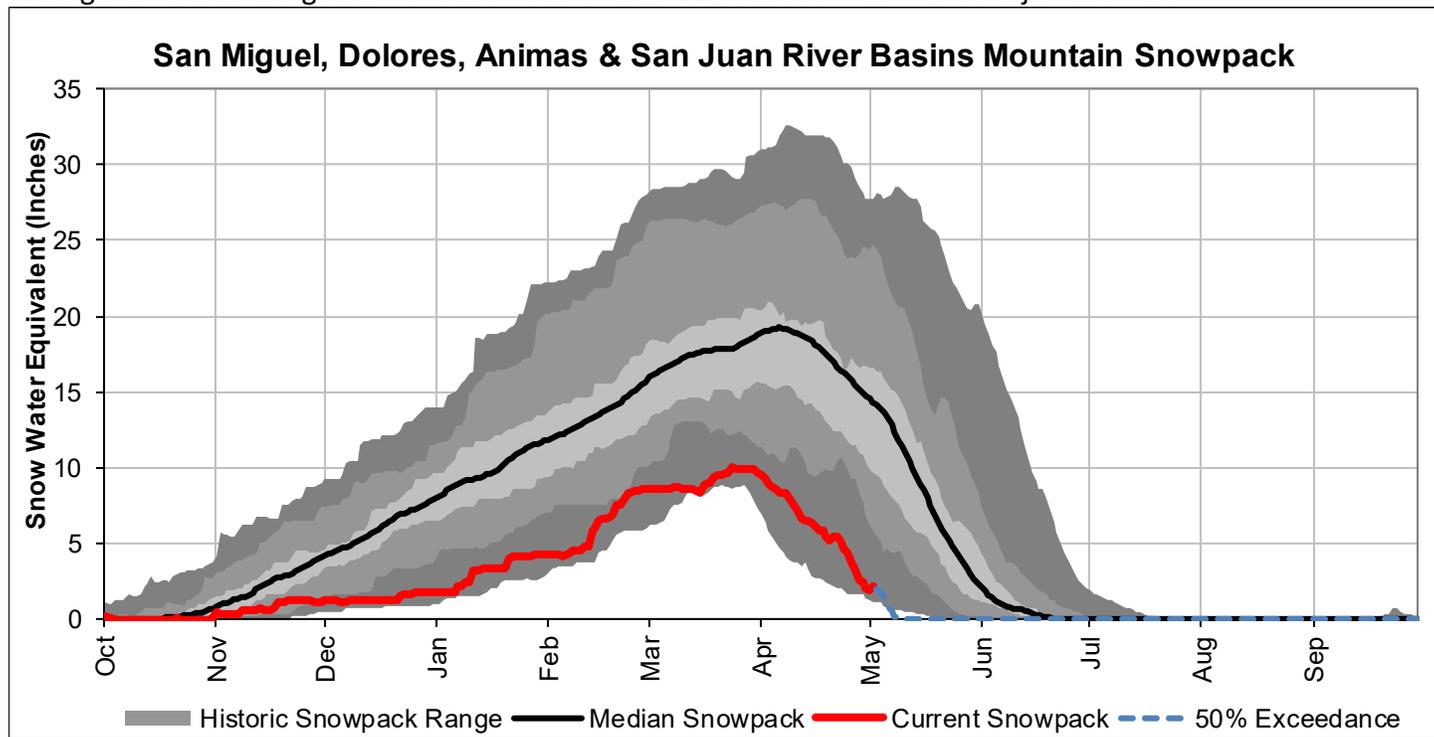
## UPPER RIO GRANDE BASIN Water Supply Forecasts May 1, 2018



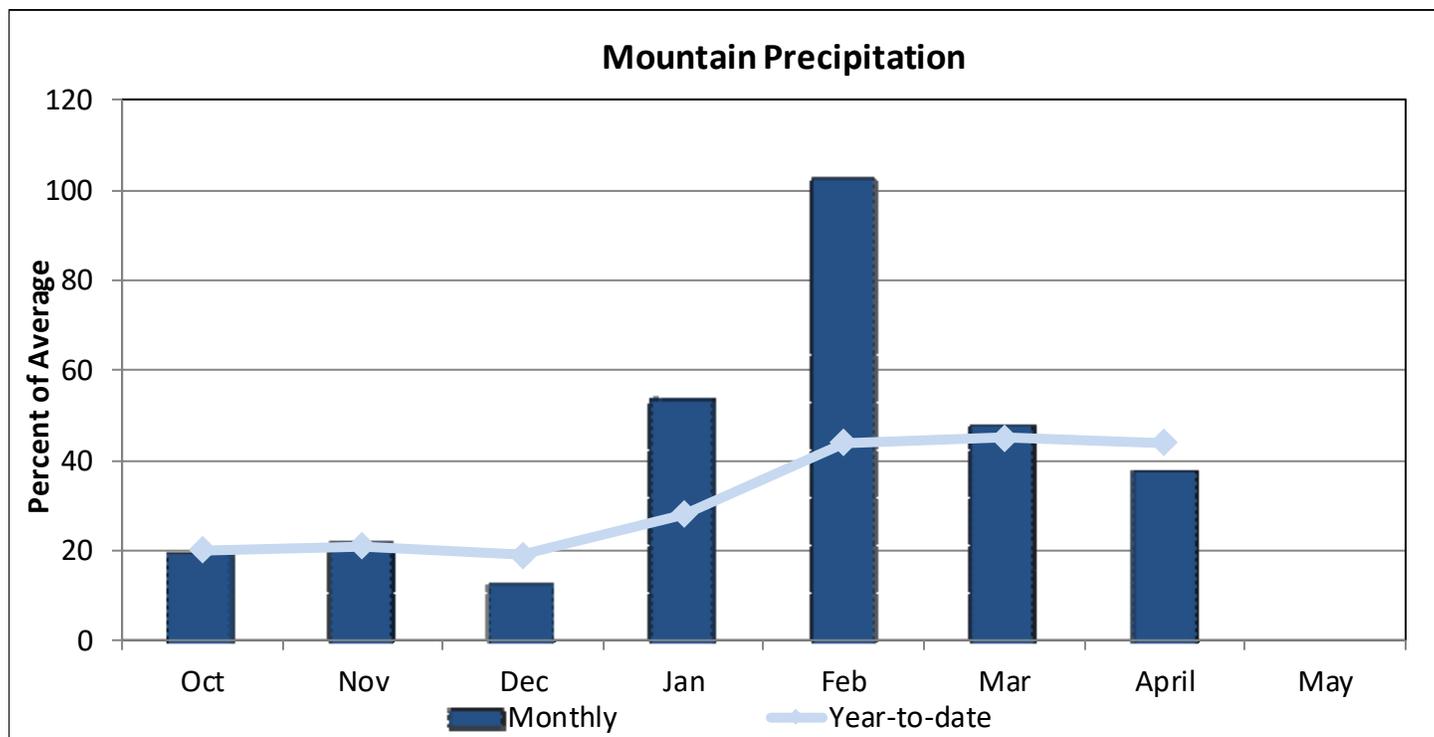
# SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS

May 1, 2018

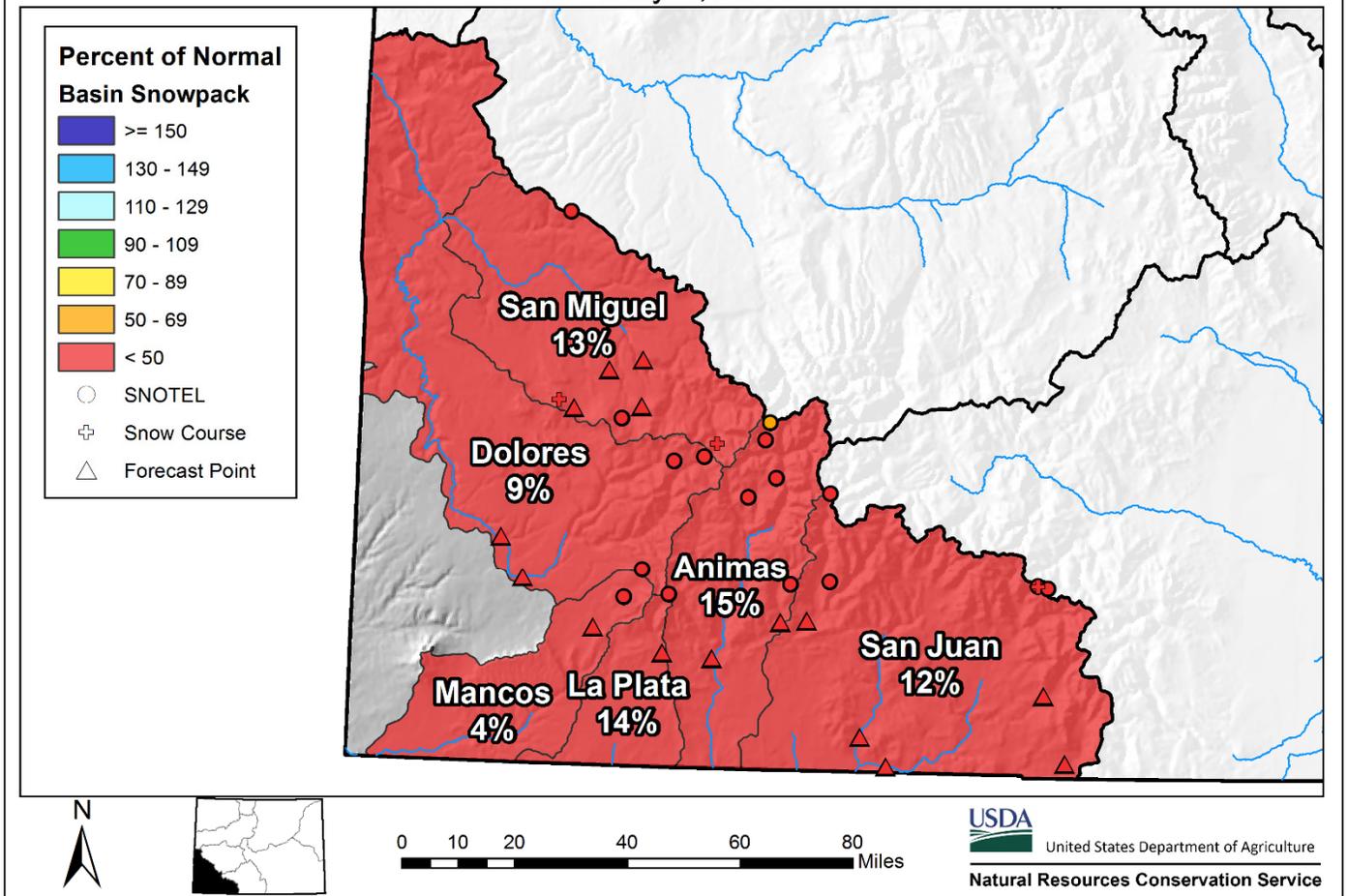
Snowpack in the combined southwest river basins is below normal at 12% of median. Precipitation for April was 38% of average which brings water year-to-date precipitation to 44% of average. Reservoir storage at the end of April was 91% of average compared to 113% last year. Current streamflow forecasts range from 34% of average for the San Miguel River near Placerville to 11% for the inflow to Navajo Reservoir.



\*SWE values calculated using daily SNOTEL data only



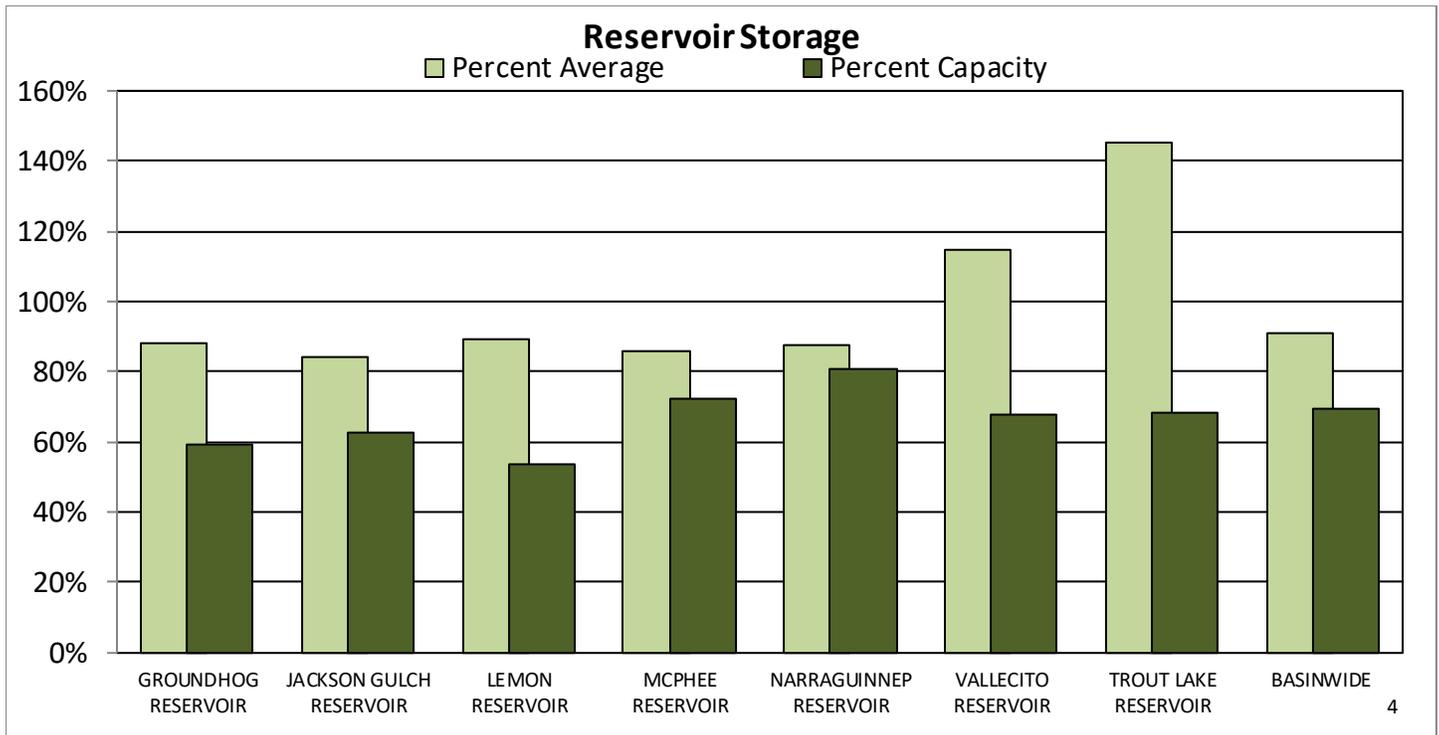
## San Miguel, Dolores, Animas, and San Juan River Basins Snowpack and Streamflow Forecasts May 1, 2018



### Watershed Snowpack Analysis May 1st, 2018

Sub-Basin	# of Sites	% Median	Last Year %	
			Median	
Animas	10	15		109
Dolores	6	9		140
San Miguel	6	13		103
San Juan	4	12		97
<b>Basin-Wide Total</b>	<b>24</b>	<b>12</b>		<b>110</b>

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



### Reservoir Storage End of April 2018

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
GROUNDHOG RESERVOIR	13.0	23.5	14.8	22.0
JACKSON GULCH RESERVOIR	6.3	9.8	7.5	10.0
LEMON RESERVOIR	21.5	26.5	24.1	40.0
MCPHEE RESERVOIR	274.7	353.2	319.4	381.0
NARRAGUINNEP RESERVOIR	15.3	18.8	17.5	19.0
VALLECITO RESERVOIR	85.3	86.5	74.2	126.0
TROUT LAKE RESERVOIR	2.2	2.0	1.5	3.2
<b>BASINWIDE</b>	418.2	520.3	459.0	601.2
Number of Reservoirs	7	7	7	7

# SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN RIVER BASINS

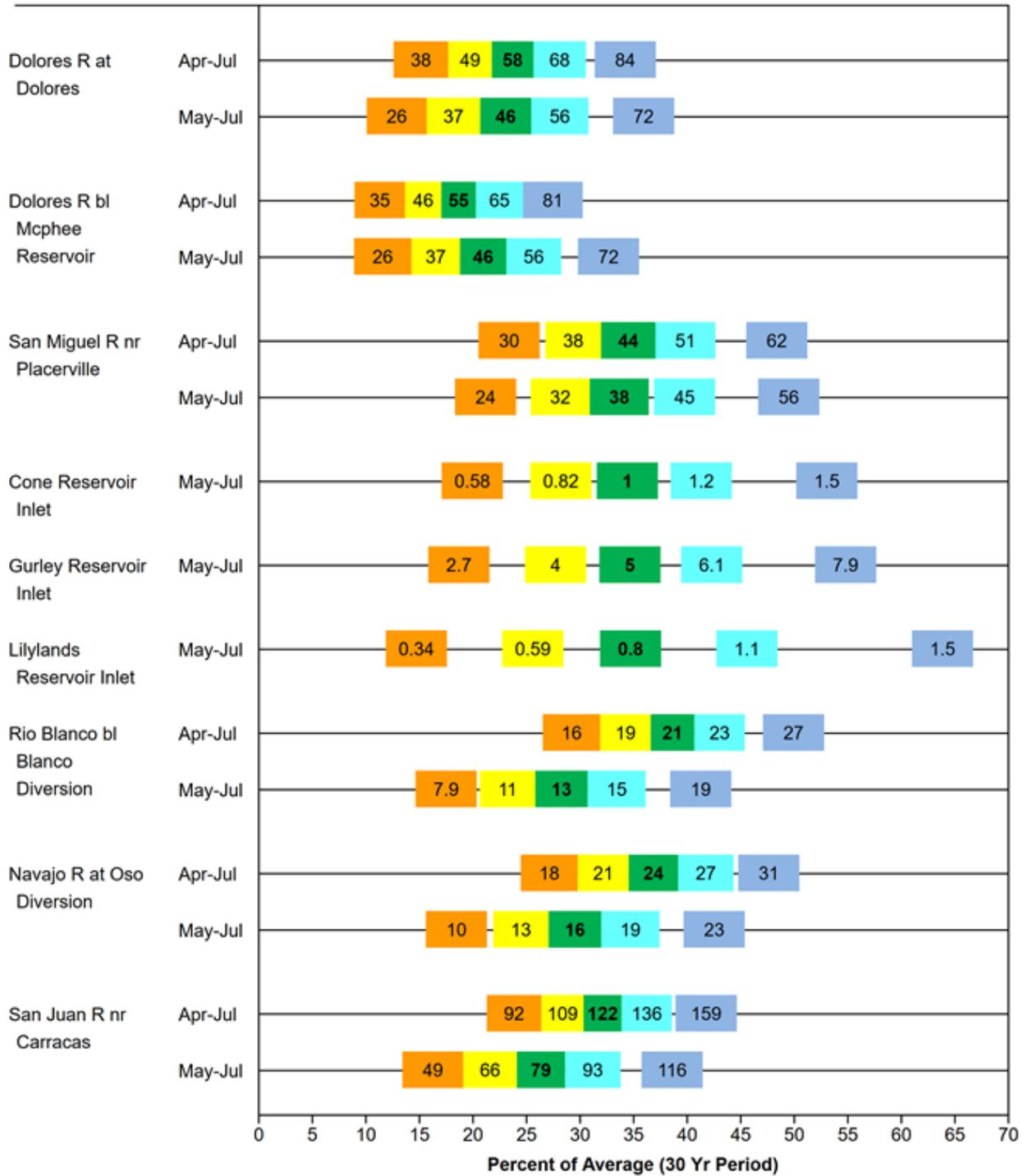
## Water Supply Forecasts

May 1, 2018

### Forecast Exceedance Probabilities and Volumes

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

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

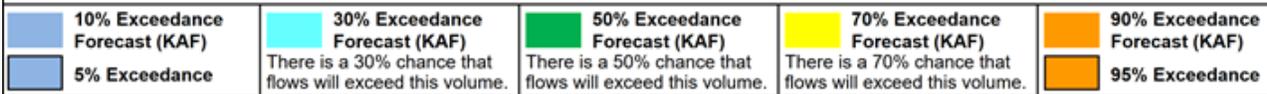
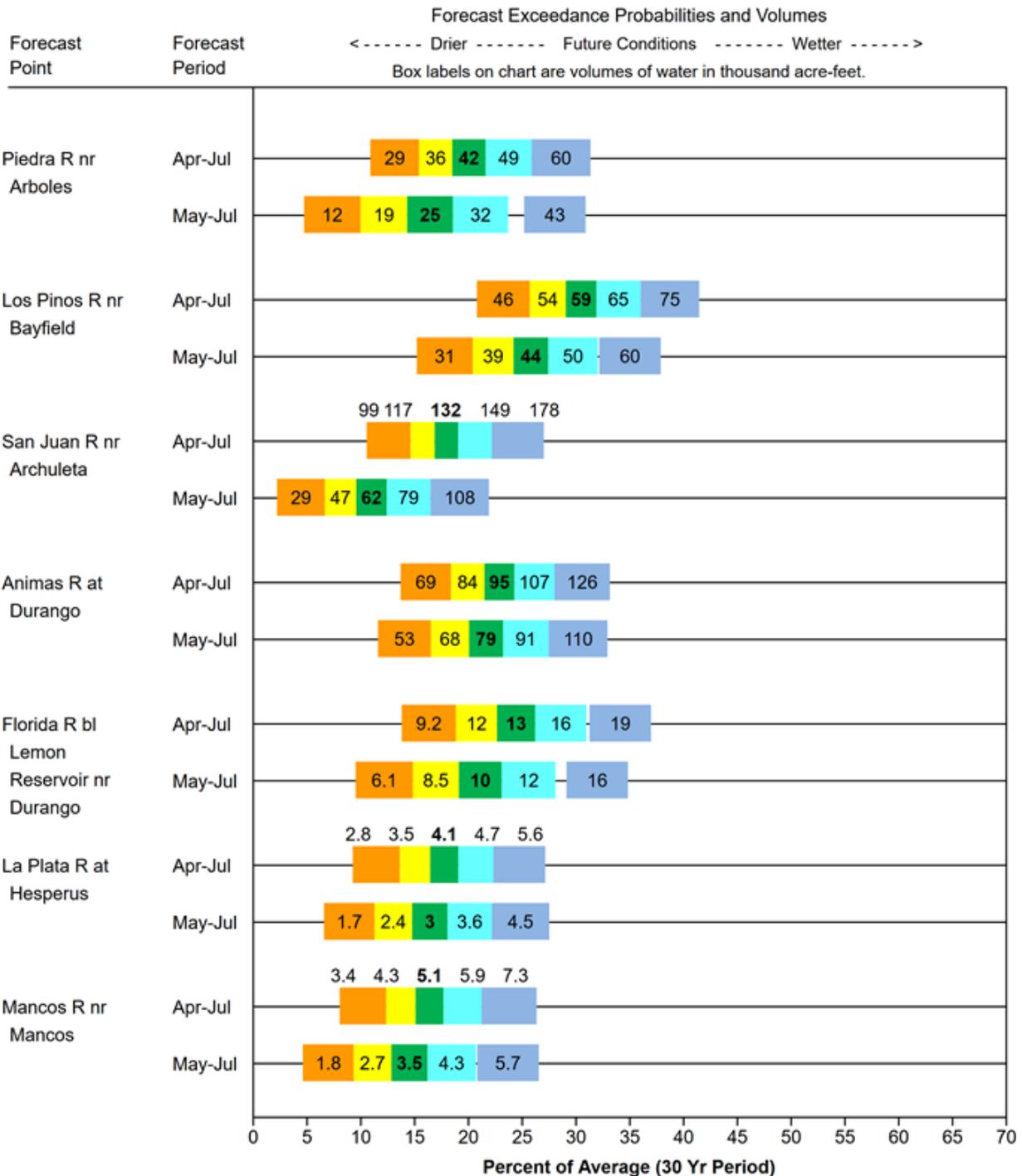


10% Exceedance Forecast (KAF)	30% Exceedance Forecast (KAF) There is a 30% chance that flows will exceed this volume.	50% Exceedance Forecast (KAF) There is a 50% chance that flows will exceed this volume.	70% Exceedance Forecast (KAF) There is a 70% chance that flows will exceed this volume.	90% Exceedance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

## SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN RIVER BASINS

### Water Supply Forecasts

#### May 1, 2018



# 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.

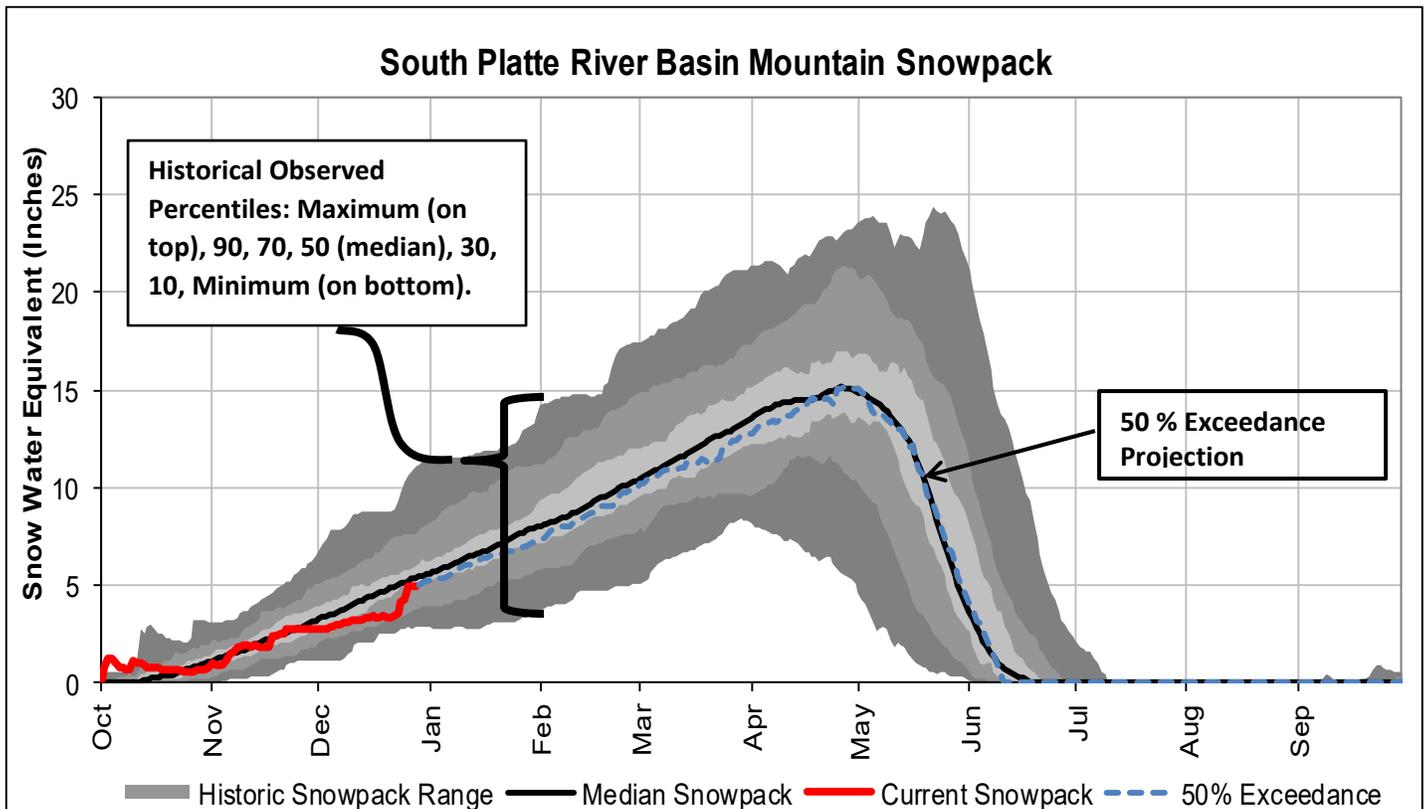
**Current** water year is represented by the heavy red line terminating on the last day the graphic was updated.

**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](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/>**

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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.

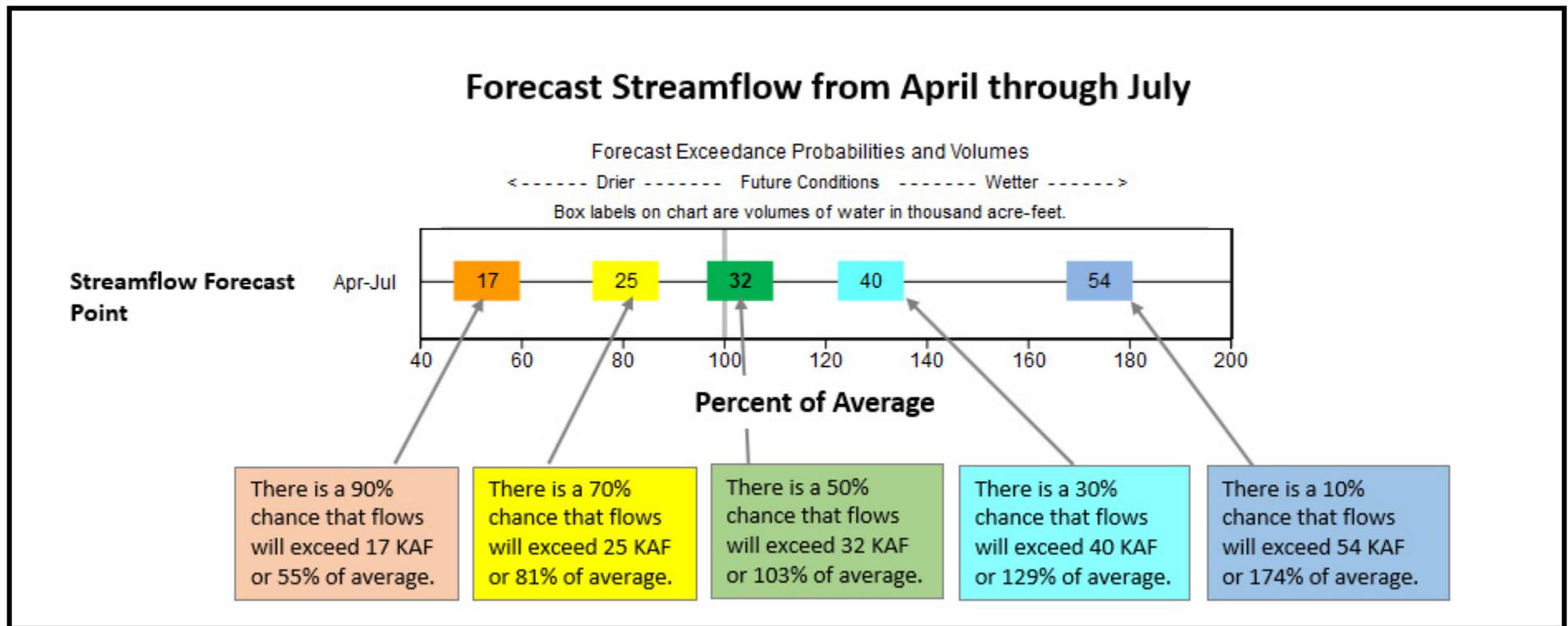
Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single 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.

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## 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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*Issued by*

**Leonard Jordan**  
**Acting Chief**  
**Natural Resources Conservation Service**  
**U.S. Department of Agriculture**

*Released by*

**Clint Evans**  
**State Conservationist**  
**Natural Resources Conservation Service**  
**Lakewood, Colorado**

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