USDA United States Department of Agriculture
Natural Resources Conservation Service

Colorado
Water Supply Outlook Report
January 1, 2020

Snowmobiling can be tough sometimes. Fortunately, Snow Survey Hydrologist, Joel Atwood was not injured during this trip into the Buffalo Park SNOTEL thanks to the abundance of soft new snow. Buffalo Park had 7.9 inches of snow water equivalent on January 1st, which is 141 percent of the median for this date.

Photo By: Zack Wilson **Date: December 19th, 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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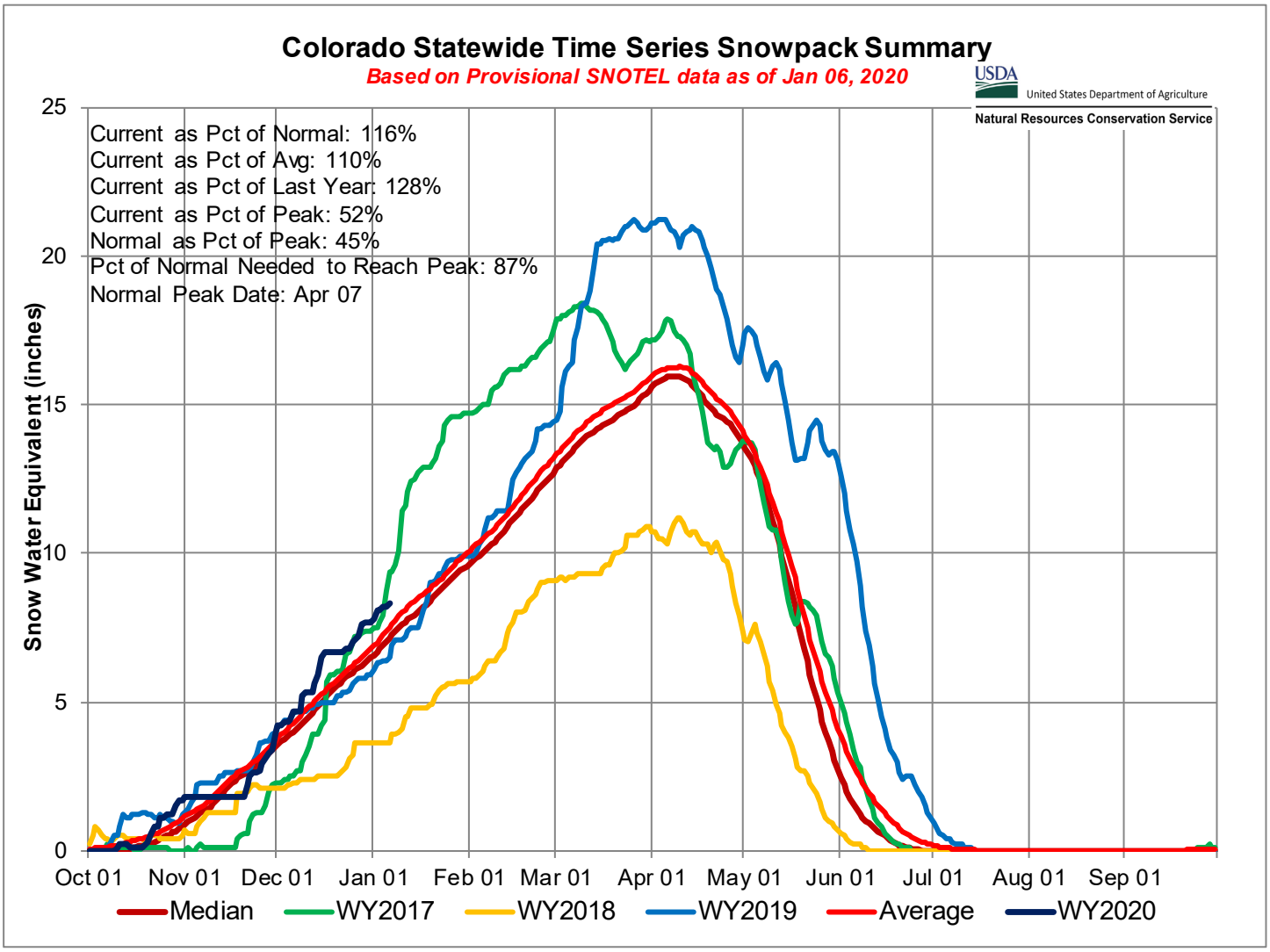
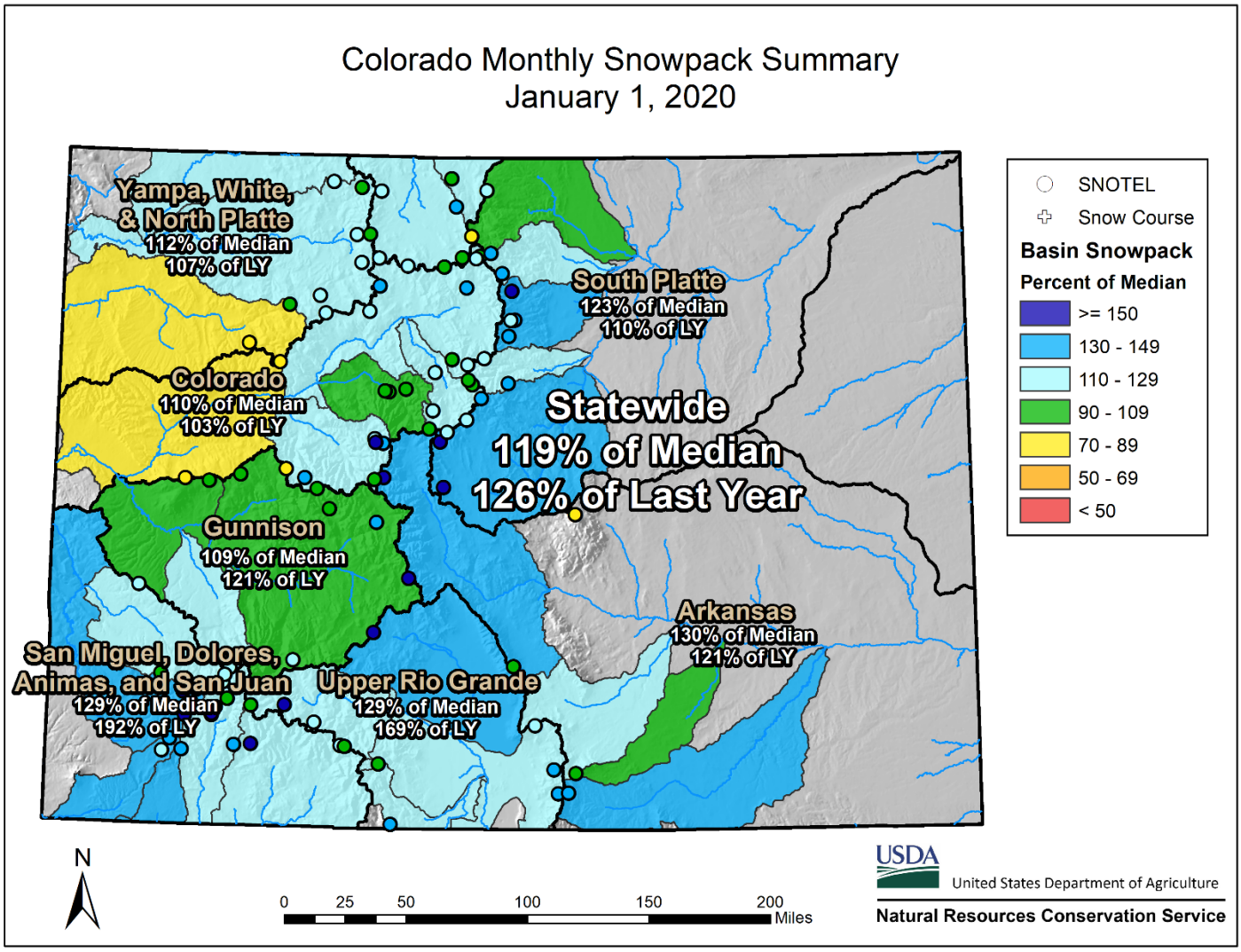
Colorado Statewide Water Supply Conditions

Summary



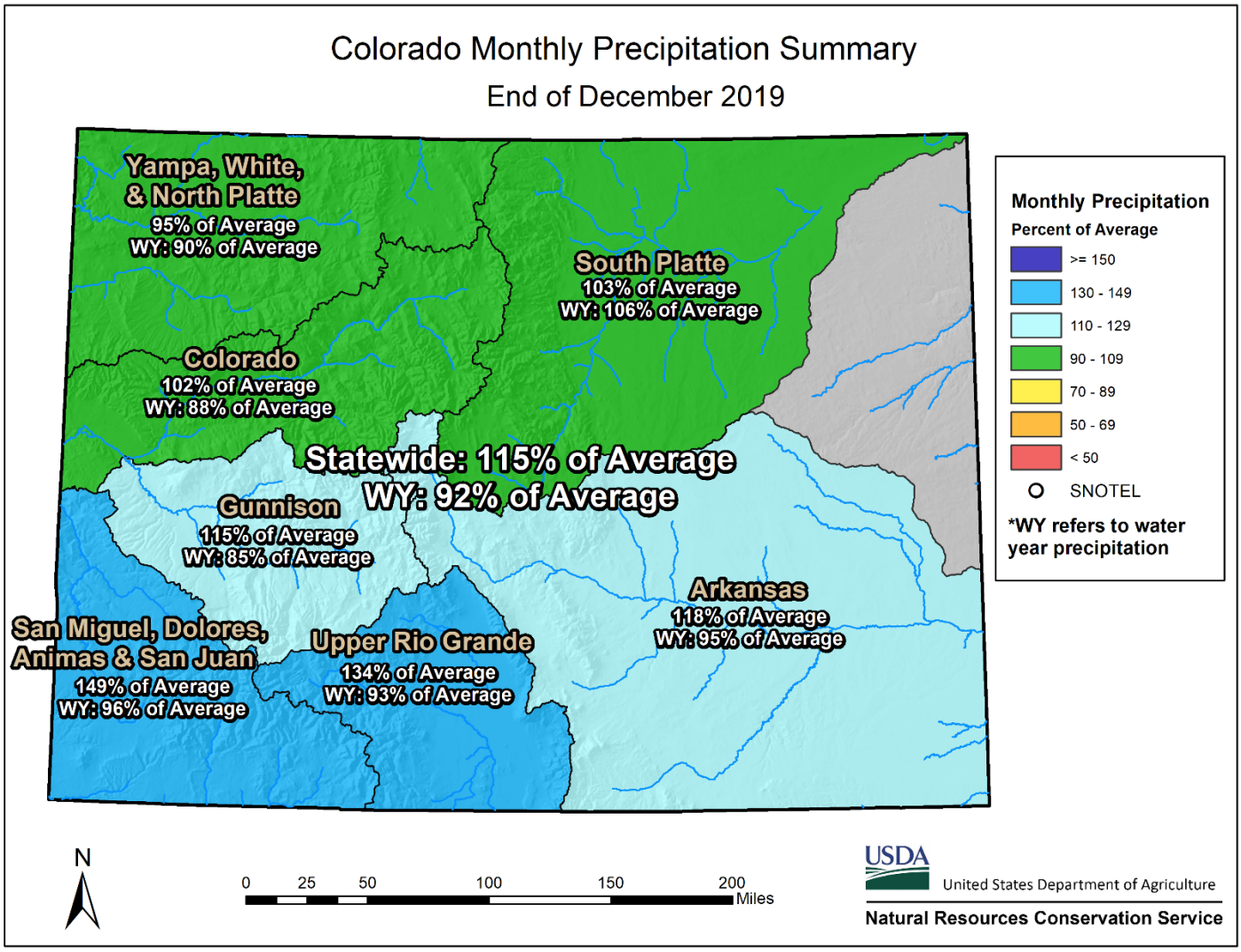
Water year 2020 has so far displayed widely varying patterns of precipitation both month-to-month and basin-to-basin. Statewide precipitation was below average for October and November and above average in December leaving Colorado water year-to-date precipitation at 92 percent of average. The above normal December precipitation accumulated almost exclusively as snow at mountain SNOTEL stations leading to all major basins holding above normal snowpack and statewide snowpack residing at 119 percent of normal as of January 1st. The combination of below normal water year precipitation, after a dry October and November, and current above normal snowpack have led water supply forecasts to be generally for near to slightly below average volumes. Across the state, 90 percent of streamflow forecasts issued are in the range of 85-115 percent of average April-July volumes. The most plentiful forecast in the state is for Cochetopa Creek below Rock Creek near Parlin at 119 percent of average and the lowest forecast is for Surface Creek near Cedaredge at 71 percent of average. Reservoir storage varies across the major basins of Colorado but as a whole is above normal at 106 percent of average. Only the Arkansas and Upper Rio Grande are holding below average storage at 98 and 86 percent of average, respectively. Storage in the other major basins ranges from 104 to 124 percent of average. Despite a dry late summer and fall the early season snow accumulations are encouraging for an ample water supply but there is still several months until the time of normal peak snowpack.

Snowpack



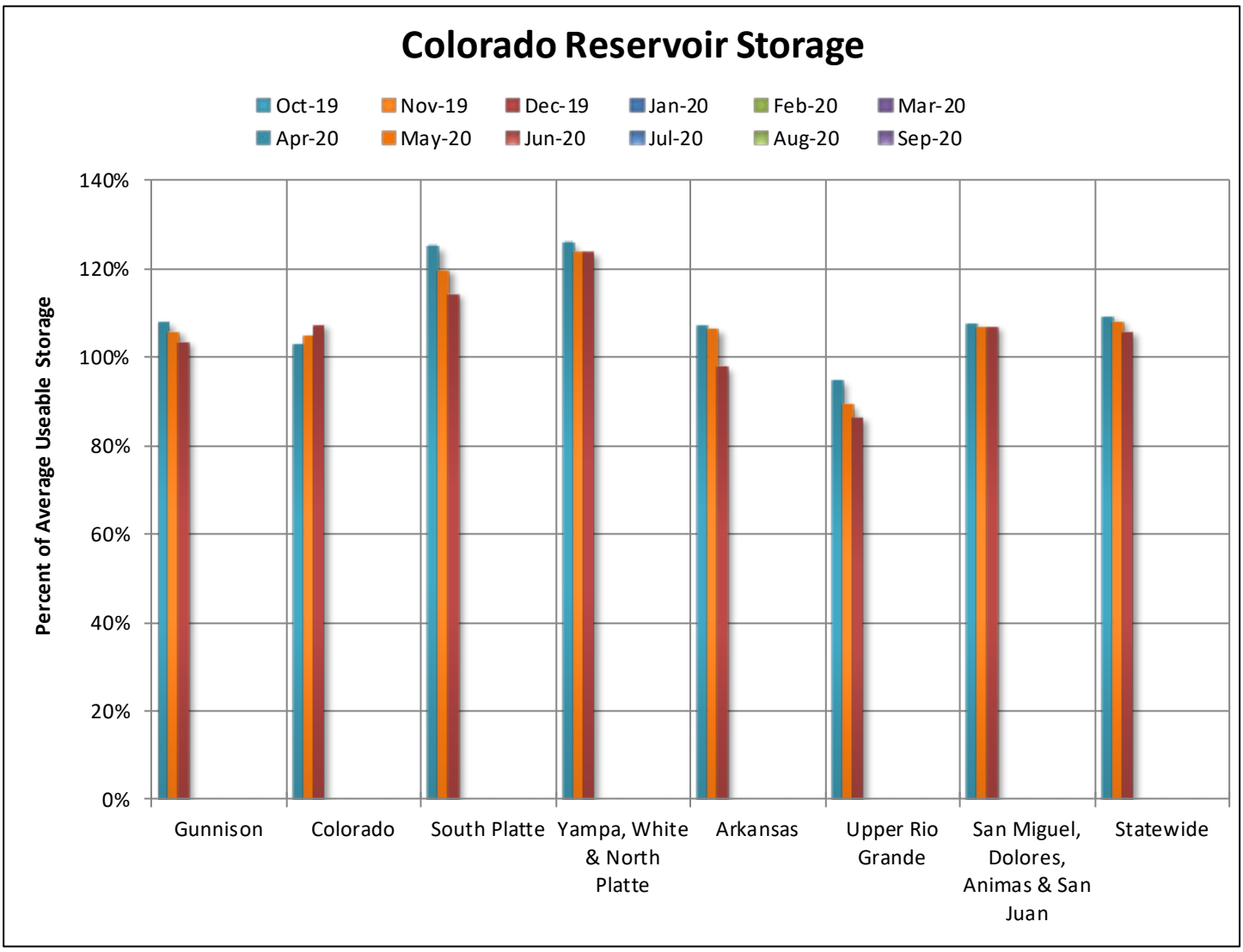
The mountains of Colorado have received generous snowfall thus far this water year, and every major river basin currently holds an above normal snowpack. While the southern mountains were relatively dry until mid-November, a wintry storm in late October resulted in accumulations of more than two inches of snow water equivalent across the mountains of northern Colorado. This fall snowpack was much above normal for much of the state for that time in the year and resulted in snowpacks greater than 200 percent of normal for November 1st. Snow accumulation has only continued to ramp up since then, for the entire state. Two storm cycles in December added several inches of snow water to the growing mountain snowpacks and particularly favored the southern mountains. These storm events have left the Rio Grande and combined San Miguel-Dolores-Animas-San Juan River basins each at 129 percent of median on January 1st and the Arkansas River basin at 130 percent. The South Platte River basin is currently at 123 percent of median while the North Platte River basin is at 112 percent. The northern river basins to the west of the Continental Divide are holding snowpacks at slightly lower levels. The Upper Colorado River basin is at 110 percent of median, The Gunnison River Basin 109 percent, and combined Yampa and White at 104 percent. There are a few sub-basins in these larger watersheds that currently have snowpacks below normal levels as indicated by SNOTEL sites. These include Surface Creek in the Gunnison (92%), Plateau Creek in the Colorado (85%), and the Upper White (87%). Despite these pockets of a below normal snow water equivalent, the statewide snowpack is at a healthy 119 percent of median. With about three months remaining for the typical snow accumulation season, this puts the mountain snowpack in a good position that could help buffer against any potential dry spells that may occur in the coming months.

Precipitation



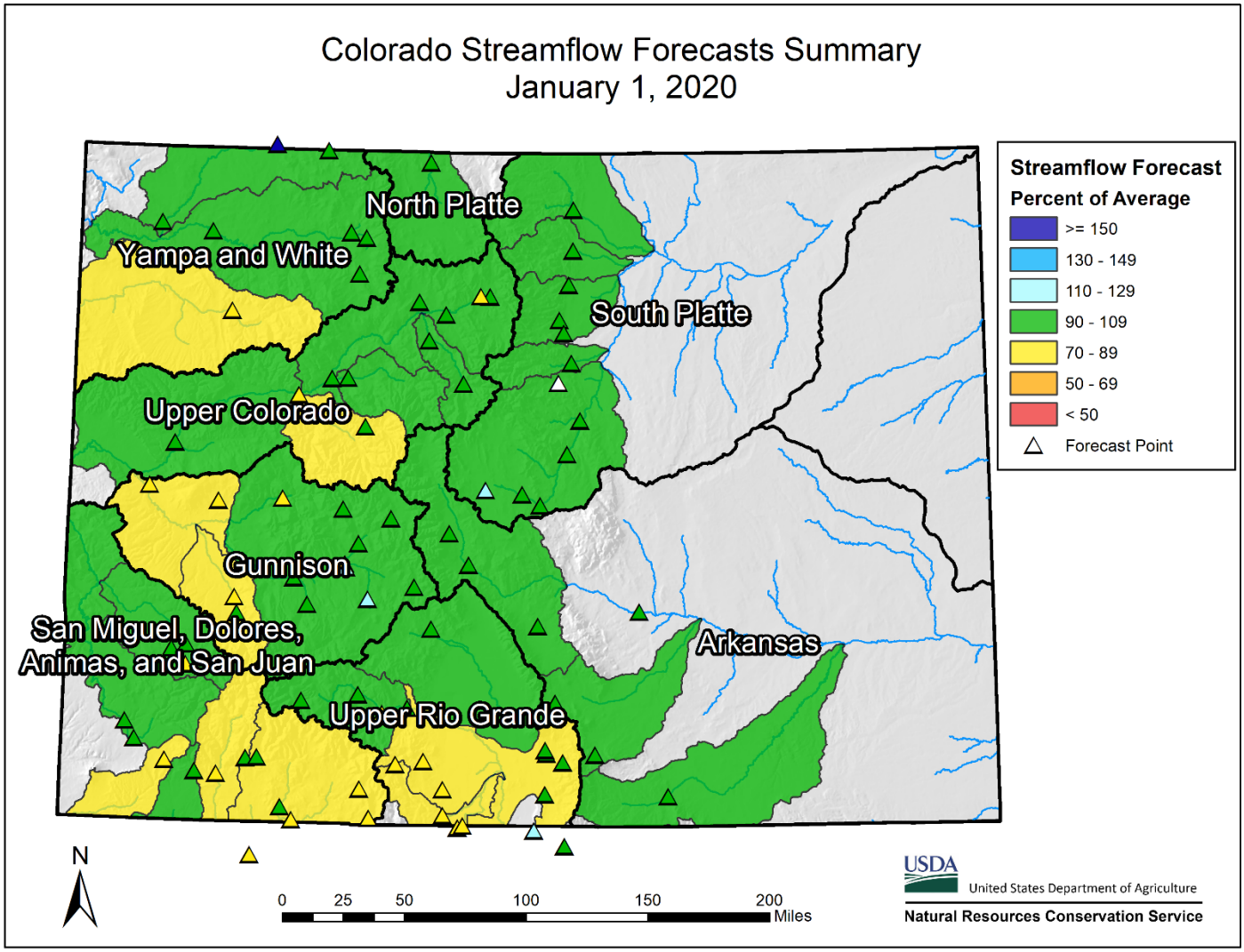
The water year began with considerable differences in precipitation accumulation between the northern and southern river basins during October. The South Platte, Colorado, and combined Yampa-White-North Platte basins received above-average precipitation with a maximum of 139 percent of average for the South Platte. In contrast, the Gunnison, Upper Rio Grande, Arkansas, and the combined San Miguel-Dolores-Animas-San Juan River basins received below-average precipitation with a minimum of 26 percent. late November storms improved conditions for the Upper Rio Grande and combined San Miguel-Dolores-Animas-San Juan River basins, which received 104 and 111 percent of average precipitation, respectively. The rest of the state received below-average precipitation for November with a minimum of 55 percent of average. Several storms from the southwest moved across the state in December producing the highest divergence from normal in the southern basins ranging from 115 to 149 percent of average. All northern basins, except the combined Yampa-White-North Platte basins, also received above-average precipitation in December ranging from 95 to 103 percent of average. Statewide, Colorado ends December with near-normal water year-to-date precipitation at 92 percent of average. The South Platte currently has above normal water-year precipitation at 106 percent of average. Other northwestern basins remain in a slight deficit with the Colorado and the Yampa-White-North Platte at 88 and 90 percent, respectively. Despite precipitation gains in December much of the southwestern parts of the state remains in drought conditions. The Gunnison, Upper Rio Grande, Arkansas, and San Miguel-Dolores-Ánimas-San Juan basins finished the year with 85, 93, 95, and 96 percent of average water-year-to-date precipitation, respectively.

Reservoir Storage



Statewide, reservoir storage is in a strong position so far this water year, with above-average conditions in most river basins. All river basins, except the Upper Rio Grande, began the water year with above-average storage due to abundant snowmelt runoff during the 2018-2019 season. The statewide average remained strong throughout October, ending the month at 109 percent. Statewide reservoir storage also remained above average in November at 108 percent. However, during this period only the Colorado River basin saw an increase in relative storage, from 103 percent of average at the end of October to 105 percent at the end of November. The Upper Rio Grande River basin ended October at 95 percent of average storage and continued to lose relative storage due to dry fall conditions, ending November at 89 percent. This trend continued for the Upper Rio Grande during December, and reservoirs in the basin are currently at 86 percent of average. The Gunnison and South Platte had a decline in relative storage from November to December but storage in each basin remains above average on January 1st at 104 and 115 percent respectively. Reservoirs in the Colorado basin saw an increase in storage, relative to normal, since November and are at 107 percent of average on January 1st. This is largely driven by high reservoir storage just west of the Continental Divide. The combined San Miguel-Dolores-Animas-San Juan and combined Yampa-White-North Platte River basins had almost no change in reservoir storage, relative to normal, from November, maintaining 107 and 124 percent of average storage, respectively. Overall reservoir storage for the state has decreased slightly since November, but remains above normal on January 1st, at 106 percent of average.

Streamflow

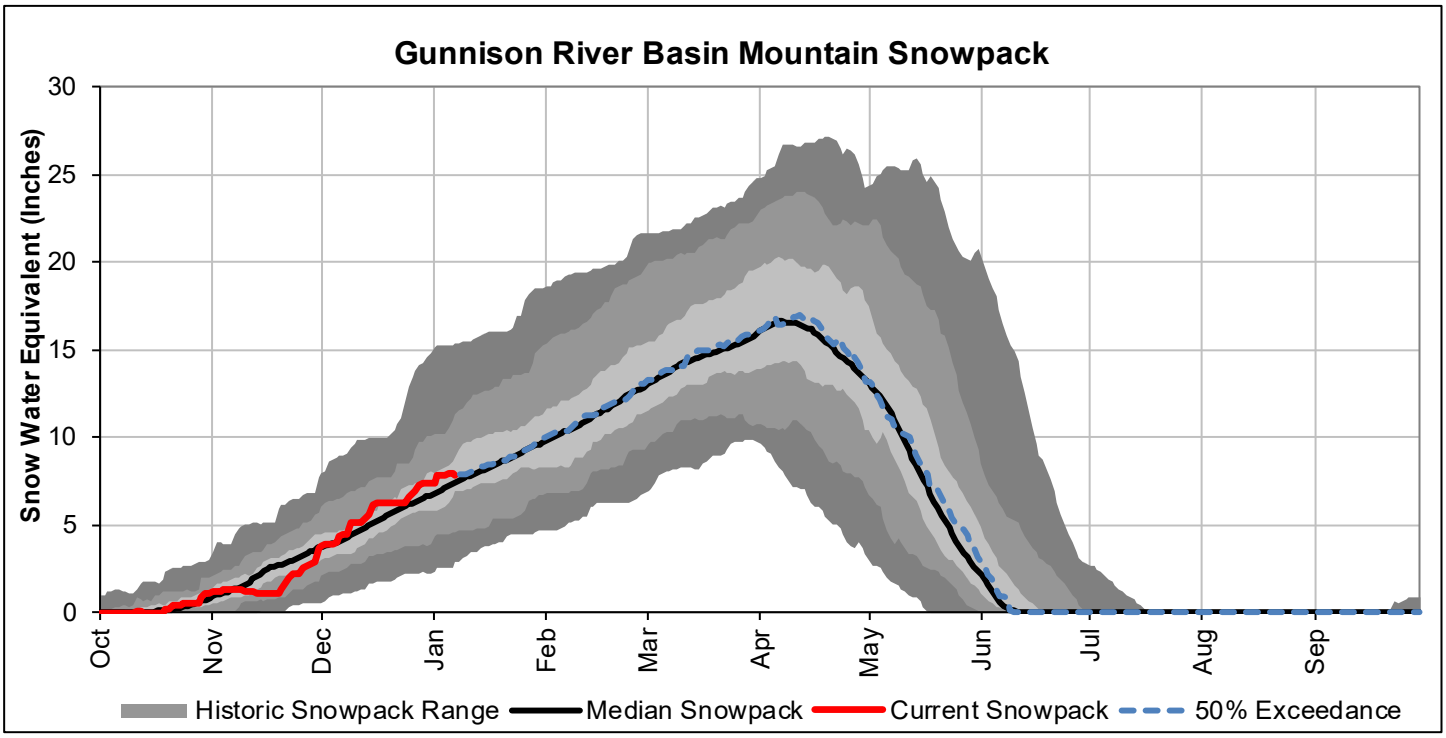


Despite the robust snowpack that blankets Colorado's mountains, current streamflow forecasts do not necessarily reflect these above normal values. Precipitation was far below average universally across Colorado for July through September of 2019, bringing a return to drought conditions to the mountain regions across the state. This resulted in low streamflows and depleted soil moisture for the start of the water year in many locations. These deficits will need to be overcome before snowmelt runoff contributes to superfluous streamflow volumes next spring. Current streamflow forecasts around the state cover a relatively wide range with most hovering right around, or slightly below average. Current streamflow forecasts in the Arkansas and South Platte River basins are higher than elsewhere in the state and range from 90 to 112 percent of average in these basins. Streamflow volumes are currently forecast to be generally below normal for the Yampa-White and Colorado River basins, and most forecasts range from 80 to 100 percent of normal. The Gunnison River basin shows the greatest span of streamflow forecasts, where the northern tributaries are currently showing below normal flows between 70 and 75 percent of average, while other drainages to the south are currently expected to have above normal flows. Streamflow forecasts for the Upper Rio Grande and combined San Miguel-Dolores-Animas-San Miguel River basins are all currently showing below average volumes and range from 70 to 97 percent of average. With many months still to come prior to runoff, these streamflow forecasts are bound to change. The uncertainty in the current water supply outlook is reflected in the range of possible runoff volumes presented at the different exceedance probabilities in the forecast charts in the basin summaries below. As the 2020 water year progresses, this range of potential runoff outcomes will narrow following the trends in precipitation and snowpack that Colorado experiences in the months to come.

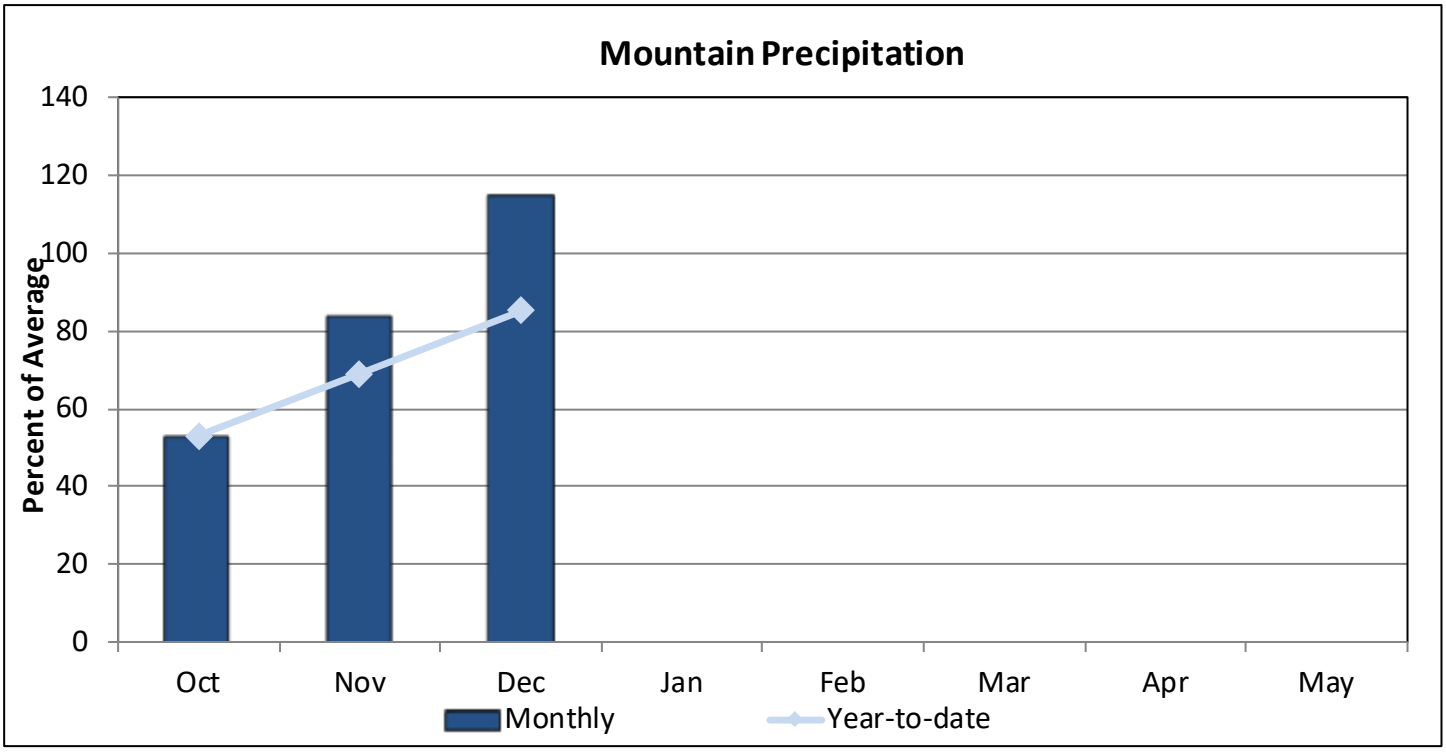
GUNNISON RIVER BASIN

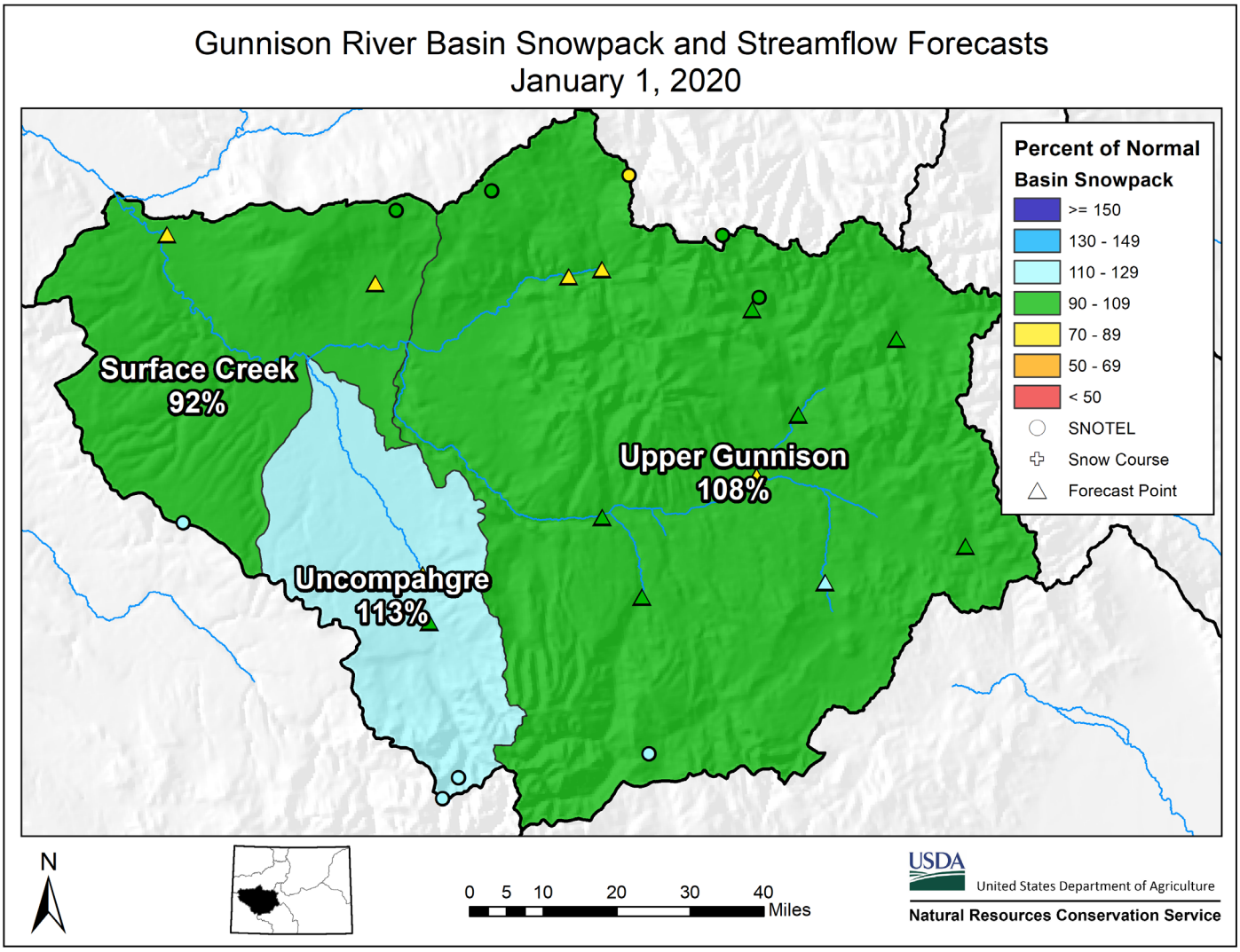
January 1, 2020

Snowpack in the Gunnison River basin is above normal at 109% of the median. Precipitation for December was 115% of average which brings water year-to-date precipitation to 85% of average. Reservoir storage at the end of December was 104% of average compared to 57% last year. Current streamflow forecasts range from 71% of average for Surface Creek at Cedaredge to 119% for Cochetopa Creek below Rock Creek near Parlin.



*SWE values calculated using daily SNOTEL data only

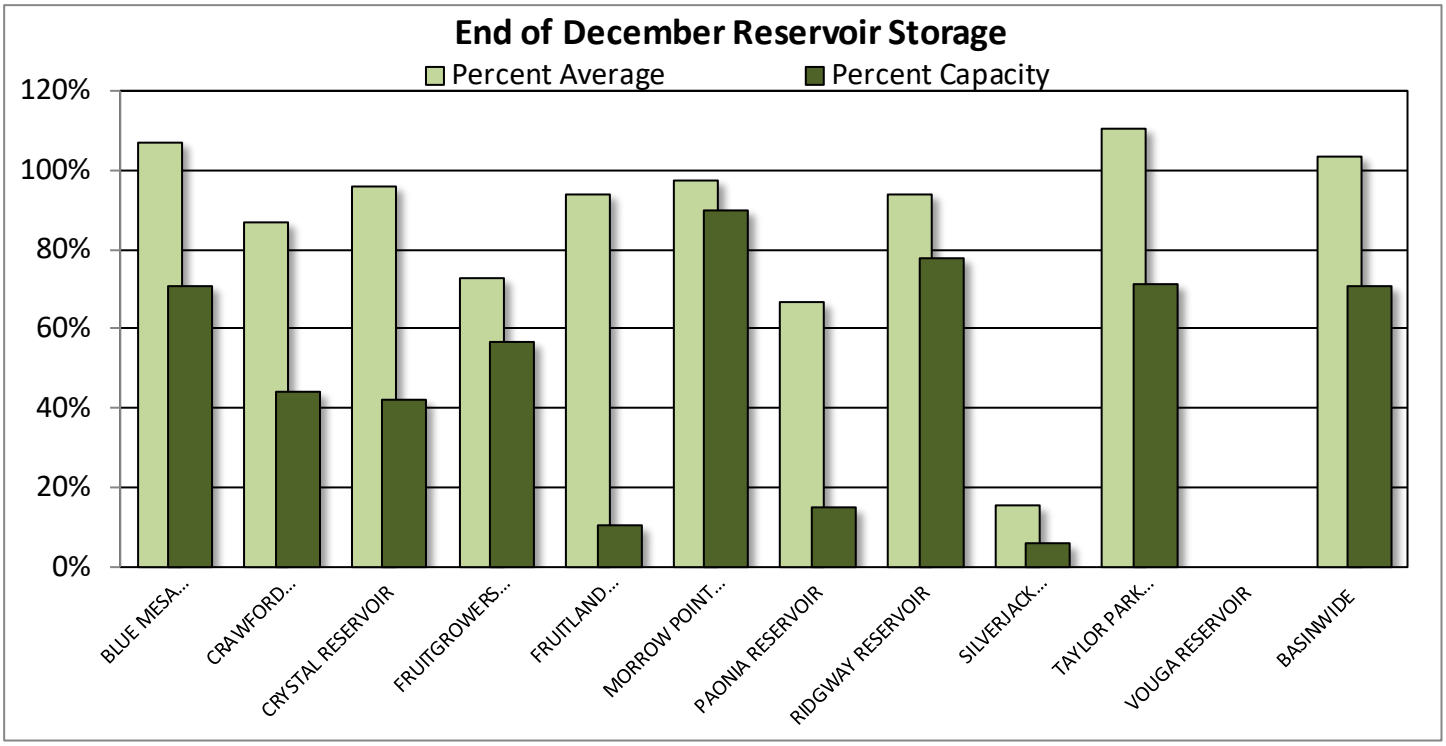




Watershed Snowpack Analysis January 1st, 2020

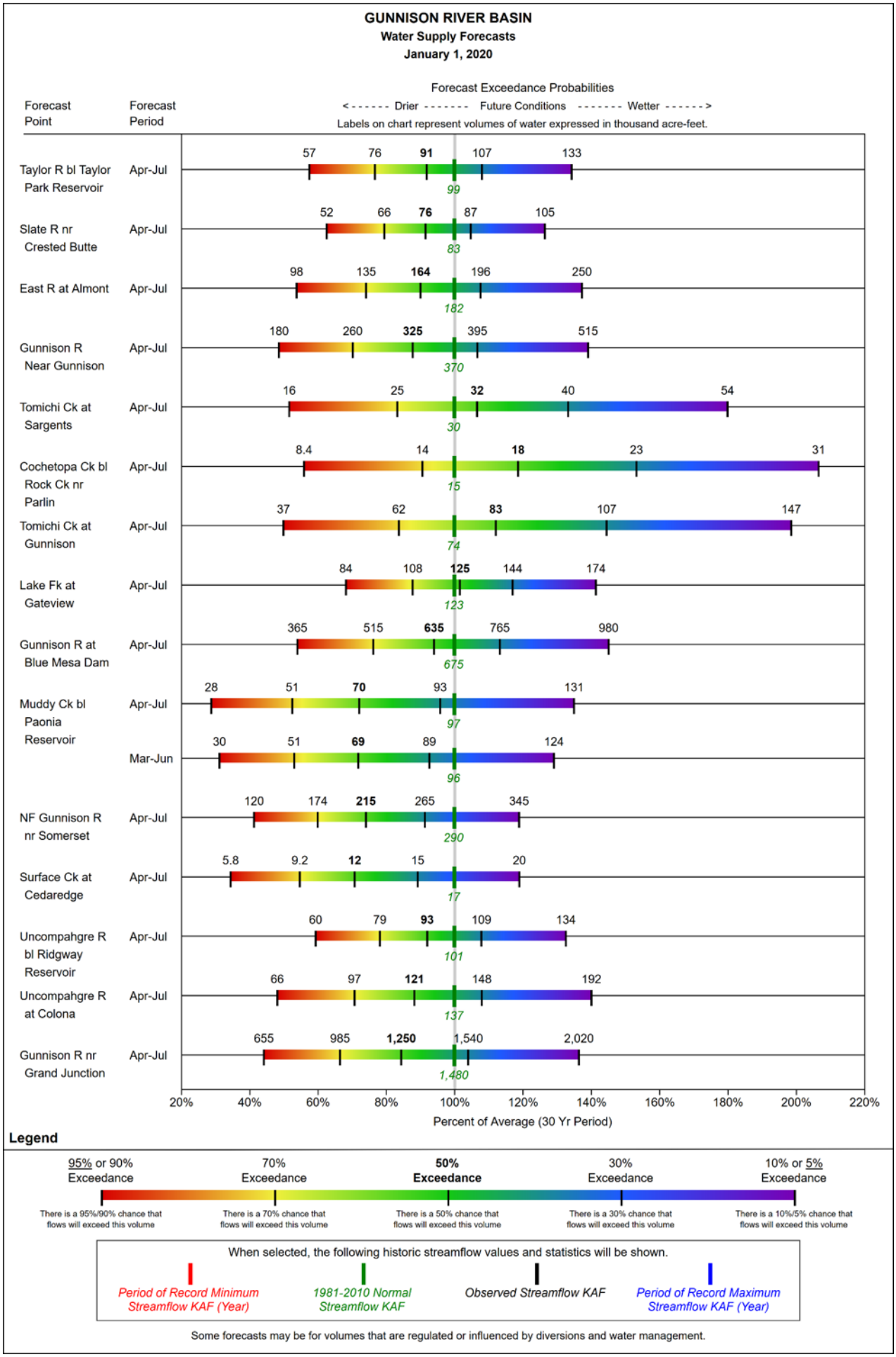
Sub-Basin	# of Sites	% Median	Last Year % Median
Upper Gunnison	10	108	94
Surface Creek	2	92	99
Uncompahgre	3	113	82
Basin-Wide Total	13	109	91

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



Reservoir Storage End of December 2019

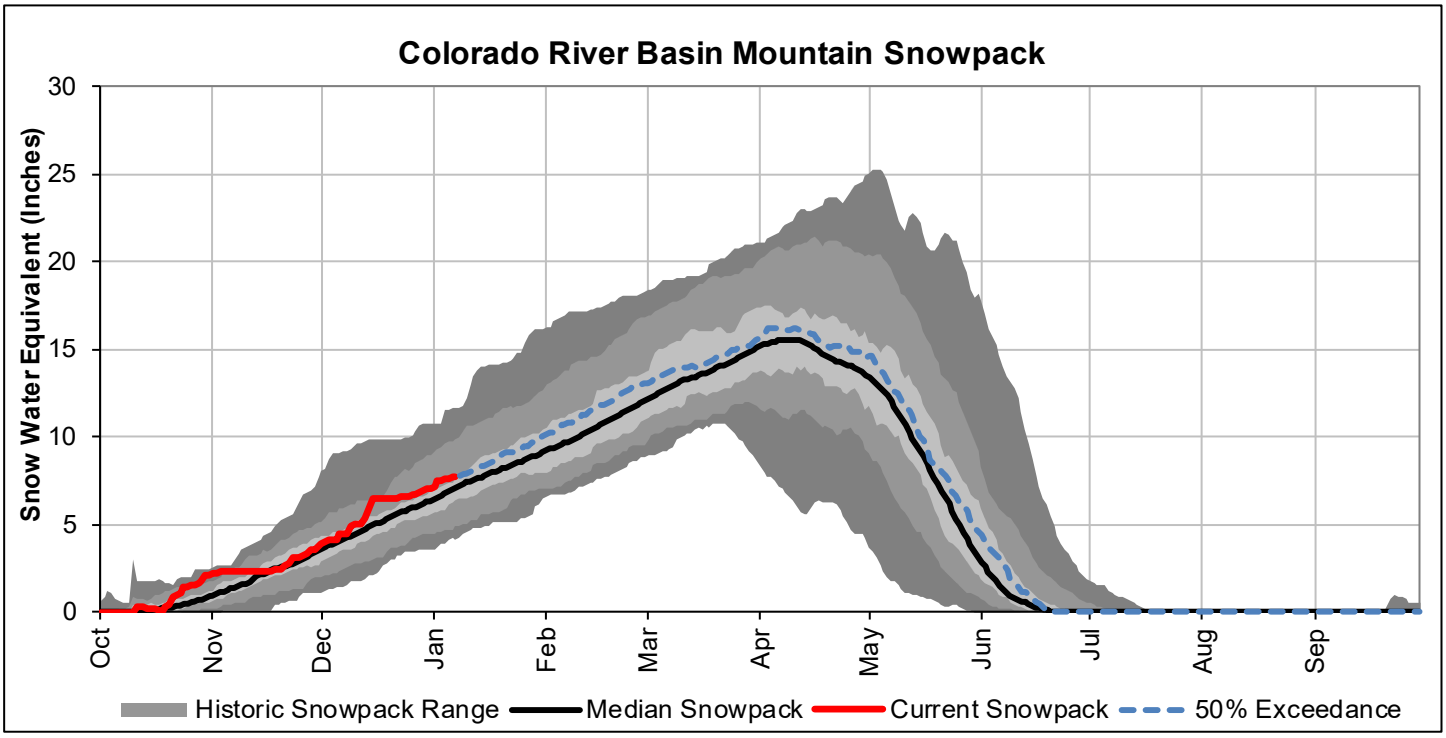
Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
BLUE MESA RESERVOIR	587.5	248.8	549.9	830.0
CRAWFORD RESERVOIR	6.2	1.1	7.1	14.0
CRYSTAL RESERVOIR	7.4	7.1	7.7	17.5
FRUITGROWERS RESERVOIR	2.0	1.7	2.8	3.6
FRUITLAND RESERVOIR	1.0	0.3	1.0	9.2
MORROW POINT RESERVOIR	108.4	107.5	111.6	121.0
PAONIA RESERVOIR	2.3	2.6	3.5	15.4
RIDGWAY RESERVOIR	64.5	45.9	68.8	83.0
SILVERJACK RESERVOIR	0.8	0.8	5.0	12.8
TAYLOR PARK RESERVOIR	75.3	59.0	68.1	106.0
VOUGA RESERVOIR		0.2		0.9
BASINWIDE	855.4	475.0	825.5	1213.4
Number of Reservoirs	10	11	10	11


GUNNISON RIVER BASIN
Water Supply Forecasts
January 1, 2020
Forecast Exceedance Probabilities
< ------- Drier ------- Future Conditions ------- Wetter ------ >
Labels on chart represent volumes of water expressed in thousand acre-feet.
Forecast Point
Forecast Period
Taylor R bl Taylor Park Reservoir Apr-Jul 57 76 91 107 133 99
Slate R nr Crested Butte Apr-Jul 52 66 76 87 105 83
East R at Almont Apr-Jul 98 135 164 196 250 182
Gunnison R Near Gunnison Apr-Jul 180 260 325 395 515 370
Tomichi Ck at Sargents Apr-Jul 16 25 32 40 54 30
Cochetopa Ck bl Rock Ck nr Parlin Apr-Jul 8.4 14 18 23 31 15
Tomichi Ck at Gunnison Apr-Jul 37 62 83 107 147 74
Lake Fk at Gateview Apr-Jul 84 108 125 144 174 123
Gunnison R at Blue Mesa Dam Apr-Jul 365 515 635 765 980 675
Muddy Ck bl Paonia Reservoir Apr-Jul 28 51 70 93 131 97
Mar-Jun 30 51 69 89 124 96
NF Gunnison R nr Somerset Apr-Jul 120 174 215 265 345 290
Surface Ck at Cedaredge Apr-Jul 5.8 9.2 12 15 20 17
Uncompahgre R bl Ridgway Reservoir Apr-Jul 60 79 93 109 134 101
Uncompahgre R at Colona Apr-Jul 66 97 121 148 192 137
Gunnison R nr Grand Junction Apr-Jul 655 985 1,250 1,540 2,020 1,480
20% 40% 60% 80% 100% 120% 140% 160% 180% 200% 220%
Percent of Average (30 Yr Period)
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.

UPPER COLORADO RIVER BASIN

January 1, 2020

Snowpack in the Colorado River basin is above normal at 110% of the median. Precipitation for December was 102% of average which brings water year-to-date precipitation to 88% of average. Reservoir storage at the end of December was 107% of average compared to 91% last year. Current streamflow forecasts range from 87% of average for the Willow Creek Reservoir inflow to 100% for the inflow to Green Mountain Reservoir.



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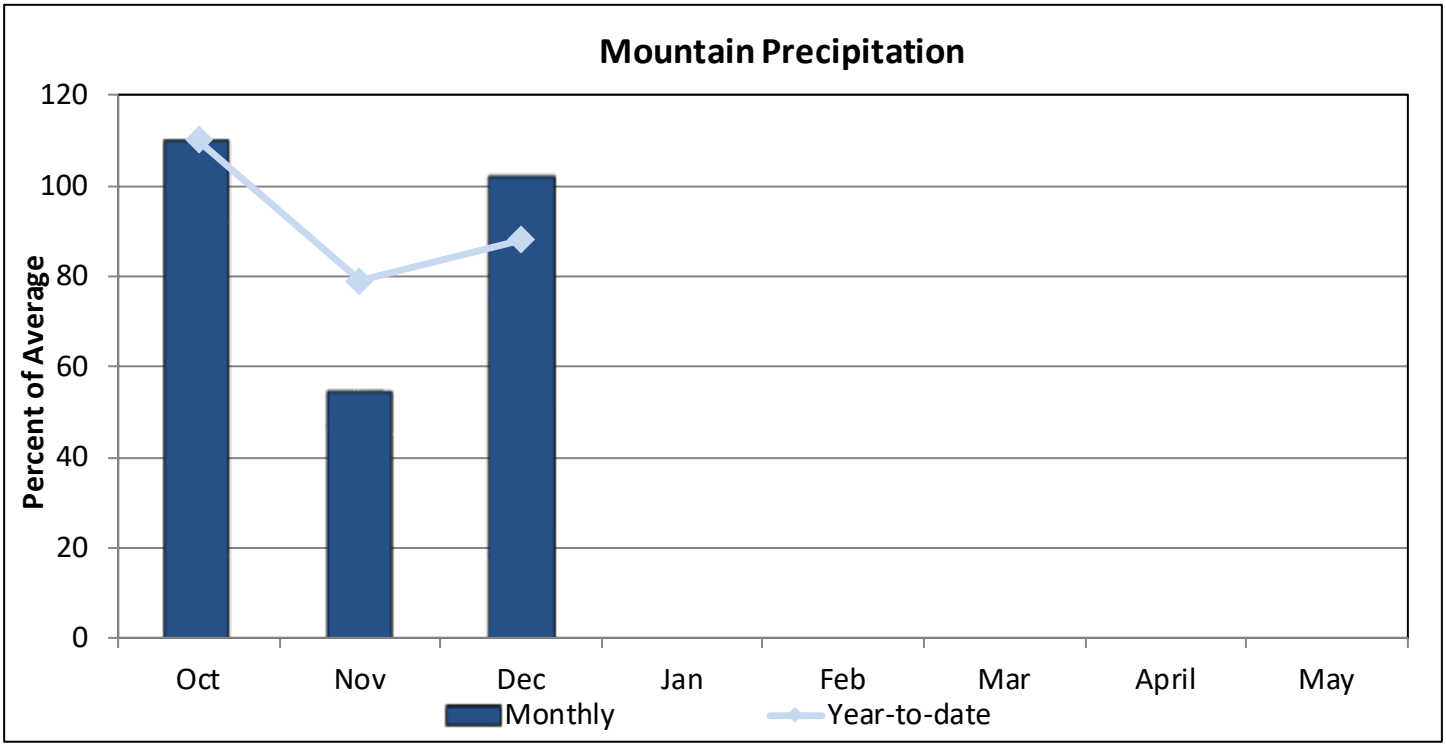
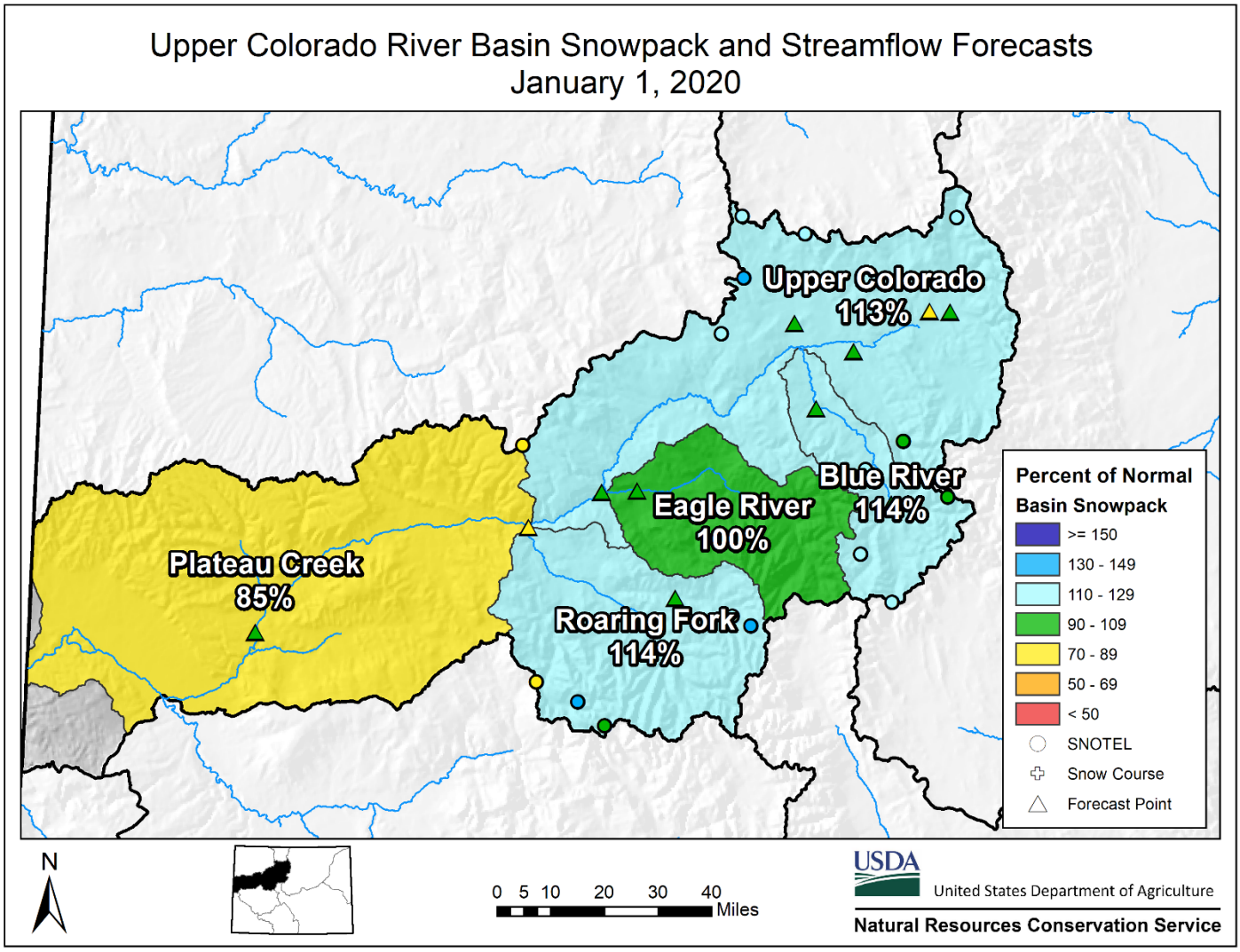
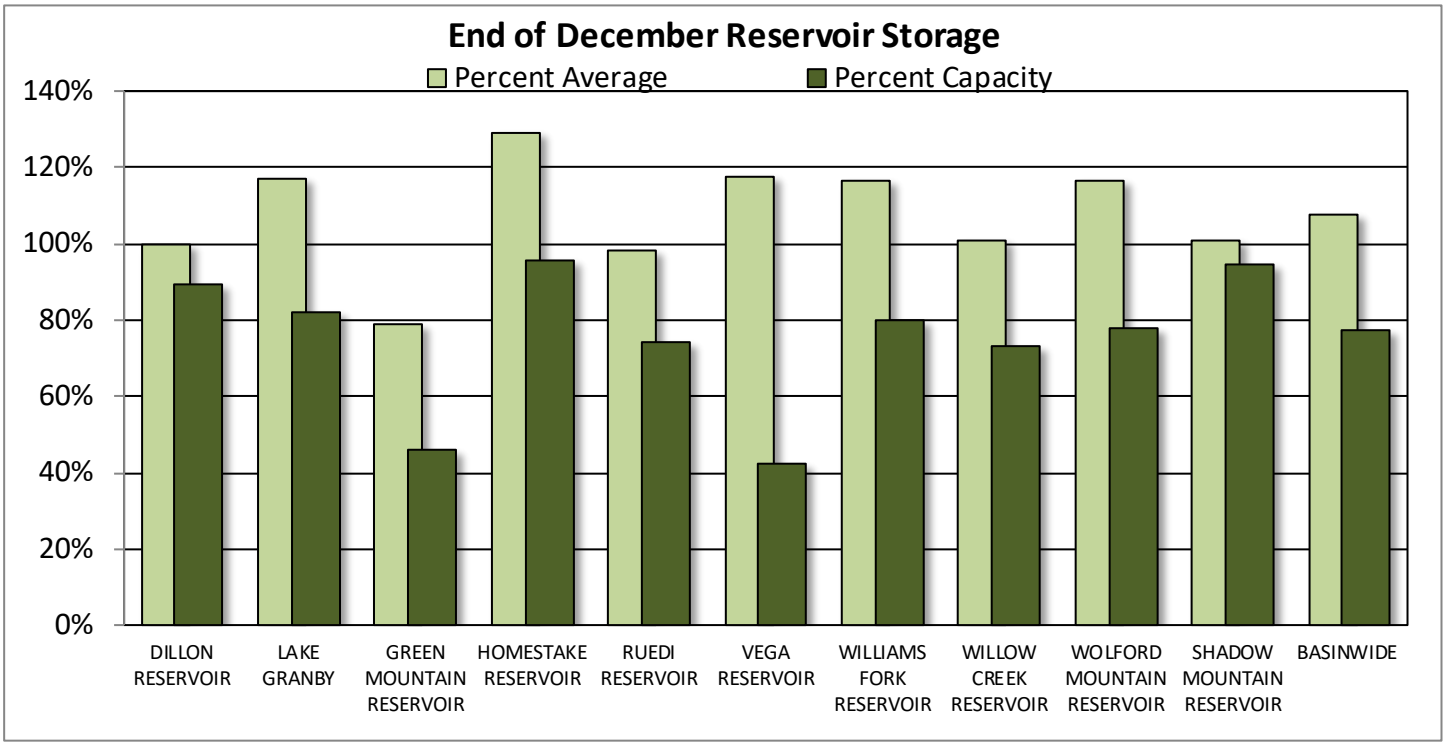




Watershed Snowpack Analysis January 1st, 2020

Sub-Basin	# of Sites	% Median	Last Year % Median
Blue River	5	114	124
Upper Colorado	19	113	107
Muddy Creek	3	122	109
Eagle River	4	100	98
Plateau Creek	5	85	94
Roaring Fork	7	114	108
Williams Fork	3	112	104
Willow Creek	2	121	113
Basin-Wide Total	28	110	107

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



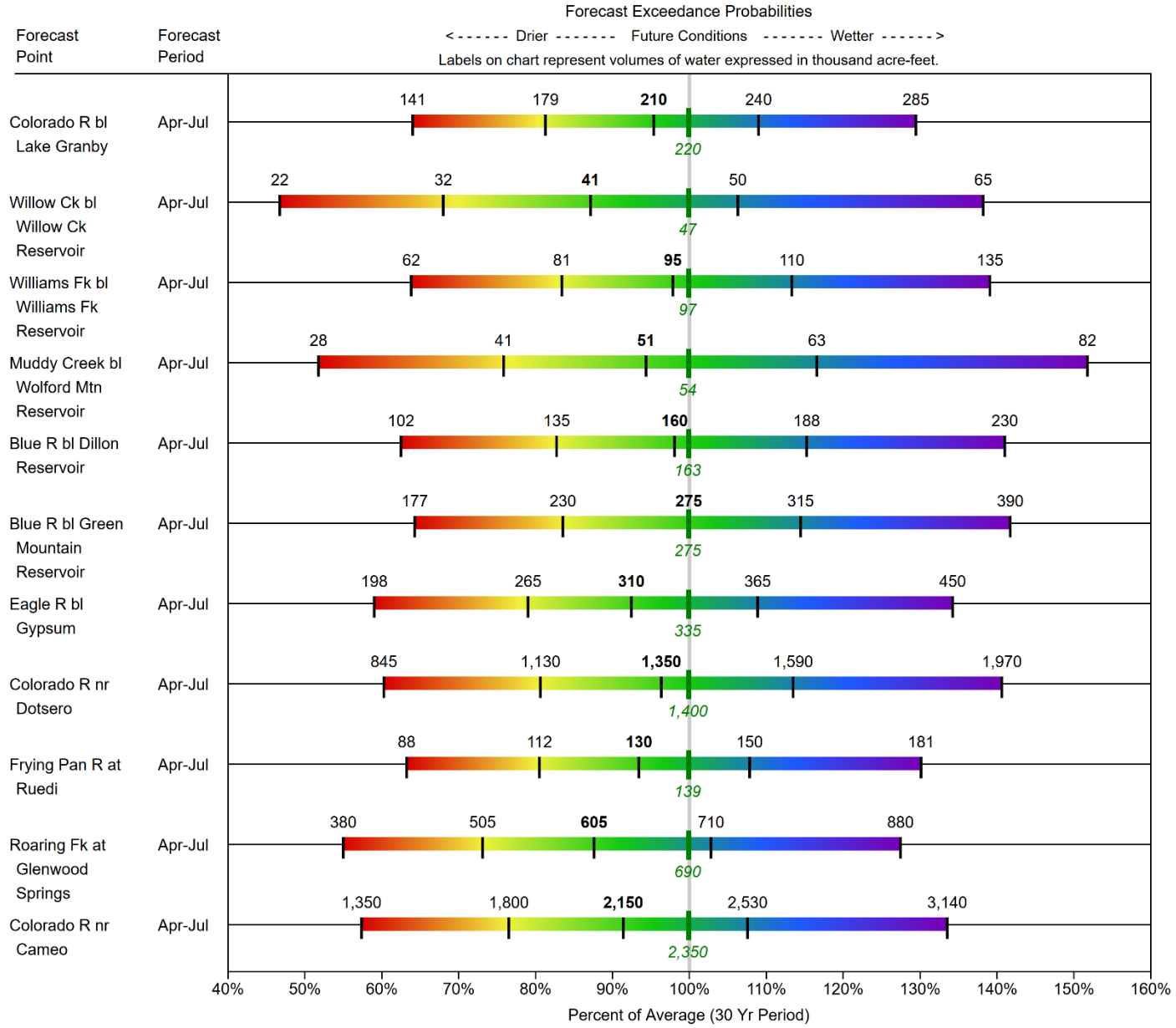
Reservoir Storage End of December 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
DILLON RESERVOIR	222.0	177.7	222.1	249.1
LAKE GRANBY	381.3	348.6	325.7	465.6
GREEN MOUNTAIN RESERVOIR	67.4	51.0	85.2	146.8
HOMESTAKE RESERVOIR	41.2	41.2	31.9	43.0
RUEDI RESERVOIR	75.6	60.0	76.8	102.0
VEGA RESERVOIR	13.9	5.0	11.8	32.9
WILLIAMS FORK RESERVOIR	77.6	69.7	66.5	97.0
WILLOW CREEK RESERVOIR	6.6	6.4	6.6	9.1
WOLFORD MOUNTAIN RESERVOIR	51.2	34.7	44.0	65.9
SHADOW MOUNTAIN RESERVOIR	17.4	17.3	17.3	18.4
BASINWIDE	954.2	811.7	887.9	1229.8
Number of Reservoirs	10	10	10	10

UPPER COLORADO RIVER BASIN

Water Supply Forecasts

January 1, 2020



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

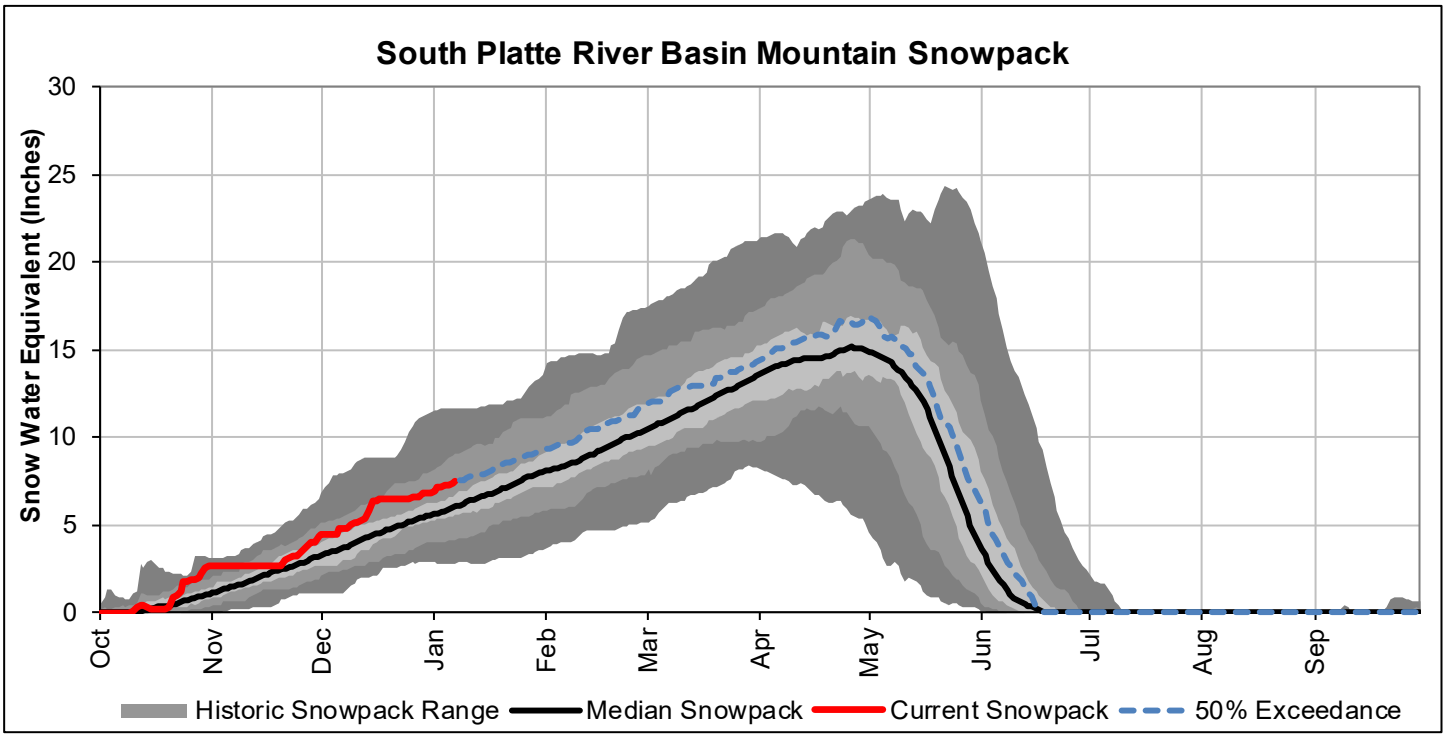
Period of Record Maximum Streamflow KAF (Year)

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

SOUTH PLATTE RIVER BASIN

January 1, 2020

Snowpack in the South Platte River basin is above normal at 123% of the median. Precipitation for December was 103% of average which brings water year-to-date precipitation to 106%. Reservoir storage at the end of December was 115% of average compared to 101% last year. Current streamflow forecasts range from 96% of average for South Platte River at South Platte to 112% for the inflow to Antero Reservoir.



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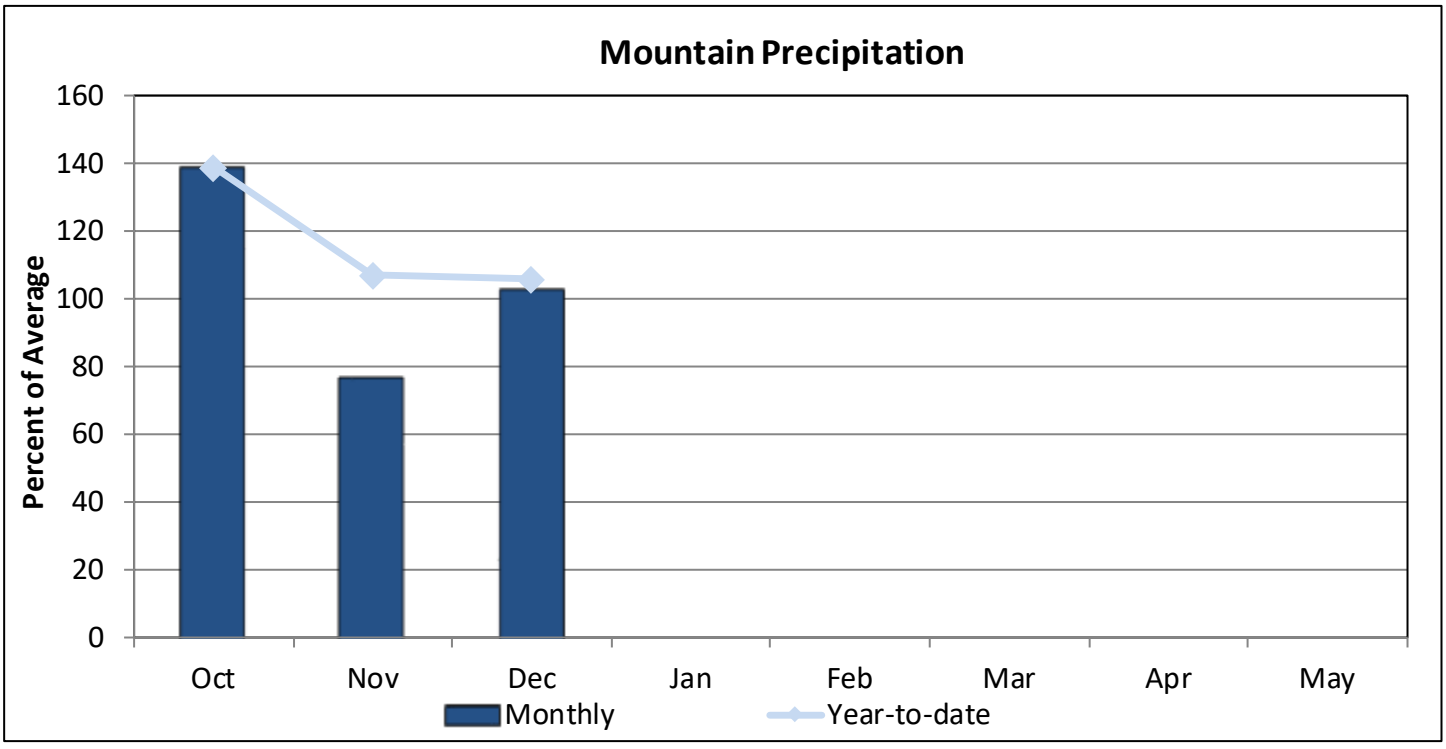
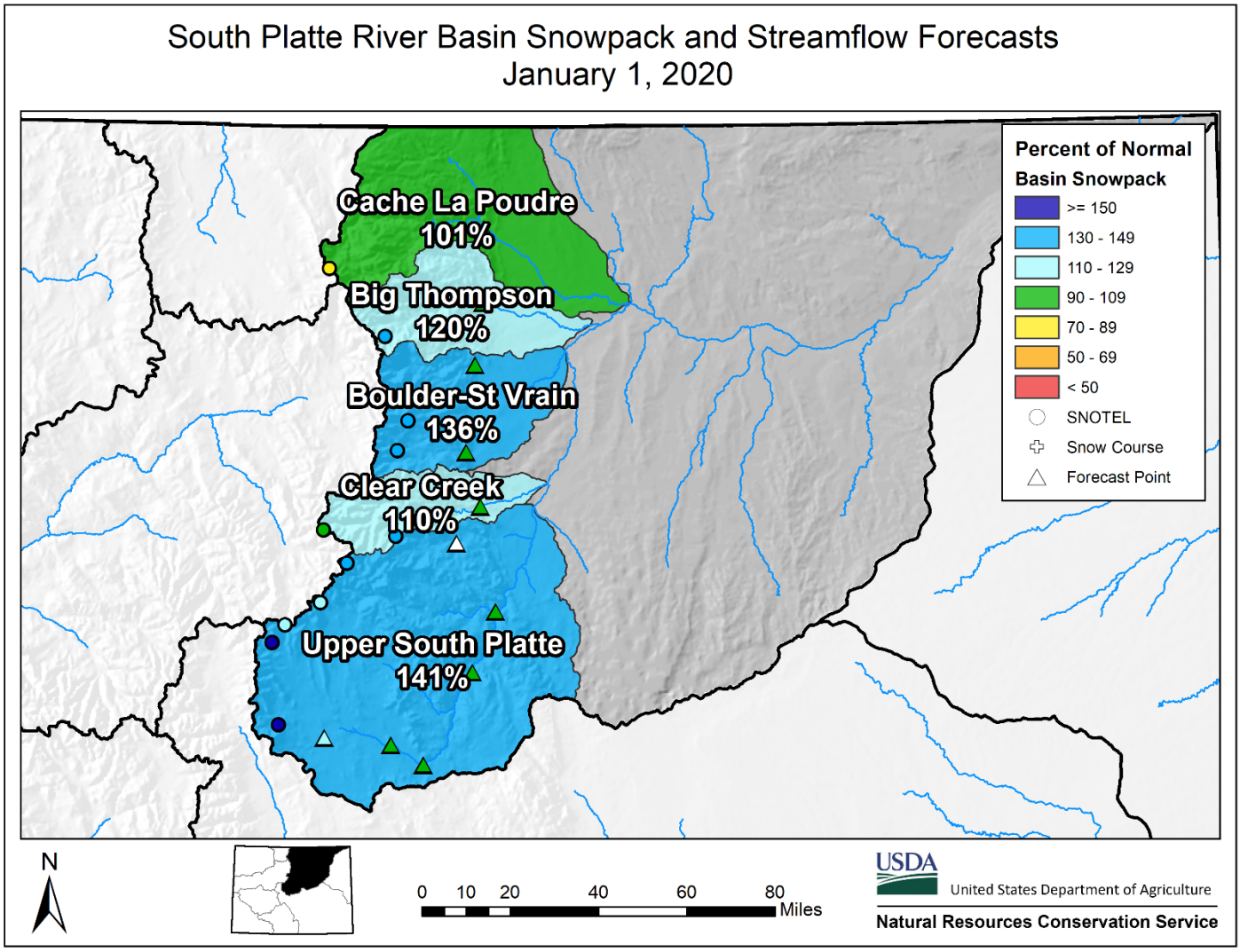
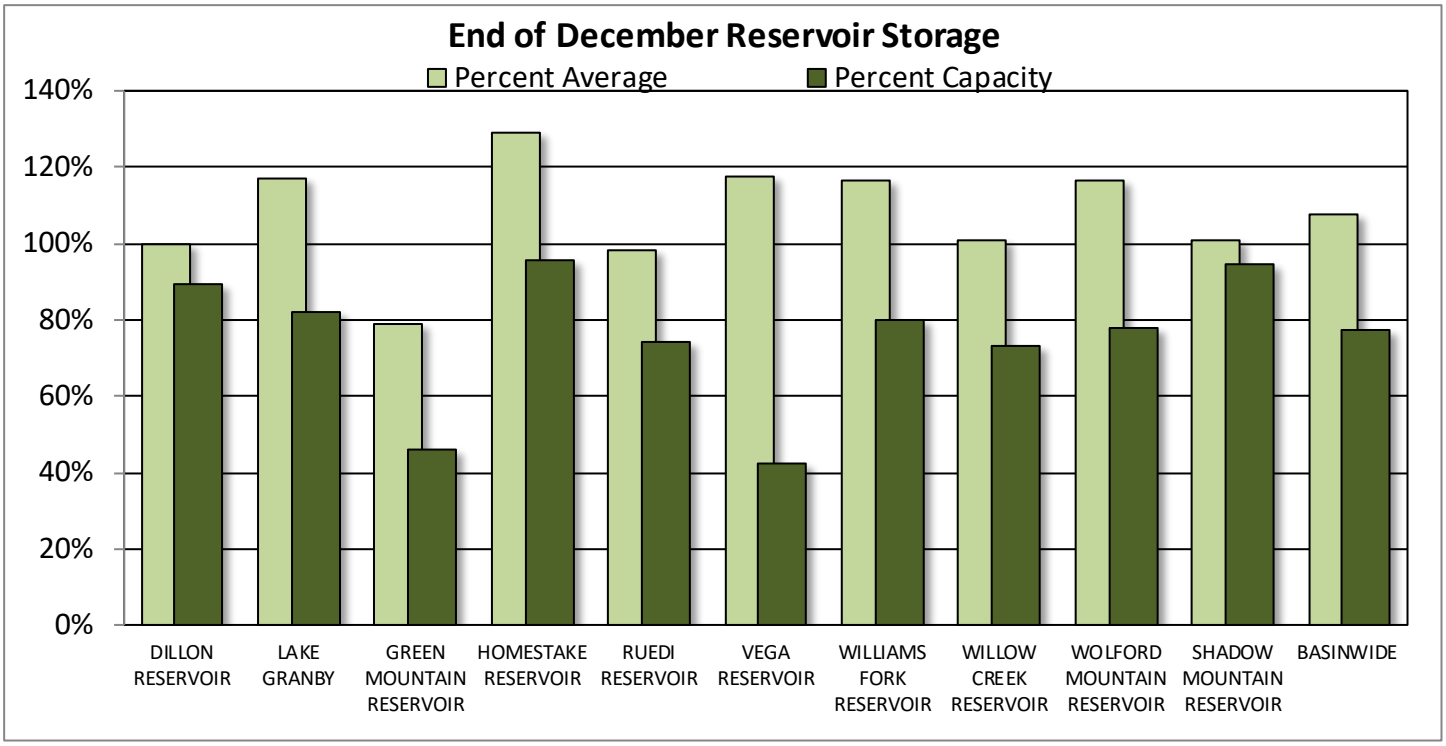




Watershed Snowpack Analysis January 1st, 2020

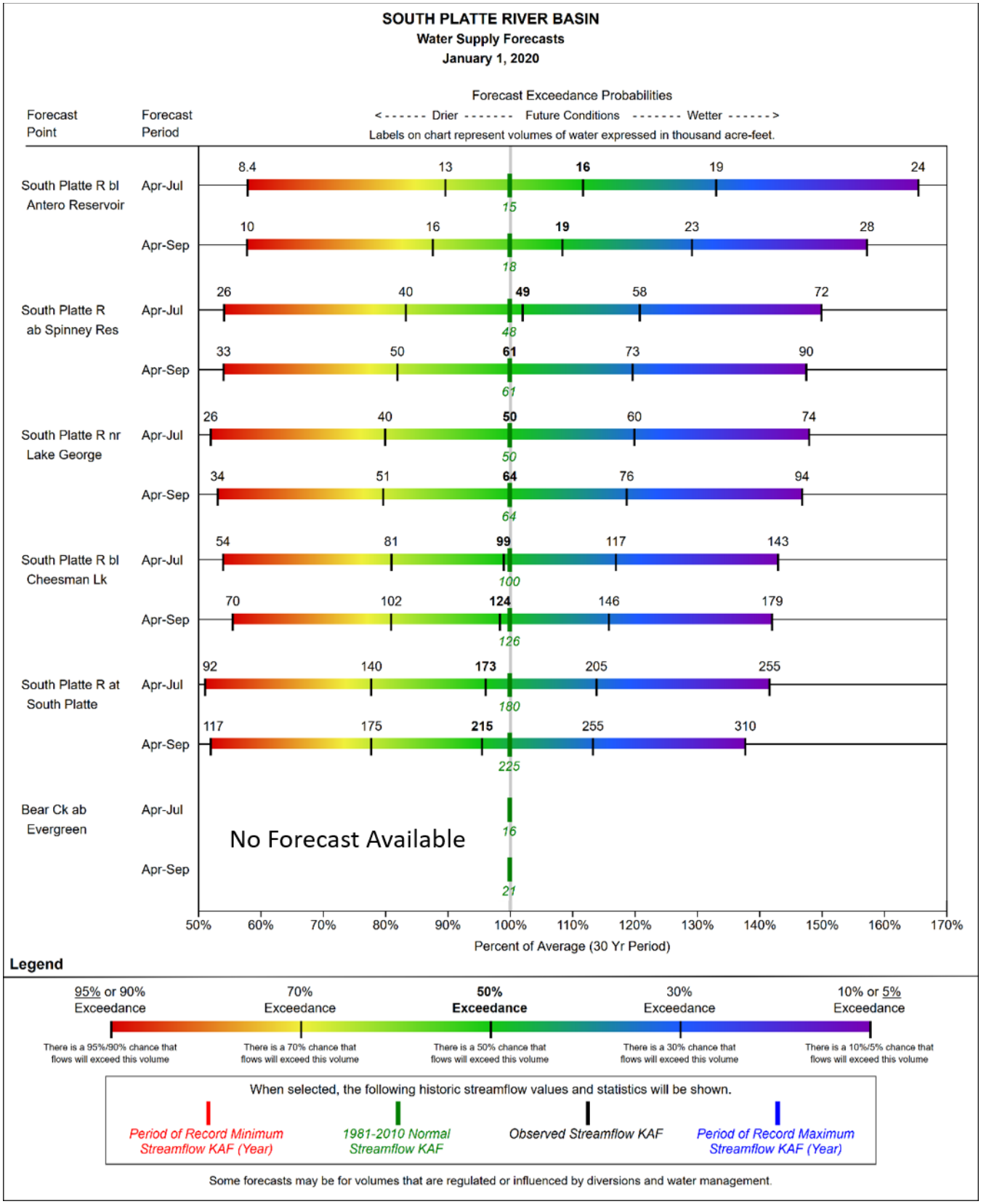
Sub-Basin	# of Sites	% Median	Last Year % Median
Big Thompson	3	120	106
Boulder Creek	3	134	104
Cache La Poudre	2	101	100
Clear Creek	2	110	107
Saint Vrain	1	152	133
Upper South Platte	6	141	132
Basin-Wide Total	17	123	112

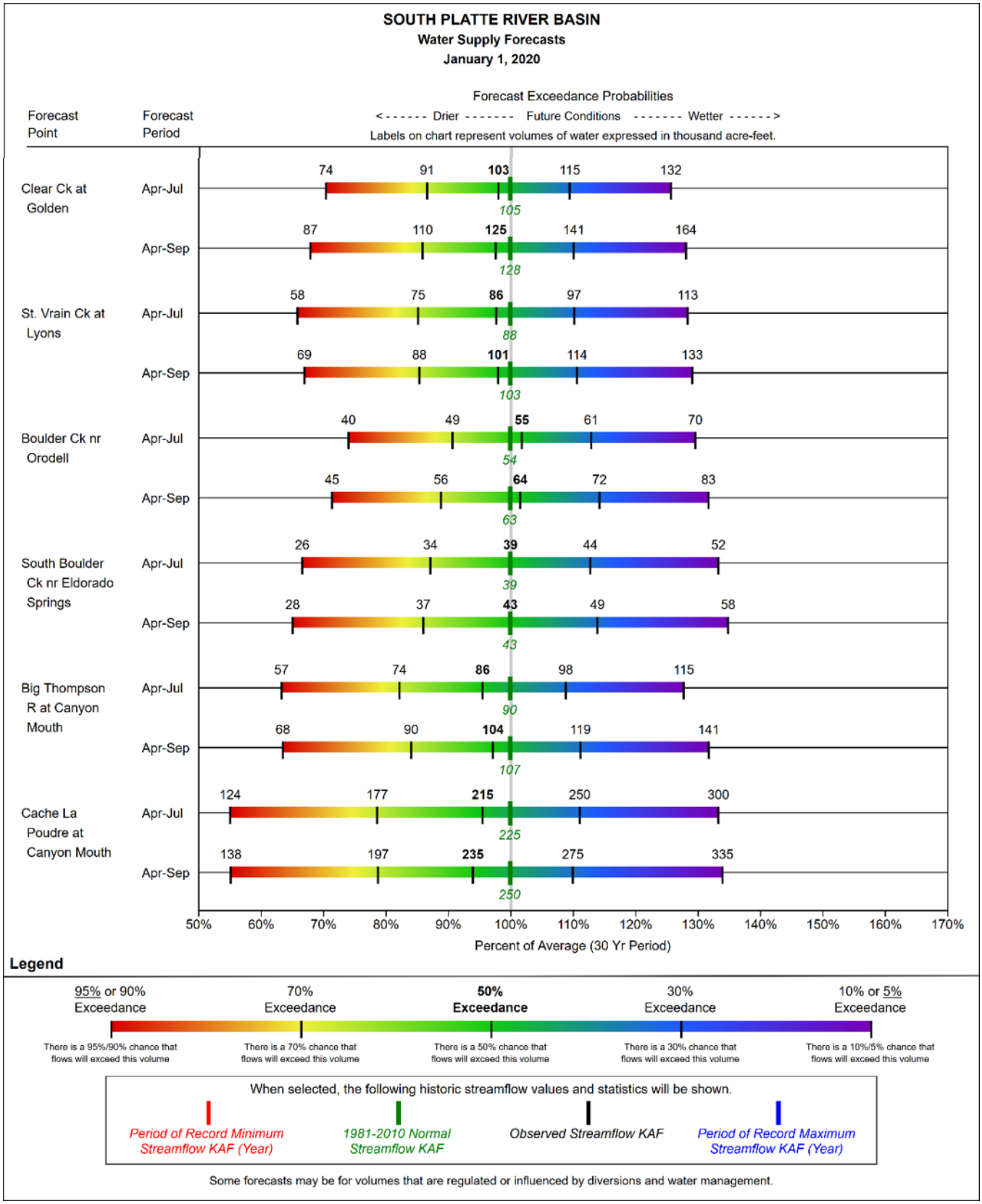
*SWE values calculated using first of month SNOTEL data and snow course measurements



Reservoir Storage End of December 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ANTERO RESERVOIR	20.1	18.9	15.5	19.9
BARR LAKE	21.2	16.8	22.3	30.1
BLACK HOLLOW RESERVOIR	3.8	4.1	2.8	6.5
BOYD LAKE	34.3	31.5	27.4	48.4
CACHE LA POUDRE	6.3	6.1	5.4	10.1
CARTER LAKE	68.5	58.1	67.5	108.9
CHAMBERS LAKE	4.7	3.3	3.1	8.8
CHEESMAN LAKE	60.7	60.1	64.3	79.0
COBB LAKE	18.2	15.2	11.7	22.3
ELEVENMILE CANYON RESERVOIR	99.5	99.2	95.9	98.0
EMPIRE RESERVOIR	18.2	24.0	20.6	36.5
FOSSIL CREEK RESERVOIR	9.3	9.2	6.3	11.1
GROSS RESERVOIR	2.4	14.8	15.4	29.8
HALLIGAN RESERVOIR	4.4	4.1	3.9	6.4
HORSECREEK RESERVOIR	0.0	0.0	8.5	14.7
HORSETOOTH RESERVOIR	133.1	73.8	83.5	149.7
JACKSON LAKE RESERVOIR	23.1	24.3	20.9	26.1
JULESBURG RESERVOIR	17.1	16.5	17.0	20.5
LAKE LOVELAND RESERVOIR	2.8	0.0	6.8	10.3
LONE TREE RESERVOIR	5.5	6.5	5.7	8.7
MARIANO RESERVOIR	0.2	0.7	2.9	5.4
MARSHALL RESERVOIR	5.4	5.2	5.4	10.0
MARSTON RESERVOIR	9.4	10.3	6.0	13.0
MILTON RESERVOIR	18.2	18.7	14.3	23.5
POINT OF ROCKS RESERVOIR	61.9	47.2	43.3	70.6
PREWITT RESERVOIR	20.8	16.3	13.9	28.2
RIVERSIDE RESERVOIR	44.2	41.2	32.1	55.8
SPINNEY MOUNTAIN RESERVOIR	38.6	27.0	30.5	49.0
STANDLEY RESERVOIR	39.2	29.0	35.8	42.0
TERRY RESERVOIR	5.2	4.8	5.1	8.0
UNION RESERVOIR	8.5	8.9	9.8	13.0
WINDSOR RESERVOIR	10.1	7.9	7.7	15.2
BASINWIDE	814.9	703.6	711.3	1079.5
Number of Reservoirs	32	32	32	32

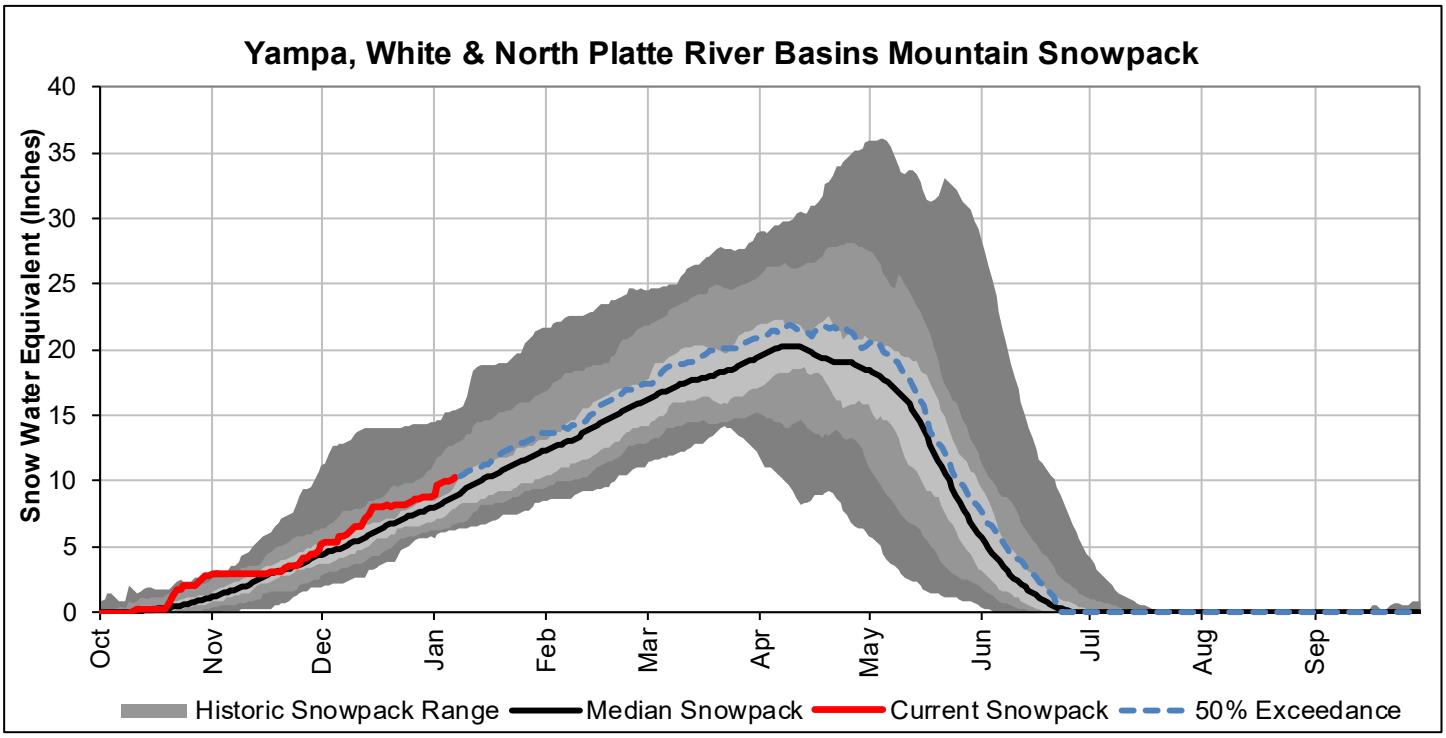

SOUTH PLATTE RIVER BASIN
Water Supply Forecasts
January 1, 2020
Forecast Exceedance Probabilities
< ------- Drier ------- Future Conditions ------- Wetter ------- >
Labels on chart represent volumes of water expressed in thousand acre-feet.
Forecast Point
Forecast Period
South Platte R bl Antero Reservoir
Apr-Jul
8.4 13 16 19 24
15
Apr-Sep
10 16 19 23 28
18
South Platte R ab Spinney Res
Apr-Jul
26 40 49 58 72
48
Apr-Sep
33 50 61 73 90
61
South Platte R nr Lake George
Apr-Jul
26 40 50 60 74
50
Apr-Sep
34 51 64 76 94
64
South Platte R bl Cheesman Lk
Apr-Jul
54 81 99 117 143
100
Apr-Sep
70 102 124 146 179
126
South Platte R at South Platte
Apr-Jul
92 140 173 205 255
180
Apr-Sep
117 175 215 255 310
225
Bear Ck ab Evergreen
Apr-Jul
16
No Forecast Available
Apr-Sep
21
50% 60% 70% 80% 90% 100% 110% 120% 130% 140% 150% 160% 170%
Percent of Average (30 Yr Period)
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.


SOUTH PLATTE RIVER BASIN
Water Supply Forecasts
January 1, 2020
Forecast Exceedance Probabilities
Forecast Point
Forecast Period
<------- Drier ------- Future Conditions ------- Wetter ------>
Labels on chart represent volumes of water expressed in thousand acre-feet.
Clear Ck at Golden
Apr-Jul
74 91 103 115 132
105
Apr-Sep
87 110 125 141 164
128
St. Vrain Ck at Lyons
Apr-Jul
58 75 86 97 113
88
Apr-Sep
69 88 101 114 133
103
Boulder Ck nr Orodell
Apr-Jul
40 49 55 61 70
54
Apr-Sep
45 56 64 72 83
63
South Boulder Ck nr Eldorado Springs
Apr-Jul
26 34 39 44 52
39
Apr-Sep
28 37 43 49 58
43
Big Thompson R at Canyon Mouth
Apr-Jul
57 74 86 98 115
90
Apr-Sep
68 90 104 119 141
107
Cache La Poudre at Canyon Mouth
Apr-Jul
124 177 215 250 300
225
Apr-Sep
138 197 235 275 335
250
50% 60% 70% 80% 90% 100% 110% 120% 130% 140% 150% 160% 170%
Percent of Average (30 Yr Period)
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.

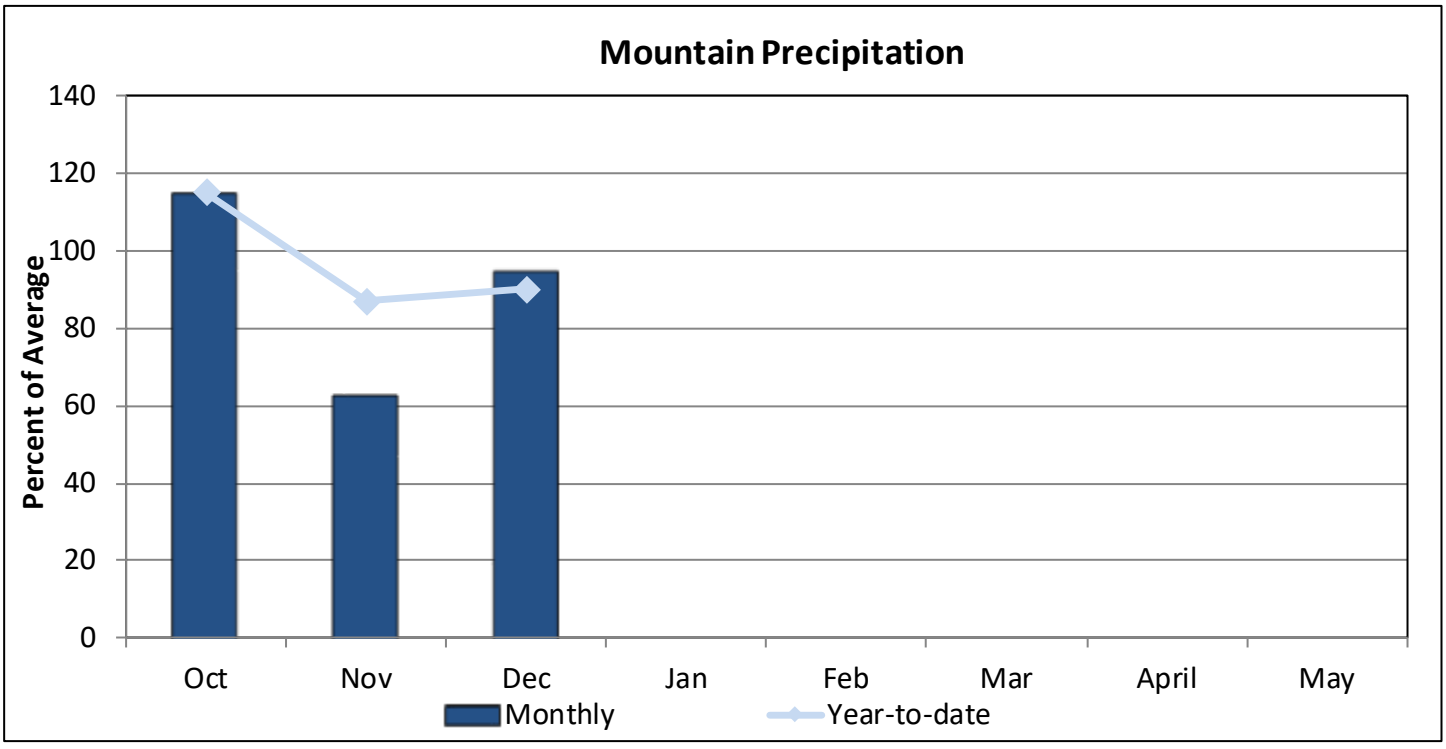
YAMPA, WHITE, NORTH PLATTE, AND LARAMIE RIVER BASINS

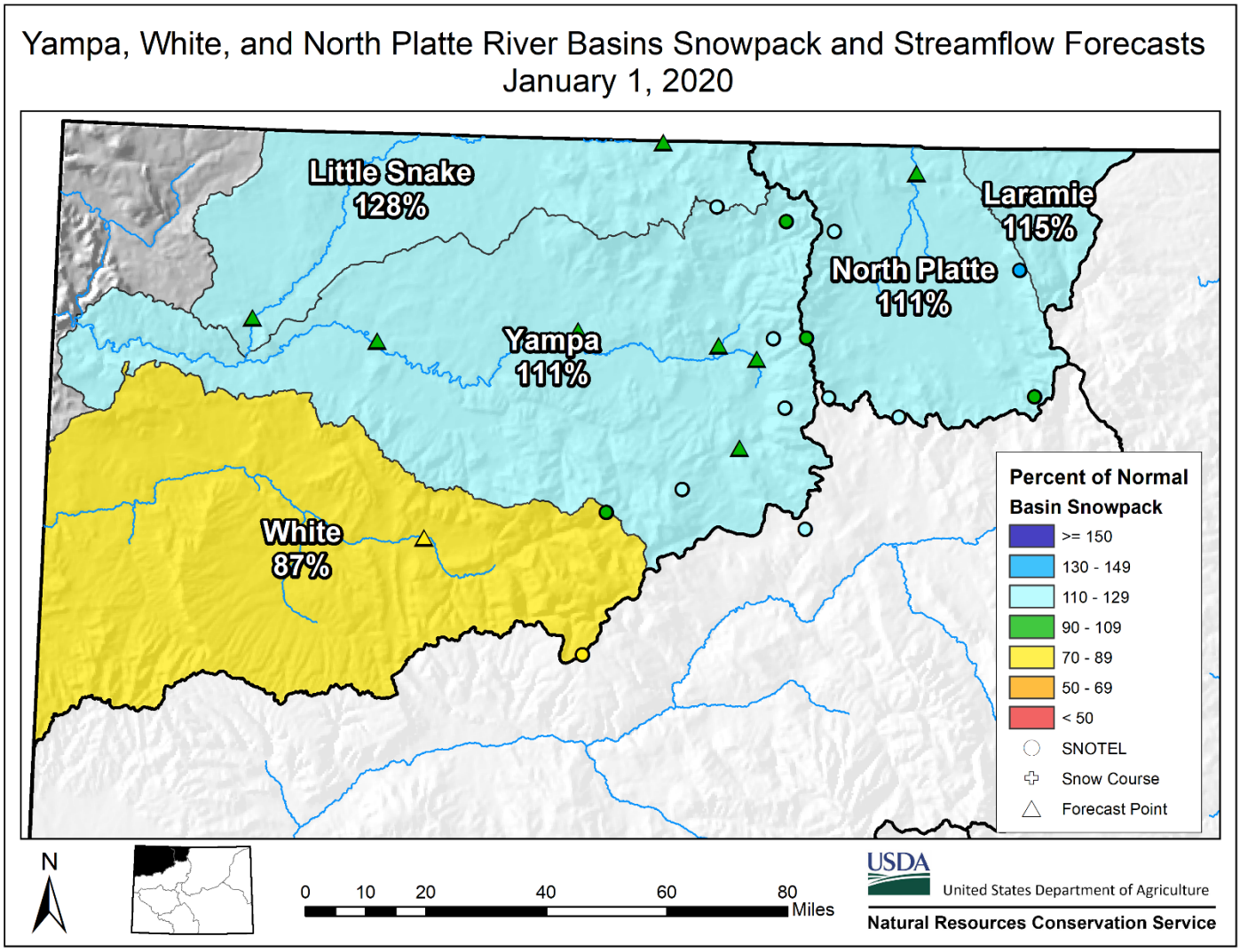
January 1, 2020

Snowpack in the Yampa, White & North Platte basins is above normal at 112% of the median. Precipitation for December was 95% of average and water year-to-date precipitation is 90% of average. Reservoir storage at the end of December was 124% of average compared to 100% last year. Current streamflow forecasts range from 82% of average for White River near Meeker to 109% for the Elk River near Milner.



*SWE values calculated using daily SNOTEL data only

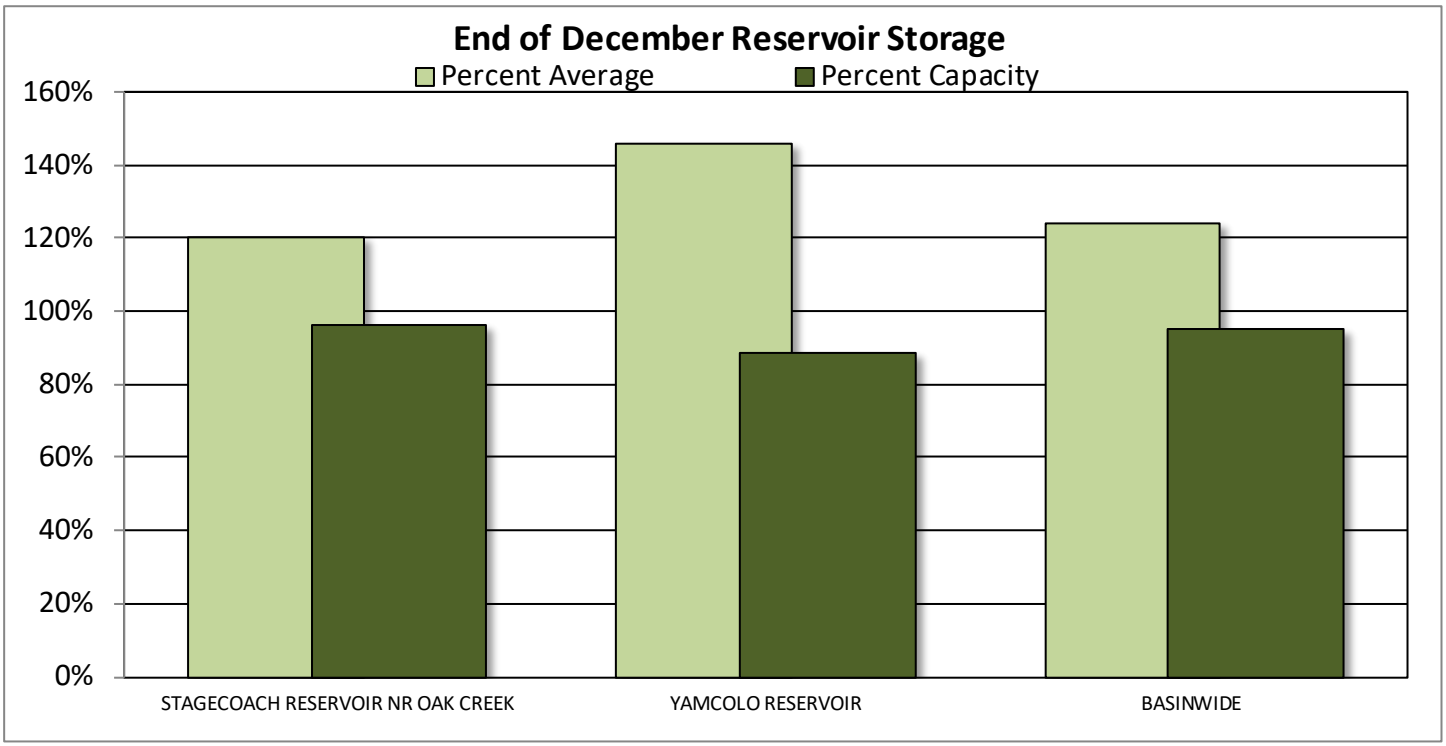




Watershed Snowpack Analysis January 1st, 2020

Sub-Basin	# of Sites	% Median	Last Year % Median
Laramie	2	115	94
North Platte	8	111	106
Total Laramie & North Platte	10	112	104
Elk	2	109	90
Yampa	9	111	107
White	3	87	107
Total Yampa & White	11	104	105
Little Snake	7	128	103
Basin-Wide Total	25	112	104

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



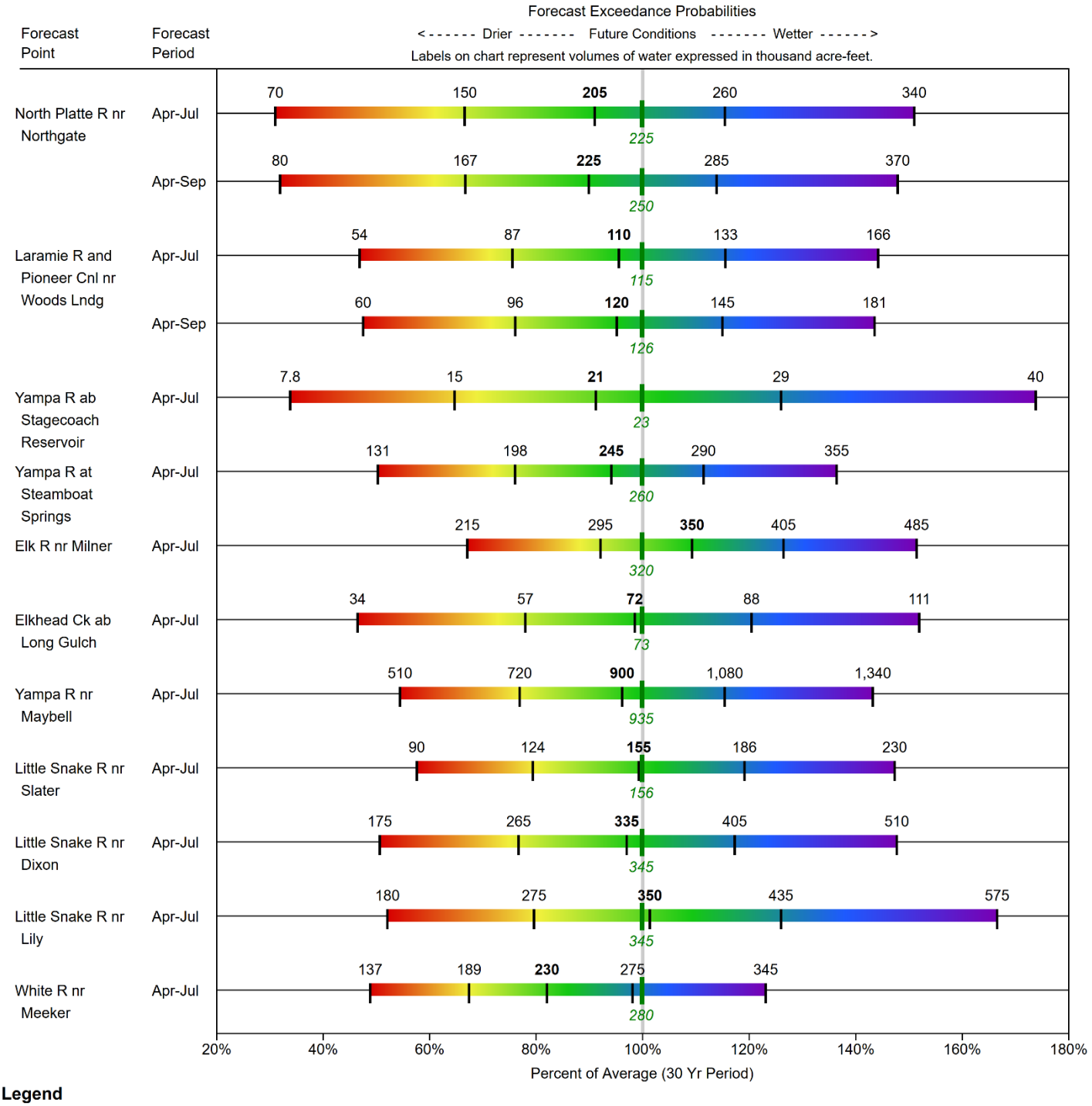
Reservoir Storage End of December 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
STAGECOACH RESERVOIR NR OAK C	35.2	31.2	29.3	36.5
YAMCOLO RESERVOIR	7.7	3.5	5.3	8.7
BASINWIDE	42.9	34.7	34.6	45.2
Number of Reservoirs	2	2	2	2

YAMPA-WHITE-NORTH PLATTE RIVER BASINS

Water Supply Forecasts

January 1, 2020



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

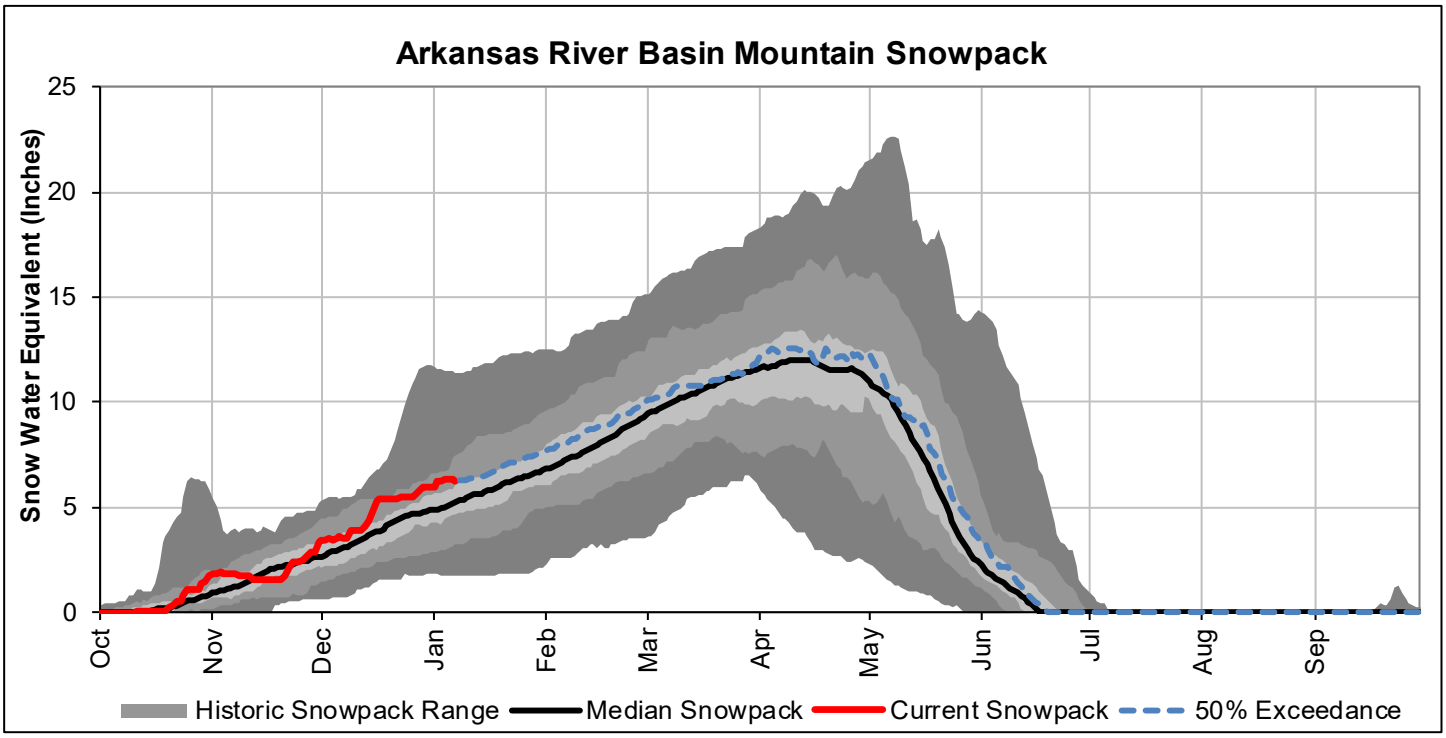
Period of Record Maximum Streamflow KAF (Year)

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

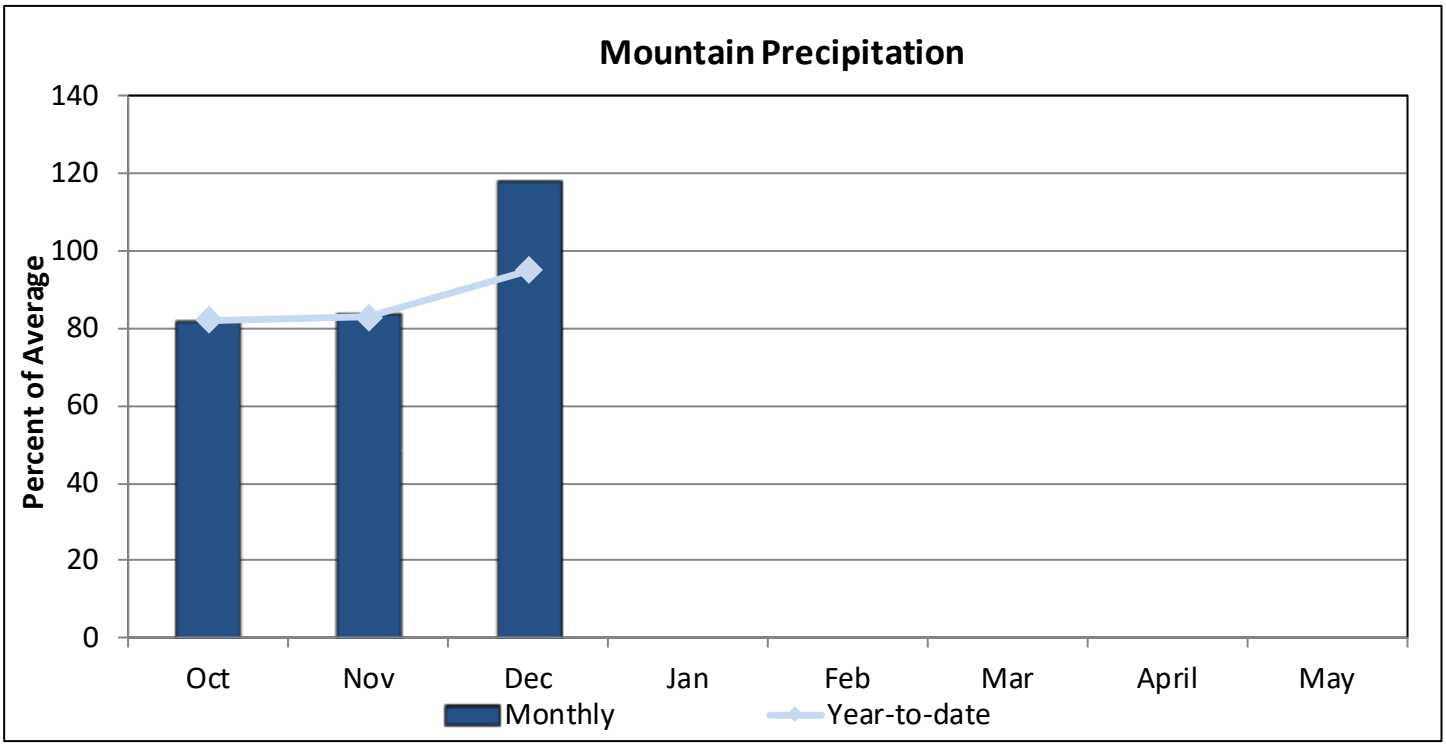
ARKANSAS RIVER BASIN

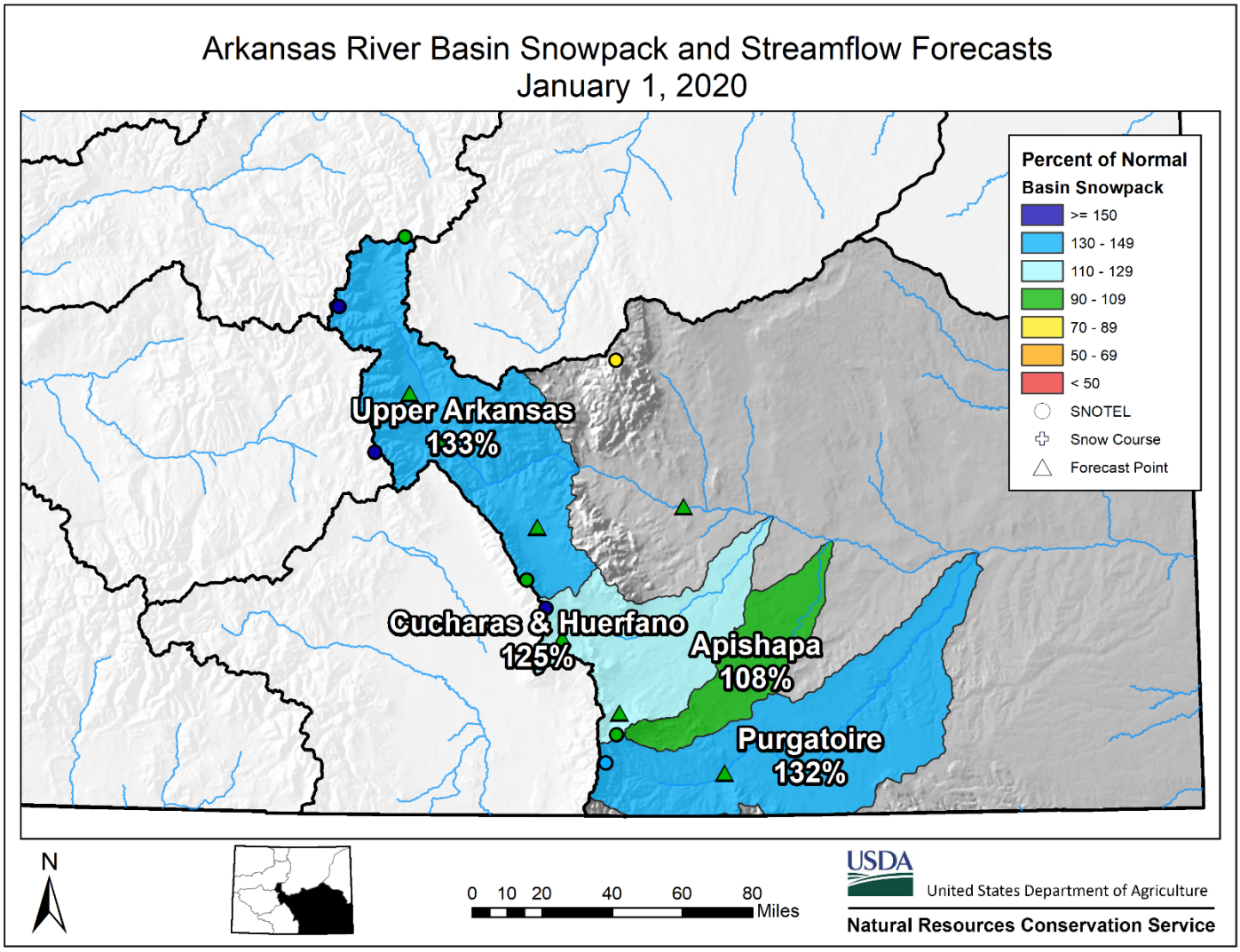
January 1, 2020

Snowpack in the Arkansas River basin is above normal at 130% of the median. Precipitation for December was 118% of average which brings water year-to-date precipitation to 95% of average. Reservoir storage at the end of December was 98% of average compared to 92% last year. Current streamflow forecasts range from 92% of average for Cucharas River near La Veta to 108% for the Arkansas River at Salida.



*SWE values calculated using daily SNOTEL data only

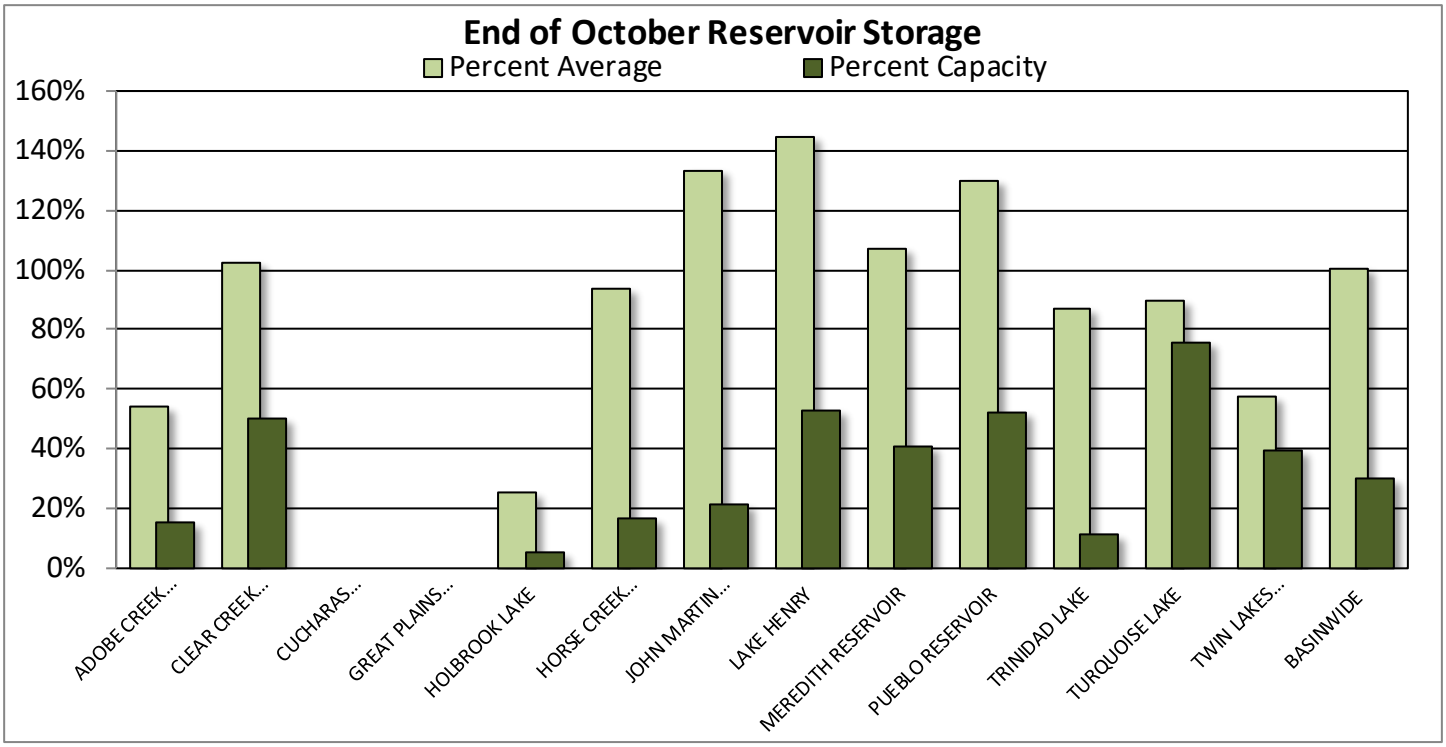




Watershed Snowpack Analysis January 1st, 2020

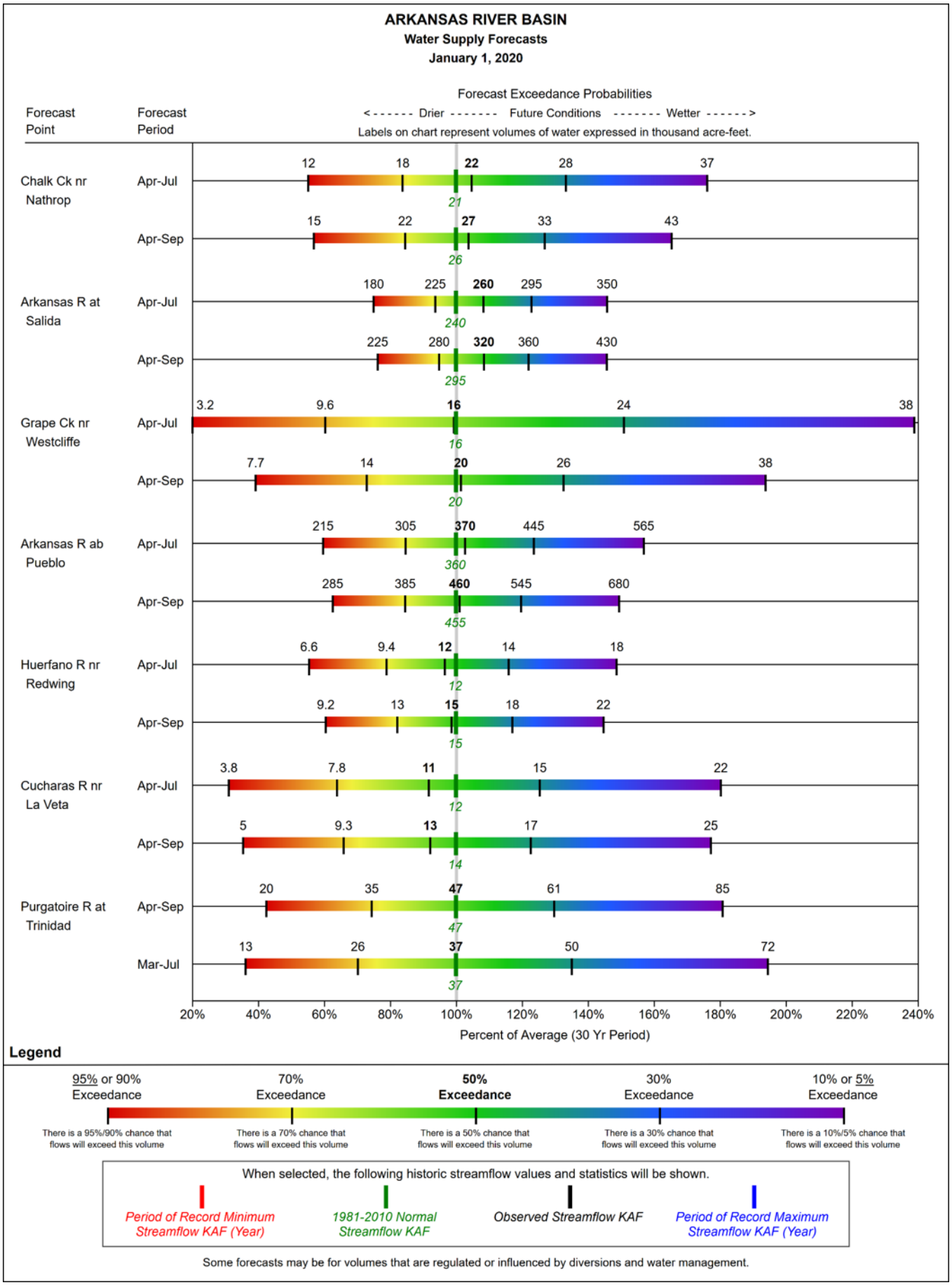
Sub-Basin	# of Sites	% Median	Last Year % Median
Upper Arkansas	3	133	121
Cucharas & Huerfano	3	125	111
Purgatoire	2	132	171
Basin-Wide Total	8	130	116

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



Reservoir Storage End of December 2019

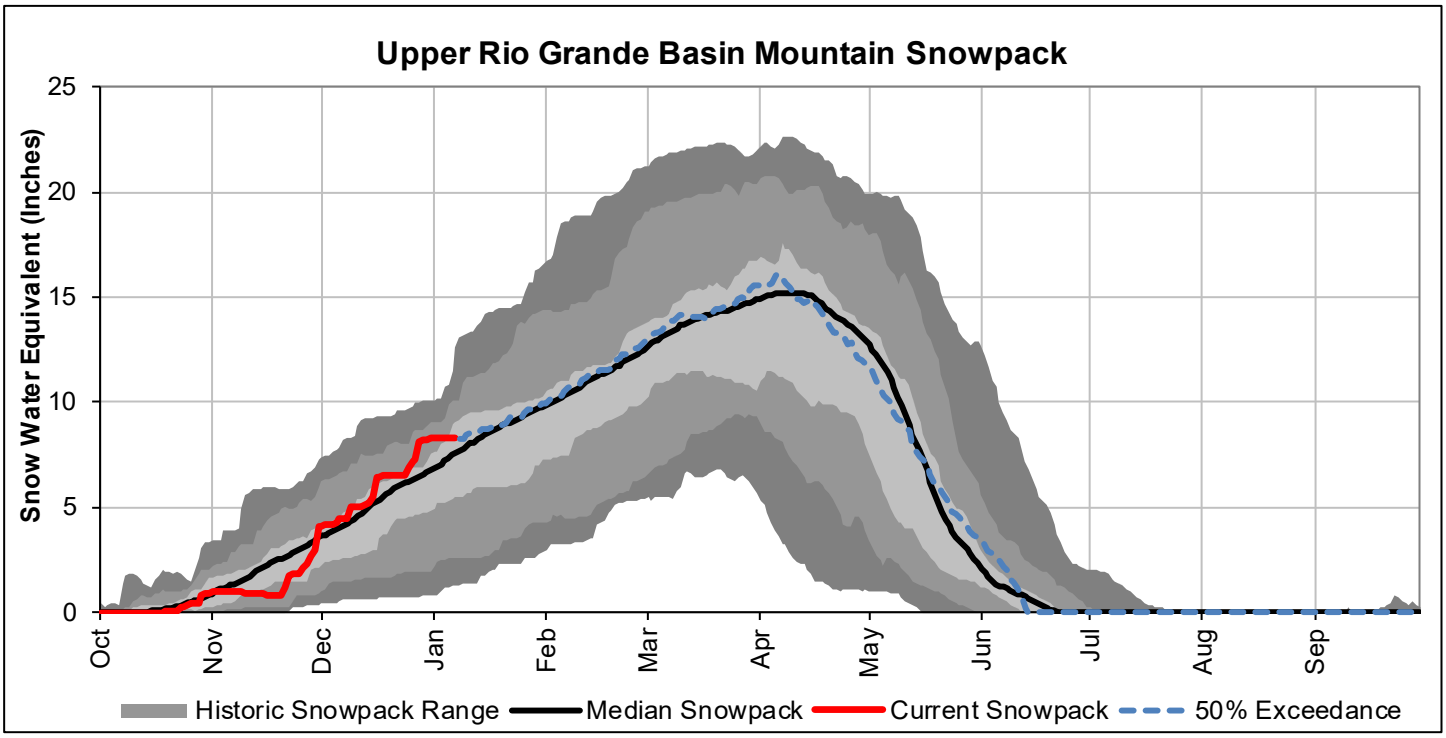
Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ADOBE CREEK RESERVOIR	23.0	9.0	32.7	62.0
CLEAR CREEK RESERVOIR	7.2	6.6	6.7	11.4
CUCHARAS RESERVOIR				40.0
GREAT PLAINS RESERVOIR				150.0
HOLBROOK LAKE	4.1	0.3	2.5	7.0
HORSE CREEK RESERVOIR	3.5	13.6	9.4	27.0
JOHN MARTIN RESERVOIR	90.1	146.1	122.8	616.0
LAKE HENRY	4.1	4.8	3.7	9.4
MEREDITH RESERVOIR	42.1	21.6	19.7	42.0
PUEBLO RESERVOIR	223.0	196.8	170.8	354.0
TRINIDAD LAKE	21.9	20.5	24.4	167.0
TURQUOISE LAKE	97.2	73.2	94.1	127.0
TWIN LAKES RESERVOIR	45.8	36.3	57.0	86.0
BASINWIDE	562.1	528.8	543.8	1698.8
Number of Reservoirs	11	11	11	13


ARKANSAS RIVER BASIN
Water Supply Forecasts
January 1, 2020
Forecast Exceedance Probabilities
Forecast Point
Forecast Period
<------- Drier ------- Future Conditions ------- Wetter ------->
Labels on chart represent volumes of water expressed in thousand acre-feet.
Chalk Ck nr Nathrop
Apr-Jul 12 18 22 28 37 21
Apr-Sep 15 22 27 33 43 26
Arkansas R at Salida
Apr-Jul 180 225 260 295 350 240
Apr-Sep 225 280 320 360 430 295
Grape Ck nr Westcliffe
Apr-Jul 3.2 9.6 16 24 38 16
Apr-Sep 7.7 14 20 26 38 20
Arkansas R ab Pueblo
Apr-Jul 215 305 370 445 565 360
Apr-Sep 285 385 460 545 680 455
Huerfano R nr Redwing
Apr-Jul 6.6 9.4 12 14 18 12
Apr-Sep 9.2 13 15 18 22 15
Cucharas R nr La Veta
Apr-Jul 3.8 7.8 11 15 22 12
Apr-Sep 5 9.3 13 17 25 14
Purgatoire R at Trinidad
Apr-Sep 20 35 47 61 85 47
Mar-Jul 13 26 37 50 72 37
20% 40% 60% 80% 100% 120% 140% 160% 180% 200% 220% 240%
Percent of Average (30 Yr Period)
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.

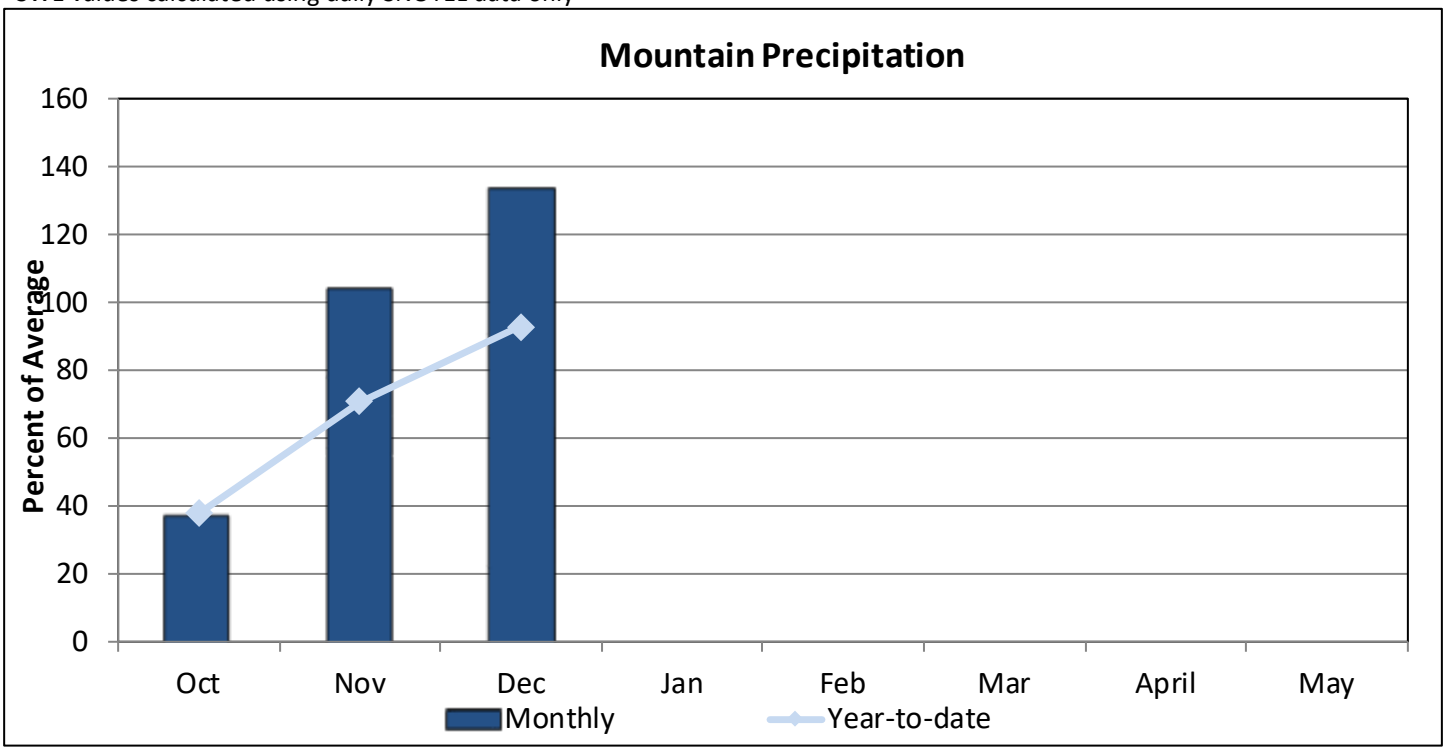
UPPER RIO GRANDE RIVER BASIN

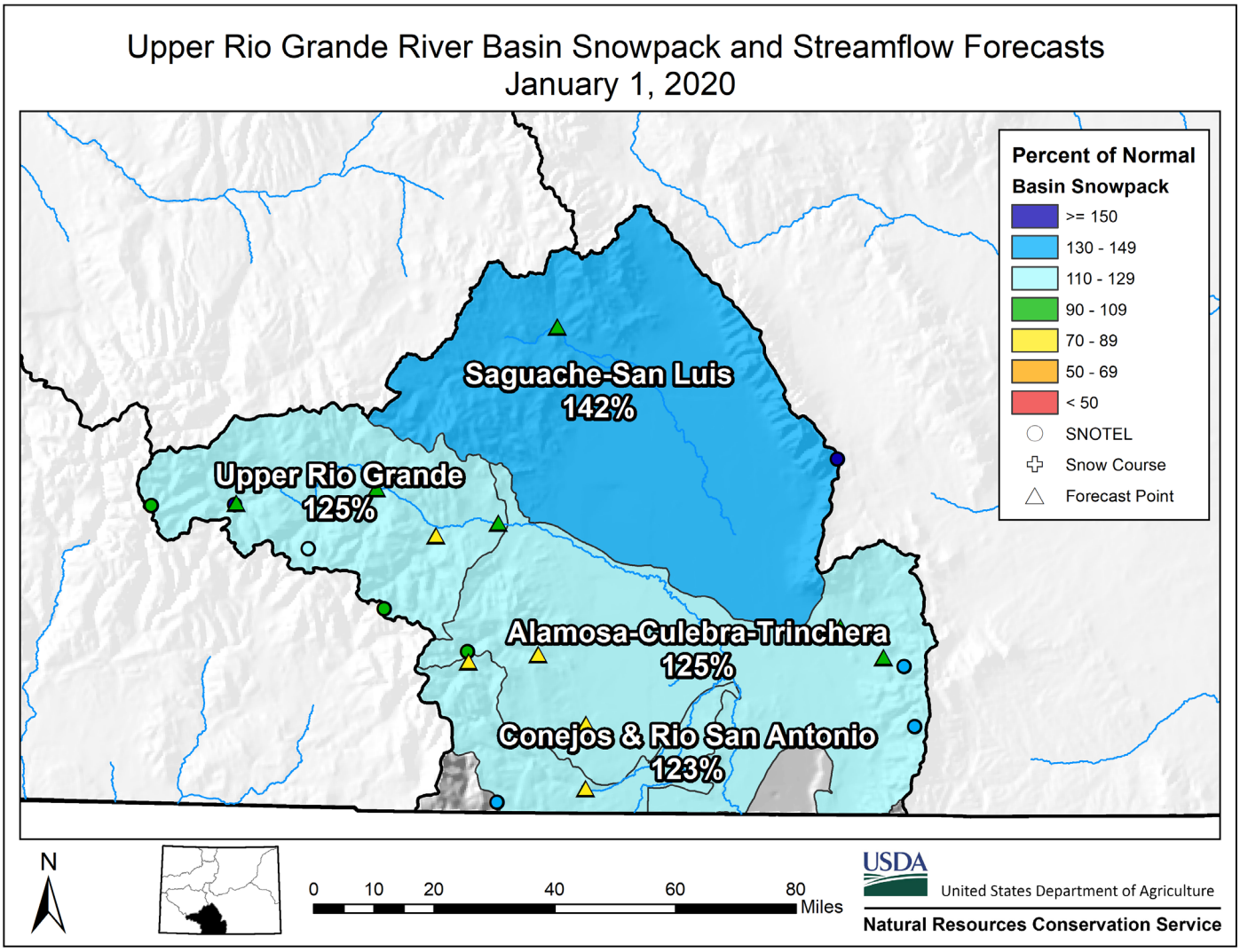
January 1, 2020

Snowpack in the Upper Rio Grande River basin is above normal at 129% of median. Precipitation for December was 134% of average which brings water year-to-date precipitation to 93% of average. Reservoir storage at the end of December was 86% of average compared to 80% last year. Current streamflow forecasts range from 71% of average for San Antonio River at Ortiz to 112% for Costilla Creek near Costilla.



*SWE values calculated using daily SNOTEL data only

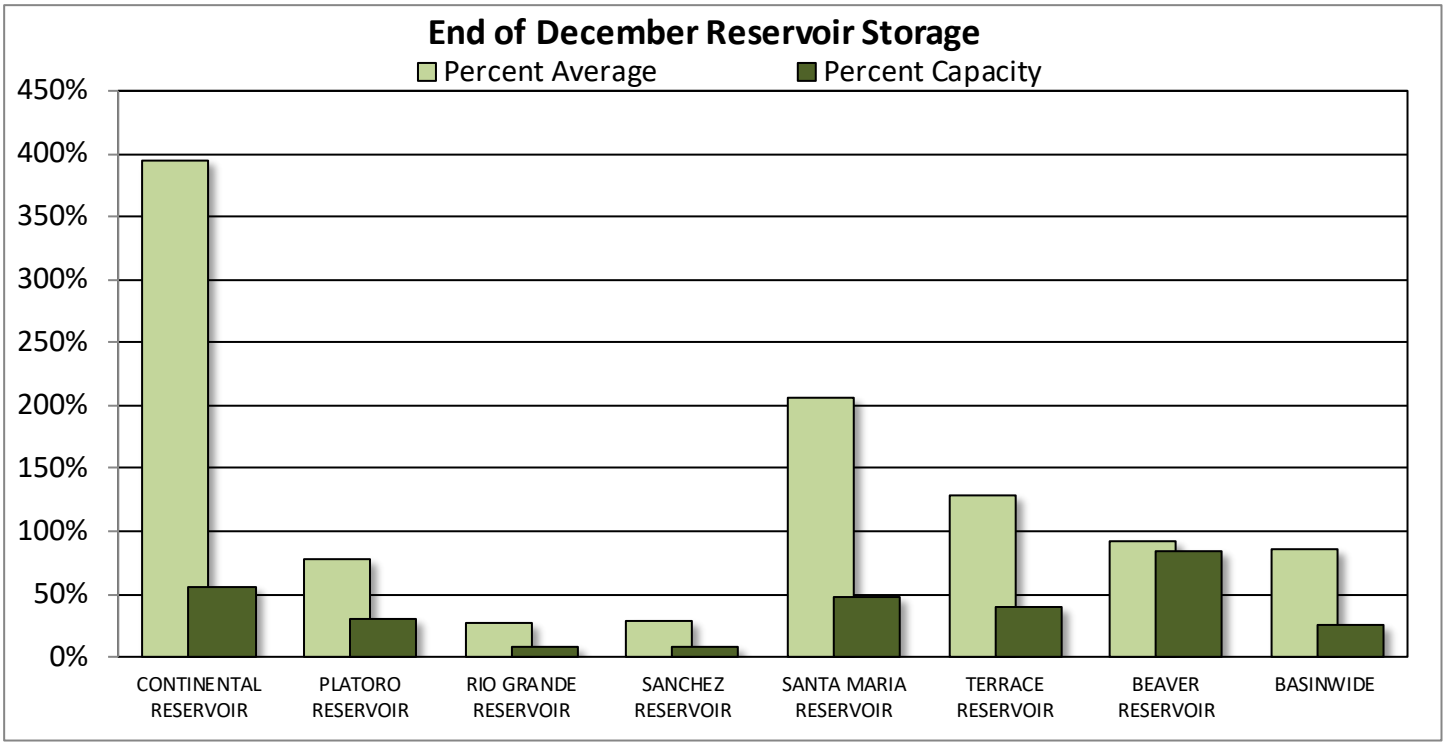




Watershed Snowpack Analysis January 1st, 2020

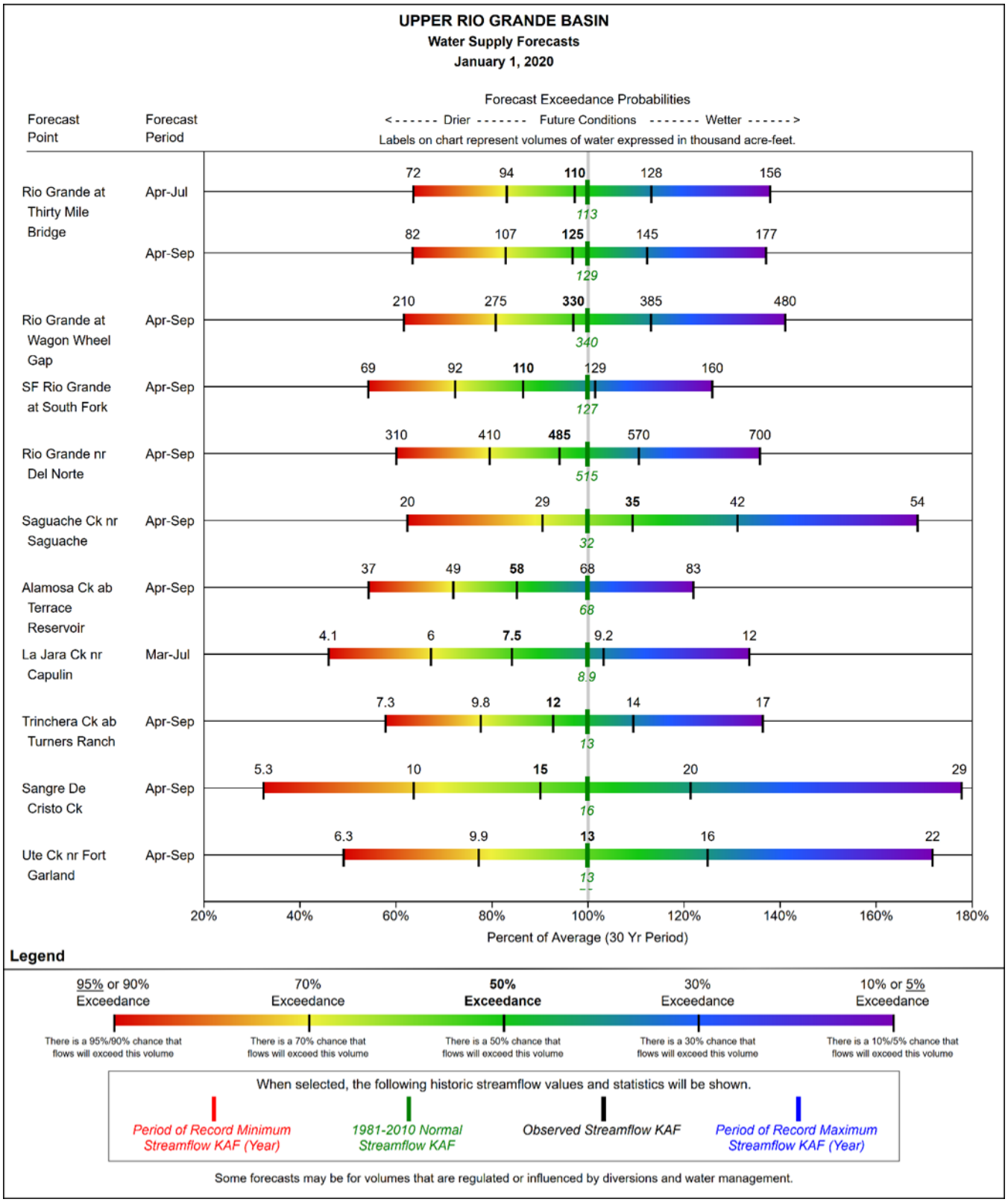
Sub-Basin	# of Sites	% Median	Last Year % Median
Alamosa Creek	1	103	44
Conejos & Rio San Antonio	2	123	53
Culebra & Trinchera Creek	3	134	95
Upper Rio Grande	5	125	73
Basin-Wide Total	11	129	76

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



Reservoir Storage End of December 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
CONTINENTAL RESERVOIR	15.0	14.6	3.8	27.0
PLATORO RESERVOIR	18.6	19.1	24.0	60.0
RIO GRANDE RESERVOIR	4.0	0.0	14.8	51.0
SANCHEZ RESERVOIR	8.0	7.0	27.5	103.0
SANTA MARIA RESERVOIR	21.5	24.1	10.4	45.0
TERRACE RESERVOIR	7.1	3.4	5.5	18.0
BEAVER RESERVOIR	3.8	3.7	4.1	4.5
BASINWIDE	77.9	71.9	90.1	308.5
Number of Reservoirs	7	7	7	7


UPPER RIO GRANDE BASIN
Water Supply Forecasts
January 1, 2020
Forecast Exceedance Probabilities
Forecast Point
Forecast Period
<------- Drier ------- Future Conditions ------- Wetter ------->
Labels on chart represent volumes of water expressed in thousand acre-feet.
Rio Grande at Thirty Mile Bridge
Apr-Jul
72 94 110 128 156
113
Apr-Sep
82 107 125 145 177
129
Rio Grande at Wagon Wheel Gap
Apr-Sep
210 275 330 385 480
340
SF Rio Grande at South Fork
Apr-Sep
69 92 110 129 160
127
Rio Grande nr Del Norte
Apr-Sep
310 410 485 570 700
515
Saguache Ck nr Saguache
Apr-Sep
20 29 35 42 54
32
Alamosa Ck ab Terrace Reservoir
Apr-Sep
37 49 58 68 83
68
La Jara Ck nr Capulin
Mar-Jul
4.1 6 7.5 9.2 12
8.9
Trinchera Ck ab Turners Ranch
Apr-Sep
7.3 9.8 12 14 17
13
Sangre De Cristo Ck
Apr-Sep
5.3 10 15 20 29
16
Ute Ck nr Fort Garland
Apr-Sep
6.3 9.9 13 16 22
13
20% 40% 60% 80% 100% 120% 140% 160% 180%
Percent of Average (30 Yr Period)
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
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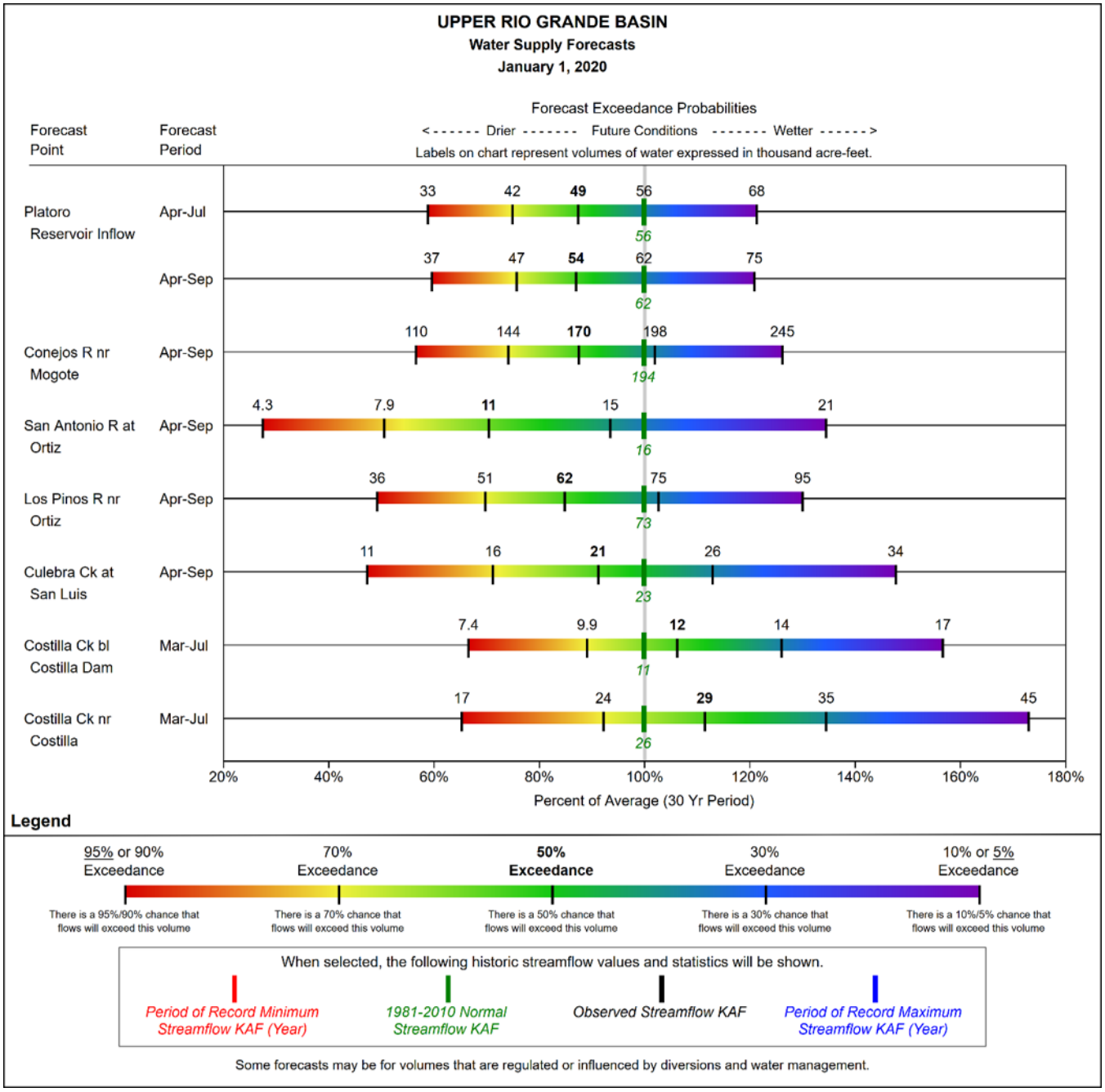
1981-2010 Normal Streamflow KAF
Observed Streamflow KAF
Period of Record Maximum Streamflow KAF (Year)
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.


UPPER RIO GRANDE BASIN
Water Supply Forecasts
January 1, 2020
Forecast Exceedance Probabilities
Forecast Point
Forecast Period
<------- Drier ------- Future Conditions ------- Wetter ------>
Labels on chart represent volumes of water expressed in thousand acre-feet.
Platoro Reservoir Inflow
Apr-Jul
33 42 49 56 68
56
Apr-Sep
37 47 54 62 75
62
Conejos R nr Mogote
Apr-Sep
110 144 170 198 245
194
San Antonio R at Ortiz
Apr-Sep
4.3 7.9 11 15 21
16
Los Pinos R nr Ortiz
Apr-Sep
36 51 62 75 95
73
Culebra Ck at San Luis
Apr-Sep
11 16 21 26 34
23
Costilla Ck bl Costilla Dam
Mar-Jul
7.4 9.9 12 14 17
11
Costilla Ck nr Costilla
Mar-Jul
17 24 29 35 45
26
20% 40% 60% 80% 100% 120% 140% 160% 180%
Percent of Average (30 Yr Period)
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
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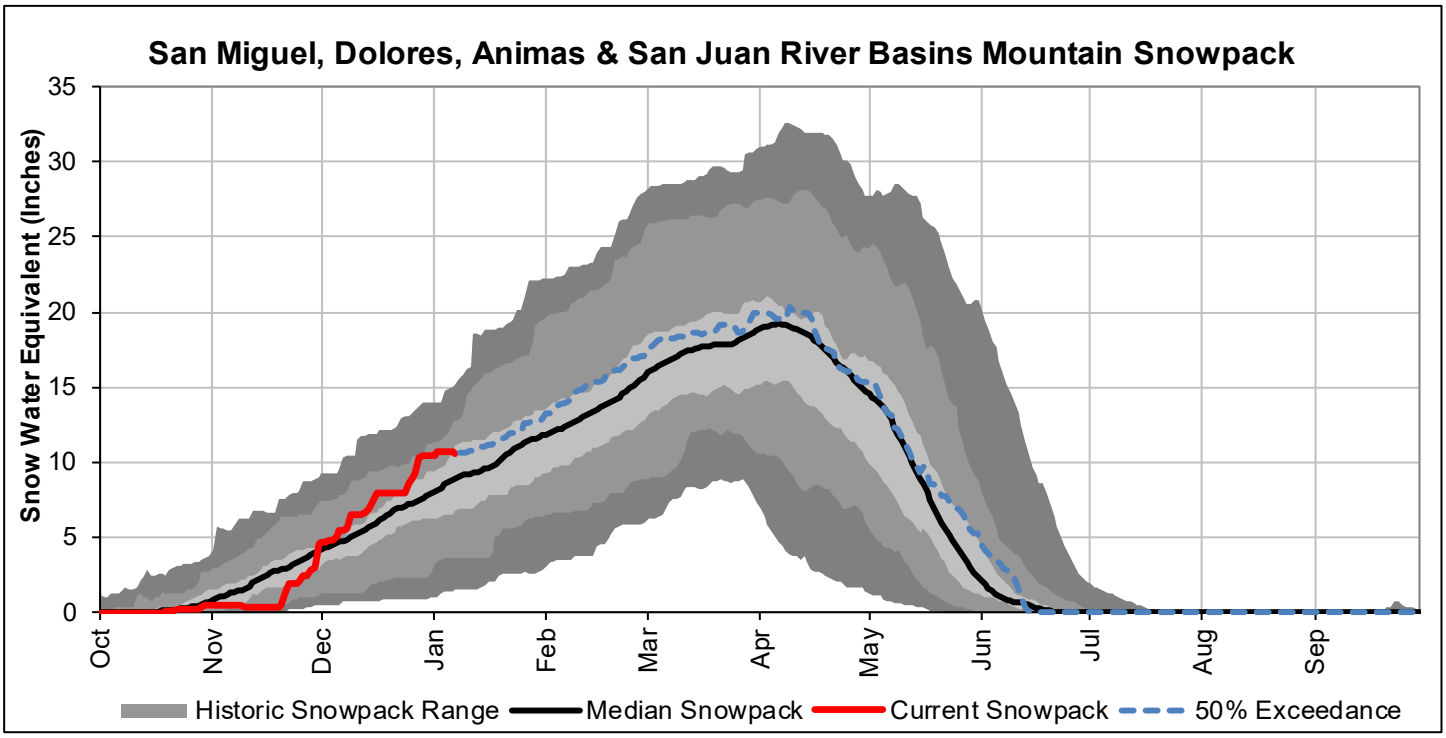
Period of Record Minimum Streamflow KAF (Year)
1981-2010 Normal Streamflow KAF
Observed Streamflow KAF
Period of Record Maximum Streamflow KAF (Year)
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

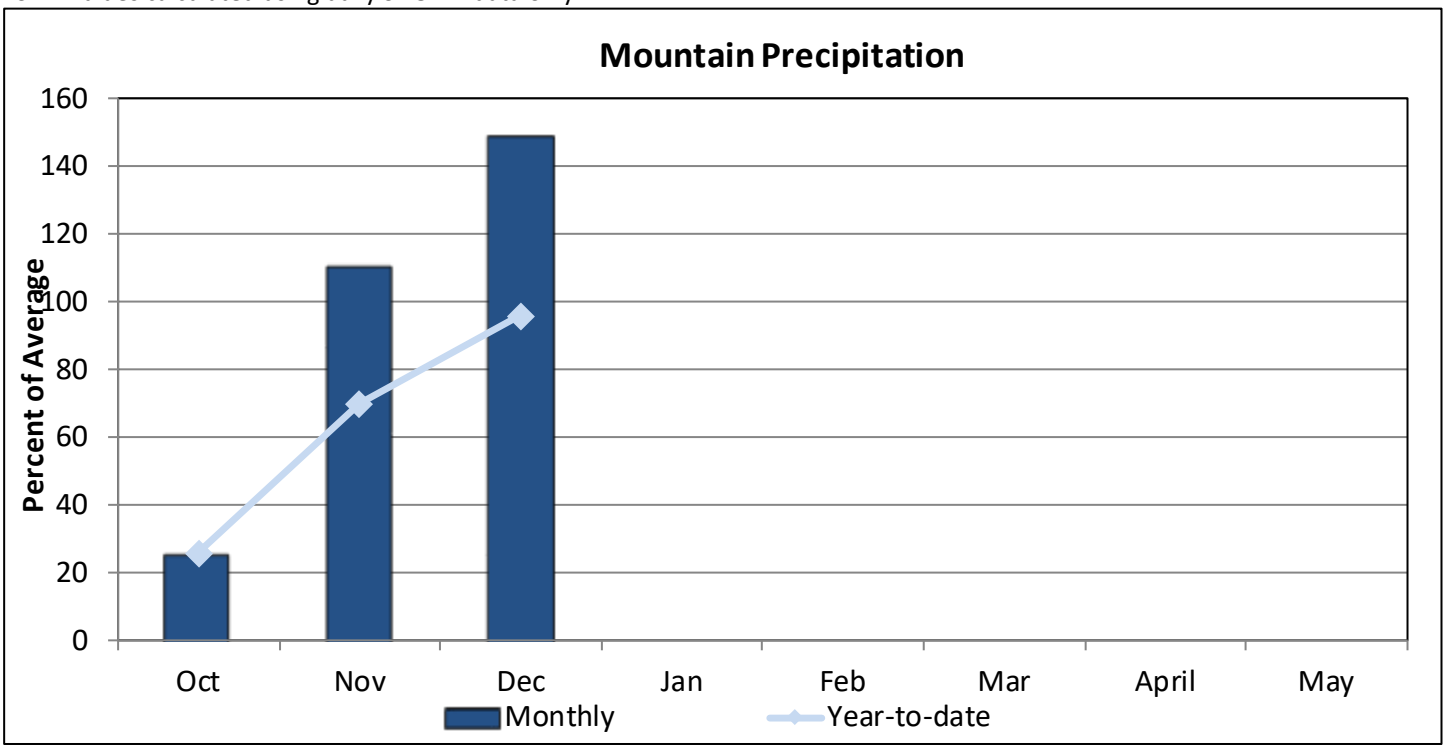
SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS

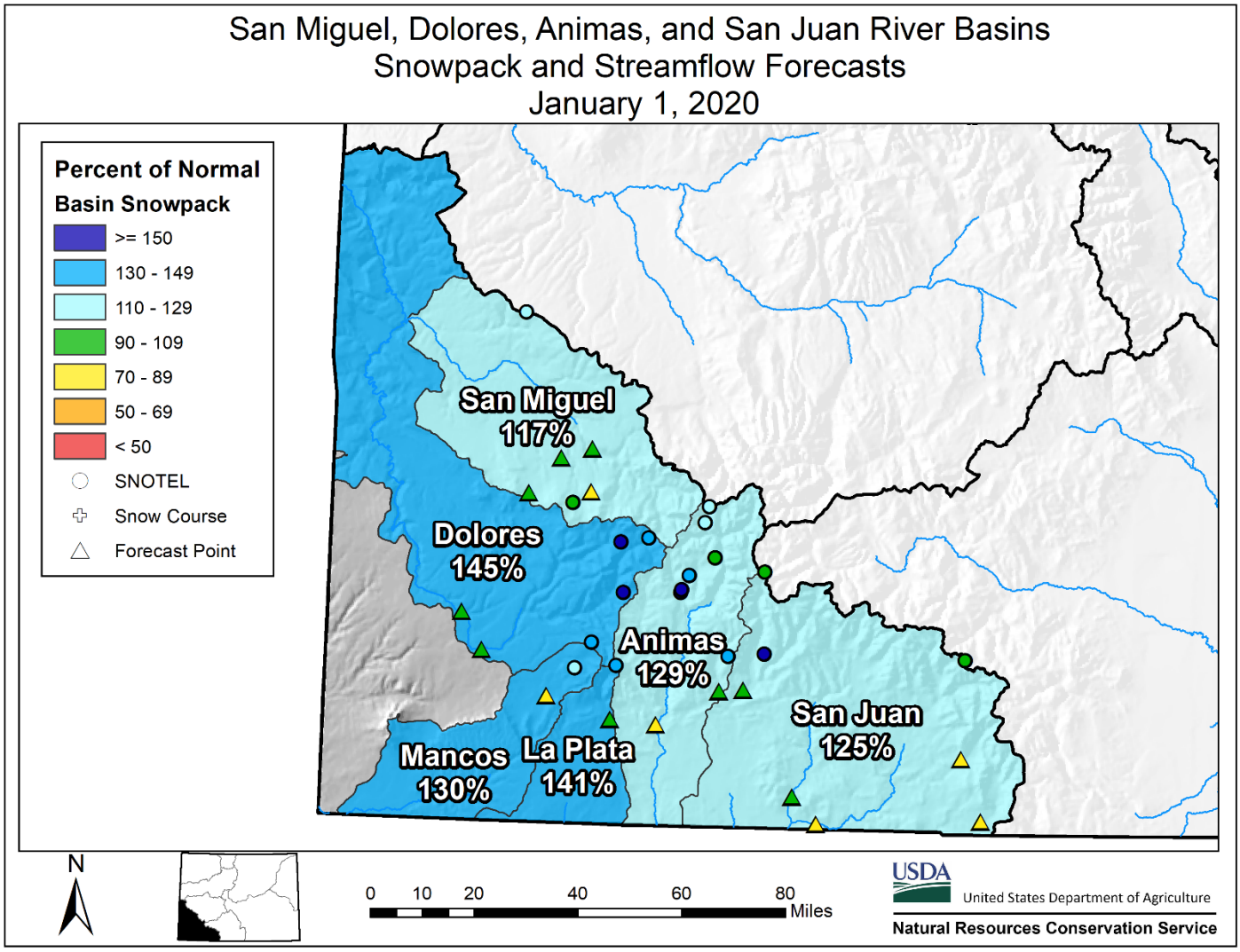
January 1, 2020

Snowpack in the combined southwest river basins is above normal at 129% of median. Precipitation for December was 149% of average which brings water year-to-date precipitation to 96% of average. Reservoir storage at the end of December was 107% of average compared to 56% last year. Current streamflow forecasts range from 82% of average for the Navajo Reservoir inflow to 96% for the La Plata River at Hesperus.



*SWE values calculated using daily SNOTEL data only

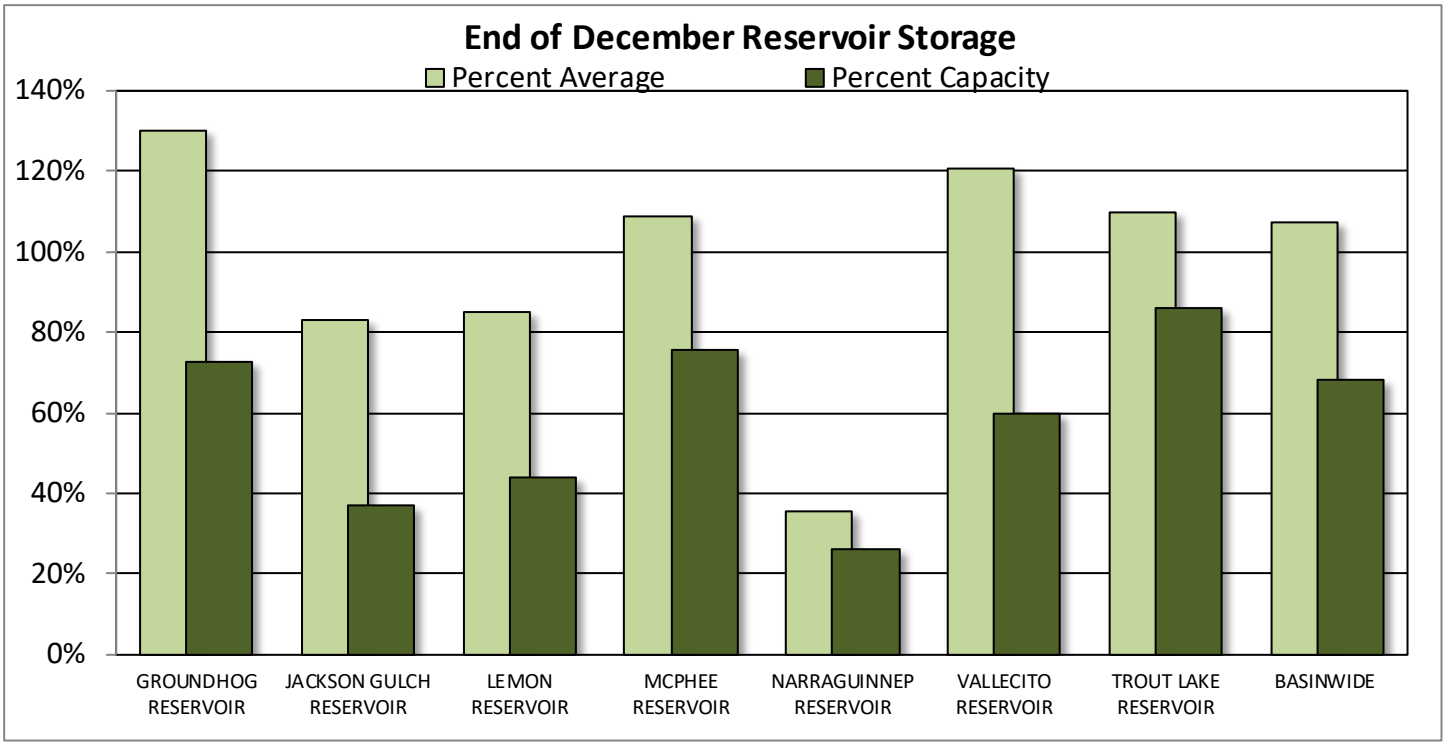




Watershed Snowpack Analysis January 1st, 2020

Sub-Basin	# of Sites	% Median	Last Year % Median
Animas	9	129	74
Dolores	5	145	59
San Miguel	3	117	66
San Juan	3	125	55
Basin-Wide Total	19	129	66

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



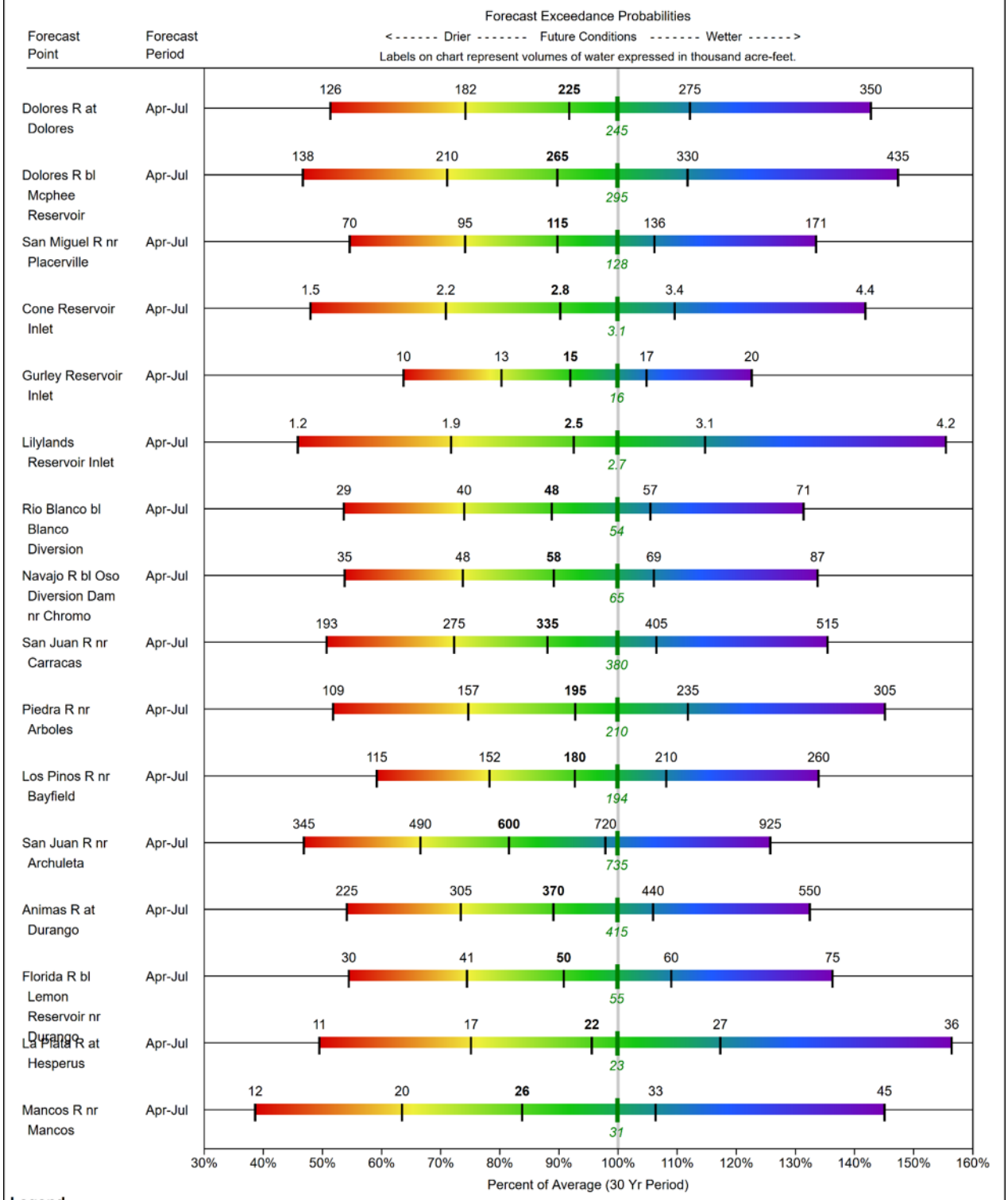
Reservoir Storage End of December 2019

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
GROUNDHOG RESERVOIR	16.0	0.2	12.3	22.0
JACKSON GULCH RESERVOIR	3.7	1.7	4.5	10.0
LEMON RESERVOIR	17.6	6.9	20.7	40.0
MCPHEE RESERVOIR	288.8	168.0	265.6	381.0
NARRAGUINNEP RESERVOIR	5.0	2.0	14.1	19.0
VALLECITO RESERVOIR	75.4	33.8	62.4	126.0
TROUT LAKE RESERVOIR	2.7	2.1	2.5	3.2
BASINWIDE	409.4	214.8	382.1	601.2
Number of Reservoirs	7	7	7	7

SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN RIVER BASINS

Water Supply Forecasts

January 1, 2020



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.

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.

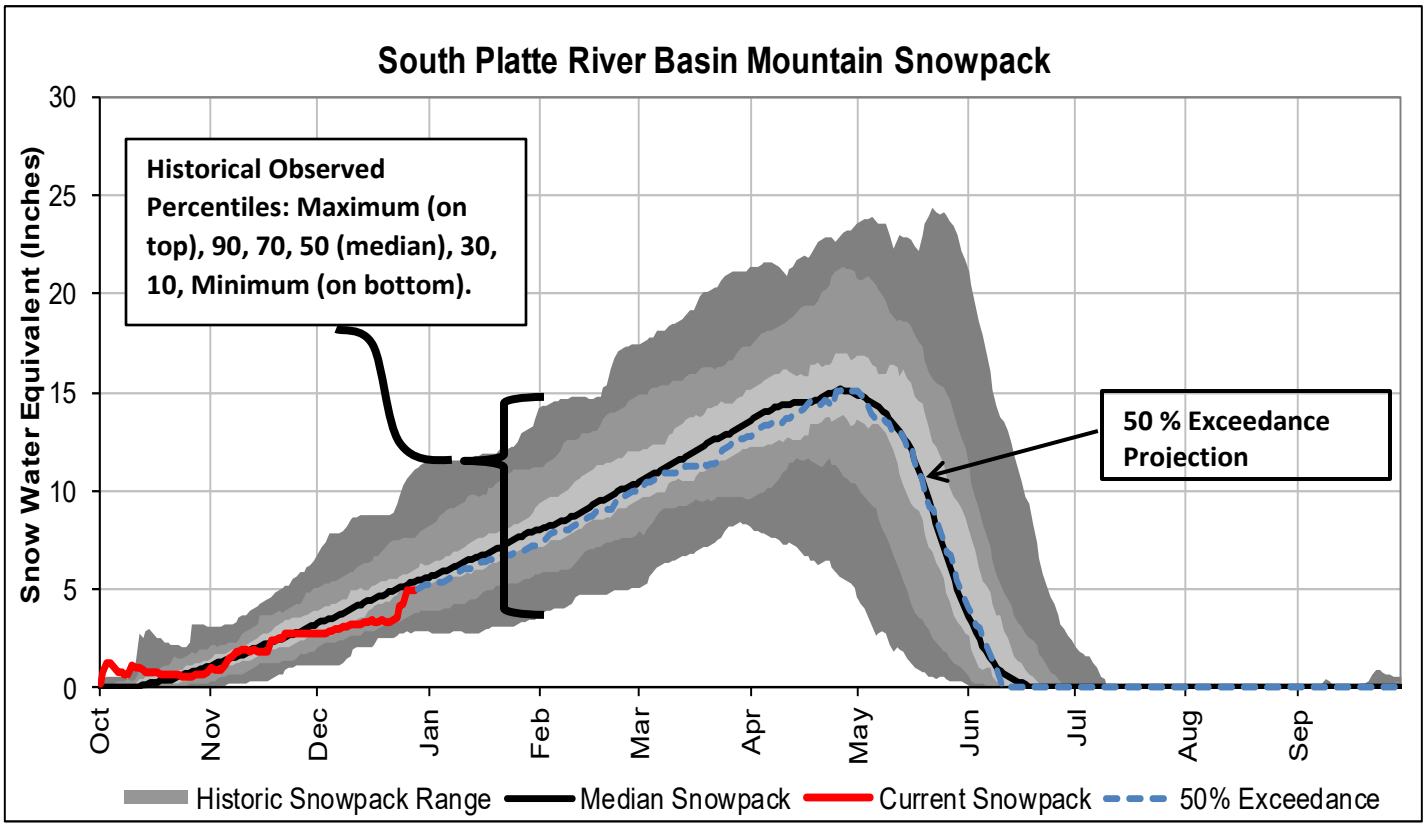
Current water year is represented by the heavy red line terminating on the last day the graphic was updated.

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 % Excedance 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
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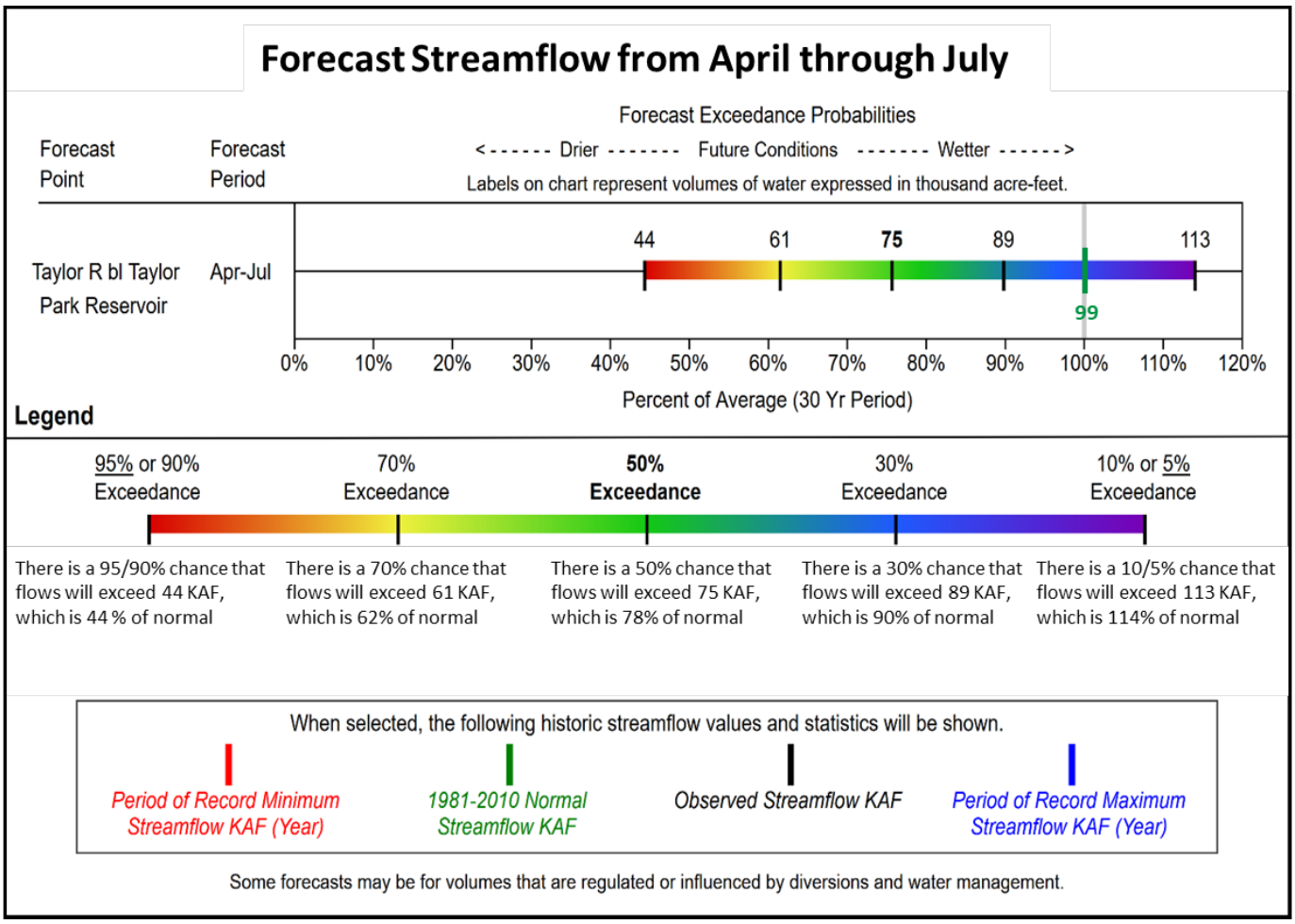
Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual 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.

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.



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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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Clint Evans
State Conservationist
Natural Resources Conservation Service
Lakewood, Colorado

Colorado
Water Supply Outlook Report
Natural Resources Conservation Service
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