USDA United States Department of Agriculture
Natural Resources Conservation Service

# Colorado
# Water Supply Outlook Report
## March 1, 2020


**Northwestern Colorado saw substantial snowpack accumulation in February. In the photo Vance Fulton is conducting a snow survey at the Corral Creek Snow Course. They measured an average of 26 inches of snow water equivalent which is 115 percent above the median value for this time of year.**

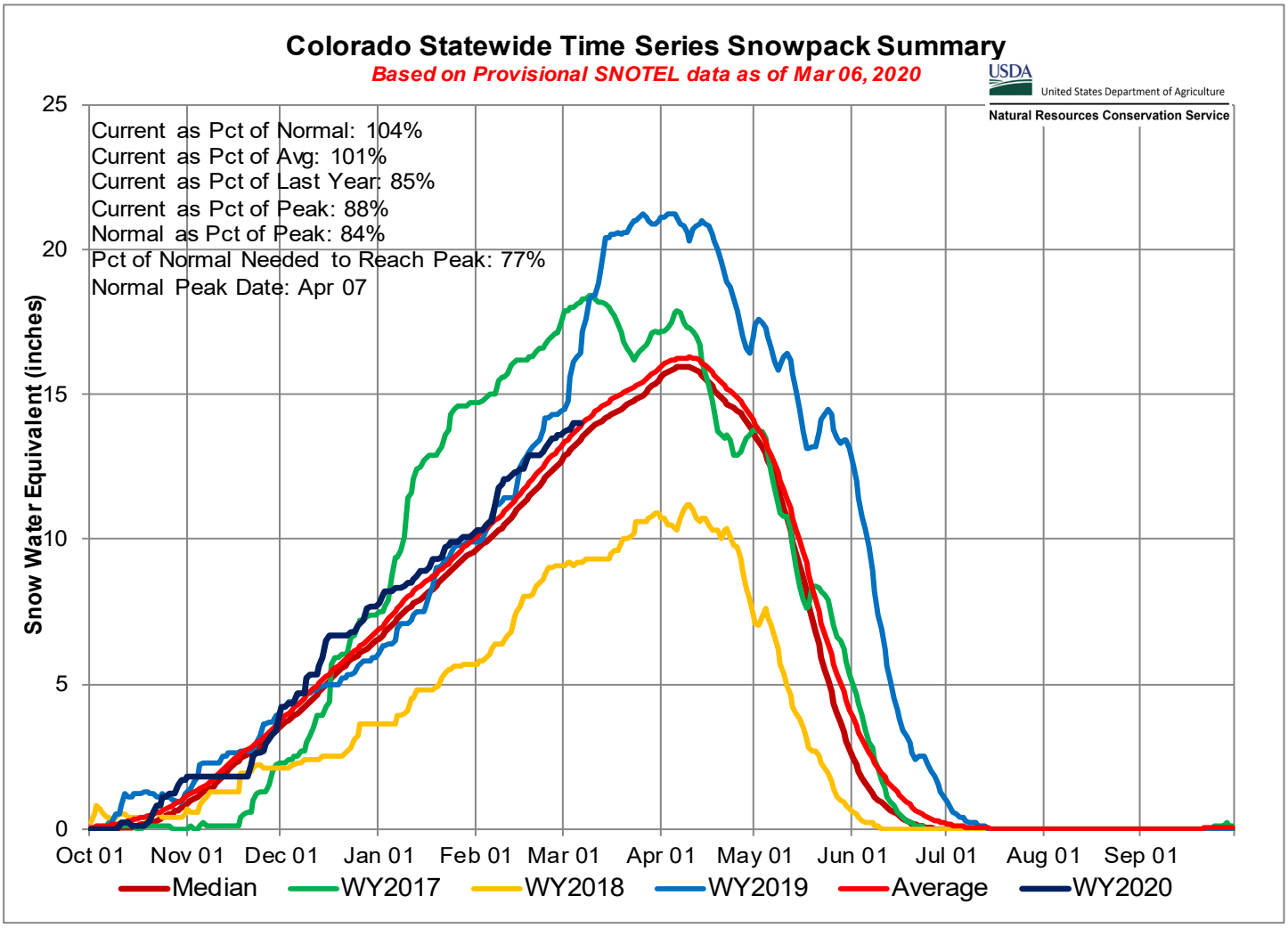
**Photo By: Mike Ardison Date: February 25th, 2020**

**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.

# Contents

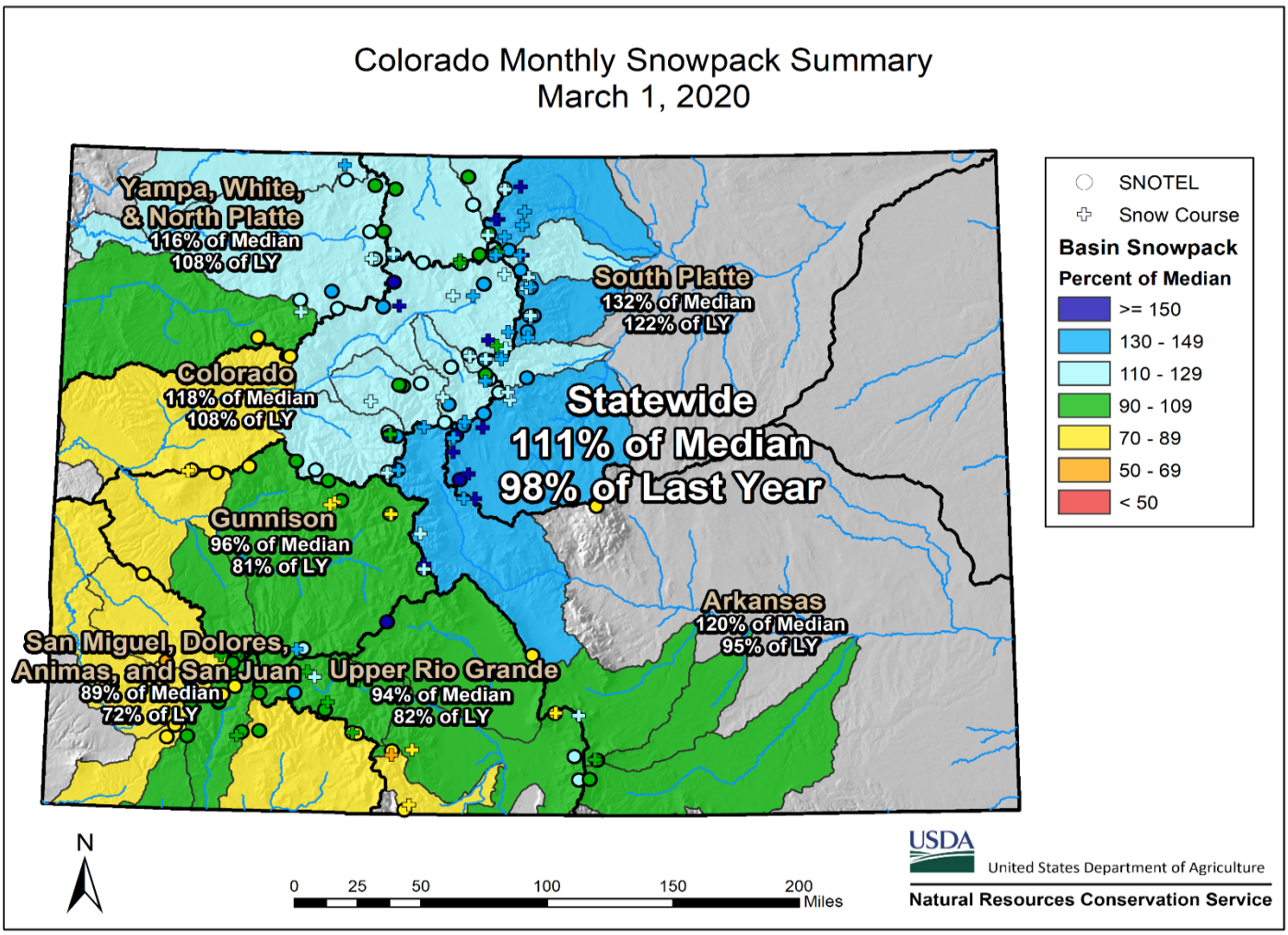
# Colorado Statewide Water Supply Conditions

## Summary



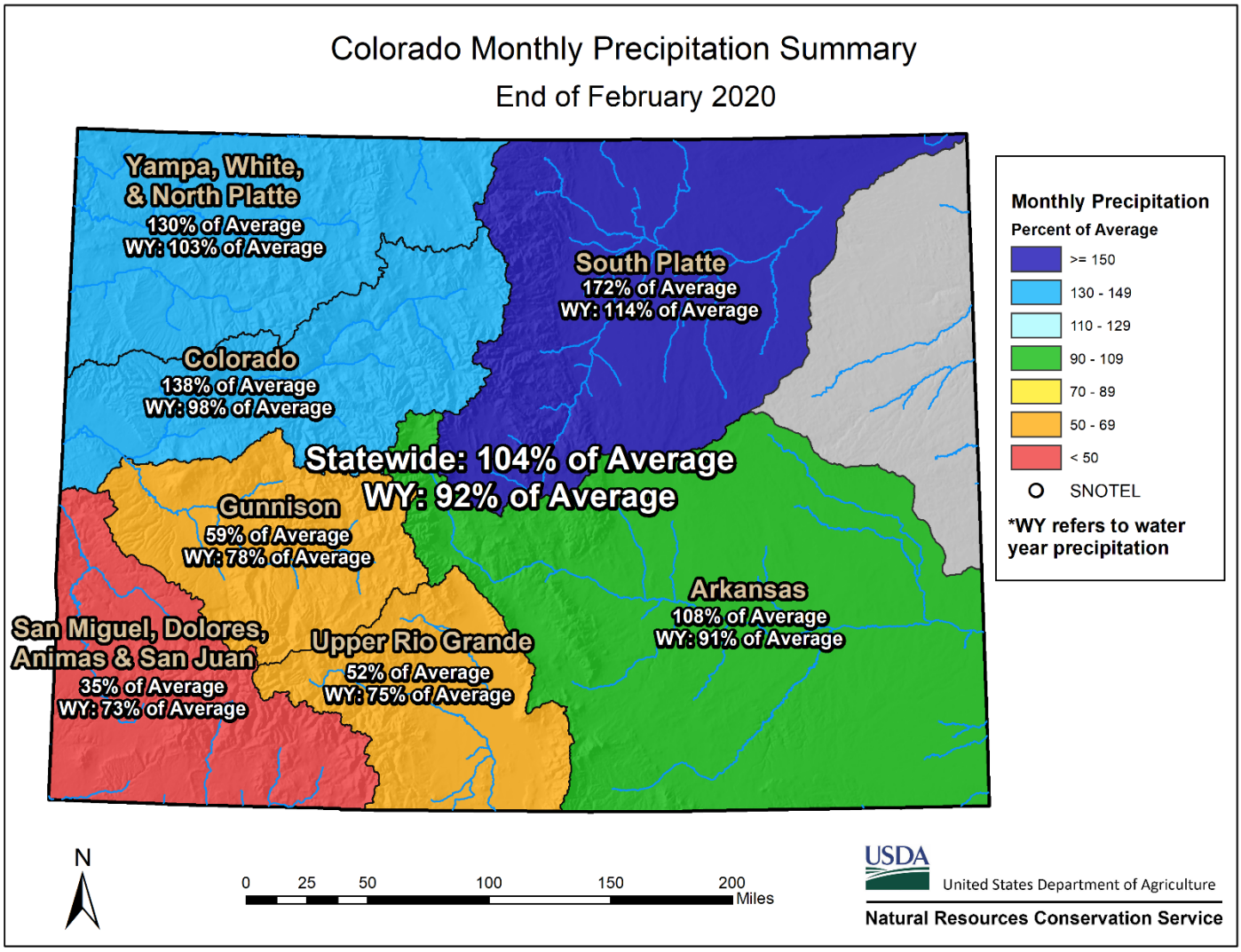

February brought dramatic differences in snow accumulation to different parts of Colorado causing notable changes in the water supply outlook. Northern Colorado received a steady series of storms while the southern half of the state remained particularly dry and there was a very sharp distinction between the two zones. On the high end the South Platte basin received 172 percent of average precipitation accumulation while the combined San Miguel, Dolores, Animas, and San Juan Basins received a meager 35 percent of average. These differences did cause considerable shifts in the percent of normal snowpack in the different basins but values are still surrounding normal values with the lowest in the state being the combined southwest basins at 89 percent of normal. Statewide snowpack was 111 percent of the median value on March 1st. After a drier than normal October and November, which varied across the state, water year precipitation values are generally 10 to 20 percent below the percent of normal snowpack depending on the basin. Reservoir storage has remained relatively stable over the last month. Currently the Rio Grande and Arkansas basins are the only in the state with below average storage and statewide storage is 107 percent of average. Following precipitation trends of the last month much of Northern Colorado saw increases in streamflow forecasts since February 1st and rivers in southern Colorado experienced decreases. While it can vary year to year there is a little over a month left in the usual snow accumulation season. That said, spring weather in Colorado can be highly variable, as the whole winter has been so far, so it will be worth keeping a close eye on changing conditions.

## Snowpack



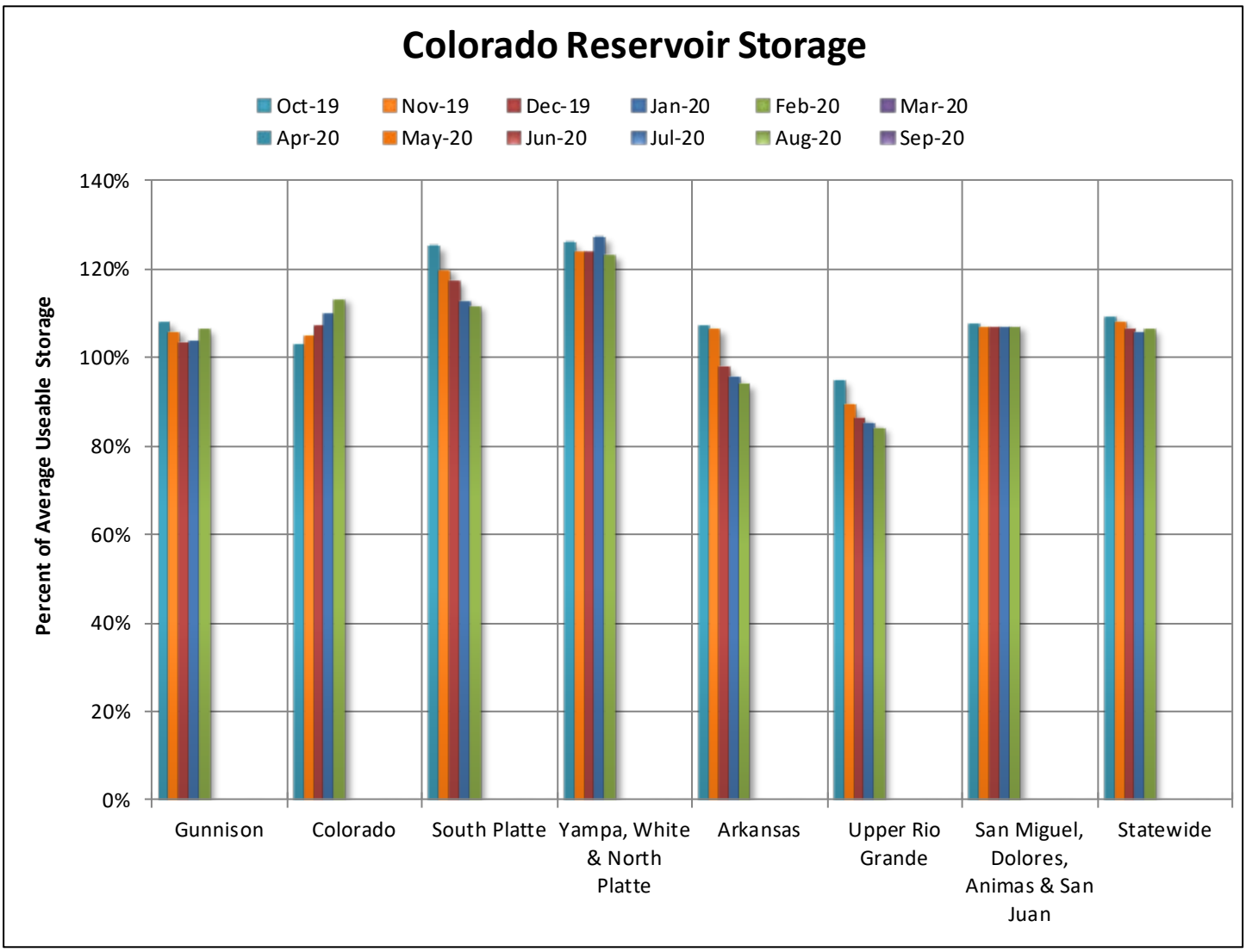

Total monthly snow accumulation has varied greatly between the northern, central, and southern mountains this winter and storm cycles during the month of February generally favored the northern and central mountains. 68 SNOTEL sites in the northern and central mountains had SWE accumulations that were normal or above normal. 12 of those SNOTEL sites had record breaking accumulations for the month of February, with several more reporting the second highest accumulations. Conversely, 47 SNOTEL stations reported SWE accumulations that were below normal, and these below normal conditions were mostly seen in the southwestern part of the state. The South Platte and Arkansas River basins currently have the highest snowpacks compared to normal at 132 and 120 percent, respectively. On the west side of the Continental Divide, the Upper Colorado and combined Yampa, White, and North Platte River basins have 118 and 116 percent of normal, respectively. Several storms back in December led to above normal accumulations for the southern mountains but it has remained relatively dry through the month of February in that part of the state. The Gunnison River basin is currently at 96 percent of normal, down from 103 percent of normal last month. The Upper Rio Grande has 94 percent of normal snowpack, down from 103 percent of normal last month. The combined San Miguel, Dolores, Animas, and San Juan basins saw the largest decrease from normal compared to last month, down from 106 to currently 89 percent of normal. With a little over a month left in the accumulation season, there is still some time for these basins to reach normal or even above normal peak snowpack conditions. As of now most of the state is close to or above normal, which is promising for a normal snowmelt-runoff season. March will be a crucial month and hopefully more snow falls across the state, especially in the southern basins.

## Precipitation



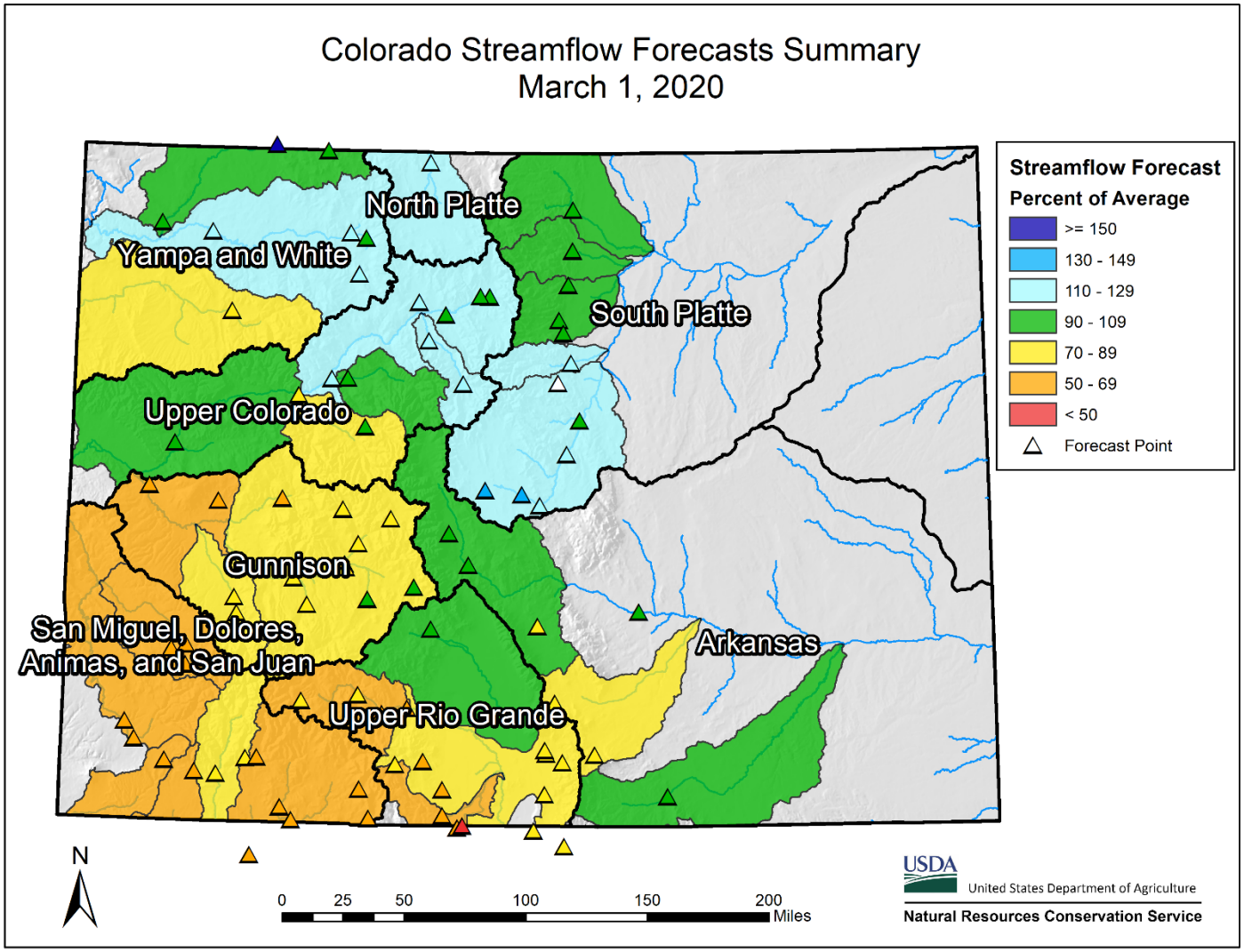

Overall, February ended with above average statewide precipitation due to storm systems from the northwest. These systems left much of the river basin in the north and east with above-average precipitation in contrast to below-average precipitation in southwestern basins. Precipitation in the South Platte, Colorado and combined Yampa, White and North Platte was 172, 138 and 130 percent of average. Nine SNOTEL sites in these basins received the highest precipitation on record for the month of February and 15 sites received the second most precipitation on record. Only six out of 65 SNOTEL sites received below average precipitation in these basins. In stark contrast, the Gunnison, Upper Rio Grande and the combined San Miguel, Dolores, Animas and San Juan basins received 59, 52 and 35 percent of average precipitation for February, respectively. Ten SNOTEL sites recorded the lowest precipitation on record during February and an additional ten saw the second lowest on record. Only Trinchera SNOTEL received above 55 percent of average precipitation in these basins. Both the combined Yampa, White, and North Platte basins and the Arkansas basin ended the month with near average water year-to-date precipitation of 103 and 91 percent. Drought conditions remain for the Upper Rio Grande, Gunnison and combined San Miquel, Dolores, Animas and San Juan river basins receiving 75, 78 and 73 percent of average water year-to-date precipitation. The South Platte ended the month with 114 percent of average water year-to-date precipitation.

## Reservoir Storage




Reservoir storage statewide has continued to slowly decline but is still above average at 107 percent of average. This same time last year, statewide reservoir storage was at 83 percent of average. Reservoir storage is currently above average across most of the state, in large part, because of the substantial snowmelt runoff season from 2018-2019. All major basins are above average for reservoir storage, except for the Rio Grande and Arkansas River basins, which currently are holding 84 and 94 percent of average, respectively. The combined Yampa, White, and North Platte River basins are currently at 123 percent of average, slightly down from 127 percent at the end of January. The combined San Miguel, Dolores, Animas, and San Juan River basins did not change from the end of last month and are currently at 107 percent of average. The Gunnison, South Platte, and Upper Colorado River basins showed slight gains compared to last month and are currently at 107, 112, and 113 percent of average, respectively. In general, all the major basins across Colorado are near normal for reservoir storage. This should give reservoir operators flexibility with decision making once snowmelt runoff begins.

## Streamflow

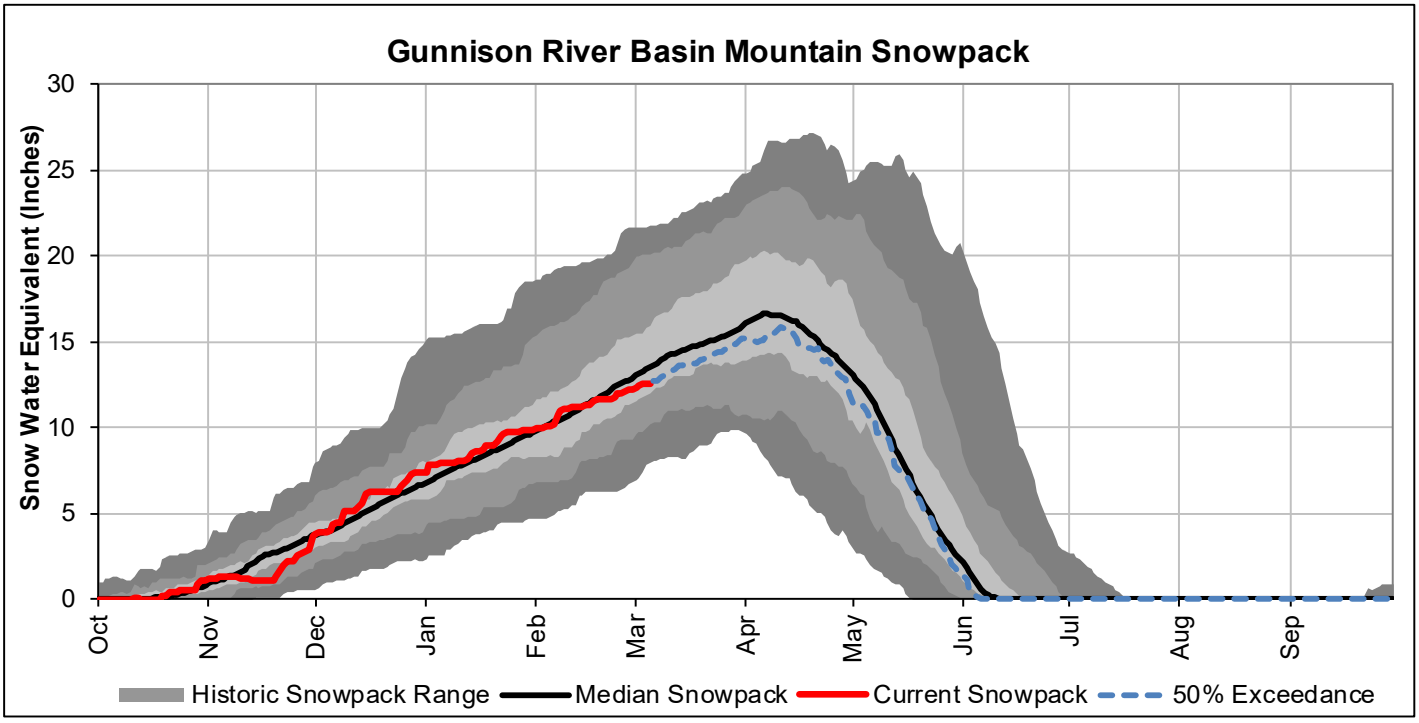



A series of storms moved across the state from the northwest during February. These systems produced above-average precipitation in northern and eastern basins then weakened substantially as they crossed the state leaving drier conditions in southwestern basins. The very dry conditions in southwestern Colorado resulted in substantially decreased forecasted runoff volume compared to January. The combined San Miguel, Dolores, Animas and San Juan and Upper Rio Grande are forecasted to have the lowest average streamflow volumes in the state at 64 and 68 percent of average, respectively. Most forecast points in the Gunnison basin are expecting below-average streamflow volumes except for locations on the west slope of the Sawatch Range. On average the Gunnison Basins forecasted streamflow volumes are 72 percent of normal. North of the crest of the Grand Mesa and Elk ranges, the streamflow outlook forecasts are much improved since February 1st. The Colorado, South Platte, and the combined Yampa, White, Little Snake basins are forecasted to have average volumes of 104, 111, and 106 percent of average, respectively. At a forecast point on the North Platte River near Northgate has a forecasted streamflow volume of 124 percent of normal. With near average February precipitation and snowfall, the Arkansas Basin averaged forecasted volumes are 96 percent of normal, only a slight decrease from January. For many forecast points, the range of potential runoff outcomes has narrowed and therefore improving confidence in the forecast for the runoff season.

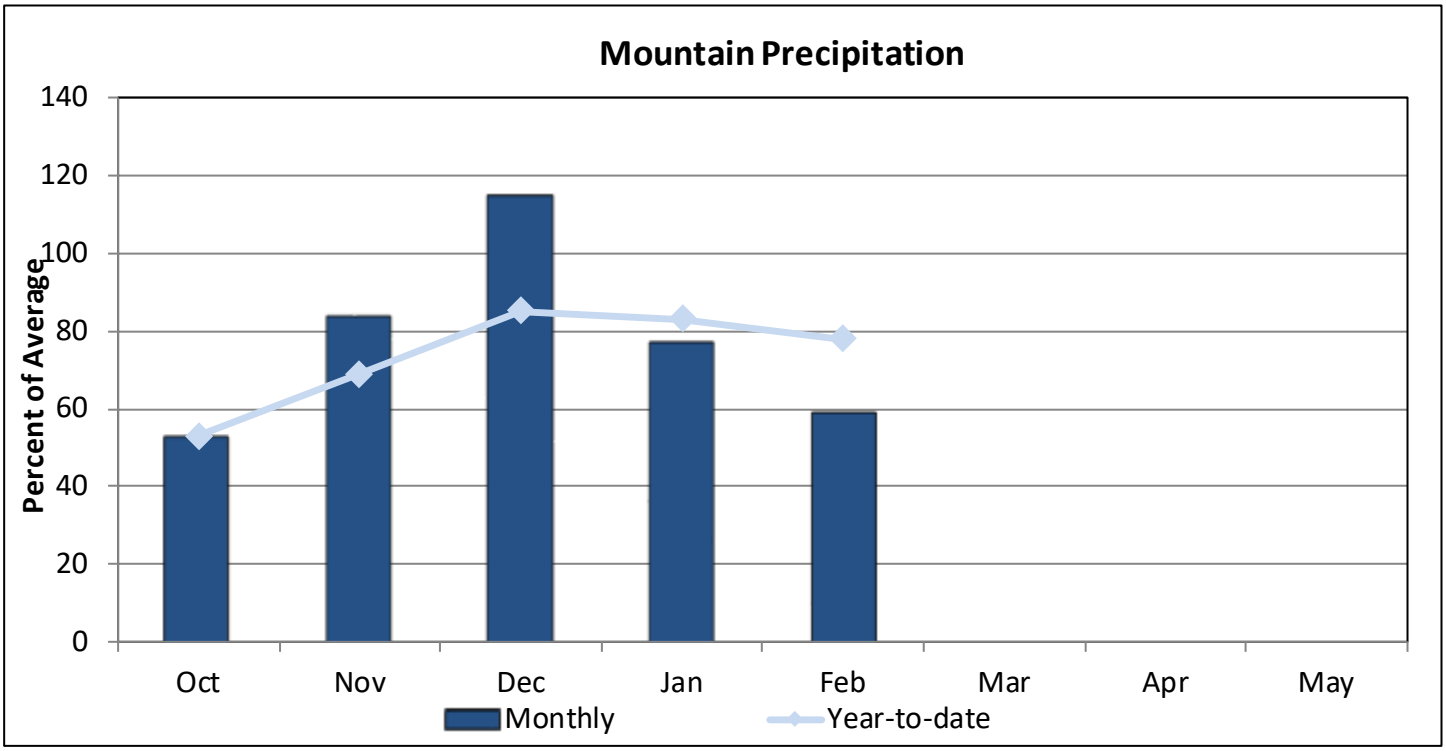
# GUNNISON RIVER BASIN

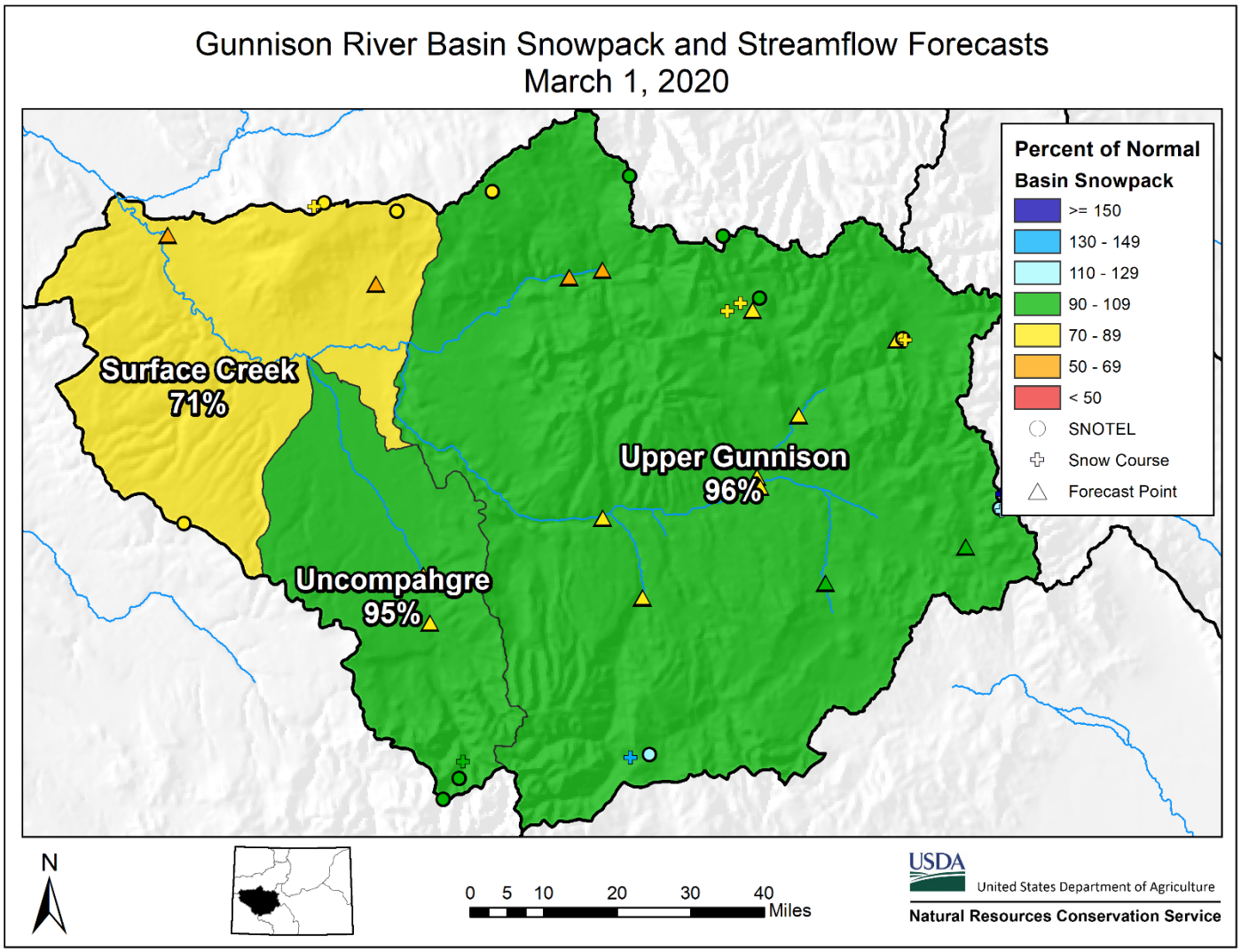
March 1, 2020

Snowpack in the Gunnison River basin is slightly below normal at 96% of the median. Precipitation for February was 59% of average which brings water year-to-date precipitation to 78% of average. Reservoir storage at the end of February was 107% of average compared to 63% last year. Current streamflow forecasts range from 54% of average for Surface Creek at Cedaredge to 93% for Cochetopa Creek below Rock Creek near Parlin.




*SWE values calculated using daily SNOTEL data only

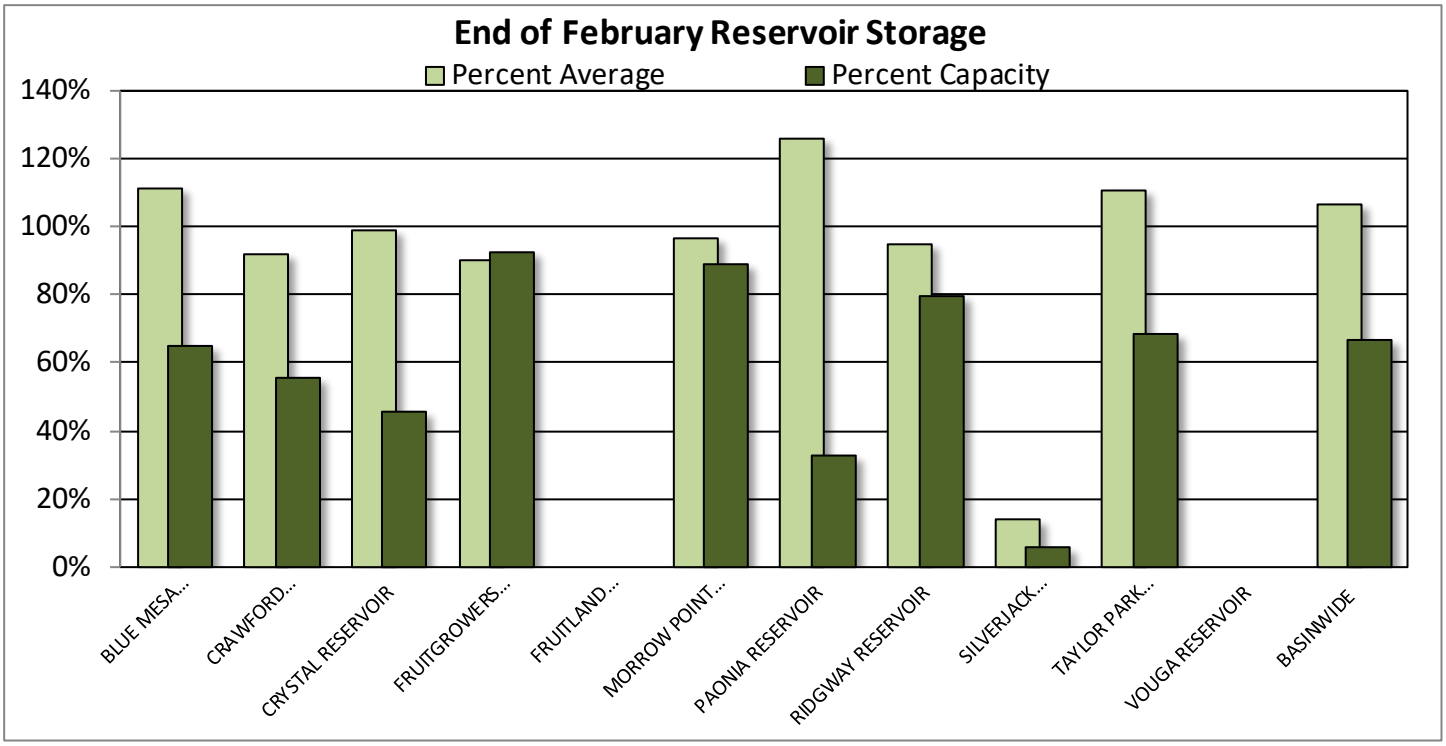





**Watershed Snowpack Analysis March 1st, 2020**

| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Upper Gunnison | 17 | 96 | 116 |
| Surface Creek | 3 | 71 | 117 |
| Uncompahgre | 4 | 95 | 124 |
| **Basin-Wide Total** | 21 | 96 | 118 |

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



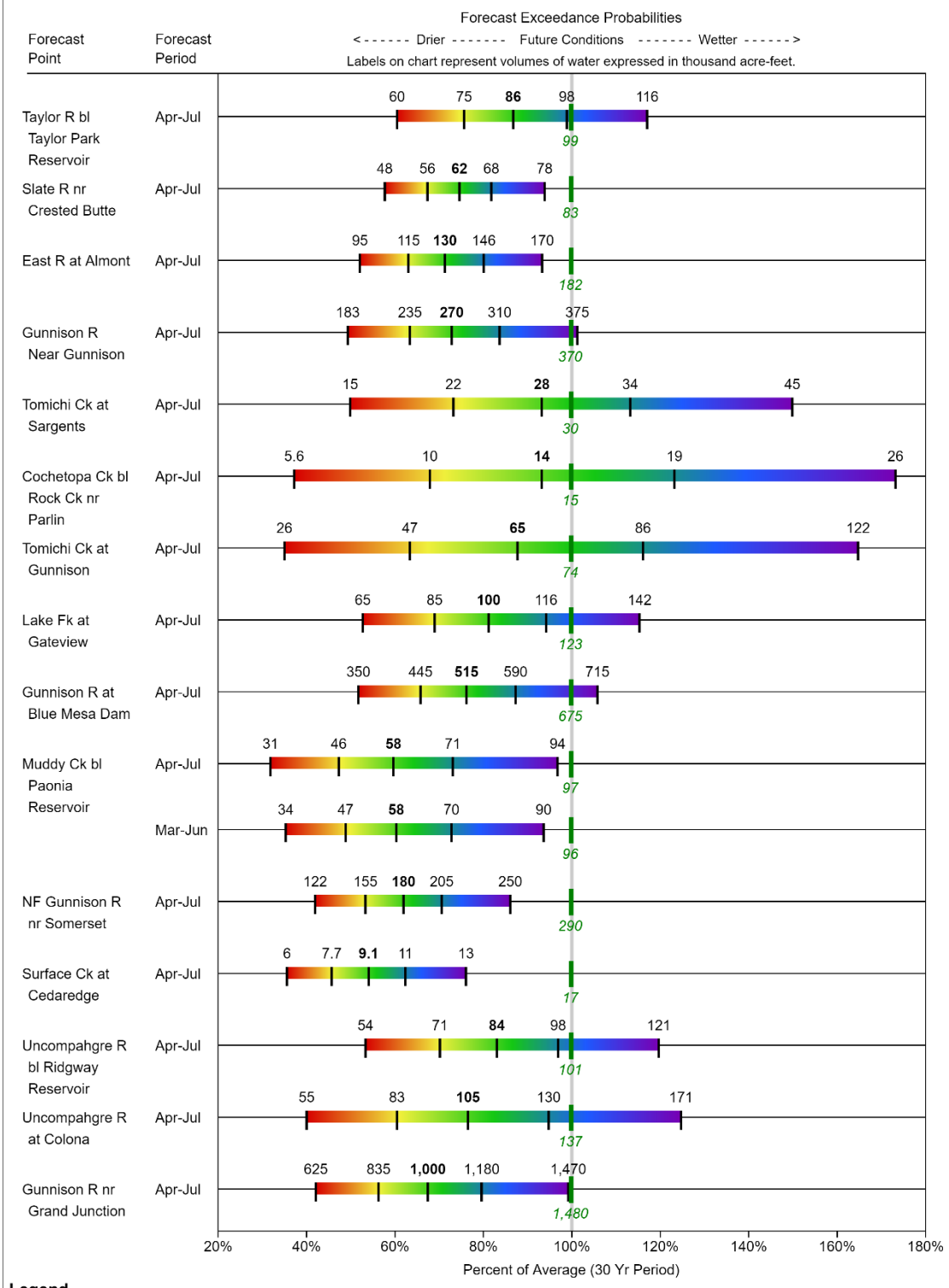

**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| BLUE MESA RESERVOIR | 537.0 | 247.7 | 482.2 | 830.0 |
| CRAWFORD RESERVOIR | 7.8 | 1.8 | 8.5 | 14.0 |
| CRYSTAL RESERVOIR | 8.0 | 7.9 | 8.1 | 17.5 |
| FRUITGROWERS RESERVOIR | 3.3 | 2.5 | 3.7 | 3.6 |
| FRUITLAND RESERVOIR | | 0.4 | | 9.2 |
| MORROW POINT RESERVOIR | 107.4 | 107.2 | 111.1 | 121.0 |
| PAONIA RESERVOIR | 5.0 | 4.0 | 4.0 | 15.4 |
| RIDGWAY RESERVOIR | 66.0 | 46.9 | 69.4 | 83.0 |
| SILVERJACK RESERVOIR | 0.8 | 1.3 | 5.5 | 12.8 |
| TAYLOR PARK RESERVOIR | 72.8 | 59.6 | 65.7 | 106.0 |
| VOUGA RESERVOIR | | 0.2 | | 0.9 |
| **BASINWIDE** | 808.2 | 479.6 | 758.2 | 1213.4 |
| Number of Reservoirs | 9 | 11 | 9 | 11 |

**GUNNISON RIVER BASIN**

**Water Supply Forecasts**

**March 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.

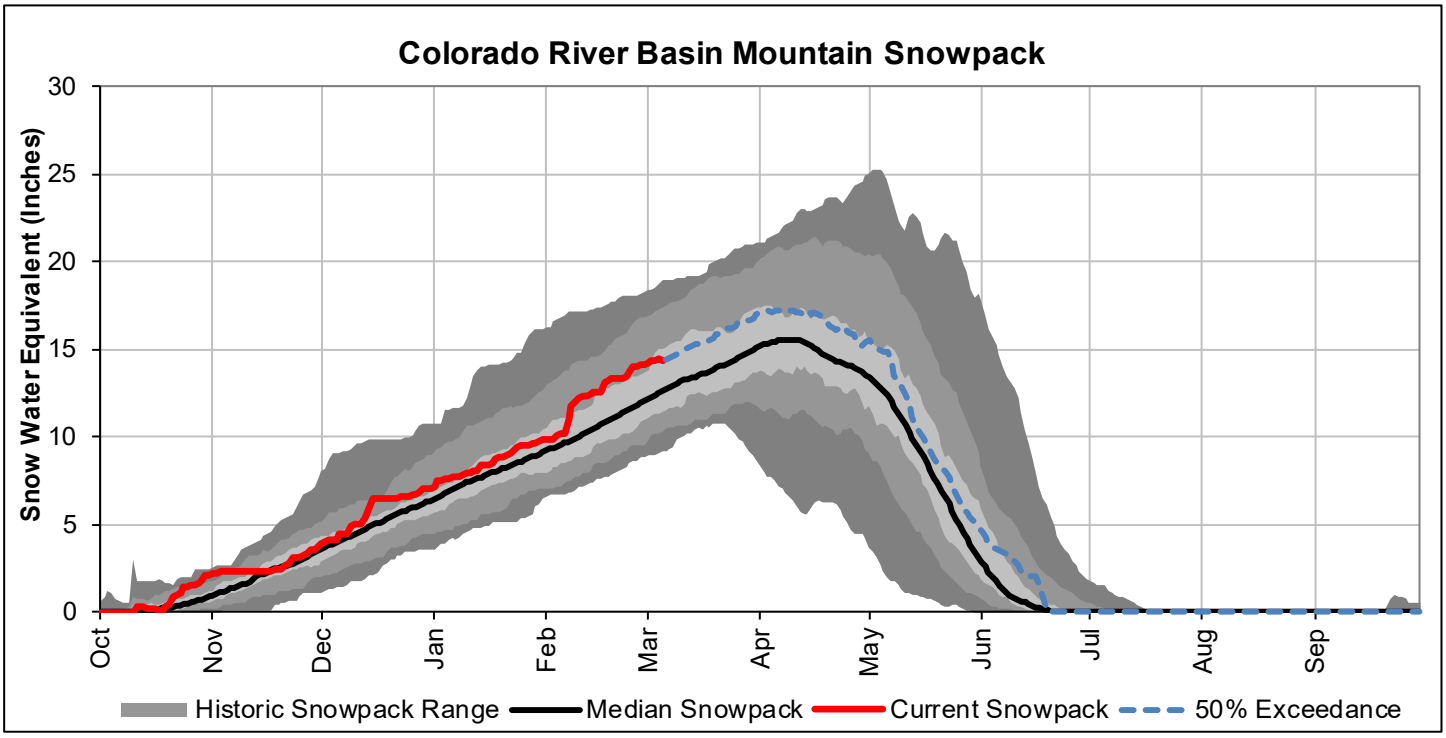
*Period of Record Minimum Streamflow KAF (Year)* | *1981-2010 Normal Streamflow KAF* | *Observed Streamflow KAF* | *Period of Record Maximum Streamflow KAF (Year)*

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

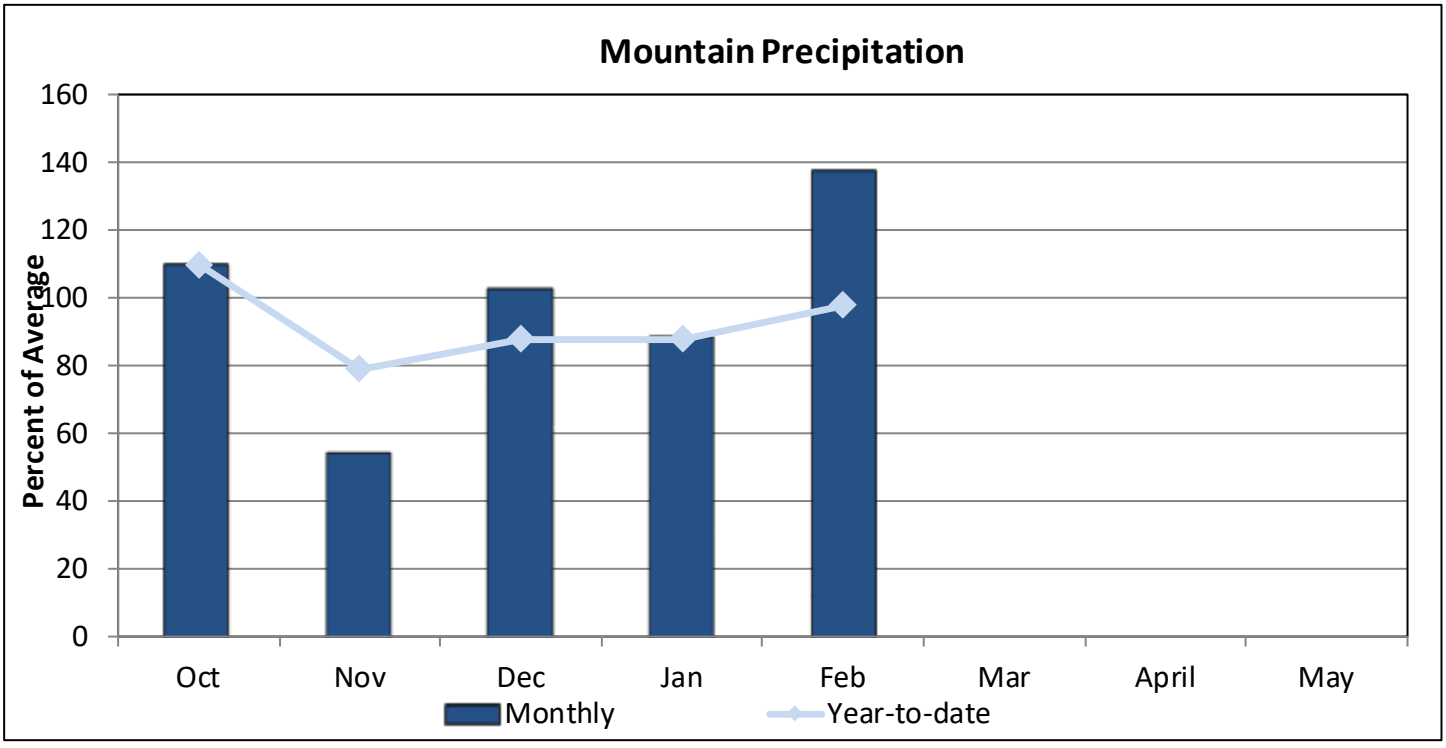
# UPPER COLORADO RIVER BASIN

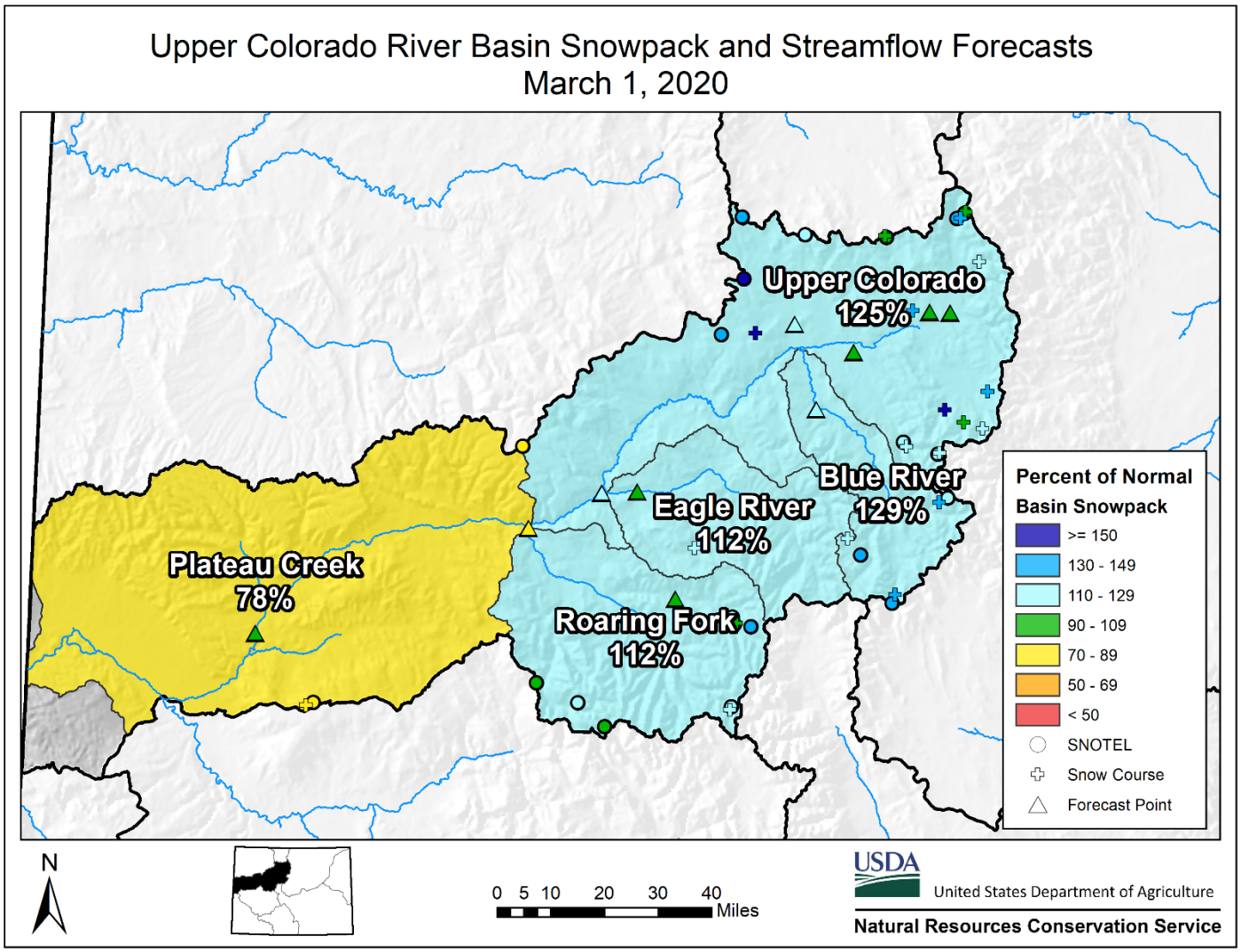
March 1, 2020

Snowpack in the Colorado River basin is above normal at 118% of the median. Precipitation for February was 138% of average which brings water year-to-date precipitation to 98% of average. Reservoir storage at the end of February was 113% of average compared to 90% last year. Current streamflow forecasts range from 86% of average for the Roaring Fork at Glenwood Springs to 126% for Muddy Creek below Wolford Reservoir.




*SWE values calculated using daily SNOTEL data only

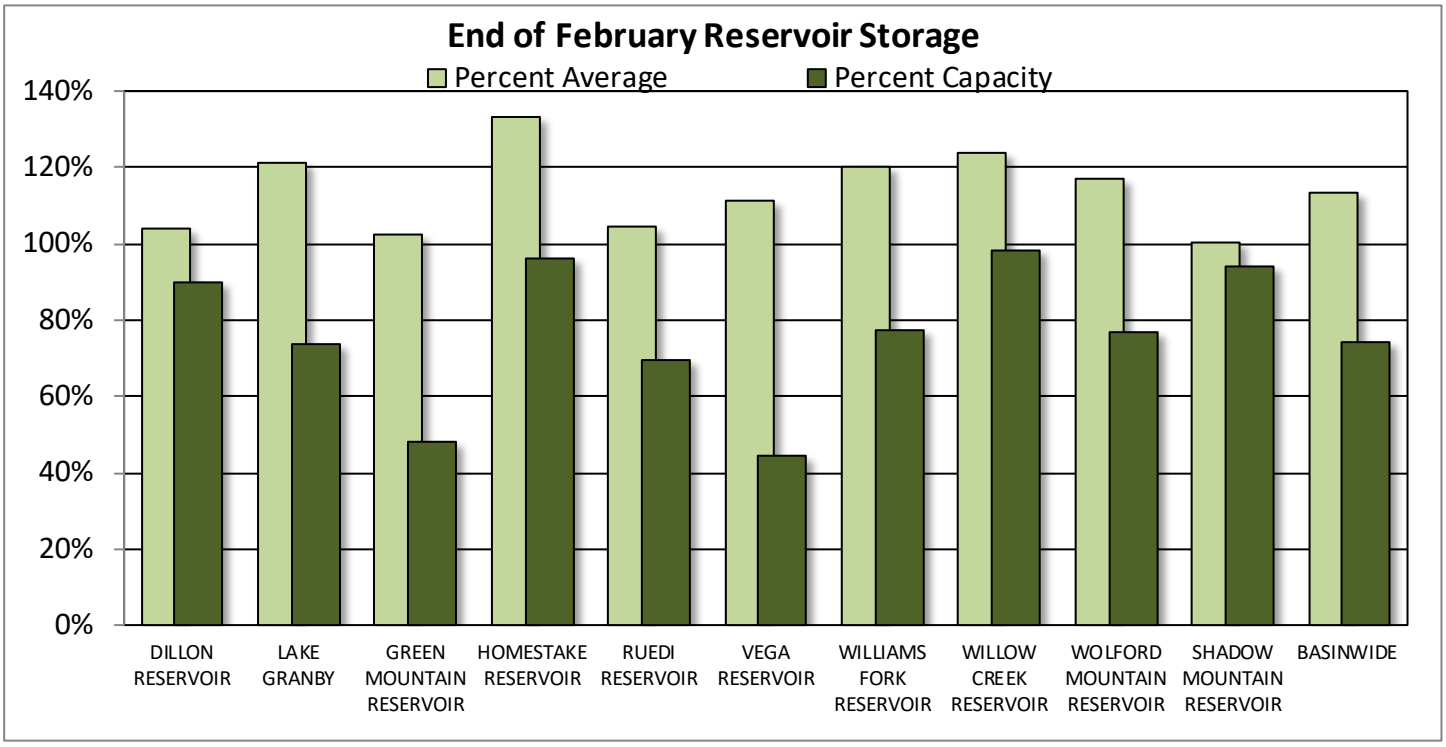





**Watershed Snowpack Analysis March 1st, 2020**

| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Blue River | 8 | 129 | 119 |
| Upper Colorado | 36 | 125 | 107 |
| Muddy Creek | 5 | 134 | 111 |
| Eagle River | 5 | 112 | 109 |
| Plateau Creek | 6 | 78 | 117 |
| Roaring Fork | 9 | 112 | 116 |
| Williams Fork | 5 | 129 | 101 |
| Willow Creek | 5 | 121 | 107 |
| **Basin-Wide Total** | 48 | 118 | 110 |

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



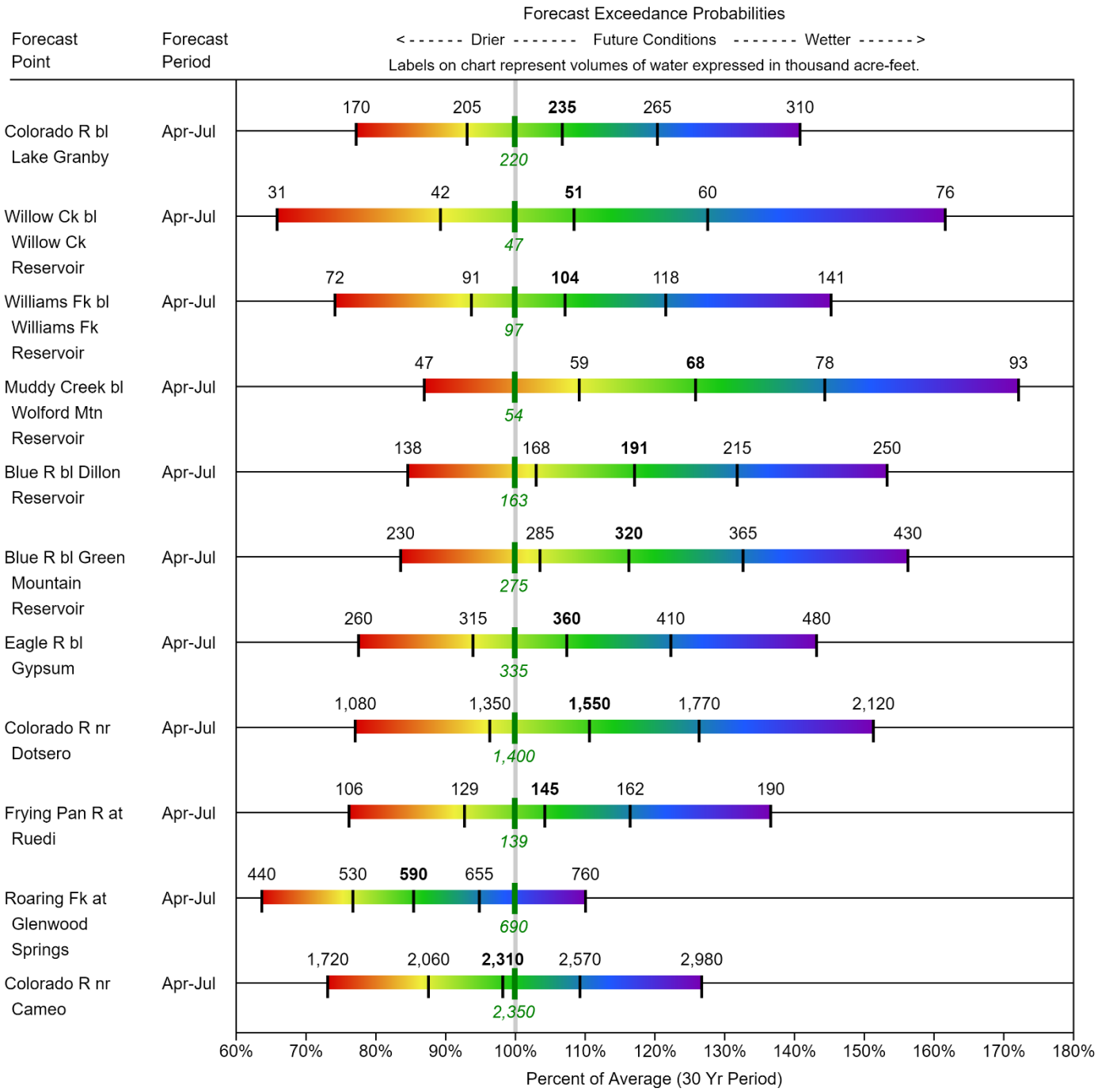

**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| DILLON RESERVOIR | 223.3 | 174.1 | 214.5 | 249.1 |
| LAKE GRANBY | 342.8 | 289.1 | 282.6 | 465.6 |
| GREEN MOUNTAIN RESERVOIR | 70.3 | 45.9 | 68.7 | 146.8 |
| HOMESTAKE RESERVOIR | 41.3 | 34.0 | 31.0 | 43.0 |
| RUEDI RESERVOIR | 70.9 | 56.4 | 67.9 | 102.0 |
| VEGA RESERVOIR | 14.6 | 6.2 | 13.1 | 32.9 |
| WILLIAMS FORK RESERVOIR | 75.1 | 65.5 | 62.4 | 97.0 |
| WILLOW CREEK RESERVOIR | 8.9 | 7.0 | 7.2 | 9.1 |
| WOLFORD MOUNTAIN RESERVOIR | 50.6 | 33.6 | 43.2 | 65.9 |
| SHADOW MOUNTAIN RESERVOIR | 17.3 | 17.3 | 17.3 | 18.4 |
| **BASINWIDE** | 915.1 | 729.1 | 807.9 | 1229.8 |
| Number of Reservoirs | 10 | 10 | 10 | 10 |

# UPPER COLORADO RIVER BASIN

**Water Supply Forecasts**

**March 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.

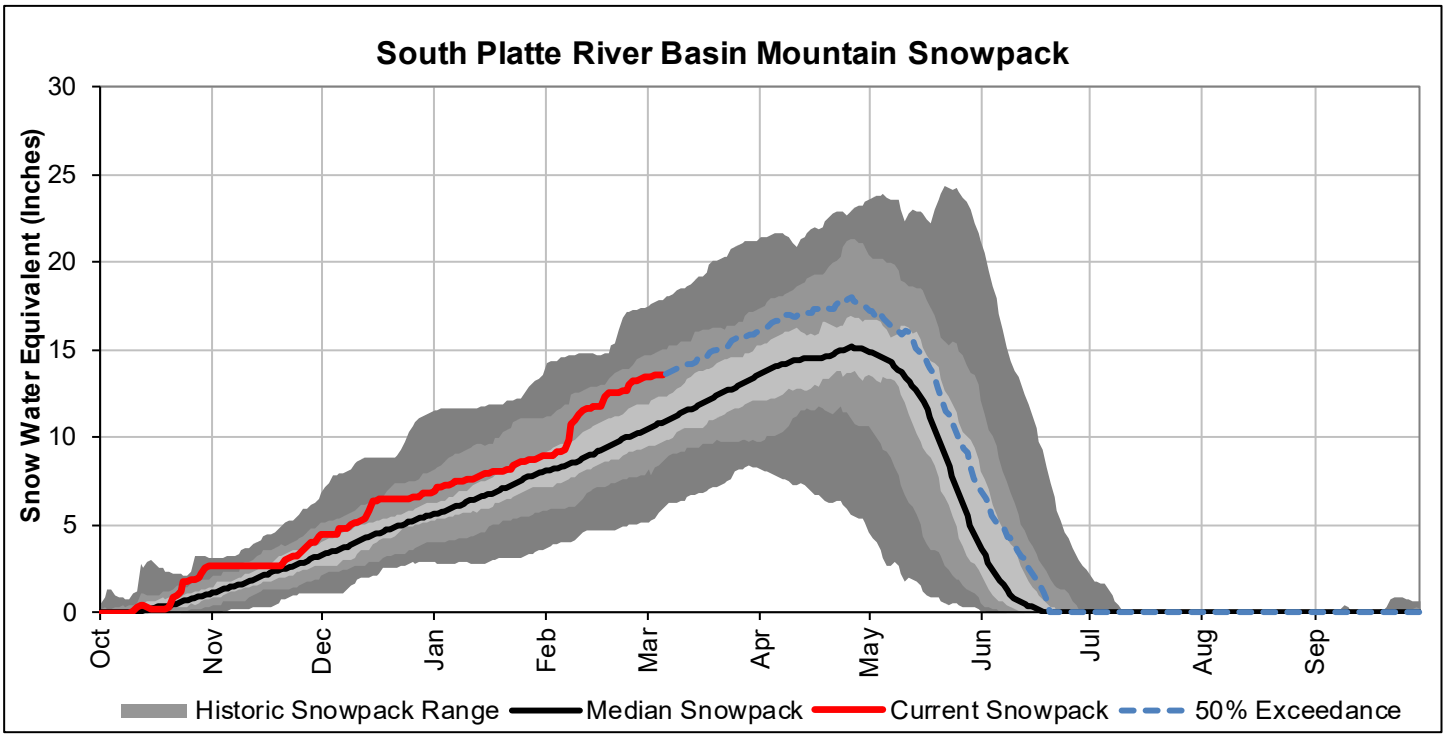
| *Period of Record Minimum Streamflow KAF (Year)* | *1981-2010 Normal Streamflow KAF* | *Observed Streamflow KAF* | *Period of Record Maximum Streamflow KAF (Year)* |
|---|---|---|---|

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

# SOUTH PLATTE RIVER BASIN

March 1, 2020

Snowpack in the South Platte River basin is above normal at 132% of the median. Precipitation for February was 172% of average which brings water year-to-date precipitation to 114%. Reservoir storage at the end of February was 112% of average compared to 103% last year. Current streamflow forecasts range from 100% of average for St. Vrain Creek at Lyons to 133% for the South Platte inflow to Spinney Reservoir.

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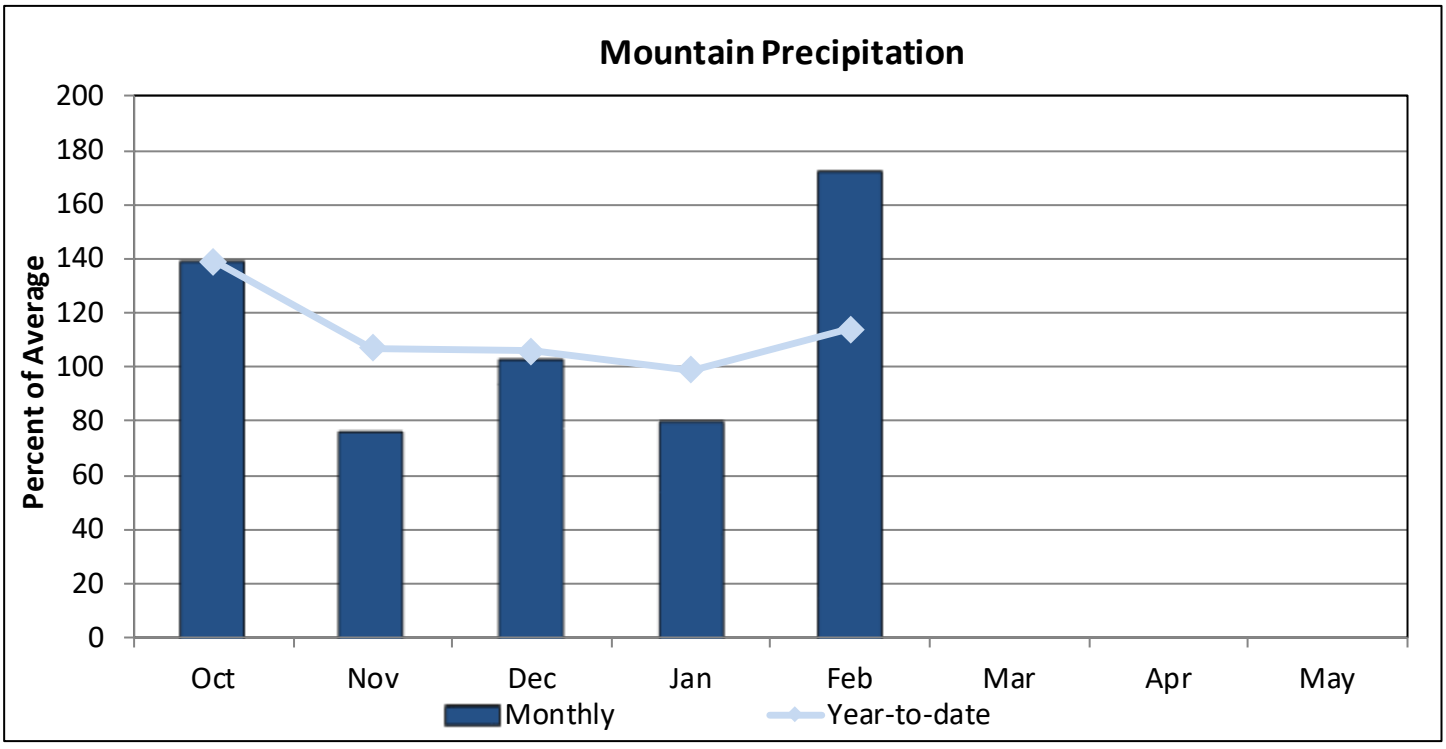
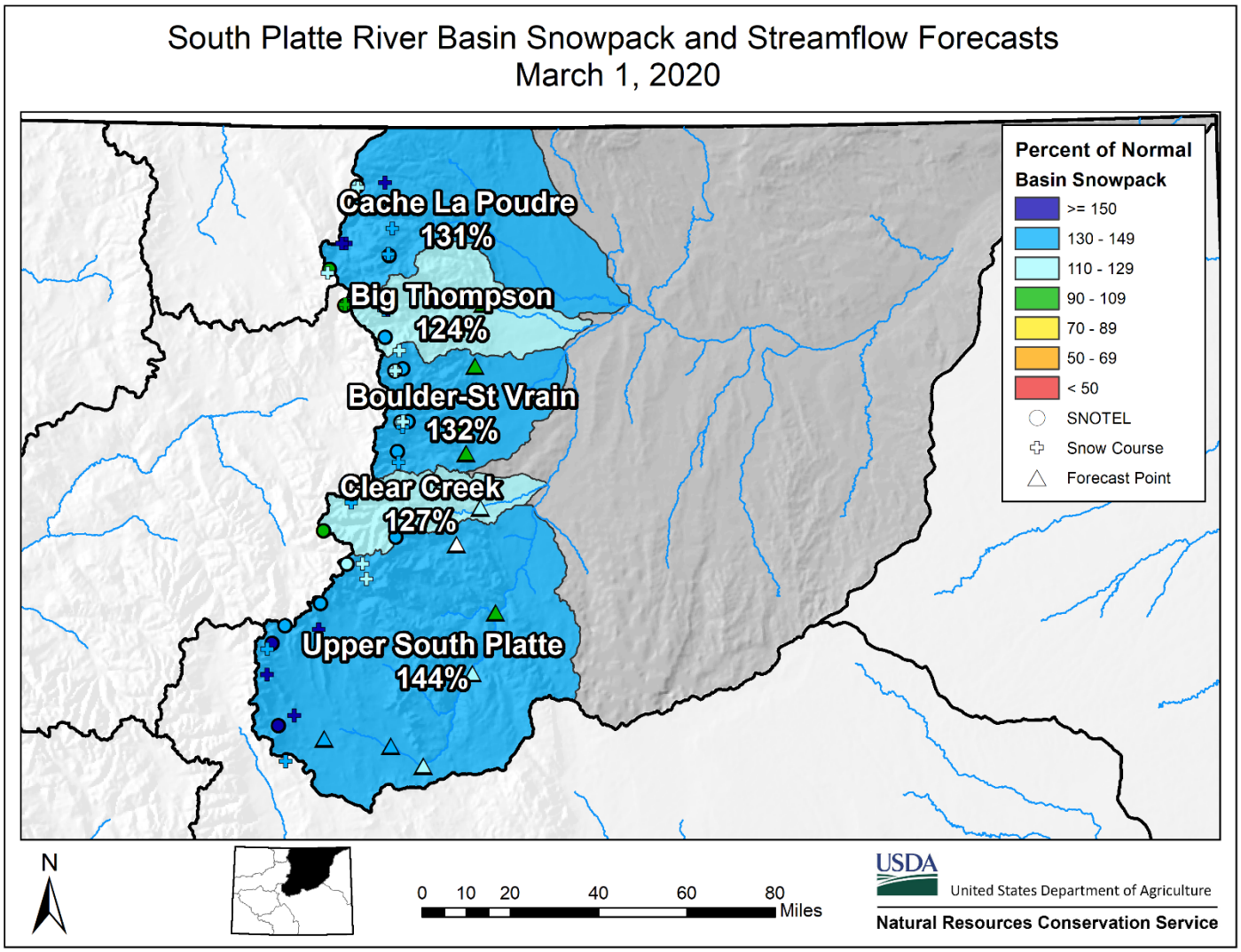
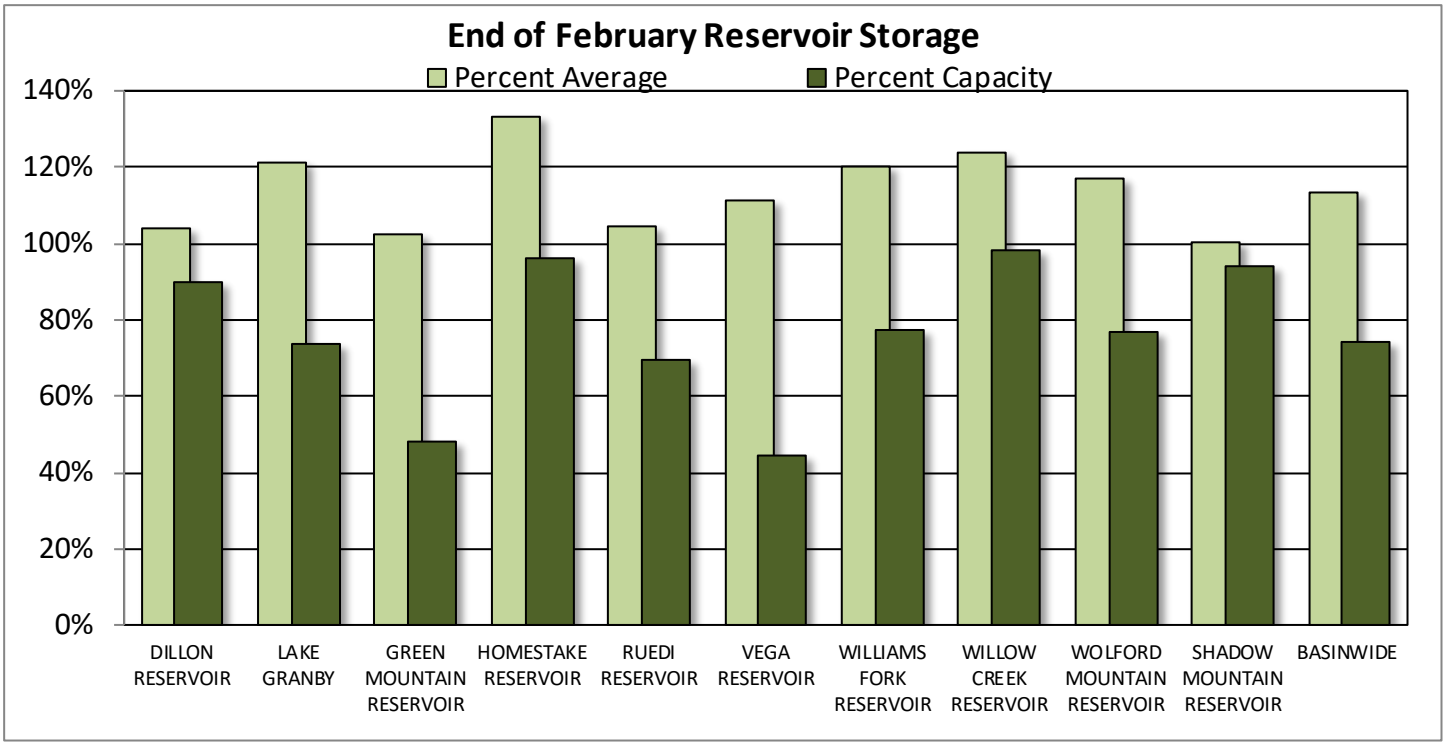





**Watershed Snowpack Analysis March 1st, 2020**

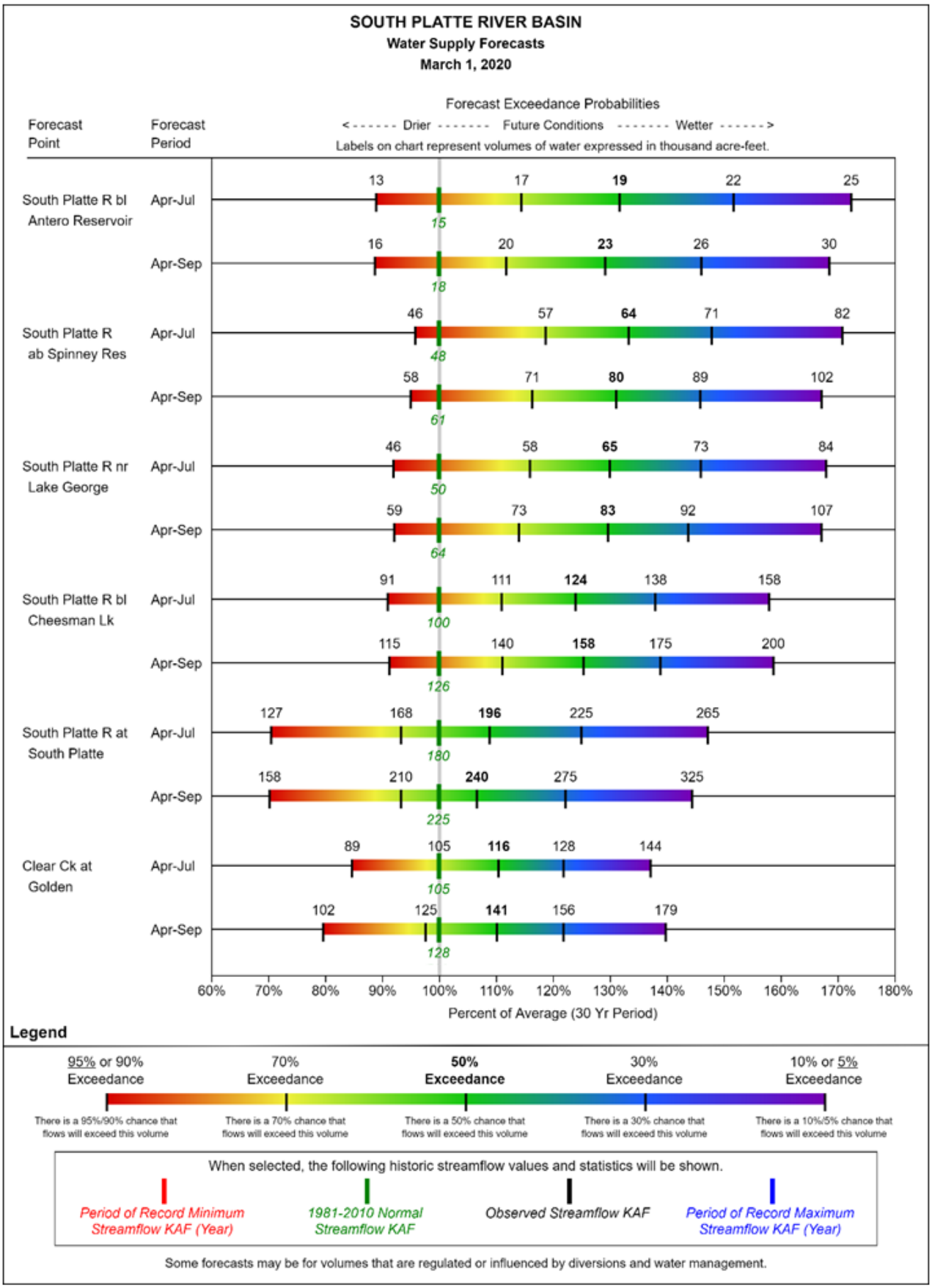
| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Big Thompson | 7 | 124 | 95 |
| Boulder Creek | 6 | 132 | 102 |
| Cache La Poudre | 10 | 131 | 103 |
| Clear Creek | 4 | 127 | 102 |
| Saint Vrain | 3 | 128 | 120 |
| Upper South Platte | 16 | 144 | 129 |
| **Basin-Wide Total** | 46 | 132 | 108 |

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




**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| ANTERO RESERVOIR | 20.0 | 19.2 | 15.2 | 19.9 |
| BARR LAKE | 23.0 | 27.3 | 26.0 | 30.1 |
| BLACK HOLLOW RESERVOIR | 3.7 | 4.0 | 2.8 | 6.5 |
| BOYD LAKE | 34.3 | 31.3 | 28.2 | 48.4 |
| CACHE LA POUDRE | 8.4 | 8.5 | 7.2 | 10.1 |
| CARTER LAKE | 91.1 | 91.0 | 87.0 | 108.9 |
| CHAMBERS LAKE | 4.4 | 2.5 | 3.2 | 8.8 |
| CHEESMAN LAKE | 54.2 | 61.4 | 63.4 | 79.0 |
| COBB LAKE | 18.1 | 15.1 | 11.6 | 22.3 |
| ELEVENMILE CANYON RESERVOIR | 100.3 | 99.4 | 95.8 | 98.0 |
| EMPIRE RESERVOIR | 25.7 | 28.4 | 25.9 | 36.5 |
| FOSSIL CREEK RESERVOIR | 9.3 | 10.1 | 7.7 | 11.1 |
| GROSS RESERVOIR | 13.9 | 11.9 | 12.8 | 29.8 |
| HALLIGAN RESERVOIR | 5.1 | 6.1 | 4.8 | 6.4 |
| HORSECREEK RESERVOIR | 9.2 | 1.2 | 11.7 | 14.7 |
| HORSETOOTH RESERVOIR | 142.4 | 93.3 | 104.8 | 149.7 |
| JACKSON LAKE RESERVOIR | 22.2 | 24.0 | 24.2 | 26.1 |
| JULESBURG RESERVOIR | 17.4 | 15.8 | 16.9 | 20.5 |
| LAKE LOVELAND RESERVOIR | 2.8 | 0.0 | 6.8 | 10.3 |
| LONE TREE RESERVOIR | 7.1 | 7.1 | 6.8 | 8.7 |
| MARIANO RESERVOIR | 0.2 | 2.0 | 3.2 | 5.4 |
| MARSHALL RESERVOIR | 6.3 | 5.8 | 5.9 | 10.0 |
| MARSTON RESERVOIR | 8.6 | 7.7 | 5.7 | 13.0 |
| MILTON RESERVOIR | 18.2 | 21.6 | 17.0 | 23.5 |
| POINT OF ROCKS RESERVOIR | 73.3 | 68.6 | 59.2 | 70.6 |
| PREWITT RESERVOIR | 26.3 | 21.0 | 17.7 | 28.2 |
| RIVERSIDE RESERVOIR | 52.1 | 52.3 | 43.5 | 55.8 |
| SPINNEY MOUNTAIN RESERVOIR | 36.1 | 30.2 | 28.1 | 49.0 |
| STANDLEY RESERVOIR | 38.3 | 28.0 | 35.7 | 42.0 |
| TERRY RESERVOIR | 5.3 | 5.5 | 5.0 | 8.0 |
| UNION RESERVOIR | 9.7 | 9.8 | 10.2 | 13.0 |
| WINDSOR RESERVOIR | 10.2 | 8.4 | 8.9 | 15.2 |
| **BASINWIDE** | 897.2 | 818.5 | 802.9 | 1079.5 |
| Number of Reservoirs | 32 | 32 | 32 | 32 |


SOUTH PLATTE RIVER BASIN
Water Supply Forecasts
March 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
13 17 19 22 25
15
Apr-Sep
16 20 23 26 30
18
South Platte R ab Spinney Res
Apr-Jul
46 57 64 71 82
48
Apr-Sep
58 71 80 89 102
61
South Platte R nr Lake George
Apr-Jul
46 58 65 73 84
50
Apr-Sep
59 73 83 92 107
64
South Platte R bl Cheesman Lk
Apr-Jul
91 111 124 138 158
100
Apr-Sep
115 140 158 175 200
126
South Platte R at South Platte
Apr-Jul
127 168 196 225 265
180
Apr-Sep
158 210 240 275 325
225
Clear Ck at Golden
Apr-Jul
89 105 116 128 144
105
Apr-Sep
102 125 141 156 179
128
60% 70% 80% 90% 100% 110% 120% 130% 140% 150% 160% 170% 180%
Percent of Average (30 Yr Period)
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
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When selected, the following historic streamflow values and statistics will be shown.
Period of Record Minimum Streamflow KAF (Year)
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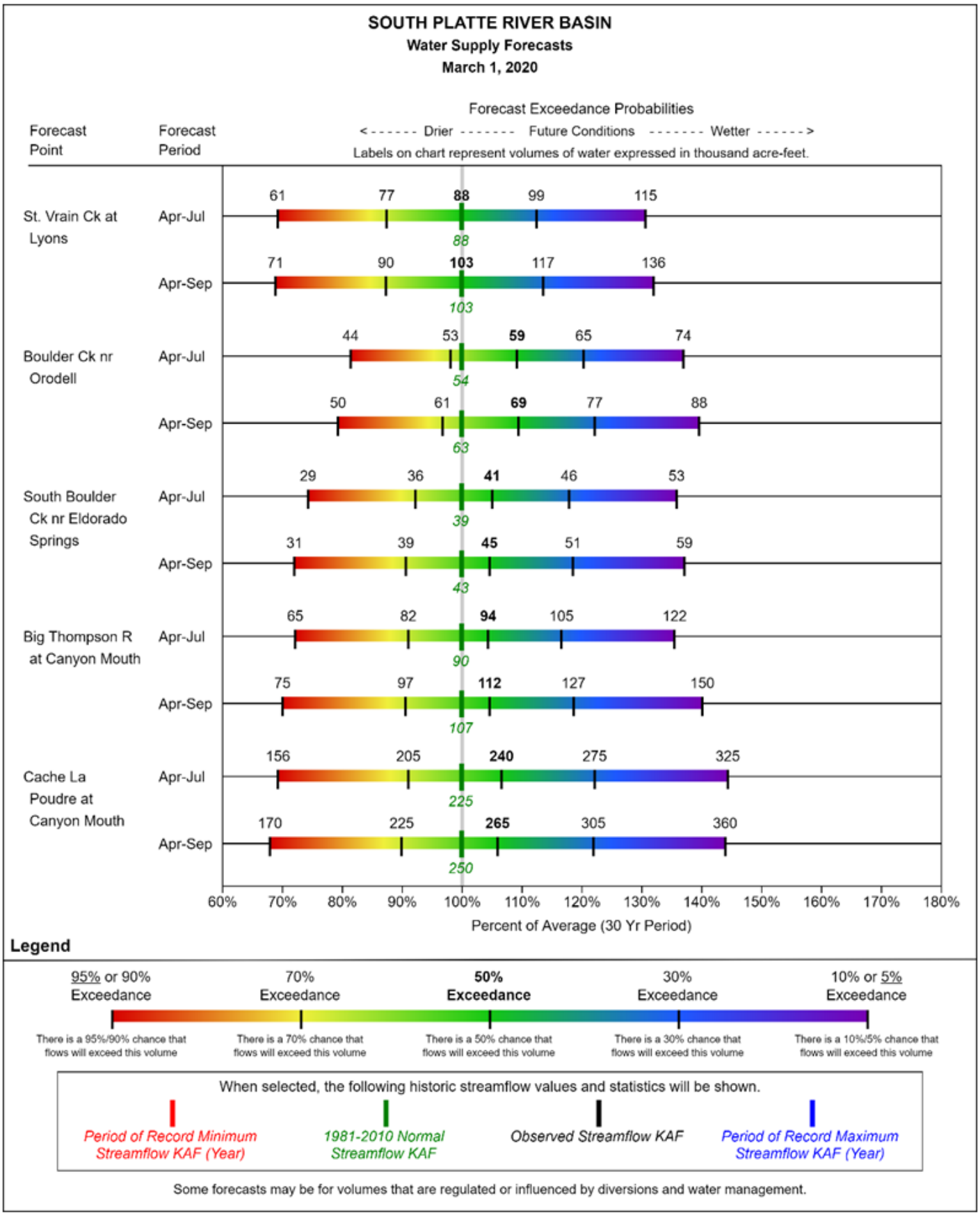
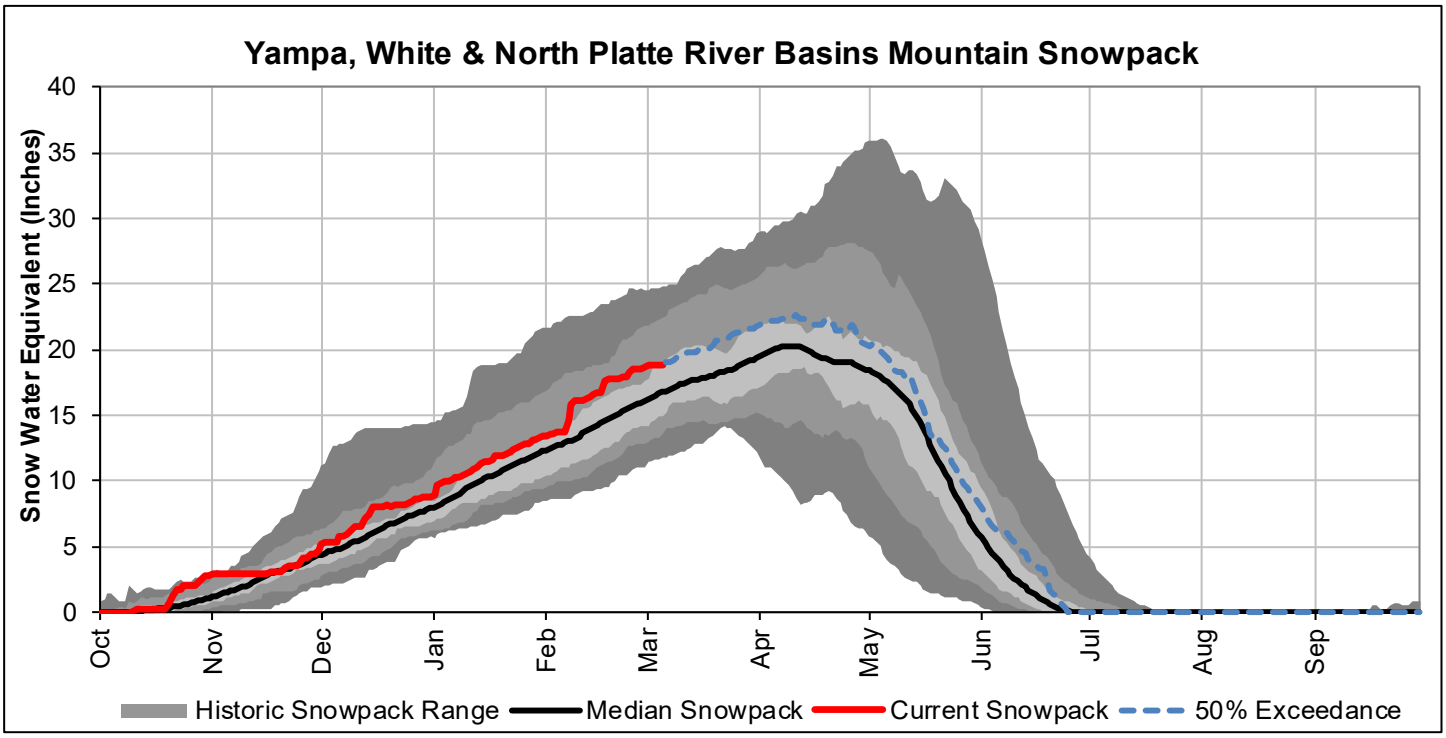
Observed Streamflow KAF
Period of Record Maximum Streamflow KAF (Year)
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.


SOUTH PLATTE RIVER BASIN
Water Supply Forecasts
March 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
St. Vrain Ck at Lyons
Apr-Jul
61 77 88 99 115
88
Apr-Sep
71 90 103 117 136
103
Boulder Ck nr Orodell
Apr-Jul
44 53 59 65 74
54
Apr-Sep
50 61 69 77 88
63
South Boulder Ck nr Eldorado Springs
Apr-Jul
29 36 41 46 53
39
Apr-Sep
31 39 45 51 59
43
Big Thompson R at Canyon Mouth
Apr-Jul
65 82 94 105 122
90
Apr-Sep
75 97 112 127 150
107
Cache La Poudre at Canyon Mouth
Apr-Jul
156 205 240 275 325
225
Apr-Sep
170 225 265 305 360
250
60% 70% 80% 90% 100% 110% 120% 130% 140% 150% 160% 170% 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
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.

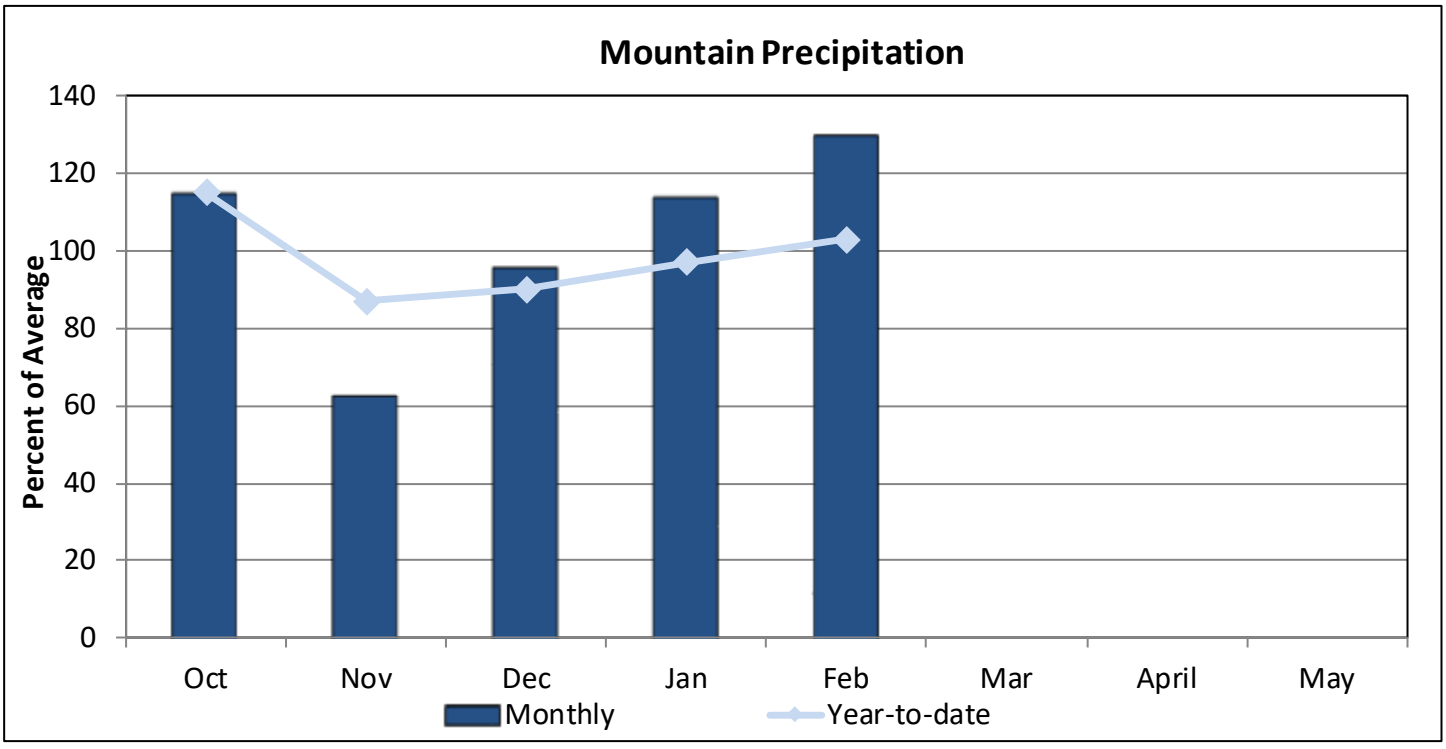
# YAMPA, WHITE, NORTH PLATTE, AND LARAMIE RIVER BASINS

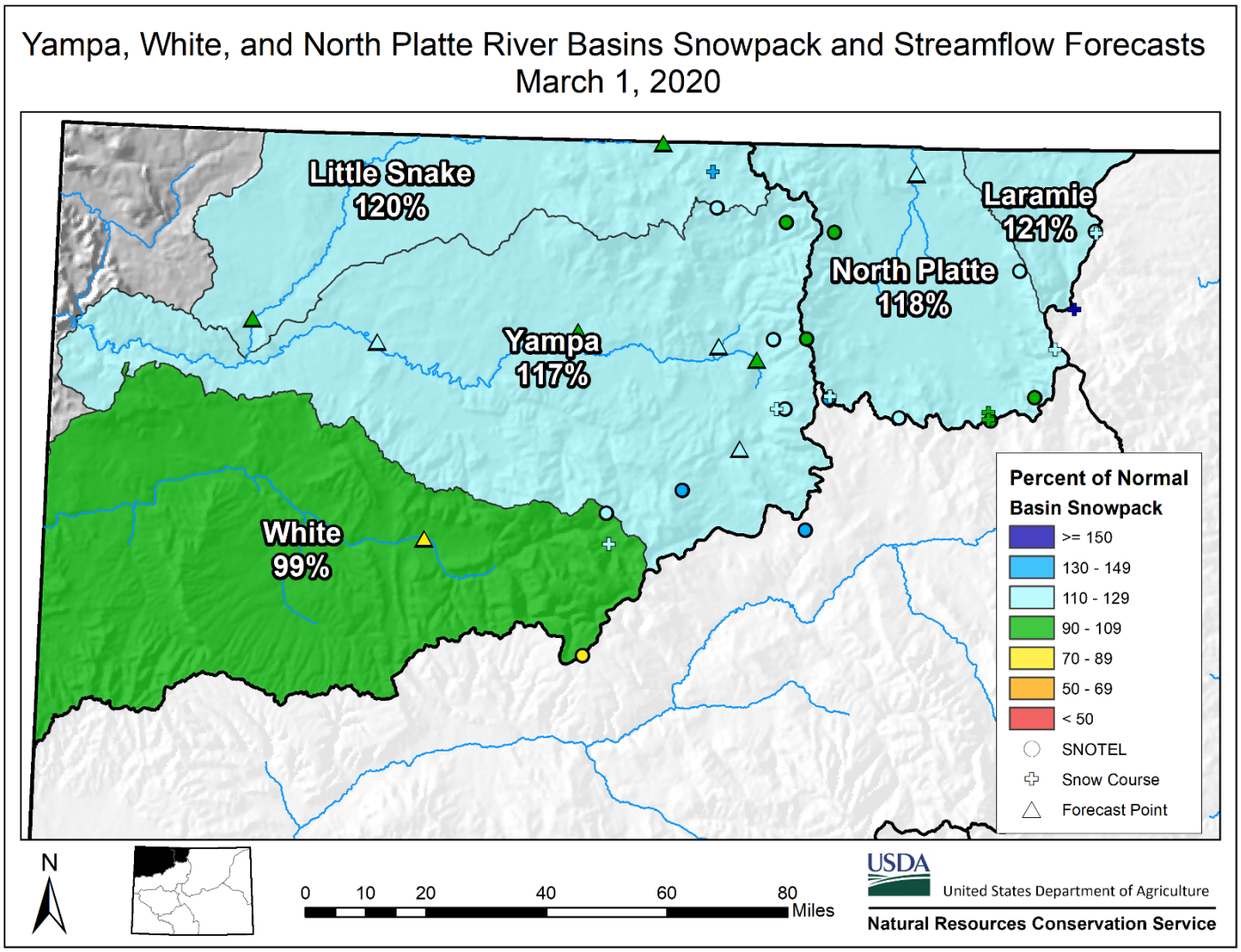
March 1, 2020

Snowpack in the Yampa, White & North Platte basins is above normal at 116% of the median. Precipitation for February was 130% of average and water year-to-date precipitation is 103% of average. Reservoir storage at the end of February was 123% of average compared to 107% last year. Current streamflow forecasts range from 82% of average for White River near Meeker to 116% for the Elk River near Milner.




*SWE values calculated using daily SNOTEL data only

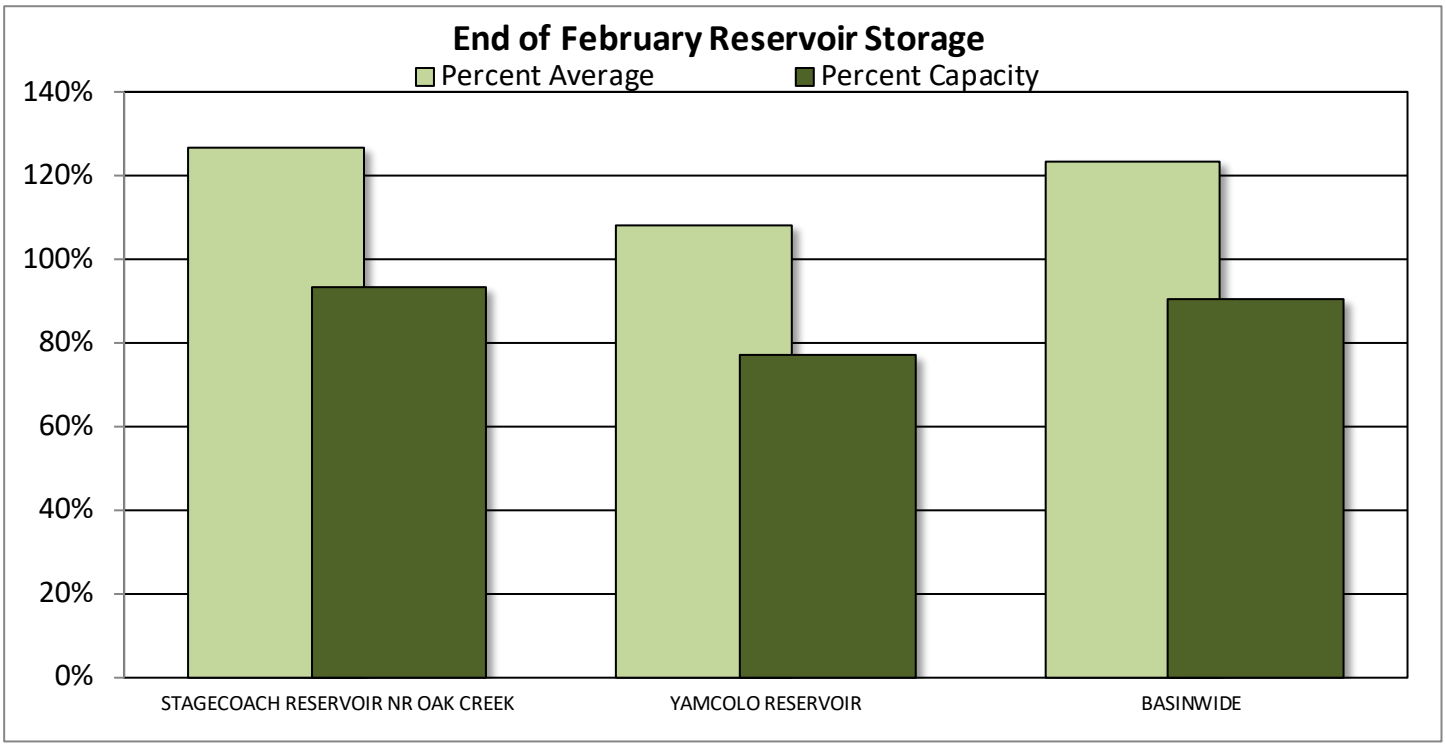





**Watershed Snowpack Analysis March 1st, 2020**

| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Laramie | 4 | 121 | 106 |
| North Platte | 12 | 118 | 106 |
| Total Laramie & North Platte | 16 | 118 | 106 |
| Elk | 2 | 102 | 91 |
| Yampa | 11 | 117 | 106 |
| White | 4 | 99 | 120 |
| Total Yampa & White | 14 | 113 | 108 |
| Little Snake | 9 | 120 | 107 |
| **Basin-Wide Total** | 35 | 116 | 107 |

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



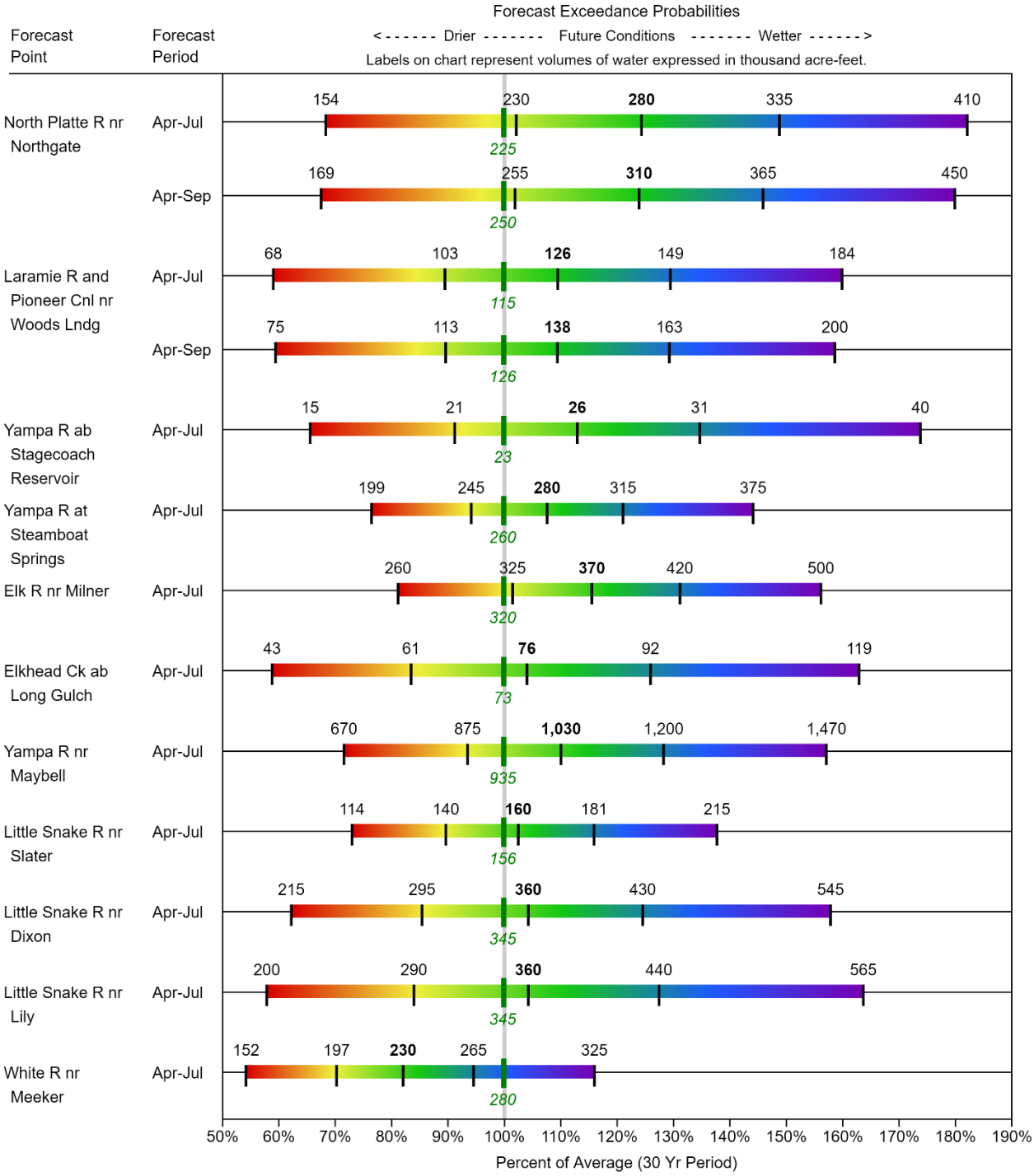

**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| STAGECOACH RESERVOIR NR OAK C | 34.1 | 31.2 | 26.9 | 36.5 |
| YAMCOLO RESERVOIR | 6.7 | 4.3 | 6.2 | 8.7 |
| **BASINWIDE** | 40.8 | 35.5 | 33.1 | 45.2 |
| Number of Reservoirs | 2 | 2 | 2 | 2 |

# YAMPA-WHITE-NORTH PLATTE RIVER BASINS

**Water Supply Forecasts**

**March 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.

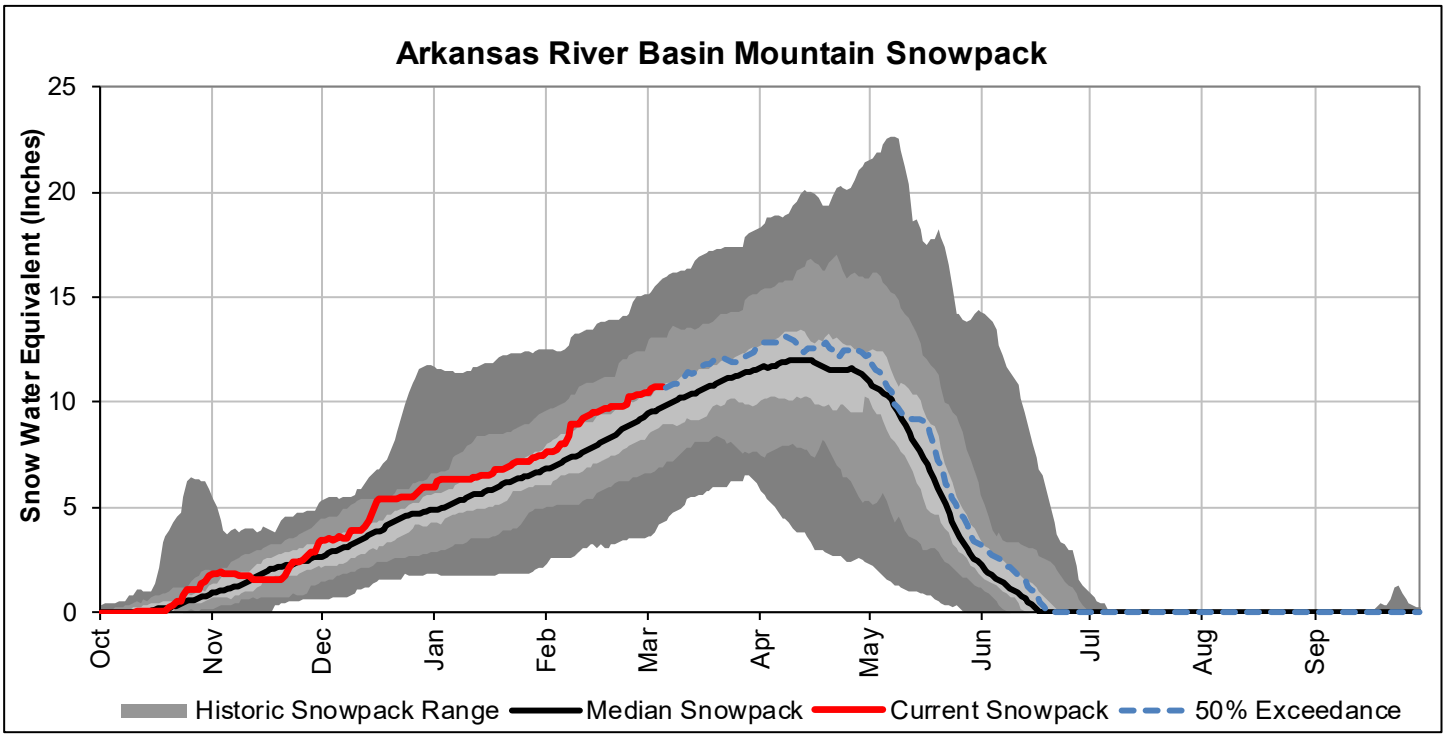
| *Period of Record Minimum Streamflow KAF (Year)* | *1981-2010 Normal Streamflow KAF* | *Observed Streamflow KAF* | *Period of Record Maximum Streamflow KAF (Year)* |
|---|---|---|---|

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

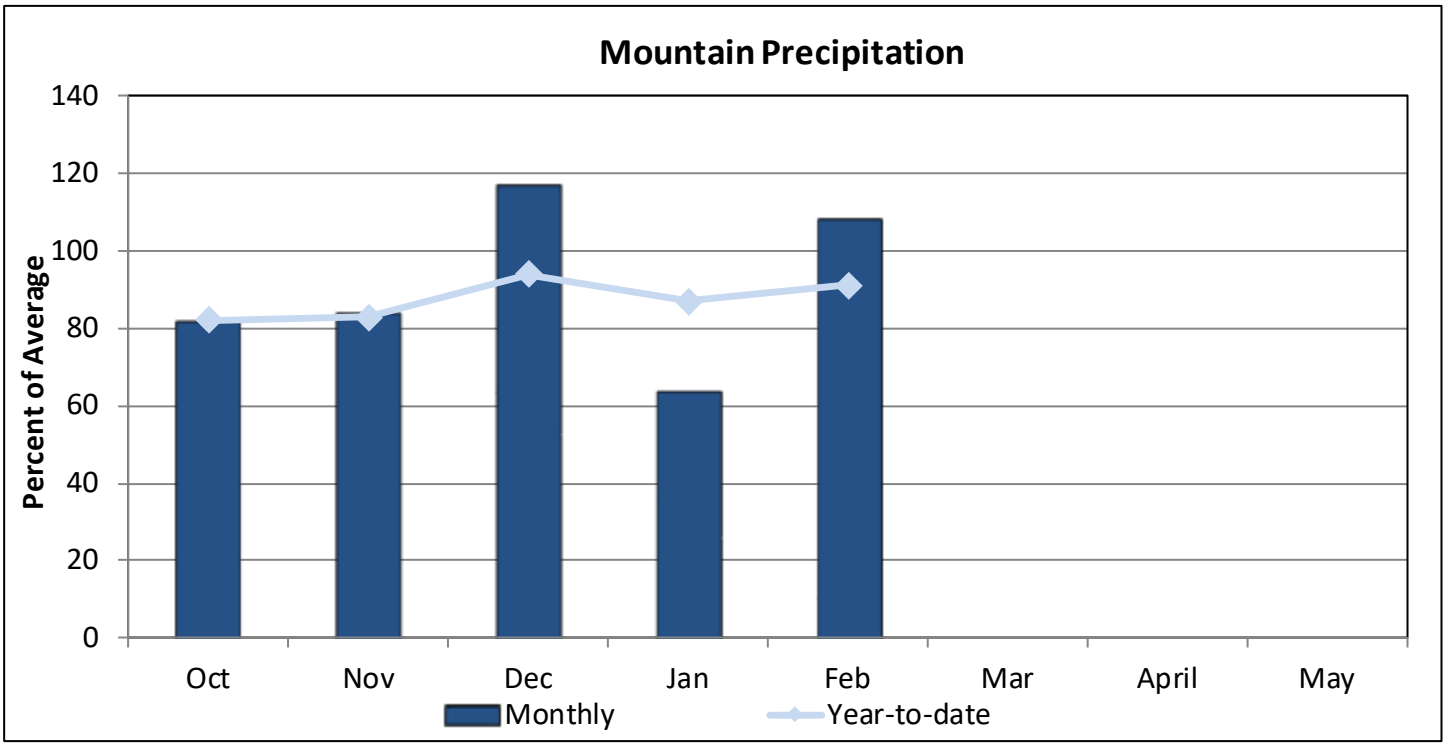
# ARKANSAS RIVER BASIN

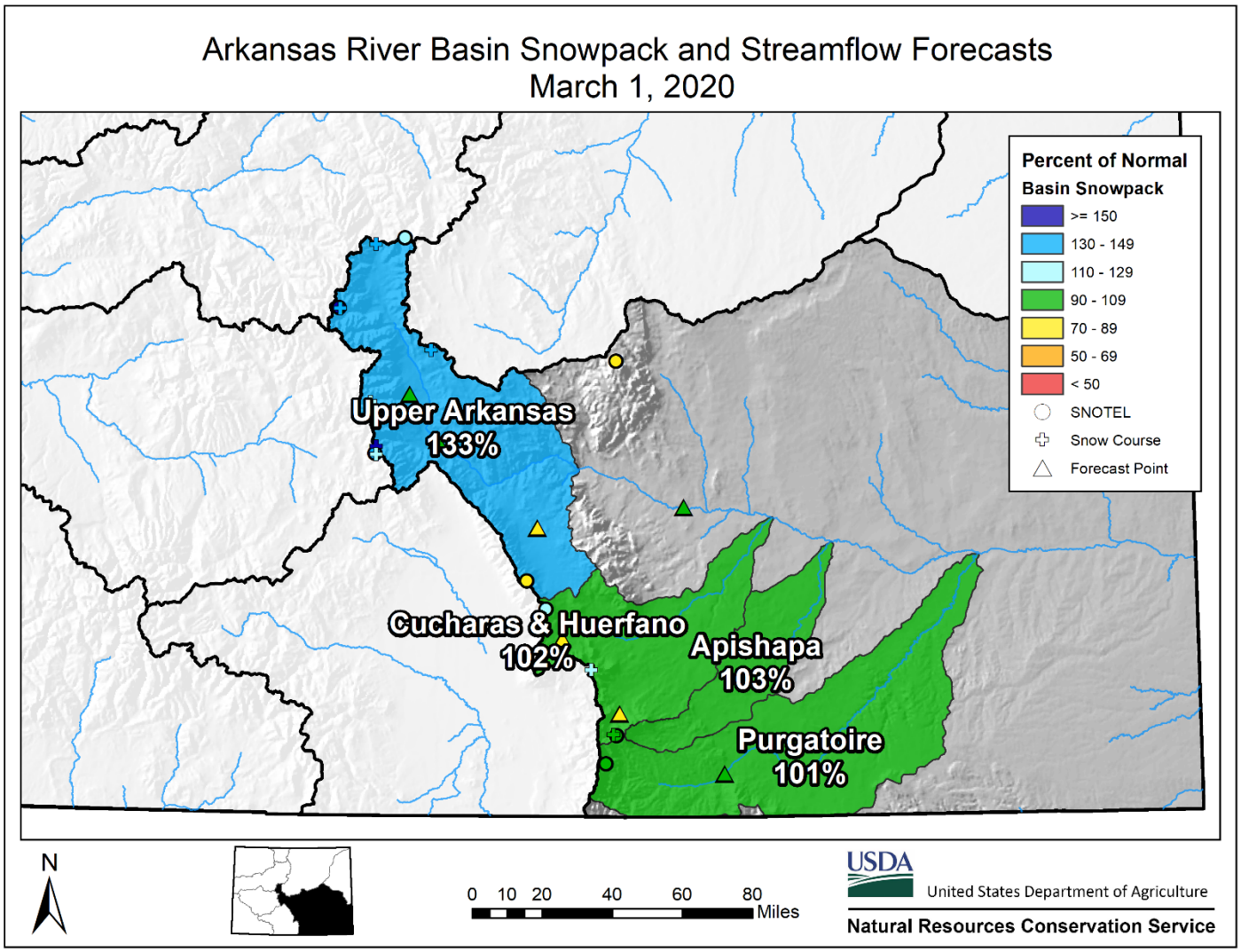
March 1, 2020

Snowpack in the Arkansas River basin is above normal at 120% of the median. Precipitation for February was 108% of average which brings water year-to-date precipitation to 91% of average. Reservoir storage at the end of February was 94% of average compared to 88% last year. Current streamflow forecasts range from 82% of average for Grape Creek near Westcliffe to 104% for the Arkansas River at Salida.




*SWE values calculated using daily SNOTEL data only

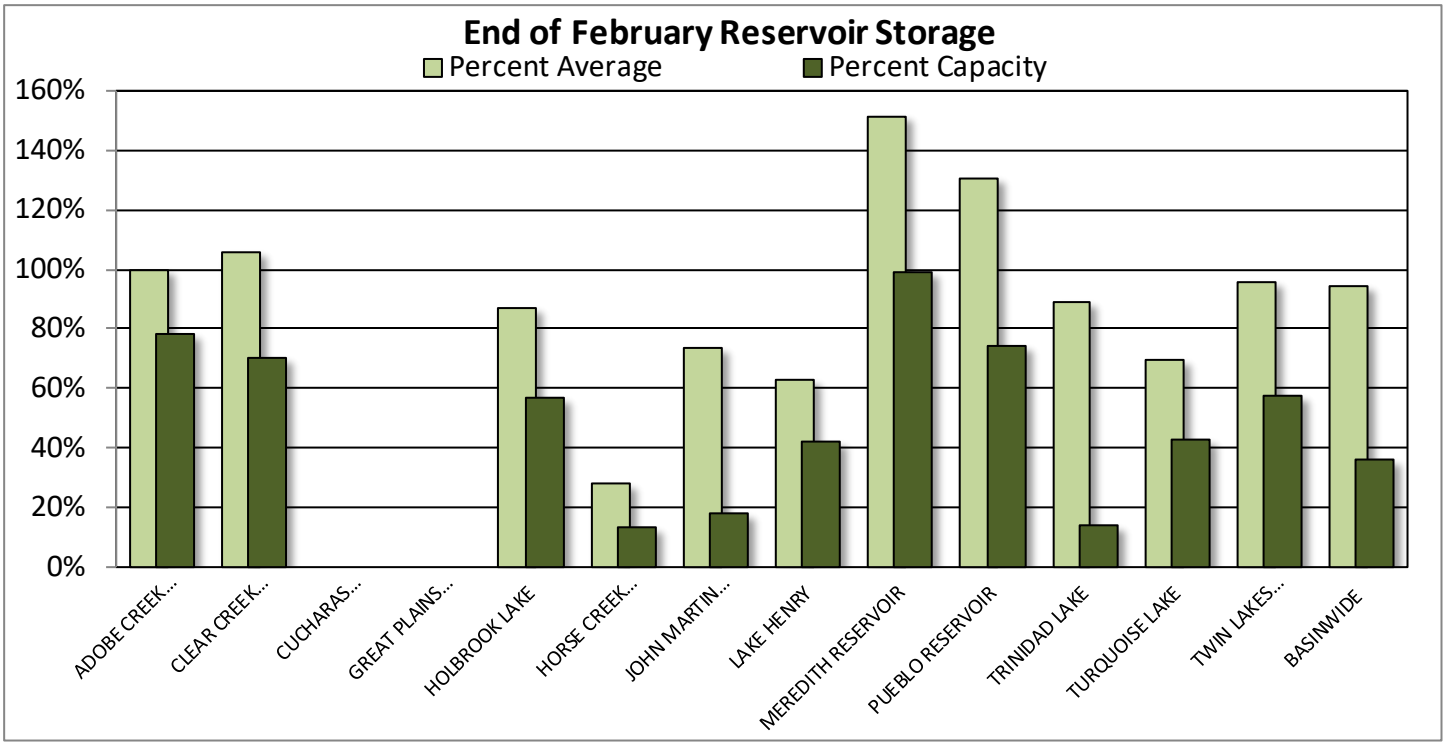





**Watershed Snowpack Analysis March 1st, 2020**

| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Upper Arkansas | 9 | 133 | 128 |
| Cucharas & Huerfano | 5 | 102 | 124 |
| Purgatoire | 2 | 101 | 139 |
| **Basin-Wide Total** | 16 | 120 | 124 |

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



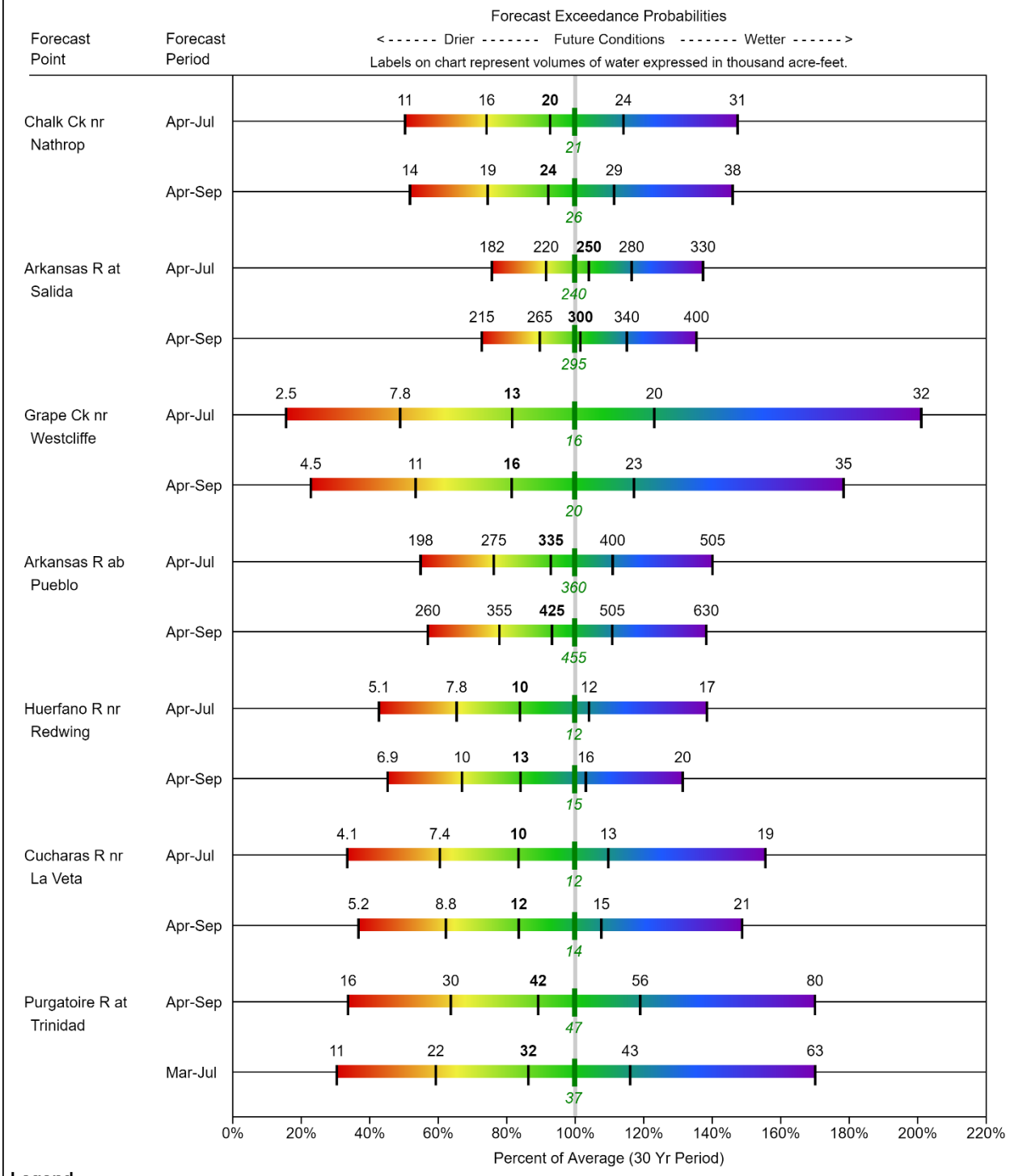

**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| ADOBE CREEK RESERVOIR | 48.6 | 9.0 | 48.9 | 62.0 |
| CLEAR CREEK RESERVOIR | 8.0 | 7.4 | 7.6 | 11.4 |
| CUCHARAS RESERVOIR | | | | 40.0 |
| GREAT PLAINS RESERVOIR | | | | 150.0 |
| HOLBROOK LAKE | 4.0 | 0.3 | 4.6 | 7.0 |
| HORSE CREEK RESERVOIR | 3.6 | 21.7 | 12.7 | 27.0 |
| JOHN MARTIN RESERVOIR | 109.1 | 163.8 | 148.2 | 616.0 |
| LAKE HENRY | 3.9 | 7.3 | 6.2 | 9.4 |
| MEREDITH RESERVOIR | 41.5 | 33.5 | 27.4 | 42.0 |
| PUEBLO RESERVOIR | 262.2 | 215.5 | 200.6 | 354.0 |
| TRINIDAD LAKE | 23.8 | 21.8 | 26.8 | 167.0 |
| TURQUOISE LAKE | 54.7 | 50.6 | 78.5 | 127.0 |
| TWIN LAKES RESERVOIR | 49.7 | 41.1 | 51.8 | 86.0 |
| **BASINWIDE** | 609.1 | 572.1 | 613.3 | 1698.8 |
| Number of Reservoirs | 11 | 11 | 11 | 13 |

# ARKANSAS RIVER BASIN

**Water Supply Forecasts**

**March 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.

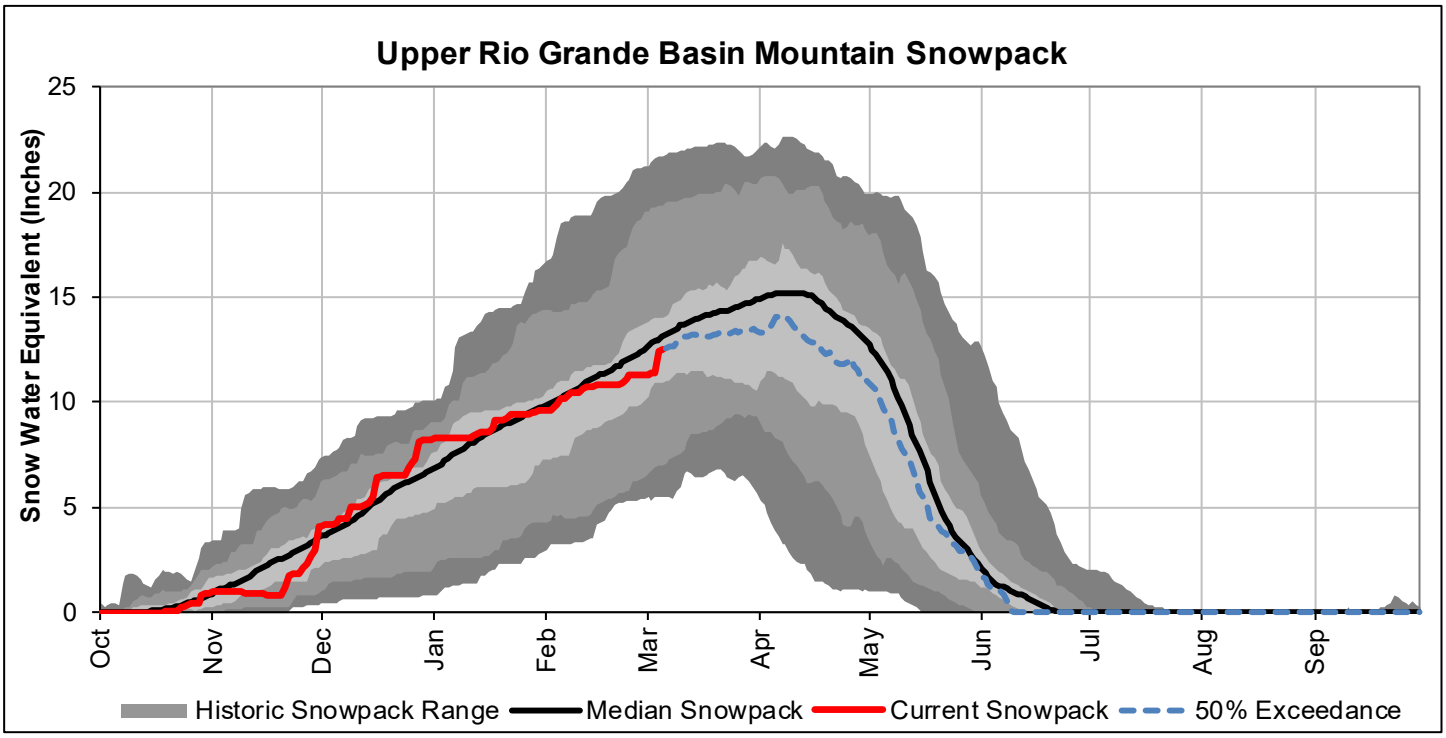
| *Period of Record Minimum Streamflow KAF (Year)* | *1981-2010 Normal Streamflow KAF* | *Observed Streamflow KAF* | *Period of Record Maximum Streamflow KAF (Year)* |
|---|---|---|---|

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

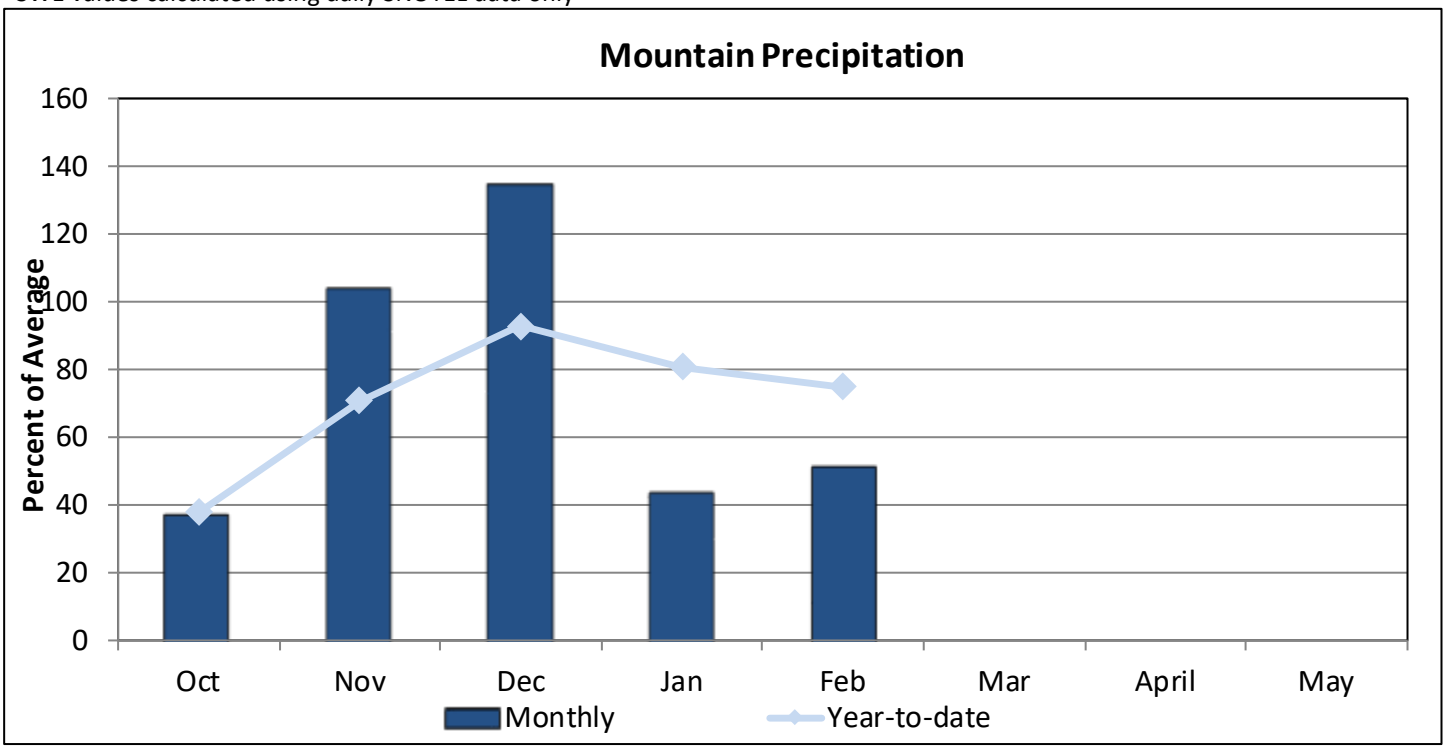
# UPPER RIO GRANDE RIVER BASIN

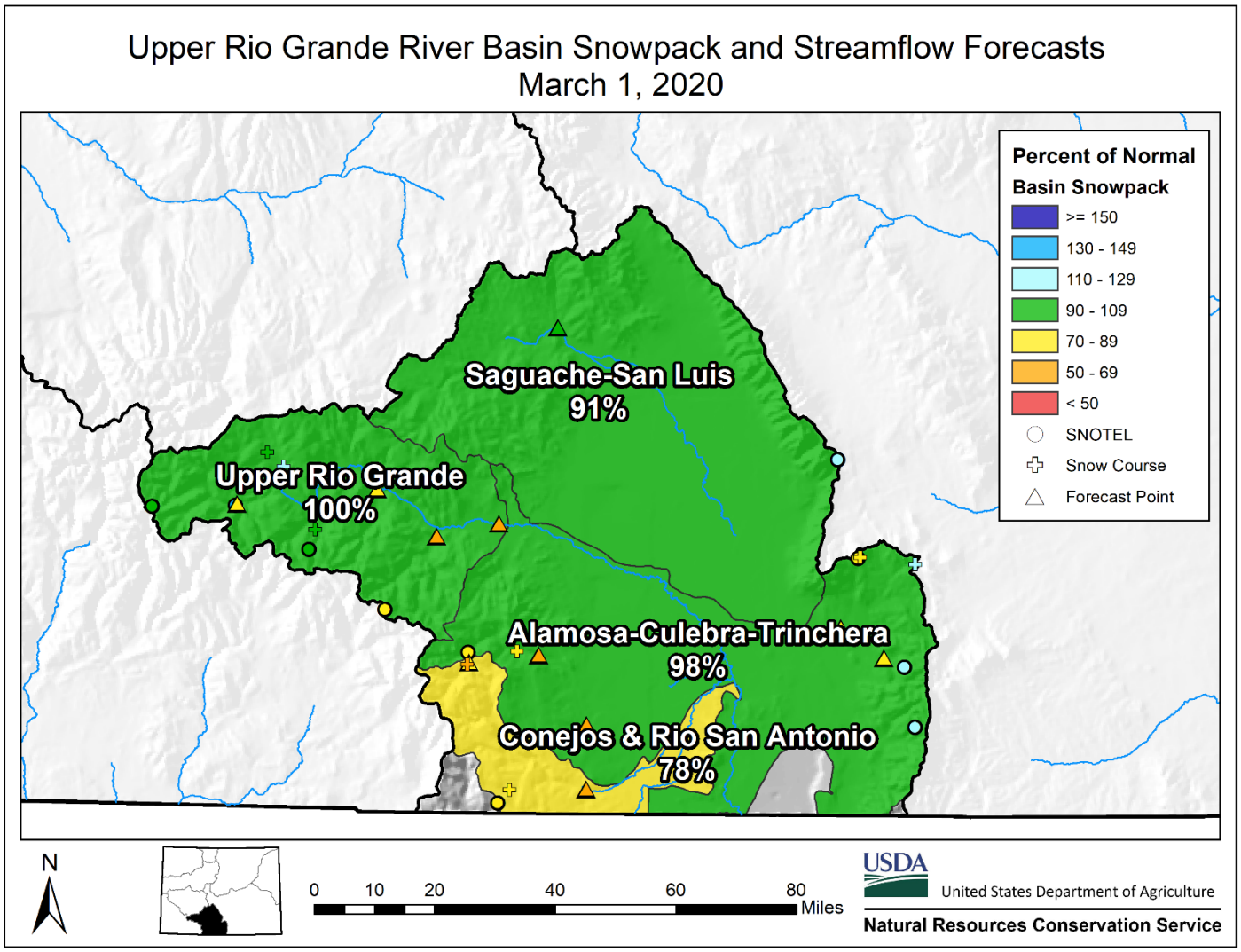
March 1, 2020

Snowpack in the Upper Rio Grande River basin is slightly below normal at 94% of median. Precipitation for February was 52% of average which brings water year-to-date precipitation to 75% of average. Reservoir storage at the end of February was 84% of average compared to 78% last year. Current streamflow forecasts range from 57% of average for La Jara Creek near Capulin to 94% for Saguache Creek near Saguache.




*SWE values calculated using daily SNOTEL data only

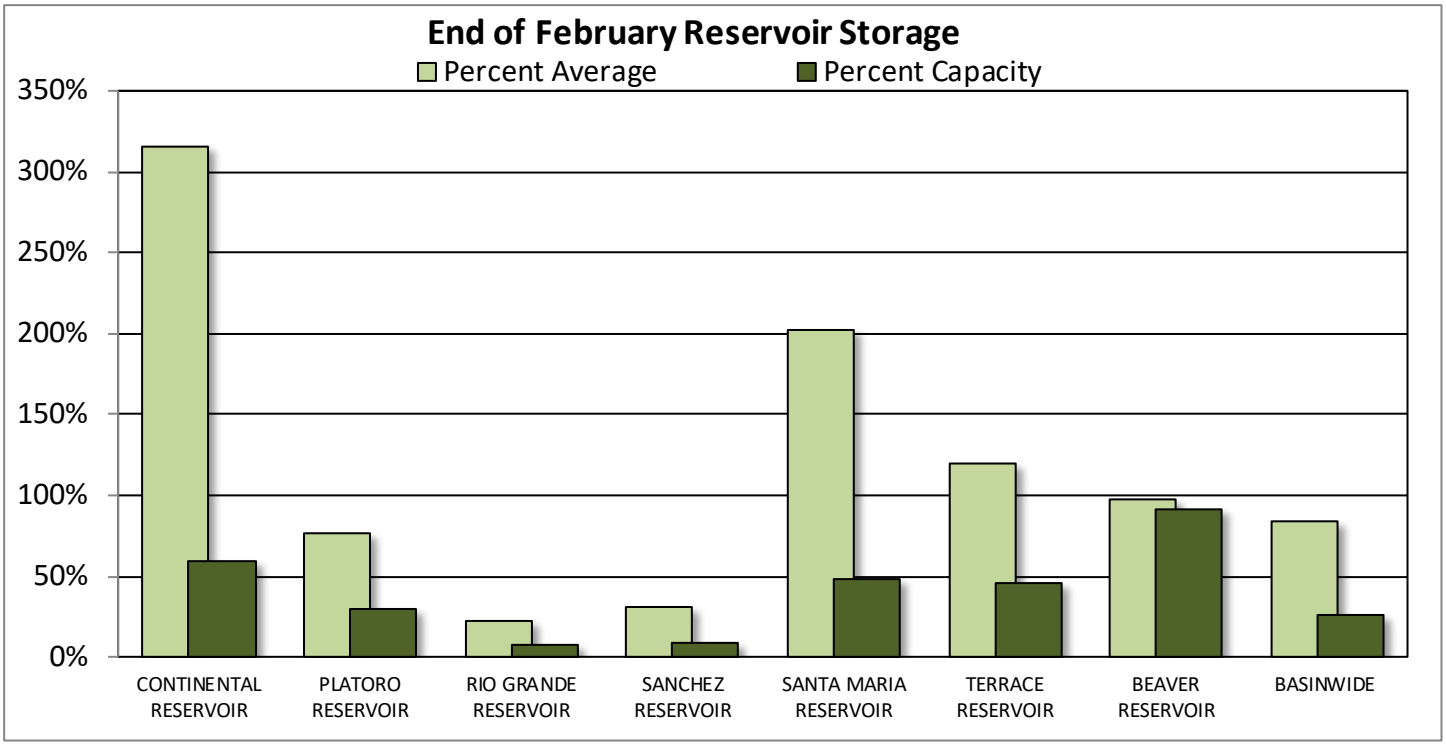





**Watershed Snowpack Analysis March 1st, 2020**

| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Alamosa Creek | 3 | 73 | 102 |
| Conejos & Rio San Antonio | 4 | 78 | 104 |
| Culebra & Trinchera Creek | 5 | 102 | 87 |
| Upper Rio Grande | 9 | 100 | 125 |
| **Basin-Wide Total** | 20 | 94 | 109 |

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



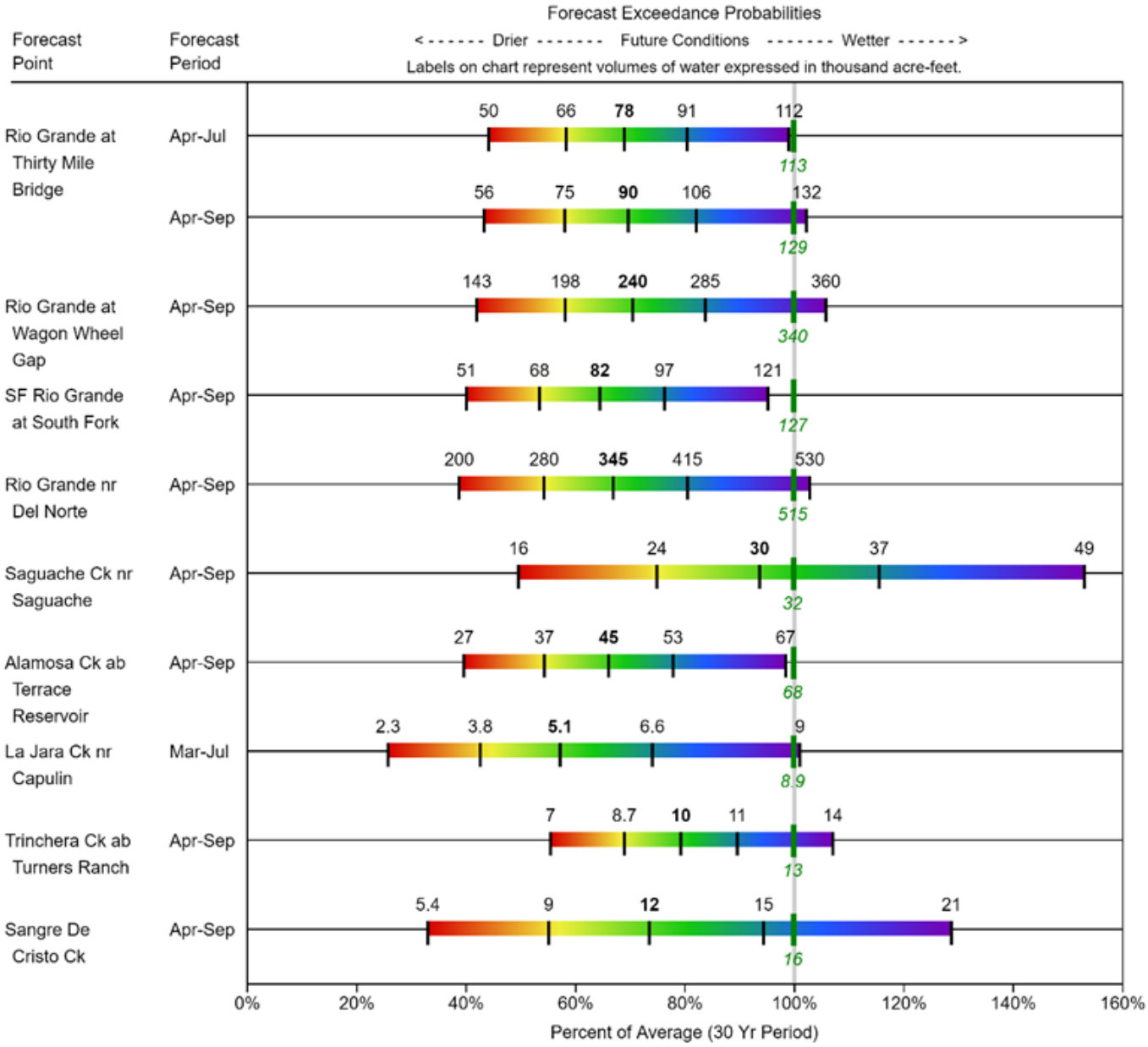

**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| CONTINENTAL RESERVOIR | 16.1 | 15.7 | 5.1 | 27.0 |
| PLATORO RESERVOIR | 18.2 | 19.2 | 23.9 | 60.0 |
| RIO GRANDE RESERVOIR | 4.0 | 0.0 | 17.6 | 51.0 |
| SANCHEZ RESERVOIR | 8.6 | 7.9 | 27.6 | 103.0 |
| SANTA MARIA RESERVOIR | 21.6 | 23.7 | 10.7 | 45.0 |
| TERRACE RESERVOIR | 8.3 | 4.6 | 6.9 | 18.0 |
| BEAVER RESERVOIR | 4.1 | 3.9 | 4.2 | 4.5 |
| **BASINWIDE** | 80.8 | 75.1 | 96.0 | 308.5 |
| Number of Reservoirs | 7 | 7 | 7 | 7 |

# UPPER RIO GRANDE BASIN

**Water Supply Forecasts**

**March 1, 2020**



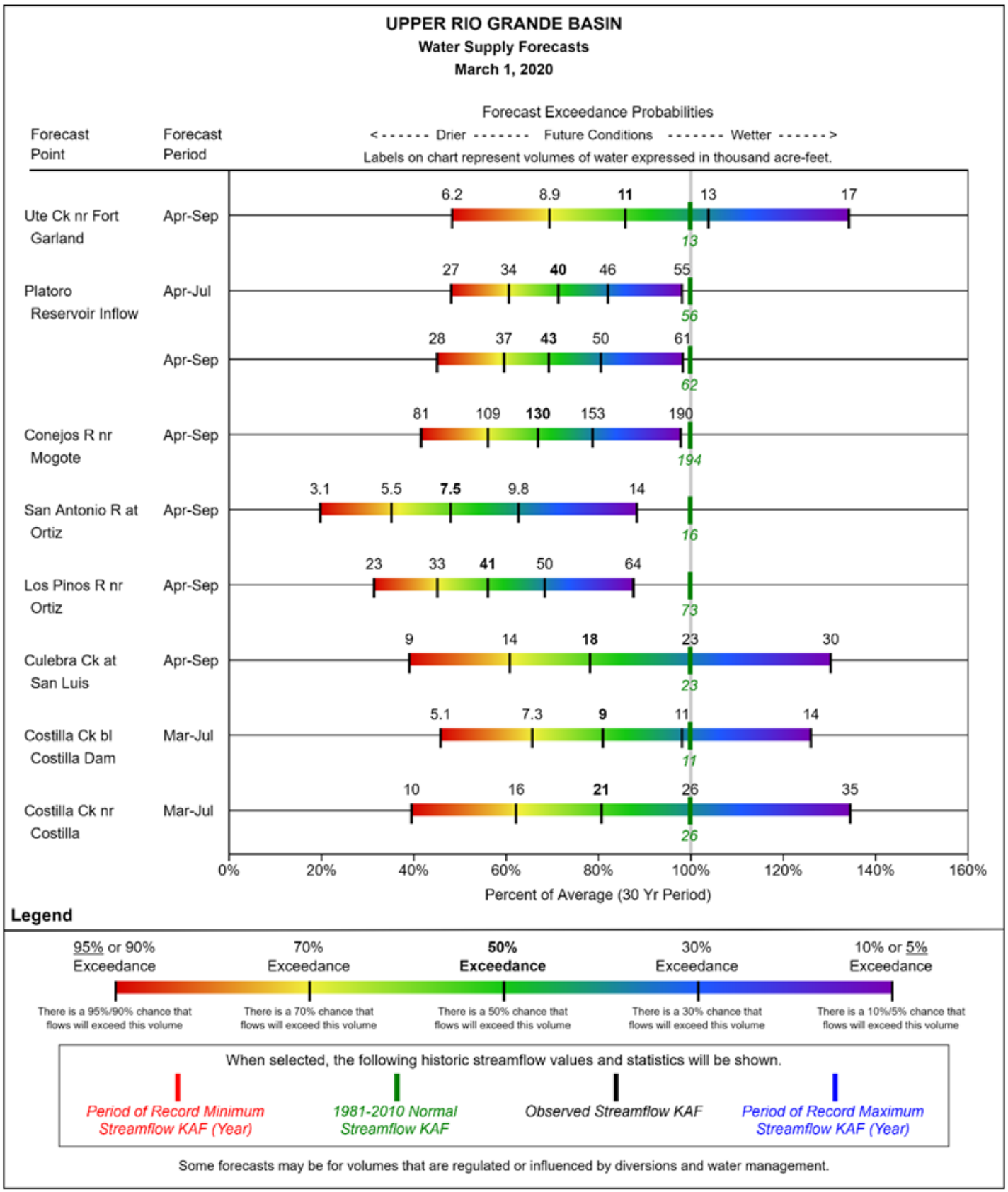

## Legend

| 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)*

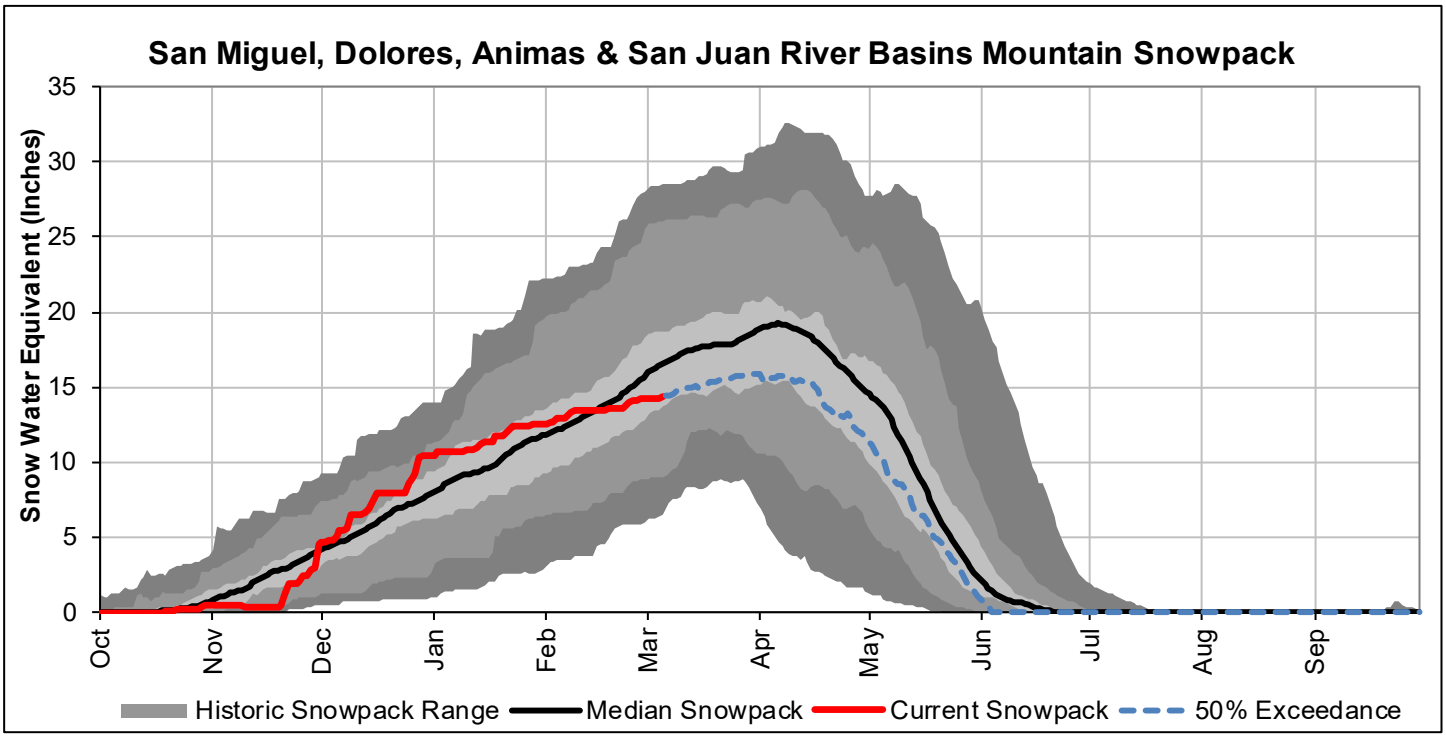
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.


UPPER RIO GRANDE BASIN
Water Supply Forecasts
March 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
Ute Ck nr Fort Garland
Apr-Sep
6.2 8.9 11 13 17
13
Platoro Reservoir Inflow
Apr-Jul
27 34 40 46 55
56
Apr-Sep
28 37 43 50 61
62
Conejos R nr Mogote
Apr-Sep
81 109 130 153 190
194
San Antonio R at Ortiz
Apr-Sep
3.1 5.5 7.5 9.8 14
16
Los Pinos R nr Ortiz
Apr-Sep
23 33 41 50 64
73
Culebra Ck at San Luis
Apr-Sep
9 14 18 23 30
23
Costilla Ck bl Costilla Dam
Mar-Jul
5.1 7.3 9 11 14
11
Costilla Ck nr Costilla
Mar-Jul
10 16 21 26 35
26
0% 20% 40% 60% 80% 100% 120% 140% 160%
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.

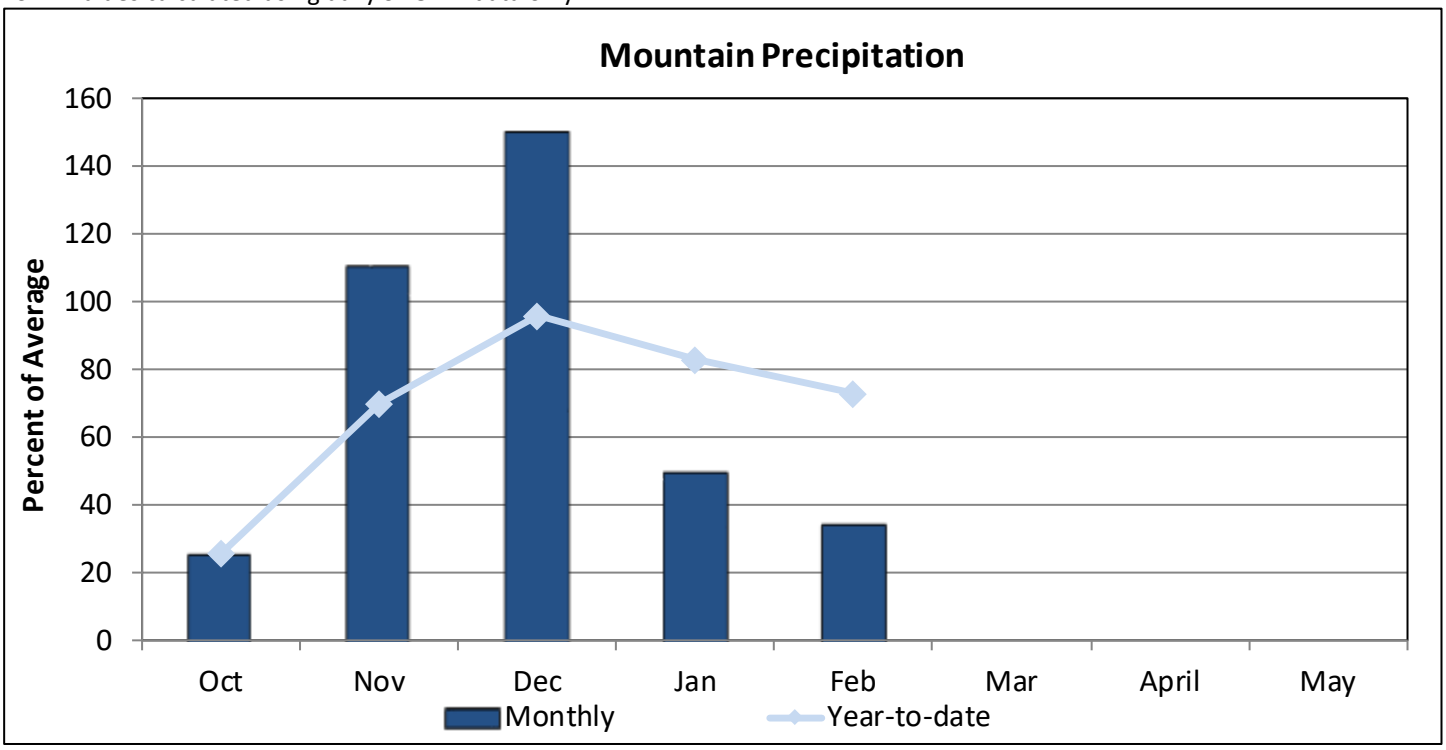
# SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS

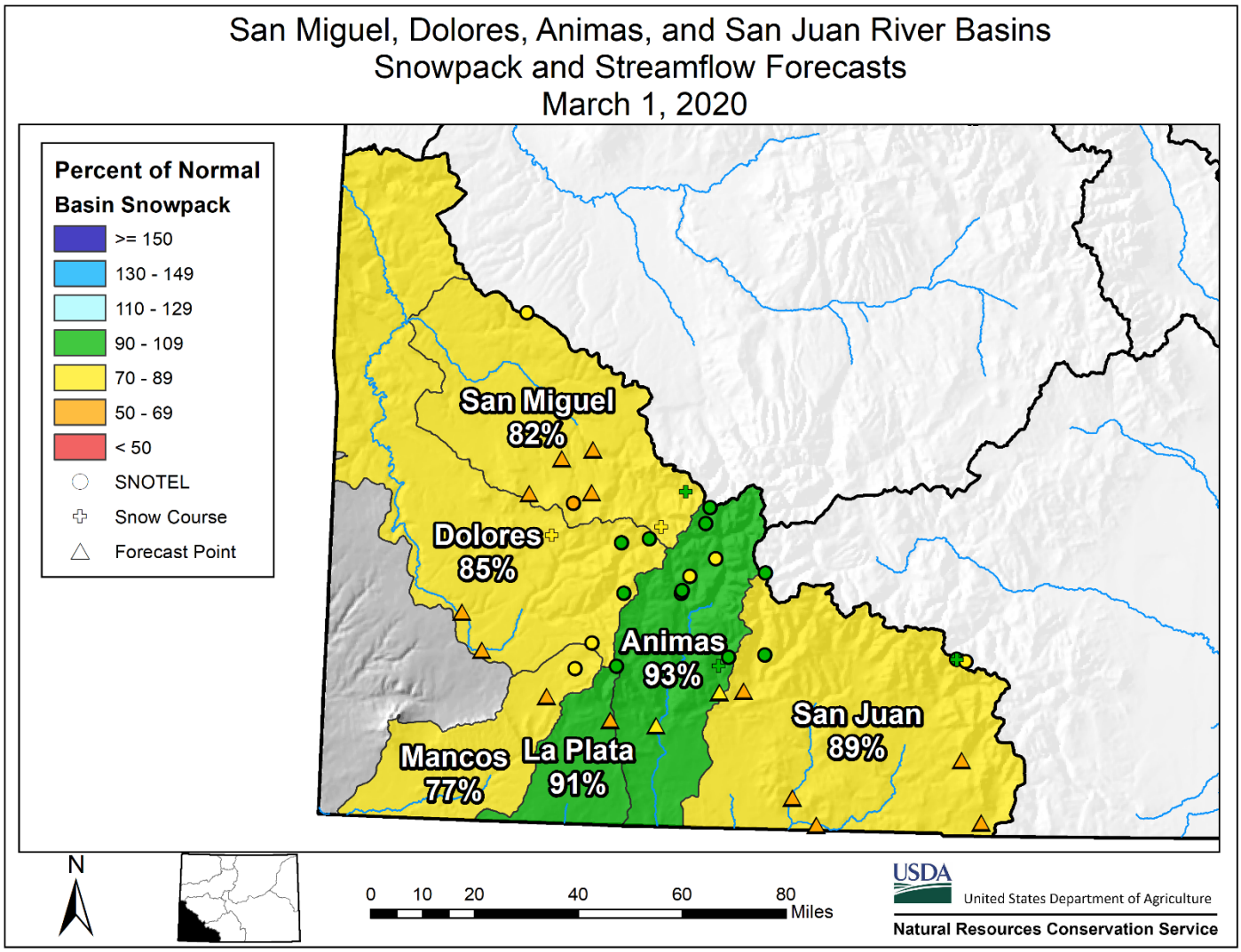
March 1, 2020

Snowpack in the combined southwest river basins is at 89% of median. Precipitation for February was 35% of average which brings water year-to-date precipitation to 73% of average. Reservoir storage at the end of February was 107% of average compared to 58% last year. Current streamflow forecasts range from 58% of average for the Mancos River near Mancos to 71% for the Animas River at Durango.




*SWE values calculated using daily SNOTEL data only

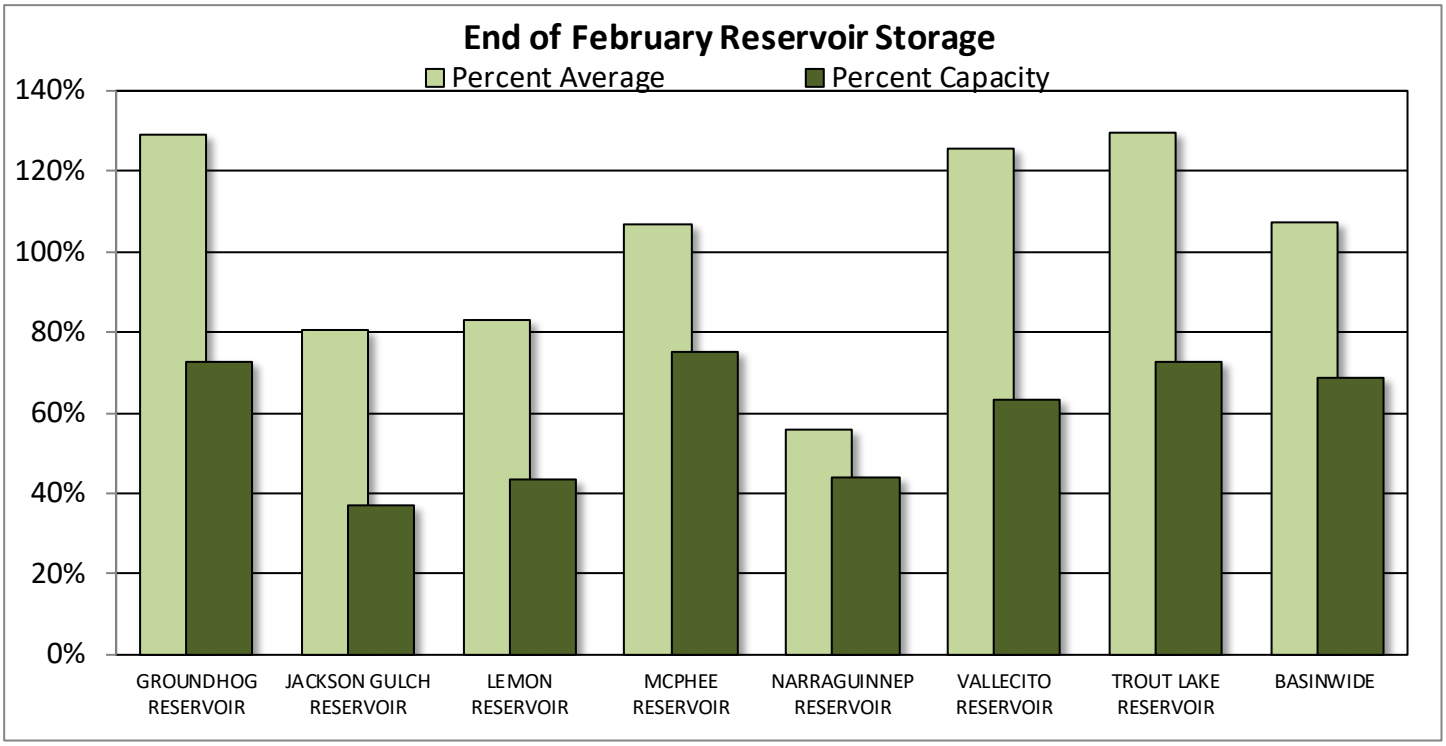





**Watershed Snowpack Analysis March 1st, 2020**

| Sub-Basin | # of Sites | % Median | Last Year % Median |
|---|---|---|---|
| Animas | 10 | 93 | 131 |
| Dolores | 6 | 85 | 120 |
| San Miguel | 5 | 82 | 113 |
| San Juan | 4 | 89 | 114 |
| **Basin-Wide Total** | 24 | 89 | 122 |

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



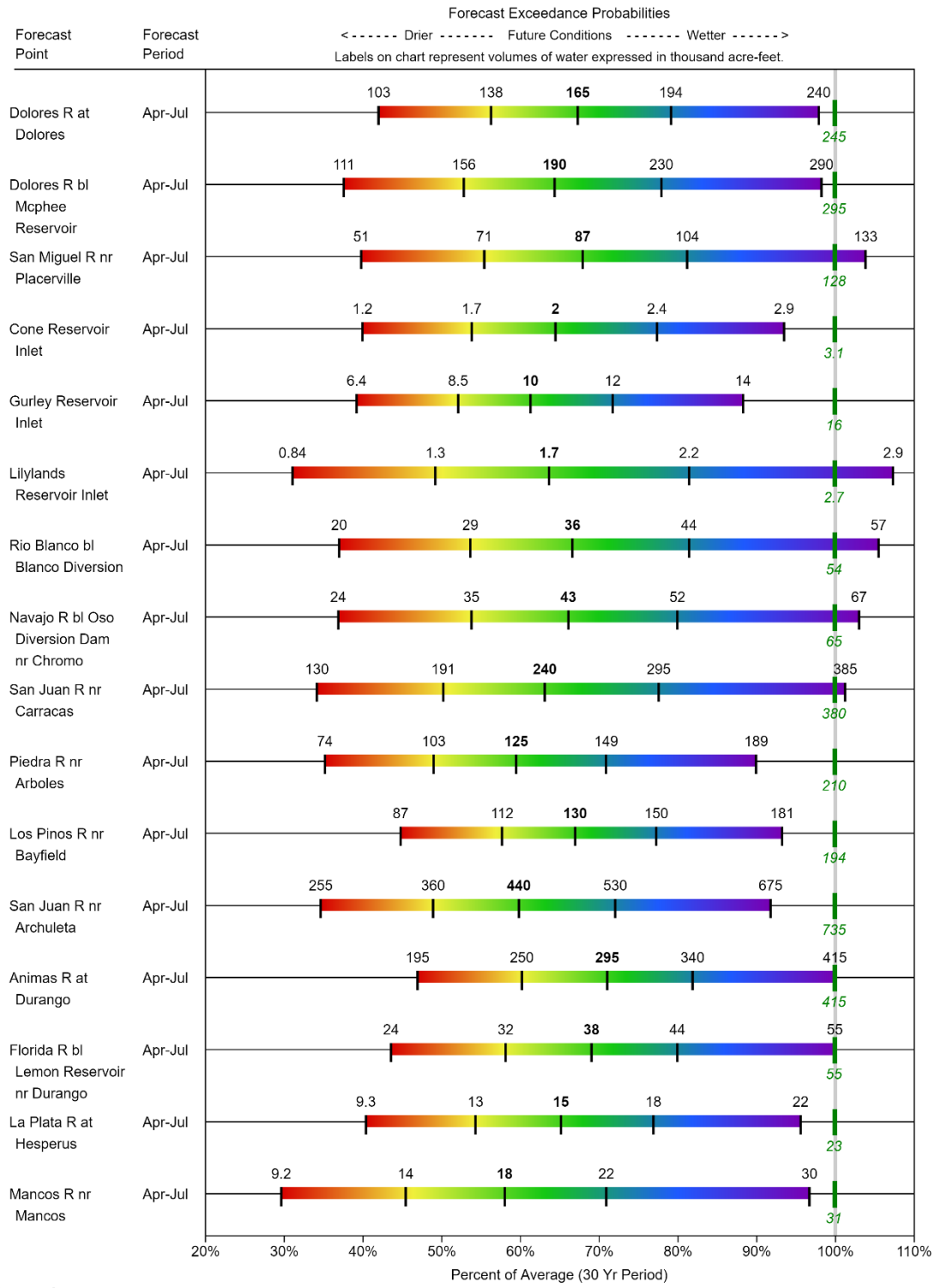

**Reservoir Storage End of February 2020**

| Reservoir | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| GROUNDHOG RESERVOIR | 16.0 | 0.3 | 12.4 | 22.0 |
| JACKSON GULCH RESERVOIR | 3.7 | 1.7 | 4.6 | 10.0 |
| LEMON RESERVOIR | 17.4 | 7.0 | 21.0 | 40.0 |
| MCPHEE RESERVOIR | 286.7 | 167.3 | 268.0 | 381.0 |
| NARRAGUINNEP RESERVOIR | 8.4 | 5.0 | 15.1 | 19.0 |
| VALLECITO RESERVOIR | 79.9 | 40.7 | 63.6 | 126.0 |
| TROUT LAKE RESERVOIR | 2.3 | 2.2 | 1.8 | 3.2 |
| **BASINWIDE** | 414.4 | 224.4 | 386.5 | 601.2 |
| Number of Reservoirs | 7 | 7 | 7 | 7 |

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

**Water Supply Forecasts**

**March 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.

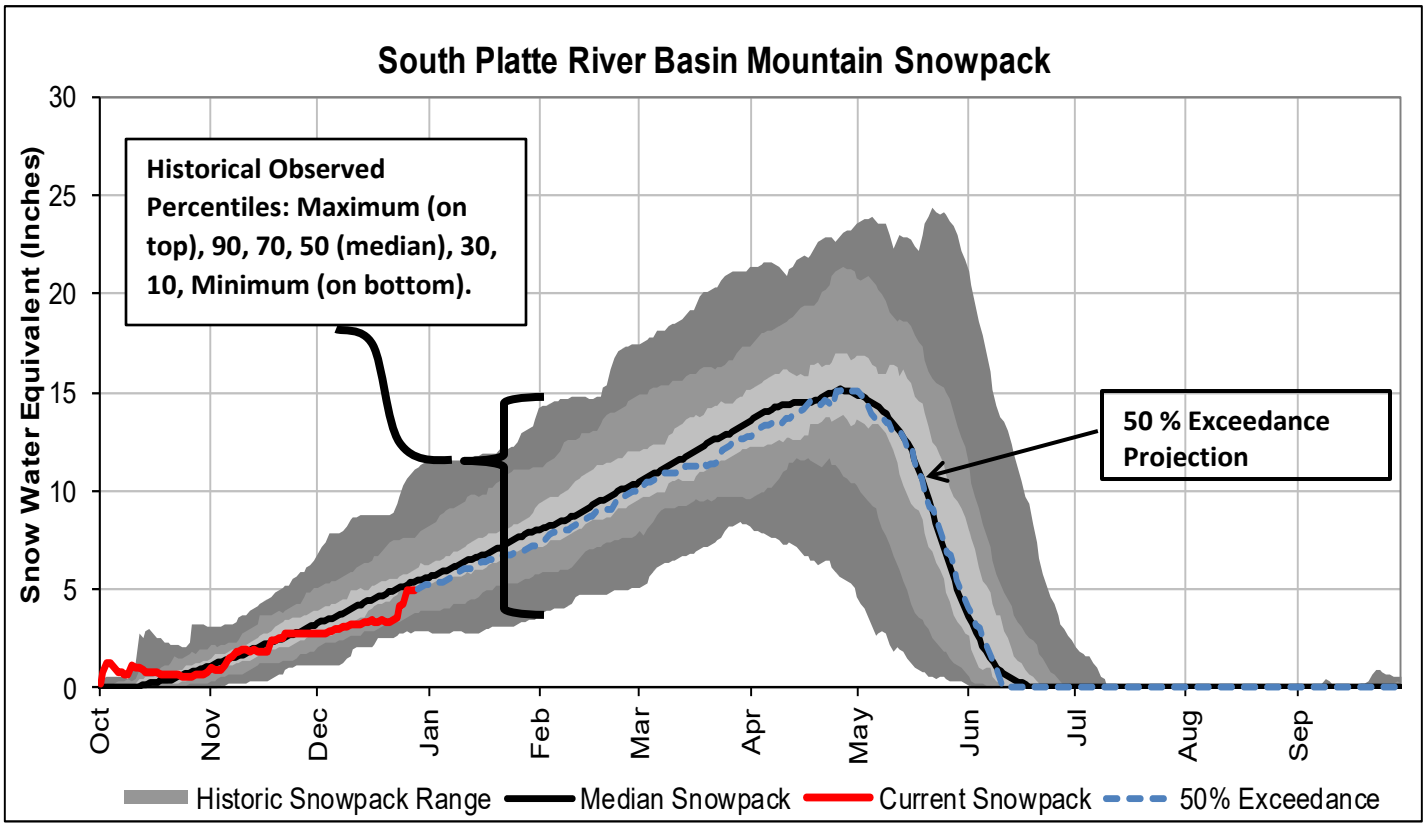
**Current** water year is represented by the heavy red line terminating on the last day the graphic was updated.

**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**
**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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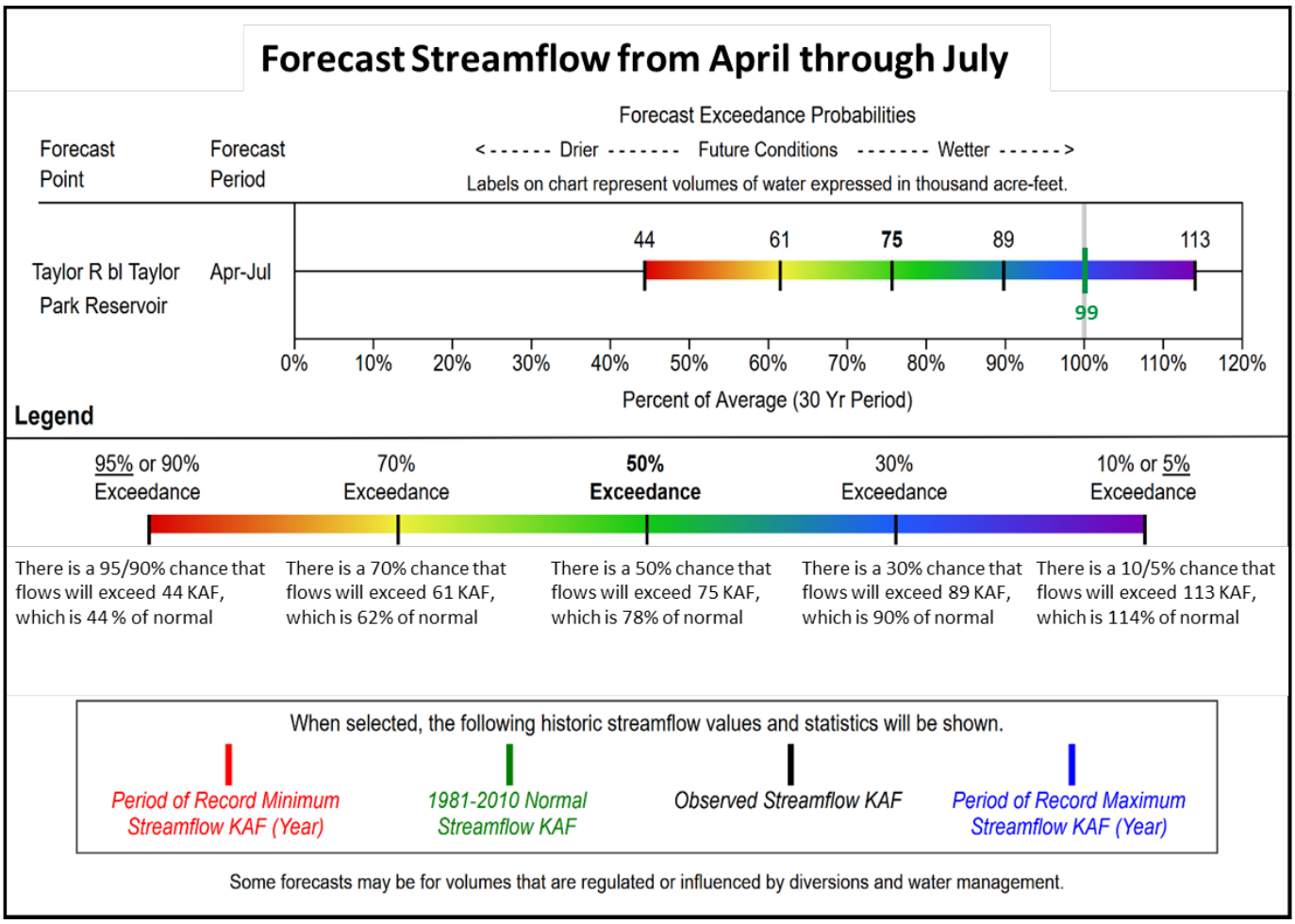
# Interpreting the Forecast Graphics

These graphics provide 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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# Colorado
# Water Supply Outlook Report
**Natural Resources Conservation Service**
**Lakewood, CO**