# COLORADO WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES ROOM 818, 1313 SHERMAN ST., DENVER, CO 80203 303-866-3581; <u>www.water.state.co.us</u>

April 1, 2018

The Surface Water Supply Index (SWSI) is used as an indicator of water supply conditions in the seven major river basins of the state and in each of the 41 smaller watersheds, or HUCs. The Colorado Water Conservation Board (CWCB) completed a major revision to the Colorado Drought Plan in 2010. At that time, Colorado adopted a revised SWSI analysis based on the components shown below, which vary depending on the time of year. The revised SWSI is based on a ranking of total volume in a HUC or major river basin ranked against similar volumes in historical years. For instance, in January, the total volume in a HUC is based on the forecasted runoff at specific locations plus the volume in storage in specific reservoirs, all within the HUC. That total volume is ranked against similar total volumes that occurred each January between 1970 and 2010.

| Time Period            | SWSI Components                                 |
|------------------------|---|
| January 1 - June 1     | Forecasted Runoff + Reservoir Storage           |
| July 1 - September 1   | Previous Month's Streamflow + Reservoir Storage |
| October 1 - December 1 | Reservoir Storage                               |

In 2015, CWCB and the Division of Water Resources (DWR) (both Divisions of the Colorado Department of Natural Resources) completed a software project to implement an automated calculation of the SWSI and to document the underlying hydrologic data. July 1, 2015 was the first month that the automated DNR SWSI was published. The results of each month's analysis are summarized within this report and additional information, maps & data are available at: <u>http://water.state.co.us/DWRDocs/Reports/Pages/SWSIReport.aspx</u>. This report also contains updates about current regional conditions and water matters prepared by each DWR Division Office.

The SWSI calculation for the winter/spring season (January 1 to June 1) is based on reservoir storage at the end of last month, in this case March 31, plus the forecasted streamflow runoff volume for the runoff season (April through September in most basins). The following SWSI values were computed for each of the seven major basins for April 1, 2018. Water supply conditions are well below normal in all but the South Platte and Arkansas River basins. Those two basins have streamflow forecasts well below normal, but the SWSI is moderated by strong reservoir storage volumes. Reservoir storage is near normal to below normal statewide. Each basin has declined since March 1.

| 7 | -0.1                  | -0.3                                       |
|---|-----------------------|--|
| 0 |                       |  |
| 9 | -0.7                  | -2.6                                       |
| 5 | -0.4                  | -5.6                                       |
| 2 | -0.8                  | -4.5                                       |
| 1 | -0.3                  | -4.6                                       |
| 1 | -0.1                  | -0.3                                       |
| 1 | -0.1                  | -1.1                                       |
| , | .5   .2   .1   1   .1 | 5 -0.4   2 -0.8   1 -0.3   1 -0.1   1 -0.1 |

|         |    |          |    | SWSI Scale  |   |              |    |        |
|---------|----|----------|----|-------------|---|--------------|----|--------|
| -4      | -3 | -2       | -1 | 0           | 1 | 2            | 3  | 4      |
| Severe  |    | Moderate |    | Near Normal |   | Above Normal | Ab | undant |
| Drought |    | Drought  |    | Supply      |   | Supply       |    | Supply |



SURFACE WATER SUPPLY INDEX FOR COLORADO BY MAJOR RIVER BASIN

# SURFACE WATER SUPPLY INDEX FOR COLORADO BY HUC



| Basin | HUC ID   | HUC Name                             | SWSI  | Reservoir<br>Storage NEP | Forecast<br>Flow NEP | Total Vol<br>(AF) |
|-------|----------|--------------------------------------|-------|--------------------------|----------------------|-------------------|
|       | 11020006 | Huerfano                             | -3.84 | 14                       | 6                    | 8,200             |
| ъ     | 11020010 | Purgatoire                           | -1.38 | 85                       | 8                    | 51,190            |
| \rka  | 11020005 | Upper Arkansas-Lake Meredith         | -2.59 | 95                       | 9                    | 287,716           |
| ssui  | 11020001 | Arkansas Headwaters                  | -1.24 | 79                       | 13                   | 334,789           |
| SI    | 11020002 | Upper Arkansas                       | -0.17 | 76                       | 11                   | 487,400           |
|       | 11020009 | Upper Arkansas-John Martin Reservoir | 1.11  | 82                       | 10                   | 610,602           |
|       | 14010003 | Eagle                                | -2.64 | N/A                      | 18                   | 240,000           |
| 6     | 14010002 | Blue                                 | -1.73 | 42                       | 30                   | 283,917           |
| lora  | 14010004 | Roaring Fork                         | -3.68 | 61                       | 6                    | 429,712           |
| Ido   | 14010001 | Colorado Headwaters                  | -1.80 | 83                       | 28                   | 1,240,930         |
|       | 14010005 | Colorado Headwaters-Plateau          | -3.19 | 42                       | 11                   | 1,511,527         |
|       | 14020003 | Tomichi                              | -3.48 | 98                       | 8                    | 25,907            |
|       | 14030003 | San Miguel                           | -3.72 | N/A                      | 5                    | 54,000            |
| Gu    | 14020006 | Uncompahgre                          | -2.35 | 48                       | 6                    | 117,350           |
| nni   | 14020004 | North Fork Gunnison                  | -3.66 | 86                       | 6                    | 120,591           |
| son   | 14020001 | East-Taylor                          | -3.50 | 77                       | 7                    | 218,709           |
|       | 14020005 | Lower Gunnison                       | -3.70 | N/A                      | 6                    | 485,000           |
|       | 14020002 | Upper Gunnison                       | -3.21 | 73                       | 7                    | 994,885           |
| Ri    | 13010004 | Saguache                             | -3.20 | N/A                      | 12                   | 16,400            |
| G     | 13010002 | Alamosa-Trinchera                    | -2.83 | 96                       | 9                    | 68,372            |
| ran   | 13010005 | Conejos                              | -2.97 | 64                       | 11                   | 126,763           |
| de    | 13010001 | Rio Grande Headwaters                | -3.24 | 91                       | 11                   | 320,696           |
| Sa    | 14080105 | Middle San Juan                      | -3.59 | 50                       | 5                    | 8,268             |
| n Jı  | 14080107 | Mancos                               | -3.71 | 62                       | 5                    | 13,731            |
| Jan   | 14080102 | Piedra                               | -3.68 | N/A                      | 6                    | 61,000            |
| -Do   | 14080104 | Animas                               | -3.79 | 38                       | 5                    | 170,895           |
| lor   | 14080101 | Upper San Juan                       | -3.66 | 68                       | 6                    | 317,265           |
| es    | 14030002 | Upper Dolores                        | -1.92 | 60                       | 6                    | 379,862           |
|       | 10190004 | Clear                                | -2.33 | N/A                      | 22                   | 85,000            |
|       | 10190001 | South Platte Headwater               | -0.49 | 84                       | 14                   | 187,900           |
| Sot   | 10190005 | St. Vrain                            | -0.92 | 86                       | 31                   | 210,760           |
| Ith   | 10190007 | Cache La Poudre                      | 0.59  | 44                       | 43                   | 385,537           |
| Pla   | 10190002 | Upper South Platte                   | -1.10 | 76                       | 14                   | 407,439           |
| tte   | 10190006 | Big Thompson                         | 1.76  | 77                       | 33                   | 581,328           |
|       | 10190003 | Middle South Platte-Cherry Creek     | -1.74 | 94                       | 29                   | 747,200           |
|       | 10190012 | Middle South Platte-Sterling         | -1.70 | 90                       | 29                   | 873,200           |
| Ya    | 14050005 | Upper White                          | -3.16 | N/A                      | 12                   | 150,000           |
| mp    | 14050003 | Little Snake                         | -2.65 | N/A                      | 18                   | 178,000           |
| ia-V  | 10180001 | North Platte Headwaters              | -0.76 | N/A                      | 41                   | 194,000           |
| Vhit  | 14050001 | Upper Yampa                          | -2.27 | 99                       | 20                   | 482,479           |
| te    | 14050002 | Lower Yampa                          | -2.07 | N/A                      | 25                   | 575,000           |

April 1, 2018 SWSI Values by HUC and Non Exceedance Probabilities (NEP)

NEP is non exceedance percentage for total reservoir storage and streamflow forecast in HUC. Some HUCs do not have any reservoirs considered in the SWSI and are shown as "N/A". Total Vol is the volume of reservoir storage in the HUC plus the streamflow forecast. NEP is calculated compared to the volume historically occurring this month during the period 1970-2010. The following table lists each component considered in each HUC.

SWSI Color Scale:

| -4.0 (Severe Drought) | 0.0 (Normal) | 4.0 (Abundant Supply) |
|-----------------------|--------------|-----------------------|
|                       |              |                       |

| HUC ID     | HUC Name                           | Component Name                          | Component<br>Volume (AF) | Component<br>NEP for Month |
|------------|------------------------------------|---|--------------------------|----------------------------|
|            |                                    | CLEAR CREEK RESERVOIR                   | 8,191                    | 66                         |
| 11020001   |                                    | HOMESTAKE RESERVOIR                     | 40,929                   | 97                         |
|            | Arkansas                           | TWIN LAKES RESERVOIR                    | 42,583                   | 69                         |
|            | Treativaters                       | TURQUOISE LAKE                          | 77,086                   | 69                         |
|            |                                    | ARKANSAS RIVER AT SALIDA                | 166,000                  | 13                         |
|            |                                    | CUCHARAS RESERVOIR*                     | 0                        | 14                         |
| 11020006   | Huerfano                           | CUCHARAS RIVER AT BOYD RANCH NR LA VETA | 3,400                    | 10                         |
|            |                                    | HUERFANO RIVER NEAR REDWING             | 4,800                    | 5                          |
| 11020010   | Duurataira                         | PURGATOIRE RIVER AT TRINIDAD            | 12,000                   | 8                          |
| 11020010   | Purgatoire                         | TRINIDAD LAKE                           | 39,190                   | 85                         |
| 11020002   |                                    | PUEBLO RESERVOIR INFLOW                 | 230,000                  | 12                         |
| 11020002   | Upper Arkansas                     | PUEBLO RESERVOIR                        | 257,400                  | 76                         |
|            |                                    | CUCHARAS RIVER AT BOYD RANCH NR LA VETA | 3,400                    | 10                         |
|            | Upper                              | HUERFANO RIVER NEAR REDWING             | 4,800                    | 5                          |
| 11020000   | Arkansas-John                      | PURGATOIRE RIVER AT TRINIDAD            | 12,000                   | 8                          |
| 11020009   | Martin                             | ADOBE CREEK RESERVOIR                   | 48,301                   | 63                         |
|            | Reservoir                          | PUEBLO RESERVOIR INFLOW                 | 230,000                  | 12                         |
|            |                                    | JOHN MARTIN RESERVOIR                   | 312,101                  | 83                         |
|            | Upper<br>Arkansas-Lake<br>Meredith | CUCHARAS RIVER AT BOYD RANCH NR LA VETA | 3,400                    | 10                         |
|            |                                    | HUERFANO RIVER NEAR REDWING             | 4,800                    | 5                          |
| 11020005   |                                    | LAKE HENRY                              | 8,625                    | 84                         |
|            |                                    | MEREDITH RESERVOIR                      | 40,891                   | 94                         |
|            |                                    | PUEBLO RESERVOIR INFLOW                 | 230,000                  | 12                         |
| 14010002   | Blue                               | GREEN MOUNTAIN RESERVOIR                | 58,917                   | 42                         |
| 14010002   |                                    | BLUE RIVER INFLOW TO GREEN MOUNTAIN RES | 225,000                  | 30                         |
|            | Colorado                           | WOLFORD MOUNTAIN RESERVOIR              | 54,030                   | 97                         |
| 14010001   | Headwaters                         | WILLIAMS FORK RESERVOIR                 | 66,900                   | 75                         |
|            | neudwaters                         | COLORADO RIVER NEAR DOTSERO             | 1,120,000                | 28                         |
| 4 40 40005 | Colorado                           | VEGA RESERVOIR                          | 11,527                   | 42                         |
| 14010005   | Headwaters-<br>Plateau             | COLORADO RIVER NEAR CAMEO               | 1,500,000                | 11                         |
| 14010003   | Eagle                              | EAGLE RIVER BELOW GYPSUM                | 240,000                  | 18                         |
| 14010004   | Popring Fork                       | RUEDI RESERVOIR                         | 64,712                   | 61                         |
| 14010004   | Roaring Fork                       | ROARING FORK AT GLENWOOD SPRINGS        | 365,000                  | 6                          |
|            |                                    | TAYLOR R INF TO TAYLOR PARK RESERVOIR   | 55,000                   | 7                          |
| 14020001   | East-Taylor                        | TAYLOR PARK RESERVOIR                   | 70,709                   | 77                         |
|            |                                    | EAST RIVER AT ALMONT                    | 93,000                   | 8                          |
| 14020005   | Lower Gunnison                     | GUNNISON RIVER NR GRAND JUNCTION        | 485,000                  | 6                          |
| 14020004   | North Fork                         | PAONIA RESERVOIR                        | 5,591                    | 86                         |
| 17020004   | Gunnison                           | NORTH FORK GUNNISON R NR SOMERSET       | 115,000                  | 6                          |
| 14030003   | San Miguel                         | SAN MIGUEL RIVER NEAR PLACERVILLE       | 54,000                   | 5                          |
| 1 4020002  | Tamishi                            | VOUGA RESERVOIR NEAR DOYLEVILLE         | 907                      | 98                         |
| 14020003   | I OMICNI                           | TOMICHI CREEK AT GUNNISON, CO           | 25,000                   | 8                          |

April 1, 2018 SWSI Component Information - Streamflow Forecast & Reservoir Storage - By HUC

| HUC ID     | HUC Name                 | Component Name                          | Component<br>Volume (AF) | Component<br>NEP for Month |
|------------|--------------------------|---|--------------------------|----------------------------|
| 14020006   | Uncompoleryo             | UNCOMPAHGRE RIVER AT COLONA             | 55,000                   | 6                          |
|            | Uncompangre              | RIDGEWAY RESERVOIR                      | 62,350                   | 48                         |
|            |                          | FRUITLAND RESERVOIR                     | 1,900                    | 38                         |
|            |                          | SILVER JACK RESERVOIR                   | 2,539                    | 7                          |
|            |                          | CRAWFORD RESERVOIR                      | 6,231                    | 19                         |
| 14020002   | Upper Gunnison           | LAKE FORK AT GATEVIEW, CO               | 57,000                   | 6                          |
|            |                          | MORROW POINT RESERVOIR                  | 103,687                  | 1                          |
|            |                          | GUNNISON R INF TO BLUE MESA RESERVOIR   | 290,000                  | 7                          |
|            |                          | BLUE MESA RESERVOIR                     | 533,528                  | 78                         |
|            |                          | SANGRE DE CRISTO                        | 2,400                    | 7                          |
|            |                          | TRINCHERA CK                            | 3,700                    | 4                          |
|            |                          | UTE CREEK                               | 3,800                    | 8                          |
| 13010002   | Alamosa-                 | CULEBRA CREEK AT SAN LUIS               | 5,000                    | 10                         |
|            | THICHELA                 | MOUNTAIN HOME                           | 8,516                    | 98                         |
|            |                          | TERRACE RESERVOIR                       | 9,956                    | 75                         |
|            |                          | ALAMOSA CREEK ABOVE TERRACE RESERVOIR   | 35,000                   | 19                         |
| 12010005   | C                        | PLATORO RESERVOIR                       | 23,763                   | 64                         |
| 13010005   | Conejos                  | CONEJOS RIVER NEAR MOGOTE               | 103,000                  | 11                         |
|            | Rio Grande<br>Headwaters | CONTINENTAL RESERVOIR                   | 12,522                   | 98                         |
| 12010001   |                          | SANTA MARIA RESERVOIR                   | 19,119                   | 90                         |
| 13010001   |                          | RIO GRANDE RESERVOIR                    | 29,055                   | 85                         |
|            |                          | RIO GRANDE NEAR DEL NORTE               | 260,000                  | 11                         |
| 13010004   | Saguache                 | SAGUACHE CREEK NEAR SAGUACHE, CO        | 16,400                   | 12                         |
|            | Animas                   | FLORIDA RIVER INFLOW TO LEMON RESERVOIR | 17,000                   | 4                          |
| 14080104   |                          | LEMON RESERVOIR                         | 18,895                   | 38                         |
|            |                          | ANIMAS RIVER AT DURANGO                 | 135,000                  | 5                          |
| 1 40004 07 |                          | JACKSON GULCH RESERVOIR                 | 5,431                    | 62                         |
| 14080107   | Mancos                   | MANCOS RIVER NEAR MANCOS                | 8,300                    | 5                          |
| 4 4090405  | Middle San               | LONG HOLLOW RESERVOIR                   | 2,268                    | 50                         |
| 14080105   | Juan                     | LA PLATA RIVER AT HESPERUS              | 6,000                    | 5                          |
| 14080102   | Piedra                   | PIEDRA RIVER NEAR ARBOLES               | 61,000                   | 6                          |
|            |                          | GROUNDHOG RESERVOIR                     | 12,470                   | 47                         |
| 14030002   | Upper Dolores            | DOLORES RIVER BELOW MCPHEE RESERVOIR    | 90,000                   | 6                          |
|            |                          | MCPHEE RESERVOIR                        | 277,392                  | 60                         |
|            |                          | VALLECITO RESERVOIR                     | 73,265                   | 68                         |
| 14080101   | Upper San Juan           | LOS PINOS RIVER NEAR BAYFIELD           | 77,000                   | 5                          |
|            |                          | SAN JUAN RIVER NEAR CARRACAS            | 167,000                  | 10                         |
|            |                          | MARIANO RESERVOIR                       | 4,000                    | 38                         |
|            |                          | LONE TREE RESERVOIR                     | 6,600                    | 26                         |
|            |                          | WILLOW CREEK RESERVOIR                  | 7,317                    | 50                         |
| 10100007   | Die Thomason             | LAKE LOVELAND RESERVOIR                 | 7,700                    | 57                         |
| 10190006   | nompson                  | BOYD LAKE                               | 35,500                   | 60                         |
|            |                          | BIG THOMPSON R AT MOUTH, NR DRAKE, CO   | 75,000                   | 33                         |
|            |                          | CARTER LAKE                             | 87,638                   | 16                         |
|            |                          | LAKE GRANBY                             | 357,573                  | 84                         |

| HUC ID   | HUC Name        | Component Name                           | Component<br>Volume (AF) | Component<br>NEP for Month |
|----------|-----------------|--|--------------------------|----------------------------|
|          |                 | BLACK HOLLOW RESERVOIR                   | 3,300                    | 69                         |
|          | Casha La        | CHAMBERS LAKE                            | 4,600                    | 73                         |
|          |                 | HALLIGAN RESERVOIR                       | 6,400                    | 95                         |
|          |                 | FOSSIL CREEK RESERVOIR                   | 9,300                    | 74                         |
| 10190007 |                 | CACHE LA POUDRE                          | 10,600                   | 99                         |
|          | rouare          | WINDSOR RESERVOIR                        | 11,600                   | 40                         |
|          |                 | COBB LAKE                                | 18,900                   | 77                         |
|          |                 | HORSETOOTH RESERVOIR                     | 105,837                  | 26                         |
|          |                 | CACHE LA POUDRE R AT CANYON MOUTH        | 215,000                  | 43                         |
| 10190004 | Clear           | CLEAR CREEK AT GOLDEN                    | 85,000                   | 22                         |
|          |                 | HORSECREEK RESERVOIR                     | 12,200                   | 10                         |
|          |                 | MILTON RESERVOIR                         | 22,000                   | 95                         |
|          |                 | BARR LAKE                                | 29,800                   | 89                         |
|          |                 | SOUTH BOULDER CK NR ELDORADO SPRINGS, CO | 32,000                   | 29                         |
|          | Middle South    | STANDLEY RESERVOIR                       | 41,200                   | 96                         |
| 10190003 | Platte-Cherry   | BOULDER CREEK NEAR ORODELL               | 49,000                   | 34                         |
|          | Creek           | SAINT VRAIN CREEK AT LYONS               | 74,000                   | 33                         |
|          |                 | BIG THOMPSON R AT MOUTH, NR DRAKE, CO    | 75,000                   | 33                         |
|          |                 | CLEAR CREEK AT GOLDEN                    | 85,000                   | 22                         |
|          |                 | SOUTH PLATTE RIVER AT SOUTH PLATTE       | 112,000                  | 14                         |
|          |                 | CACHE LA POUDRE R AT CANYON MOUTH        | 215,000                  | 43                         |
|          |                 | JULESBURG RESERVOIR                      | 20,700                   | 74                         |
|          |                 | PREWITT RESERVOIR                        | 23,900                   | 76                         |
|          |                 | JACKSON LAKE RESERVOIR                   | 25,800                   | 20                         |
|          |                 | SOUTH BOULDER CK NR ELDORADO SPRINGS, CO | 32,000                   | 29                         |
|          | Middle South    | EMPIRE RESERVOIR                         | 36,400                   | 99                         |
|          |                 | BOULDER CREEK NEAR ORODELL               | 49,000                   | 34                         |
| 10190012 |                 | RIVERSIDE RESERVOIR                      | 55,400                   | 71                         |
|          | Thatte Sterning | POINT OF ROCKS RESERVOIR                 | 69,000                   | 82                         |
|          |                 | SAINT VRAIN CREEK AT LYONS               | 74,000                   | 33                         |
|          |                 | BIG THOMPSON R AT MOUTH, NR DRAKE, CO    | 75,000                   | 33                         |
|          |                 | CLEAR CREEK AT GOLDEN                    | 85,000                   | 22                         |
|          |                 | SOUTH PLATTE RIVER AT SOUTH PLATTE       | 112,000                  | 14                         |
|          |                 | CACHE LA POUDRE R AT CANYON MOUTH        | 215,000                  | 43                         |
|          |                 | ANTERO RESERVOIR                         | 20,100                   | 84                         |
| 10100001 | South Platte    | ELEVENMILE CANYON RESV INFLOW            | 34,000                   | 14                         |
| 10190001 | Headwater       | SPINNEY MOUNTAIN RESERVOIR               | 34,200                   | 80                         |
|          |                 | ELEVENMILE CANYON RESERVOIR              | 99,600                   | 62                         |
|          |                 | TERRY RESERVOIR                          | 6,500                    | 92                         |
|          |                 | MARSHALL RESERVOIR                       | 8,100                    | 84                         |
|          |                 | UNION RESERVOIR                          | 11,891                   | 56                         |
| 10100005 | St Vrain        | GROSS RESERVOIR                          | 13,469                   | 76                         |
| 0190000  |                 | BUTTONROCK (RALPH PRICE) RESERVOIR       | 15,800                   | 99                         |
|          |                 | SOUTH BOULDER CK NR ELDORADO SPRINGS, CO | 32,000                   | 29                         |
|          |                 | BOULDER CREEK NEAR ORODELL               | 49,000                   | 34                         |
|          |                 | SAINT VRAIN CREEK AT LYONS               | 74,000                   | 33                         |

| HUC ID   | HUC Name                   | Component Name                     | Component<br>Volume (AF) | Component<br>NEP for Month |
|----------|----------------------------|------------------------------------|--------------------------|----------------------------|
| 10190002 |                            | CHEESMAN LAKE                      | 64,239                   | 49                         |
|          | Opper South<br>Platte      | SOUTH PLATTE RIVER AT SOUTH PLATTE | 112,000                  | 14                         |
|          | T tutte                    | DILLON RESERVOIR                   | 231,200                  | 86                         |
| 14050003 | Little Snake               | LITTLE SNAKE RIVER NEAR LILY       | 178,000                  | 18                         |
| 14050002 | Lower Yampa                | YAMPA RIVER NEAR MAYBELL           | 575,000                  | 25                         |
| 10180001 | North Platte<br>Headwaters | NORTH PLATTE R NR NORTHGATE        | 194,000                  | 41                         |
| 14050005 | Upper White                | WHITE RIVER NEAR MEEKER            | 150,000                  | 12                         |
|          |                            | YAMCOLO RESERVOIR                  | 8,279                    | 73                         |
|          |                            | ELKHEAD CREEK ABOVE LONG GULCH     | 34,000                   | 17                         |
| 14050001 | Upper Yampa                | STAGECOACH RESERVOIR NR OAK CREEK  | 35,200                   | 99                         |
|          |                            | YAMPA RIVER AT STEAMBOAT SPRINGS   | 160,000                  | 18                         |
|          |                            | ELK RIVER NEAR MILNER, CO          | 245,000                  | 25                         |

NEP is non exceedance percentage (percentile) for volume of the component compared to this month during the historical period 1970-2010.

\*Empty, filling restriction

Water Volume NEP Color Scale:

0 (Well Below Normal) 50 (Normal) 100 (W

100 (Well Above Normal)

# Basinwide Conditions Assessment

March, typically one of the wetter months in northeast Colorado, actually saw a reversal of the February wetter and cooler than normal weather pattern. Temperatures over the entire region were slightly warmer than normal. Precipitation was more of a "mixed bag" than temperature. The eastern and southern parts of the area were significantly dryer than normal while the central and northwestern parts of the area were at least near normal in terms of precipitation.

In a reflection of the dryer conditions, the South Platte basin snowpack Snow Water Equivalent (SWE) decreased from 89% of median on March 1 to 83% of median on April 1. However, this overall number conceals two important facts: even though the percentage of median went down, the actual SWE increased by approximately 2 inches; and the snowpack has two distinct areas. The Clear Creek basin (I-70) is a SWE dividing line in northeast Colorado in 2018 with the area north generally being much closer to normal SWE and the area south generally much less than even the 83% of median SWE.

Interestingly, I-70 also provides a useful dividing line to characterize the USDA Drough Monitor rating for northeast Colorado. The areas north of I-70 showed only a negligible change in Drought Rating between the end of February and the end of March. This area still contains areas of no drought rating, DO "Abnormally Dry" rating,

and D1 "Moderate Drought" rating. In contrast, the area south of I-70 saw a significant increase in D1 rated area. This included most of Park County being converted from a D0 rating to a D1 rating.

As perhaps could be expected from the split precipitation pattern described above, the flows at the Kersey and Julesburg index stream flow gages were also split. The overall March mean flow at the Kersey gage was 695 cfs or 101% of the long term mean flow of 688 cfs. The overall March mean flow at the Julesburg gage was 174 cfs. This represents a flow of just 34% of the long term mean flow of 512 cfs.

The mainstem call on the South Platte River was

much more junior than what would normally be expected during a dry month. Free River conditions existed below Chatfield Reservoir for all of March. Probably due to the dry conditions, many of the major South Platte tributaries remained under call in March or began to see either calls or more senior calls toward the end of the month.

South Platte basin reservoir storage in March continued the generally above average trend in place for some time now. The overall end of March storage in the group of selected reservoirs was about 85% of capacity. This compares to a long term average end of March storage of about 80% of capacity.







# **Basinwide Conditions Assessment**

The SWSI value for the month was +1.7.

# <u>Outlook</u>

Total distributed reservoir storage following the Pueblo Winter Water Program was 138,905 acrefeet, including 60,589 acre-feet in Pueblo Reservoir, 64,682 acre-feet in diversions to off-channel reservoirs, and 13,634 acre-feet in John Martin Reservoir (after distribution to accounts). Conservation Storage in John Martin Reservoir through March 14, 2018 totaled 53,924 acre-feet. Storage values were above the 20-year average for the Pueblo Winter Water Program and well above the 1950-1975 pre-Winter Water Storage average for Conservation Storage in John Martin Reservoir.

# Administrative/Management Concerns

Pueblo Reservoir has once again been the focus of management concerns due to the fact that water stored over the winter forced storage levels up into the flood control space. Under the flood control criteria for Pueblo Reservoir, this can occur during winter months, however the level of the reservoir has to be reduced to target levels each day between April 1<sup>st</sup> and 15<sup>th</sup>.



Pueblo

Avg. 3/31 Contents

Twin Lakes

Turauoise

■ 3/31/18 Contents

0

John Martin





Arkansas Basin SWSI History Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.

## **Basinwide Conditions Assessment**

The SWSI value for the month was -3.2. Flow at the gaging station Rio Grande near Del Norte averaged 250 cfs (91% of normal). The Conejos River near Mogote had a mean flow of 91 cfs (103% of normal). Streamflow in the upper Rio Grande basin was near the long term averages with the exception of the Sangre de Cristo range streams, which are already seeing the effects of meager snowpack. Snowfall on the mountains and plains during March was scarce with only a modest gain after mid-month.

## <u>Outlook</u>

The month of March had warmer and drier conditions when compared to long-term records. Year to date precipitation is below normal for the San Luis Valley. NOAA weather forecasts for the next three months call for below normal precipitation and warmer than normal temperatures.

The recent coordinated forecast by the NRCS and NWS predict below normal runoff conditions throughout the upper Rio Grande basin. The best forecast within the basin is 59% of normal for the inflow to Platoro Reservoir, on the Conejos River. The Rio Grande, the Alamosa River, and Saguache Creek drainages are all expected to have only 50% of average runoffs. The Sangre de Cristo mountains have very poor snowpack. Runoff will be only 15 to 35% of normal.

## Administrative/Management Concerns

The upper Rio Grande basin is bracing for drought conditions rivaling those of 2002 and 2003. For the western and northern portion of the basin, the snowpack is generally better than 2002 (a 25% of average runoff year), but worse than 2003 (a 50% runoff year). Above average streamflow during 2017 should have some carryover benefit. For the Sangre de Cristo mountains, runoff this year has little possibility of surpassing 2002 volumes.

Reservoir storage, while not a huge component of satisfying the need for irrigation water in the basin, is in decent shape and should help some. Unfortunately, this is a year when the draft on the aquifers for irrigation use will be heavy, potentially nullifying the gains in the previous five years.

## Public Use Impact

Due to the warm and dry conditions, all drainages in the Rio Grande basin began irrigation season diversions before April 1. The irrigation season policy pertains to both surface diversions and irrigation well use.





Rio Grande-DataComposite-SWSI



#### **GUNNISON BASIN**

#### **Basinwide Conditions Assessment**

Weather conditions returned to drier than average in the Gunnison basin during March. Most of the basin received between 30 and 70% of average, with some areas, such as Cochetopa Creek, receiving less than 30%. Gunnison basin average snowpack appears to have peaked on March 30th at 59% of the 30-year median, which is lower than the 2002 peak of 64%. The North Fork Gunnison above Paonia Reservoir and the Grand Mesa continue to contain the worst snowpack in the basin. In fact, the basin above Paonia Reservoir peaked at 55% of the median on March 30th, which compares to a peak of 69% in 2002. Similarly, the Grand Mesa peaked at 46% of the median on April 8th, which compares to a peak of 58% in 2002. Fortunately, storms in early April have kept conditions cooler and provided additional snowpack to areas above Blue Mesa and Taylor Park Reservoirs. In fact, the Taylor Park Snotel group has improved from 69% of the median peak on April 1st to 80% on April 15th.

#### <u>Outlook</u>

Colorado Basin River Forecast Center (CBRFC) April to July runoff forecasts for the Taylor River at Taylor Park Reservoir, Lake Fork Gunnison River at Gateview, Gunnison River at Blue Mesa Reservoir, Uncompanyer River at Ridgway Reservoir, Muddy Creek at Paonia Reservoir and Surface Creek at Cedaredge are 76%, 60%, 57%, 47%, 44%, and 29% of average, respectively. The ESP model produced by the CBRFC now shows Surface Creek producing runoff equal to the previous low runoff of 3,700 acre-feet experienced in 1977.

Unfortunately, the NWS forecast for April to June places the Gunnison basin squarely in the area expected to receive lower than average precipitation and above average temperatures.

#### Administrative/Management Concerns

Current forecasts for only 345,000 acre-feet of runoff into Blue Mesa Reservoir place the basin in the "Dry" category for determining target

flows in the Aspinall Unit Operations EIS Record of Decision. This eliminates the peak flow targets and reduces baseflow targets at Whitewater to 890 cfs for April and May. Also, forecast inflow at this level only results in a 1,000 cfs peak in the Black Canyon based on calculations in the reserve water right decree for the National Park.

The Uncompanding Valley Water Users Association (UVWUA) began diverting water at the Gunnison Tunnel on March 15th and ramped up to their full diversion of 1,000 cfs on April 16th. Demand for water from irrigators is high and runoff has not begun in earnest, therefore, diversions at the GT are exceeding natural inflow into the Aspinall Unit. This has resulted in what is termed the April hole, which has caused the UVWUA to use storage water from their first fill account already. In fact, nearly 2,000 acre-feet has already been used to fulfill demand in their system. Demand will only increase as sweet corn will be planted in the coming weeks throughout the Uncompander Valley.

At the beginning of the irrigation season on April 2nd, a number of Tongue Creek tributaries with their source on the Grand Mesa were placed on call. These calls occurred on Surface Creek, Ward Creek and Dirty George Creek and are currently being administered at 1883 priorities. Flows in Surface Creek have been so low due to the lack of runoff that only the number 1 water right for the Alfalfa Ditch has been in priority. A call at these senior priorities this early in the season places the many reservoirs on those tributaries out of priority and unable to fill until the call is removed. As such, Division 4 Water Commissioners have been out measuring gage heights to determine reservoir levels at the time of call. When the reservoirs thaw out, the Water Commissioners will then release the out of priority storage to the stream for diversion by senior direct flow rights. If the call is removed during runoff they will measure the reservoirs again and determine the volume that must be released when the call goes back on later in the spring/summer.

As stated previously, it is expected that many areas that don't regularly require administration or curtailment by Water Commissioners in Water Division 4, will be under administration in 2018. These may include the Uncompany River, and tributaries in the Upper Gunnison, such as Tomichi Creek.





Gunnison-DataComposite-SWSI



<u>Basinwide Conditions Assessment</u> The SWSI value for the month was -2.9.

# <u>Outlook</u>

Colorado River flows are currently running around average and forecast to run below average through April with tributary flows running below average throughout April. As of April 12th, Upper Colorado River Basin snowpack was 84 percent of median snow water equivalent and 87 percent of average precipitation. Below average temperatures and above average precipitation are forecast for April.

## Administrative/Management Concerns

As of the call on the Colorado main stem is the Junior Shoshone Hydro Power right for 158 cfs for a total of 1408 cfs at the Shoshone Power Plant. Green Mountain is releasing to bypass inflows, provide contract and HUP obligations and make C-BT replacements. Grand Valley Irrigation diversions(Government Highline/Orchard Mesa Irrigation, Grand Valley Irrigation canals) are now running and are at or near full capacity.

## Public Use Impacts

After the dismal snowpack during the 2017-2018 ski season, Aspen Skiing Co. is planning to expand their snowmaking for next ski season. Aspen Highlands and Buttermilk delayed their openings this ski season due to a lack of snow. SkiCo has realized that this season is the poster child for the threat of climate change.



Colorado-DataComposite-SWSI



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## Basinwide Conditions Assessment

March precipitation was below average in the Yampa, White, and North Platte River basins. Precipitation for the month, as measured at the SNOTEL sites operated by NRCS, was reported at 90% of average for the Yampa, White, and North Platte River basins. Total precipitation for the water year as a percent of average to date in the combined basins at the end of March was 85%.

Snowpack for the combined basins as of April 1st, 2018 was at 87% of average. The snow water equivalent (SWE) as of March 31, 2018 was 92% of average for the North Platte River basin and 81% of average for the Yampa River basin and White River basin.

NRCS predicts well below average spring and summer streamflows in the Yampa, White, and North Platte River basins. The latest runoff forecasts from the NRCS for the April through July period are 87% of average for the North Platte River at Northgate, 62% of average for the Yampa River near Maybell, 52% of average for the Little Snake River near Lily, and 53% of average for the White River near Meeker.

Division 6 stream gages opened to date include ILLRANCO, MICMERCO, MICWLDCO and WMFKMHCO. Remaining gages will be opened during April or early May.

## <u>Outlook</u>

As of March 31st Fish Creek Reservoir was storing approximately 3,244 AF, 78% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 8,300 AF at the end of March 2018. The capacity of Yamcolo Reservoir is 8,700 AF. The G3 web server is not functioning currently for Elkhead Creek Reservoir. The contact for the Colorado River District will let me know when the site is available. The capacity of Elkhead Creek Reservoir is 24,778 AF. On March 31, 2018, Stagecoach Reservoir was storing 35,200 AF, 96% of capacity.

Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir for irrigation purposes, and Elkhead Creek Reservoir for municipal, industrial, recreational, and fish recovery releases. Stagecoach Reservoir is primarily used for recreation though a significant amount of stored water is allocated for municipal, industrial, irrigation and augmentation uses.

## Public Use Impacts

Steamboat Ski Resort has received 238 inches of snowfall since early November. That is well below the average snowfall to date. The resort is currently closed for the season.

Please check the Stagecoach Reservoir State Park website for the fishing report. The reservoir is currently

icing-off. The ice is mostly surrounded by open water and may be moving throughout the day. Extreme caution is advised.

Steamboat Lake conditions have not been updated since February 21, 2018.



Yampa-White-DataComposite-SWSI



# **Basinwide Conditions Assessment**

Flow at the Animas River at Durango averaged 115 cfs (37% of average). The flow at the Dolores River at Dolores estimated average is 48 cfs (35% of average). The La Plata River at Hesperus averaged 4.8 cfs (28% of average). Precipitation in Durango was 0.40 inches for the month, 33% of the 30-year average of 1.22 inches. Precipitation to date in Durango, for the water year, is 2.53 inches, 25% of the 30-year average of 9.93 inches. End of last month precipitation to date, for the water year was 26% of average. The average high and low temperatures for the month of March in Durango were 57° and 25°. In comparison, the 30-year average high and low for the month is 55° and 25°. At the end of the month Vallecito Reservoir contained 74,075 acre-feet compared to its average content of 58,254 acre-feet (127% of average). McPhee Reservoir was up to 277,136 acre-feet compared to its average content of 274,333 (101% of average), while Lemon Reservoir was up to 19,230 acre-feet as compared to its average content of 20,638 acre-feet (93% of average).

# <u>Outlook</u>

Precipitation (0.40 inches) was well below average for March in Durango. There were 106 years out of 124 years of record where there was more precipitation than this year. The flows in the rivers within the basin remained well below average for this time of year. The Animas River has never been lower than this year. There are 108 out of 108 years of record where the total flow past the Animas River at Durango stream gauge was more than this year. There were 101 out of 107 years of record where the total flow past the Dolores stream gauge was more than this year and 98 out of 101 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year.











HUC:14080107-APR-DataComposite-SWSI



# HUC 10180001 (North Platte Headwaters) Surface Water Supply - APR

HUC:10180001-APR-PrevMoStreamflow-SWSI HUC:10180001-APR-ForecastedRunoff-SWSI HUC:10180001-APR-ReservoirStorage-SWSI HUC:10180001-APR-DataComposite-SWSI



HUC:10190001-APR-Reservoirstorage-SWS HUC:10190001-APR-DataComposite-SWSI





- HUC:10190003-APR-DataComposite-SWSI



HUC:10190004-APR-PrevMoStreamflow-SWSI HUC:10190004-APR-ForeoastedRunoff-SWSI HUC:10190004-APR-ReservoirStorage-SWSI HUC:10190004-APR-DataComposite-SWSI

-6.00



HUC:10190005-APR-DataComposite HUC:10190005-APR-PrevMoStreamflow HUC:10190005-APR-FroeastedRunoff HUC:10190005-APR-ReservoirStorage

HUC 10190005 (St. Vrain) SWSI Values - APR





HUC:10190005-APR-PrevMoStreamflow-SWSI HUC:10190005-APR-ForecastedRunoff-SWSI HUC:10190005-APR-ReservoirStorage-SWSI HUC:10190005-APR-DataComposite-SWSI





= HUC:10190006-APR-PrevMoStreamflow-SWSI = HUC:10190006-APR-ForeoastedRunoff-SWSI = HUC:10190006-APR-ReservoirStorage-SWSI = HUC:10190006-APR-DataComposite-SWSI



HUC:10190007-APR-DataComposite-SWSI



HUC:10190012-APR-DataComposite-SWSI



- HUC:11020001-APR-DataComposite-SWSI



HUC:11020002-APR-PrevMoStreamflow-SWSI HUC:11020002-APR-ForecastedRunoff-SWSI HUC:11020002-APR-ReservoirStorage-SWSI HUC:11020002-APR-DataComposite-SWSI







HUC 11020009 (Upper Arkansas-John Martin Reservoir) Surface Water Supply - APR

HUC:11020009-APR-DataComposite-SWSI





HUC:13010001-APR-DataComposite-SWSI







HUC 13010005 (Conejos) SWSI Values - APR Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.





= HUC:13010005-APR-PrevMoStreamflow-SWSI = HUC:13010005-APR-PorecastedRunoff-SWSI = HUC:13010005-APR-ReservoirStorage-SWSI = HUC:13010005-APR-DataComposite-SWSI



HUC:14010001-APR-DataComposite-SWSI



HUC:14010002-APR-DataComposite HUC:14010002-APR-PrevMoStreamflow HUC:14010002-APR-ForeoastedRunoff HUC:14010002-APR-ReservoirStorage

HUC 14010002 (Blue) SWSI Values - APR Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.



= HUC:14010002-APR-PrevMoStreamflow-SWSI = HUC:14010002-APR-ForeoastedRunoff-SWSI = HUC:14010002-APR-ReservoirStorage-SWSI = HUC:14010002-APR-DataComposite-SWSI









HUC 14020001 (East-Taylor) SWSI Values - APR Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.





HUC:14020001-APR-PrevMoStreamflow-SWSI HUC:14020001-APR-ForecastedRunoff-SWSI HUC:14020001-APR-ReservoirStorage-SWSI

HUC:14020001-APR-DataComposite-SWSI



HUC:14020002-APR-DataComposite-SWSI









HUC:14020006-APR-DataComposite-SWSI







- HUC:14050001-APR-DataComposite-SWSI



HUC:14050002-APR-DataComposite-SWSI



- HUC:14050003-APR-DataComposite-SWSI



HUC:14050005-APR-DataComposite-SWSI



HUC:14080101-APR-DataComposite-SWSI





