

Statewide Water Availability Task Force Meeting Updates

Provided herein is a summary of the Statewide Water Availability Meeting held on March 21, 2013.

Statewide Weather Conditions:

- While January temperatures were significantly colder than normal and February temperatures ranged from -1 to -5 degrees Fahrenheit in Colorado, March temperatures have been highly variable throughout much of Colorado. Overall, March temperatures have been slightly above normal.
- During February, precipitation was below average for all basins except for the Arkansas and South Platte basins where precipitation was slightly below average. During March, so far, storms have helped maintain existing snowpack levels but have not boosted below normal precipitation and snow pack equivalent. So far, March moisture has been below average for all basins except for the South Platte basin which has received a near average amount of moisture.
- Colorado Climate Center weather stations report near average moisture conditions for Alamosa and Burlington, below average moisture conditions for Grand Junction, Montrose, Mesa Verde, Pueblo, Walsh, Akron, and Boulder; and well below moisture conditions for Grand Lake and Fort Collins.
- According to the US Drought Monitor, as of March 19, 2013 21% of the state is experiencing exceptional drought (D4), 27% of the state is experiencing extreme drought (D3), 41% of the state is experiencing severe drought (D2), and 11% of the state is experiencing moderate drought (D1). Driest conditions occur throughout much of the eastern plains of Colorado.

Statewide Water Conditions:

- For the Colorado 2013 Water Year so far, precipitation as a percentage of normal is below average for all basins and ranges from 71% of average in the Gunnison basin to 77% of average in the Yampa, White, and North Platte basins.
- **A Summary of the 2013 Water Year, so far, is as follows:**
 - *October* - began water year with below normal mountain precipitation and snow water equivalent. Statewide snow water equivalent was only 28% of normal on November 1;
 - *November* - ended up being drier than October. All basins had very low snow packs by end of month. Statewide snow water equivalent on December 1 was only 34% of normal;
 - *December* - Snow storms in mid to late December boosted snow pack but it was not enough to reach normal conditions. By January 1, statewide snow pack was 70% of normal;
 - *January* - Very little snow or precipitation. Southern basins have the highest precipitation percentages so far. All basins have had their snow pack percentages decline since January 1.
 - *February* - Precipitation below average for the month in all basins. What snow we did receive was just enough to keep basin snowpack percentages from further decline.
 - *March* - Storms have helped maintain snowpack but have not boosted snowpack. Below normal precipitation and snow water equivalent so far.
- Statewide snow pack as of March 21st was at 77% of average, and is below average for all major river basins. As of March 25, 2013 the statewide April 1st snowpack is projected to be at 73% of average with the South Platte basin projected at 61% of average snowpack. Snowpack is projected to be completely melted out on or before June 1st.
- Statewide reservoir storage is at 71% of average, and is well below average for all major river basins except the Yampa, White, and North Platte basins which are reporting 106% of average storage. Reservoir storage in the upper Rio Grande basin is only 53% of average.
- As of March 1st, the NRCS stream flow 2013 forecast for Colorado projects flows will be below average for all streams in all major river basins and will range from a high of 75% of average in the upper Rio Grande basin to a low of 33% of average in the upper Rio Grande basin.
- The Surface Water Supply Index (SWSI) developed by the Colorado Division of Water Resources and the U.S.D.A. Natural Resources Conservation Service is used as an indicator of mountain-based water supply conditions in the major river basins of the state. It is based on stream flow, reservoir storage, and precipitation for the summer period of May through October (June 1 through November 1). During the summer period, stream flow is the primary component in all basins except the South Platte basin where reservoir storage is given the most weight.
- The statewide SWSI values for February (March 1) range from a high value of -1.0 in the upper Rio Grande basin to a low value of -3.4 in the Colorado River basin. Drought conditions continue to be widespread throughout the state. The SWSI decreased in every basin in the state compared to last

month. With the exception of exception of reservoir storage in the Rio Grande basins, all components of the SWSI (reservoir storage, cumulative precipitation, and snow pack) are below normal for March 1. (A SWSI value of -2 implies moderate drought, a SWSI value of -4 implies severe drought).

Listed in the following table are reservoir storage and precipitation conditions as of March 21, 2013.

Basin	Snow Pack % of Average	Reservoir Storage (% of average)	Total Water Precipitation (% of average)
South Platte	69	82	73
Arkansas	75	55	70
Upper Rio Grande	82	53	72
San Miguel, Dolores, San Juans, Animas	83	67	74
Gunnison	75	77	71
Colorado	72	66	74
Yampa, White, North Platte	78	106	77
Statewide Conditions	77	71	73

Natural Resources Conservation Service 2013 Stream Flow Forecast (range of stream flows per basin)

- *Yampa/White/North Platte:*
 - 69% Elk River near Milner
 - 61% White River near Meeker
 - 58% Yampa River near Maybell
 - 57% Yampa River above Stagecoach Reservoir
 - 57% Little Snake River near Slater
 - 53% Elkhead Creek above Long Gulch near Hayden
 - 51% Little Snake River near Lily
 - 38% N Platte River near Northgate
- *Colorado:*
 - 68% Willow Creek Reservoir inflow
 - 68% Lake Grandby inflow
 - 66% Dillon Reservoir inflow
 - 63% Eagle River below Gypsum
 - 58% Ruedi Reservoir inflow
 - 56% Roaring Fork River at Glenwood Springs
 - 56% Colorado River near Cameo
- *South Platte:*
 - 68% Clear Creek at Golden
 - 65% Cache La Poudre at Canyon Mouth
 - 63% Bear Creek above Evergreen
 - 59% St Vrain Creek at Lyons
 - 56% Elevenmile Canyon Reservoir inflow
 - 52% South Platte River at South Platte
 - 51% Big Thompson River at mouth near Drake
 - 48% Antero Reservoir inflow
- *Gunnison:*
 - 67% Ridgway Reservoir inflow
 - 67% Lake Fork at Gateview
 - 60% Slate River near Crested Butte
 - 57% Cochetopa Creek below Rock Creek
 - 52% N.F. Gunnison River near Somerset
 - 49% Paonia Reservoir inflow
 - 47% Gunnison River near Grand Junction

- 42% Tomichi Creek at Gunnison
- *San Miguel/Dolores/Animas/San Juan:*
 - 73% Vallecito Reservoir inflow
 - 67% San Juan River near Carracus
 - 66% San Miguel River near Placerville
 - 64% Animas River at Durango
 - 64% Piedra River near Arboles
 - 63% Mancos River near Mancos
 - 58% McPhee Reservoir inflow
- *Rio Grande:*
 - 75% Platoro Reservoir inflow
 - 74% Rio Grande at Thirty Mile Bridge
 - 70% South Fork Rio Grande at South Fork
 - 69% Saguache Creek near Saguache
 - 67% La Jara Creek near Capulin
 - 43% Culebra Creek at San Luis
 - 33% Sange de Cristo Creek
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- *Arkansas:*
 - 68% Huerfano River near Redwing
 - 61% Chalk Creek near Nathrop
 - 58% Pueblo Reservoir inflow
 - 60% Trinidad Lake inflow
 - 56% Arkansas River at Salida
 - 53% Cucharas River near La Veta

Forecast (copied from Klaus Wolter's Executive Summary at [http: www.cdc.noaa.gov/people/klaus_wolter/SWcasts](http://www.cdc.noaa.gov/people/klaus_wolter/SWcasts) updated March 21, 2013).

1. While El Nino/La Nina can provide decent guidance for climate outlooks around here, this is not very helpful in our current ENSO-neutral situation. A cold Northeast Pacific combined with a warm North Atlantic stacked the deck towards dry conditions in the southwestern U.S. in 2012-2013 as in other recent years.
2. Much of this year's low snowpack was 'precipitated' by a dry fall in 2012, confirming the critical role of that season in setting the stage for a 'good' or 'bad' runoff season. The next two weeks hold the promise of an active storm-track and 'normal' to much-below normal temperatures, especially during the next five days.
3. My statistical forecast for late spring (April-June) shows a healthy tilt towards wetness covering much of our state. Given that this forecast is not driven by a strong ENSO signal, and that other tools are more pessimistic, one should not 'bet the farm' on a wet spring. I will have a summer forecast available in April.
4. The odds for a switch to El Nino this summer are lower than was forecast for last year. In fact, we live in a decade that appears to favor La Nina over El Nino, so it would not be surprising if we experience La Nina conditions by 2014.
5. Bottom-line: Since about 2000, we appear to be stuck in a regime of mostly drier and warmer years than 'normal'. While the jury is still out on how much of that is due to 'natural variability' vs. greenhouse gas emissions, I do not see any promising signs of a 'hydrologic regime change' on the horizon.

Flooding Risk in 2013 (notes from Klaus Wolter)

Snowmelt Related

1. Poor snowpack decreases snowmelt-related flooding potential throughout Colorado.
2. Fairly low dust load so far does not currently pose a threat in terms of increasing the speed of snowmelt, and is much less a threat in 2013 for earlier than normal snowmelt than for 2009, 2010.
3. Active storm track so far this winter and early spring poses less risk of stationary 'heat waves' that would trigger an early snow melt surge.

Flashflood Related

1. Some of the most prominent examples of flash flooding occurred during El Nino onset years (1965, 1976, 1997) while others did not (1999). I believe the odds for that scenario are lower than year.
2. Recent wildfires in the Colorado Front Range have lowered the threshold for flash flooding and mudslides – it will take several years to overcome this threat. (Jamestown fire of October 2003 kept us busy for at least five years). However, the greatest risk for this will be over the watersheds that were hit last year (El Paso and Larimer Counties).

Abbreviated Basin Updates (From Division of Water Resource's Water Supply Conditions Report Dated March 2013).

S Platte - Cumulative storage in the major plains reservoirs (Julesberg, North Sterling, and Prewitt) is at 68% of capacity. Cumulative storage in the major upper-basin reservoirs (Cheesman, Eleven Mile, Spinney, and Antero) is at 75% of capacity. February gave the South Platte basin a transition from generally mild to dry to cool and wet at the lower elevations. This was primarily because of two winter storms that occurred during the latter half of the month. However, the overall snowpack at the higher elevations only improved from 60% of average at the end of the January to 65% of average at the end of February. This continued the status of the South Platte basin having the lowest snow pack percentage in the state. Stream flows at both the Kersey and Julesberg index gages remained below average for February. The Kersey gage monthly mean stream flow was 412 cfs or 61% of the historic mean of 674 cfs and below the February 2003 mean of 576 cfs. The February Julesberg gage monthly mean stream flow was 67 cfs or 12% of the historic mean of 582 cfs. This is above the February 2003 mean of 40 cfs. Overall, reservoir storage in the basin was at 82% of the end of February average. This compares with an end of February 2003 average of 54% and an end of February 2002 average of 84%. The main-stem and tributary river calls continued with diversions to storage rights throughout the month. The tributary calls generally remained stable throughout the month but the main-stem calls did continue the slow movement started in January toward more junior calls. The lower elevation moisture definitely helped in this regard.

Arkansas – Reservoir storage in the Pueblo Winter Water Program totaled 60,113 acre-feet at the end of February. This storage amount is lower than last year's storage to date (only 53% of last year) and represents 48% of the past five-year average. Conservation storage in John Martin Reservoir has accumulated 4,453 acre-feet versus 15,070 acre-feet as of the end of February last year (30%). Lack of availability of municipal leased water and expected reductions in yield of other replacement sources have caused each major well association to submit replacement plans at the end of February that project from zero to 30% pumping allocations.

Rio Grande - Flow at the gaging station Rio Grande near Del Norte averaged 131 cfs (72% of normal) during February. The Conejos River near Mogote had a mean flow of 36 cfs (71% of normal) during the month. Flow to the state line was 63% of normal due to some freezing of ice in and around the channel. Temperatures were slightly below normal in the San Luis Valley during February. Alamosa received only 0.15 inches of precipitation during the month, 0.11 inches below normal. Snowpack conditions throughout the upper Rio Grande basin roughly followed the normal gain seen during February with the exception of the Conejos River and its tributaries where snowfall was scarce. Unfortunately, the whole upper Rio Grande basin is tracking at roughly 20% to 30% below normal snowpack since mid-December. Recent NRCS stream flow forecasts for 2013 are calling for well below average runoff in the upper Rio Grande basin this year. As an example, the Sangre de Cristo Mountain Range is in very poor shape with forecasted runoff of only 33 to 63% of normal. The NOAA three-month outlook suggests this basin and most of Colorado should expect above normal temperatures and below normal precipitation for the April through June period. If the current trend of warm and dry conditions persists, the Division Engineer expects early calls for irrigation water this year. Diversions from the Rio Grande and Conejos will commence around the first of April.

Gunnison – February returned to a drier than average pattern everywhere in the basin except the Uncompahgre Plateau, which is the only SNOTEL station in the Gunnison basin reporting greater than average snow water equivalent (SWE) at 103%. Overall snowpack conditions in the basin fell to 72% of average on March 1st. The Cochetopa Creek, Tomichi Creek, and Taylor River drainages improved slightly, but continue to have the worst conditions in the basin, with only 60% of average SWE above Taylor Reservoir. With average snow for the remainder of the season, the NRCS predicts that the Gunnison basin snowpack will reach 75% of average peak, with a probable maximum of 90% of average and a probable minimum of 65% of average. The April-July inflow forecast for Blue Mesa Reservoir was reduced to 360,000 acre-feet (53% of average). It appears that drought rules will apply for determining endangered fish base flows and Black Canyon would be less than 768 cfs, and the target base flow at Whitewater would be 900 cfs instead of 1050 cfs. Blue Mesa releases continue to generally match outflows, preventing the reservoir from gaining much storage volume and it currently sits at 30 feet below the same time last year. Blue Mesa is predicted to reach a maximum

level of 48 feet below the spillway (55% active capacity) and Taylor Park reservoir will only fill to 76% of capacity. The Upper Gunnison River Water Conservancy District (UGRWCD) is working with the Uncompahgre Valley Water Users Association (UCVWUA), the Bureau of Reclamation (USBR), and Tri-County Water Conservancy District (TCWCD) to purchase up to 6500 acre-feet of water out of Ridgway Reservoir (managed by TCWCD) and the Aspinall Unit, in order to provide additional water to the UUVUA and forestall an early (April & May) Gunnison Tunnel call on the entire Upper Gunnison basin. An agreement for this one year sale has not been finalized, but would allow irrigators in the Upper Gunnison basin to get water on their pastures in April and May when it is available.

Colorado – Warmer temperatures have alleviated ice-affected conditions for most gages on the Eagle and Roaring Fork Rivers. Flows will continue to run significantly below average through March. Williams Fork and Green Mountain Reservoir releases should remain unchanged through March. Storms throughout February have done little to improve snowpack. Grand Valley Irrigators will begin canal diversions the final week of March. Shoshone Power plant will operate both turbines at capacity related to river flows through March. Green Mountain Reservoir releases were reduced slightly due to Dillon Reservoir release reductions, but will maintain a release rate of 150 cfs. Williams Fork and Ruedi Reservoir will maintain releases of 41-45 cfs. A study assessing flows in the Roaring Fork and Crystal Rivers performed by S.K. Mason Environmental for Public Counsel of the Rockies, Friends of Rivers and Renewables, and the Roaring Fork Conservancy, has identified segments of both rivers “running significantly below the levels ... necessary to protect the environment”. The CWCB holds in-stream flow water rights for environmental protection junior to nearly all trans-mountain and irrigation water rights which have reduced flow in these segments for decades. The projected inflow to Lake Powell for water year 2013 is 5.81 million-acre-feet (maf) which is 54% of the 30-year average beginning 1980. This compares to the water year 2012 inflow volume of 4.91 maf and water year 2011 inflow of 16 maf.

Yampa/White – Total water year precipitation for the water year as a percent of average to date in the combined basins at the end of February was 78% of average, the highest in the state. The NRCS predicts well below average spring and summer stream flows in the Yampa, White, and North Platte River basins.

San Juan/Dolores/Animas/San Miguel - Flow at the Animas River at Durango was estimated to average 157 cfs (76% of average). The flow at the Dolores River at Dolores was estimated to average 31 cfs (55% of average). The LaPlata River at Hesperus was estimated to average 3.4 cfs (46% of average). Precipitation in Durango was 1.06 inches for the month, 65% of the 30-year average of 1.63 inches. Precipitation to date in Durango, for the water year, is 4.68 inches, 56% of the 30-year average of 8.35 inches. The average high and low temperatures for the month of February in Durango were 40 and 13 degrees. In comparison, the 30-year average high and low for the month is 45 and 19 degrees. At the end of the month Vallecito Reservoir contained 84% of its storage content, McPhee Reservoir contained 70% of its storage content, and Lemon Reservoir contained 40% of its storage content.