

# COLORADO

## WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES  
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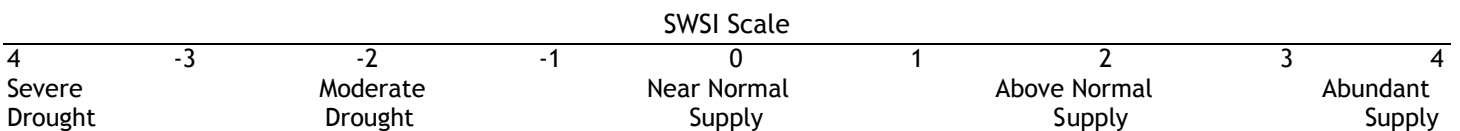
May 2015

The Surface Water Supply Index (SWSI) developed by this office and the U.S.D.A. Natural Resources Conservation Service (NRCS) is used as an indicator of mountain-based water supply conditions in the major river basins of the state. It is based on snowpack, reservoir storage, and precipitation for the winter period of November through April (December 1 through May 1). During the winter period, snowpack is the primary component in all basins except the South Platte basin, where reservoir storage is given the most weight. The enclosed narratives are provided by the Division of Water Resources Office in each stream basin.

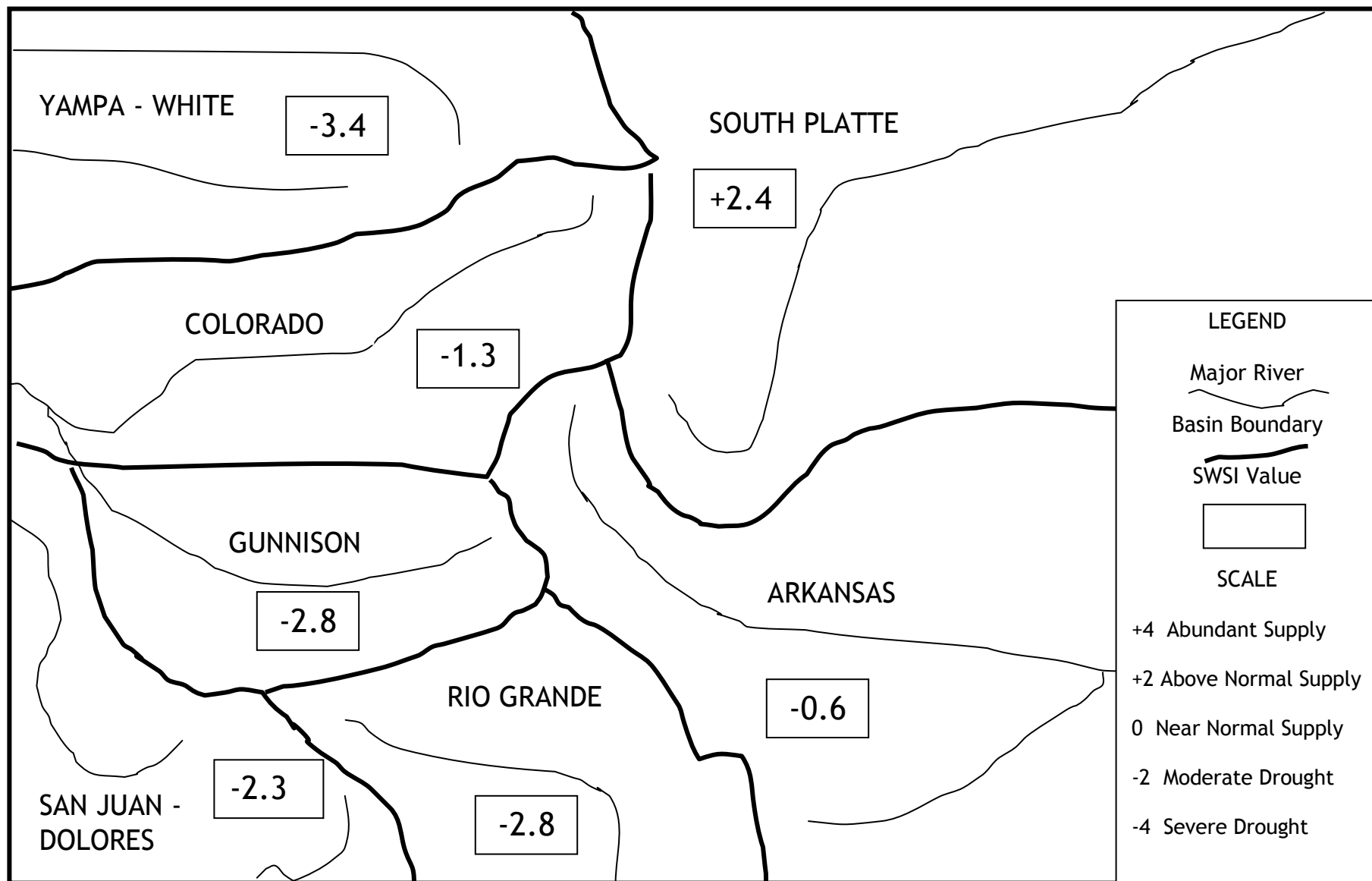
The statewide SWSI values for April (May 1) range from a high value of +2.4 in the South Platte River Basin to a low of -3.4 in the Yampa/White River Basin, the fourth month in a row to repeat this pattern. Reservoir storage remained very strong statewide. May 1 snowpack was well below normal in each basin. SWSI values in each basin are lower than observed last year at this time.

The following SWSI values were computed for each of the seven major basins for May 1, 2015. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10.

Basin	May 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	2.4	0.6	-0.1
Arkansas	-0.6	0.6	-0.8
Rio Grande	-2.8	-0.6	-2.1
Gunnison	-2.8	-0.2	-3.6
Colorado	-1.3	0.0	-3.0
Yampa/White	-3.4	-0.1	-3.3
San Juan/Dolores	-2.3	-0.3	-1.2



# SURFACE WATER SUPPLY INDEX FOR COLORADO



May 1, 2015

Basinwide Conditions Assessment

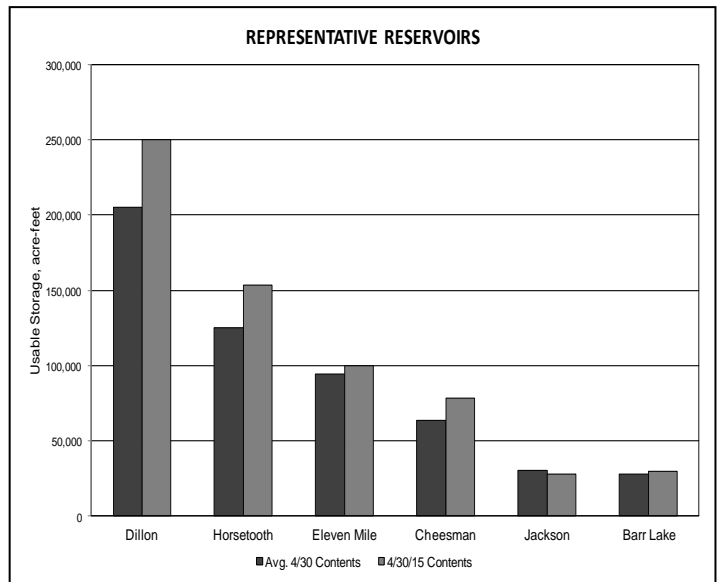
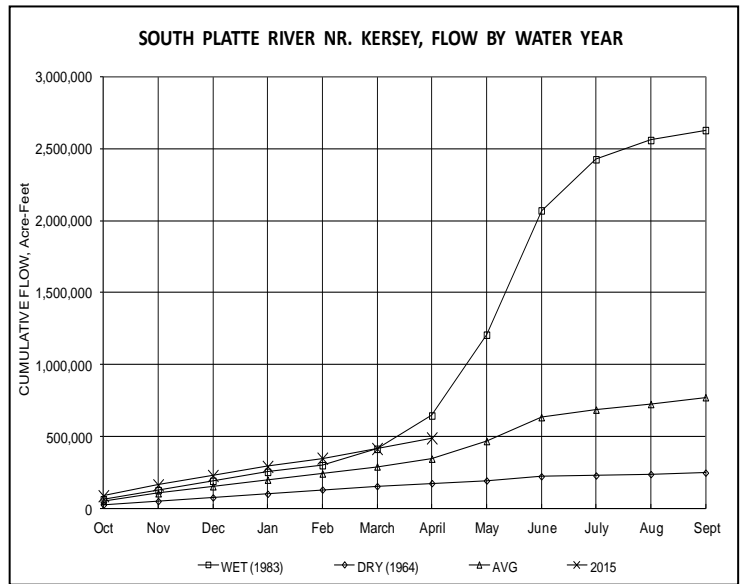
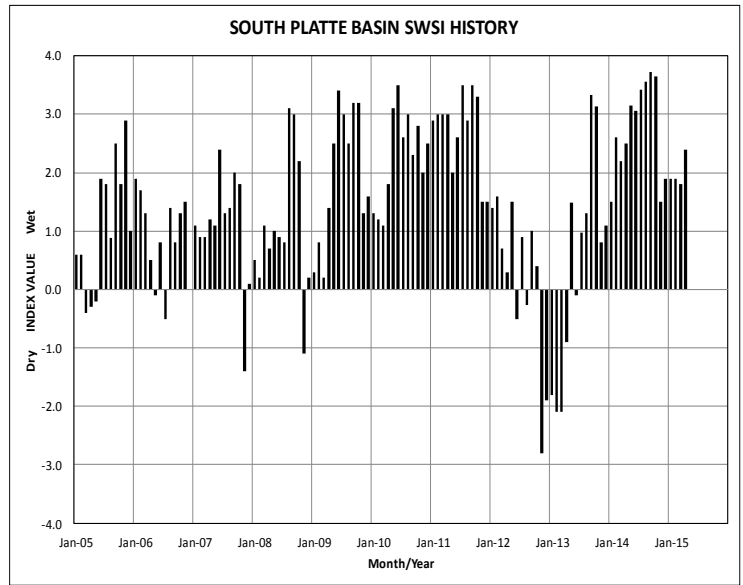
The SWSI value for the month was 2.4. Thankfully, though the first two weeks of April continued the warm and very dry trend from March, the last two weeks reversed that trend. Overall temperatures for April were very near (slightly above) average over the entire area. By the end of April, precipitation over all of northeastern Colorado was at least very near normal with some areas significantly above normal. In fact, by the end of April the areas of the basin that had moved into a D0 “Abnormally Dry” Drought Index Rating in March had moved back to no drought rating at all.

The South Platte basin snow water equivalent (SWE) according to the SNOTEL network continued the abnormal variability in April that began in March. The SWE was 110% of average on March 3; then fell to 87% of average by April 2; then jumped in the last half of April to reach a peak of 98% of normal on April 28. In terms of actual SWE, values were relatively flat from early March to mid-April at about 12 inches of water before sharply increasing the last half of April to end up just less than 15 inches of water on April 28.

The shift in flow pattern observed at the Kersey and Julesburg index gages last month continued in April. Flows at the Kersey gage flows remained strong with a monthly average of about 150% of the historic mean. Julesburg flows were again below the historic mean at approximately 70% the historic mean.

The very unusual seven month streak of free river on the South Platte mainstem below the Denver metro area (since August 26, 2014) came to an end on April 7, 2015. However, calls on the mainstem only lasted until April 17 when the improved precipitation conditions discussed above again resulted in free river. There was also a call on the Poudre for 5 days during this same period. Boulder and South Boulder Creeks were the only other South Platte tributaries with calls in April. One or both of these two creeks were under at least junior calls for all but 4 days during April.

Reservoir storage in the South Platte basin continued to be very good through the month of April. Average end of April storage is approximately 82% of capacity, but actual storage was approximately 93% of capacity on April 30, 2015.



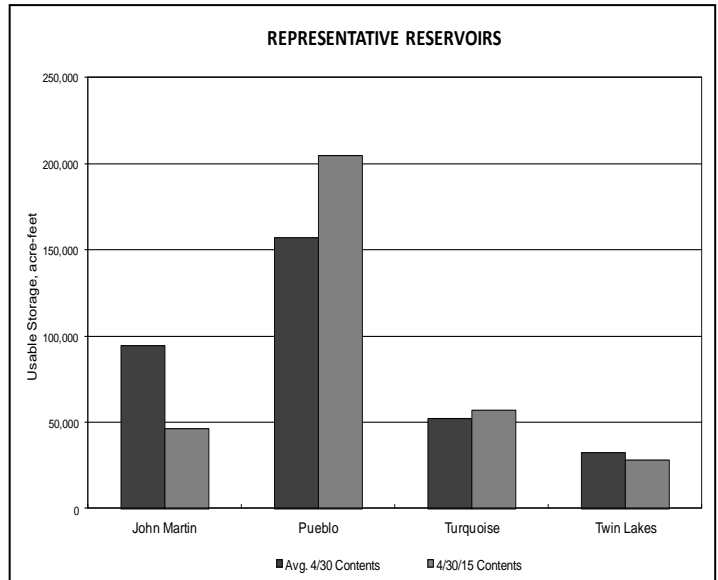
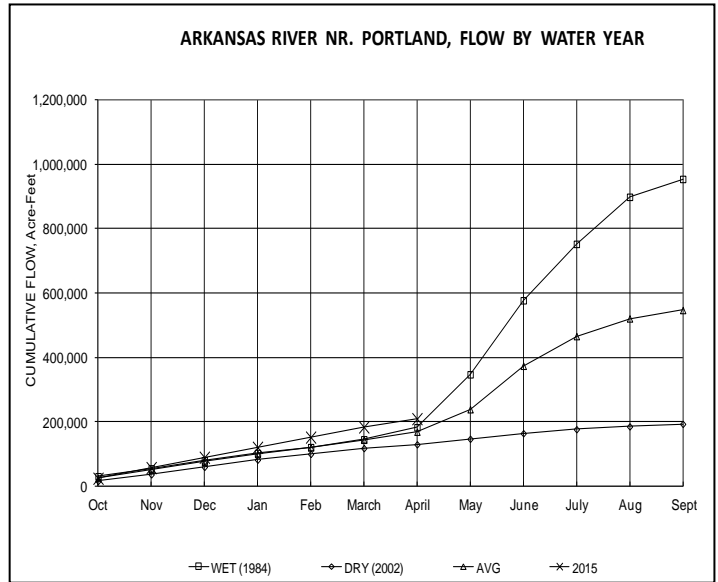
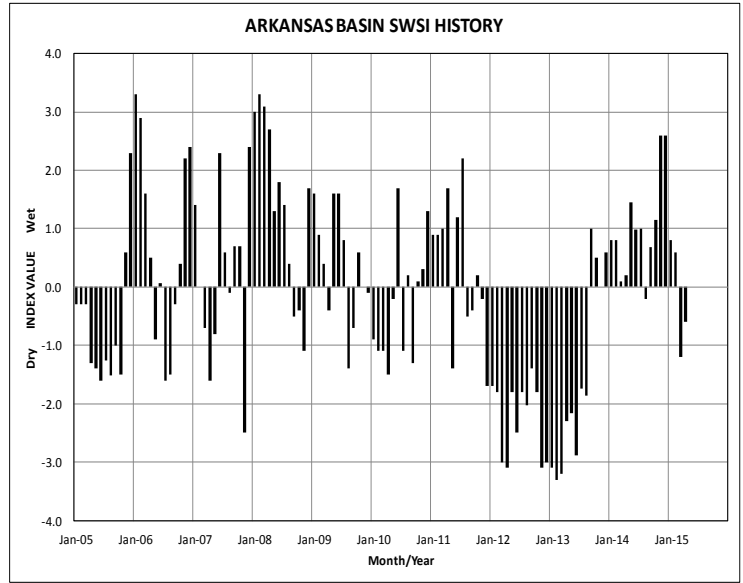
Basinwide Conditions Assessment

The SWSI value for the month was -0.6. The Buffalo Canal placed a call below John Martin Reservoir on April 1st; consequently the distribution of conservation storage into accounts per the 1980 Operating Agreement for John Martin Reservoir began on April 1, 2015. Total storage from November 1, 2014 through April 11, 2015 distributed into accounts in John Martin Reservoir was approximately a net of 20,489 acre-feet.

Mainstem river calls at the beginning and end of the month were Fort Lyon Canal 3-1-1887 water right from Pueblo Reservoir down to John Martin Reservoir with a call slightly more junior.

Administrative / Management Concerns

April began with concerns about falling snowpack levels, however additional rain and snow events during the month caused some relief to be experienced by the close of the month.



Basinwide Conditions Assessment

The SWSI value for the month was -2.8. Flow at the gaging station Rio Grande near Del Norte averaged 839 cfs (119% of average). The Conejos River near Mogote had a mean flow of 205 cfs (73% of average). Flow to the state line was only 40% of normal as upstream diversions for irrigation needs continued.

Warm temperatures in March and the first half of April produced an early melt throughout the upper Rio Grande basin. Fortunately, temperatures cooled and a modest amount of precipitation in the mountains during the second half of the month slowed the runoff and held back some of the snowpack for the long season ahead.

Alamosa received precipitation totaling 0.43 inches during April, 0.16 inches below normal. Temperatures in the San Luis Valley were significantly above normal for the eighth month in a row!

Outlook

NRCS forecasts are now predicting April through September runoff to be only 50% of average on the Rio Grande near Del Norte and 40% for the Conejos near Mogote. Other drainages of particular concern are the Alamosa River (35%), Saguache Creek (81%), and the eastern side of the basin where runoff from Sangre de Cristo Range Creeks is expected to be in range of 60 to 84% of the long-term average.

Based on these forecasts, water users in the basin who are reliant on stream flow for irrigation and stock watering needs should expect extremely limited availability.

The National Weather Service is still predicting a good chance for better than average precipitation the next several months.

Administrative/Management Concerns

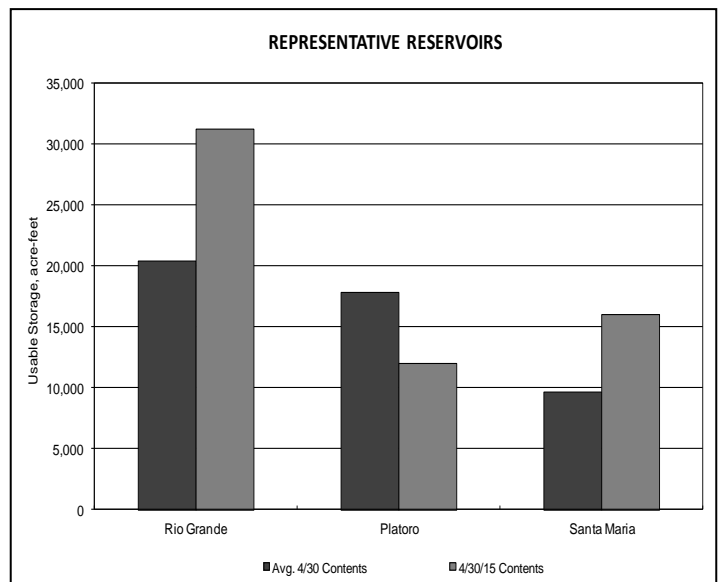
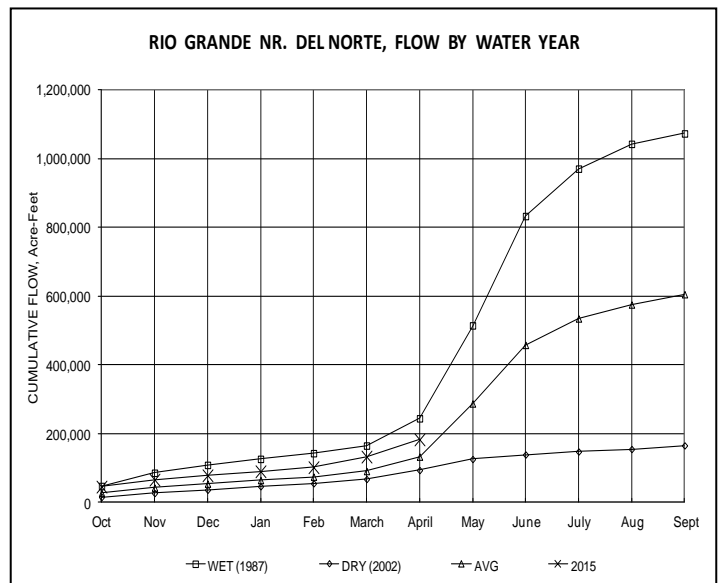
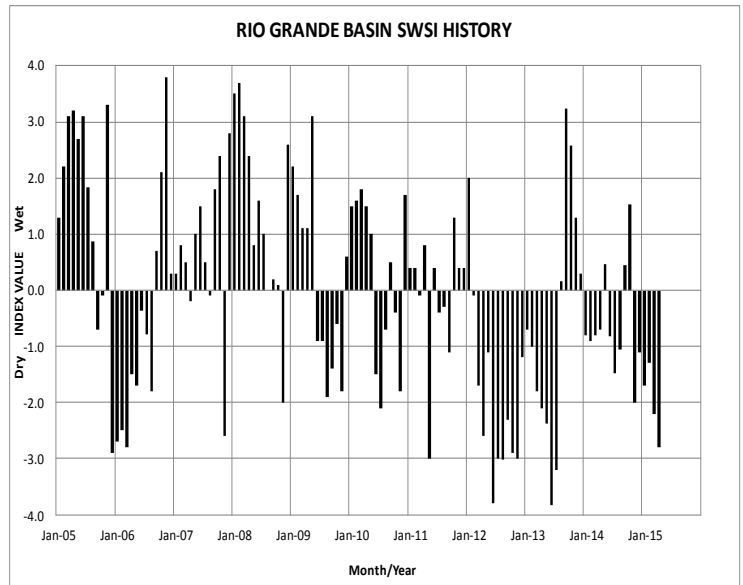
Water rights were curtailed slightly during April on the Rio Grande and the Conejos. It appears that little or no curtailment will be necessary on these drainages to make water available for Rio Grande Compact deliveries in 2015. This is a common practice for poor to fair runoff years.

With only the most senior water rights able to divert throughout the summer, massive pumping from the valley's aquifers will be necessary to meet irrigated crop demand.

On May 1, 2015, the State Engineer approved the Annual Replacement Plan (ARP) of the Rio Grande Water Conservation District's Special Improvement Subdistrict No. 1. Replacement of injurious pumping depletions from irrigation well use continues for the fourth season. Subdistrict No. 1 is the first of several proposed subdistricts aimed at assuring compliance with the expected State Engineer's Rules for Groundwater use in Water Division No. 3. More information on this process can be obtained through the DWR website at [www.water.state.co.us](http://www.water.state.co.us)

Public Use Impact

Reservoir storage is already very low in this basin and will be depleted even further. The anticipated poor stream flow will adversely affect the farming, ranching, and recreational industries in the basin.



Basinwide Conditions Assessment

The SWSI value for the month was -2.8. Conditions moderated a bit in the Gunnison basin during the latter part of April and early May. Precipitation was above average in the lower basin during April and below average in the upper basin with temperatures 1 to 3 degrees cooler than average, which slowed down the runoff. According to Snotel measurements, on May 12<sup>th</sup> the basin has 71% of the average snow water equivalent (SWE) for the date. Despite additional precipitation, the March 15<sup>th</sup> peak mentioned in the previous report was the seasonal peak, however, after heavy melt during the first part of April most gages experienced a slower than average melt rate and some, such as Red Mountain Pass, picked up a significant boost in SWE. Unfortunately, the North Fork Gunnison River remains in the worst condition with the basin above Paonia Reservoir recording snow all gone as of the middle of April, which is two months early. Rains during the month have definitely helped wet the lower valleys, however, which has resulted in greening of fields without requiring substantial irrigation water.

Outlook

The CBRFC May 1<sup>st</sup> forecasted April to July streamflows range from 30% of average on Surface Creek in Cedaredge to 76% of average on the Lake Fork Gunnison River. A new forecast is due out on May 15<sup>th</sup> and should show some improvement due to recent storms.

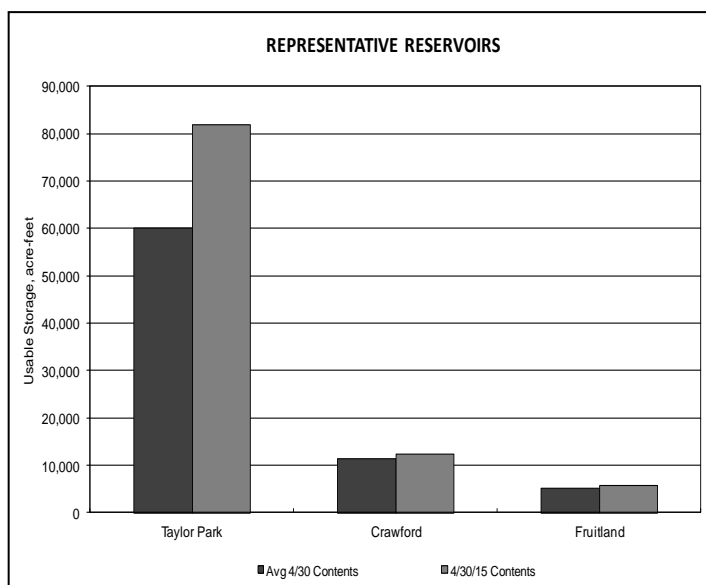
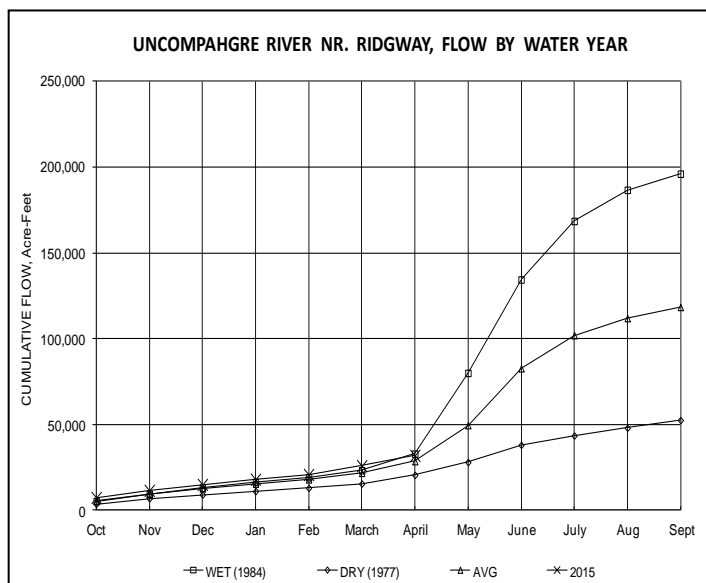
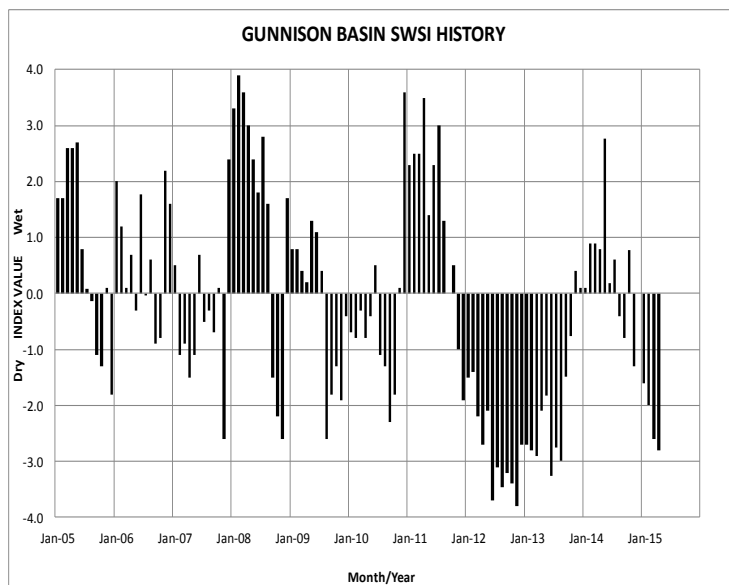
Administrative/Management Concerns

It still appears that the Gunnison basin will experience significant administrative issues this year, but the early season administrative demand has moderated with the precipitation. Many irrigators in the Surface Creek valley near Cedaredge were satisfied by natural streamflow due to the precipitation during late April and early May. As such, the calls on Ward Creek and Dirty George Creek, which prevent some Grand Mesa Reservoirs from storing, have been released as of May 6<sup>th</sup> and 7<sup>th</sup> respectively. Water commissioners spent time in April shoveling snow off of gage rods on top of the Grand Mesa to determine storage levels at the time of the call. This is a month earlier than they typically begin checking reservoir storage, but was necessary for administration of out of priority storage once the reservoir outlets thaw out and can be opened. Paonia Reservoir filled as well due to the delay in calls on the mainstem of the North Fork Gunnison River.

The April to July inflow forecast for Blue Mesa Reservoir was 440,000 acre-feet on May 1<sup>st</sup>, which places the basin in a moderately dry condition and sets the one-day peak flow target in the Black Canyon at 2,054 cfs, and the ROD flow target at Whitewater at 4,991 cfs for only one day. The USBR planned to time a 4,200 cfs peak release from Crystal Dam with a North Fork peak on May 10<sup>th</sup> to accomplish the ROD target, but fortunately significant rain in the North Fork area produced over 4,000 cfs below Leroux Creek on May 7<sup>th</sup>, and the flow at Whitewater on the Gunnison peaked at over 5,800 cfs on May 8<sup>th</sup>. This met the ROD target without significant releases from the Aspinall Unit and the USBR estimates that this saved approximately 23,000 acre-feet of storage water! As a result, peak operations for both the Black Canyon water right and ROD targets are already complete for 2015. Releases at Crystal will ramp down to produce a flow below the Gunnison Tunnel of 400 cfs by May 13<sup>th</sup>.

Pubic Use Impacts

The lower flows to be released from the Aspinall Unit should make for a good floating season in the Gunnison Gorge starting May 13<sup>th</sup>, certainly much improved from 2014.



Basinwide Conditions Assessment

The SWSI value for the month was -1.3.

Outlook

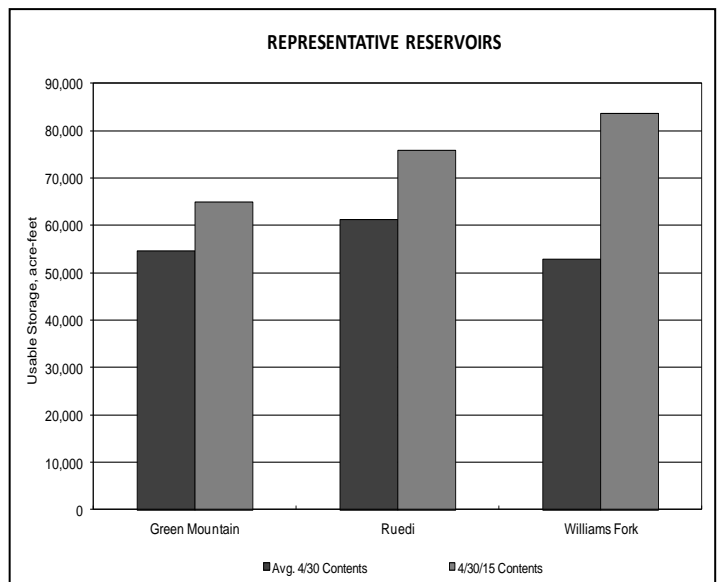
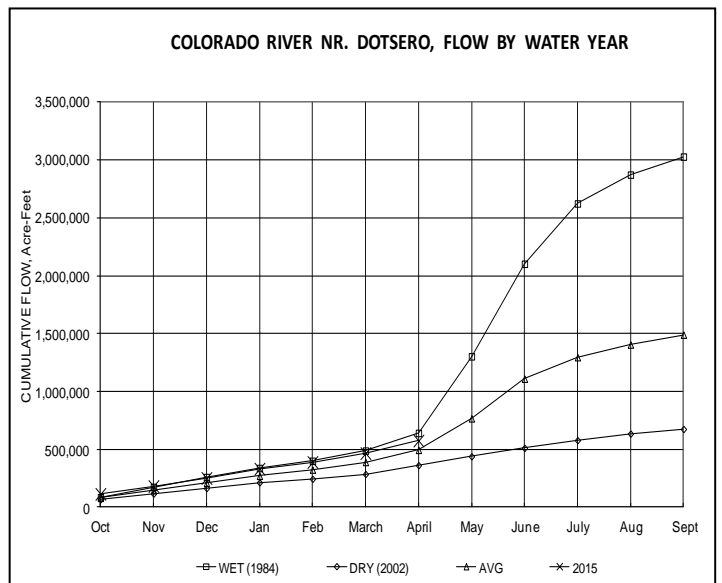
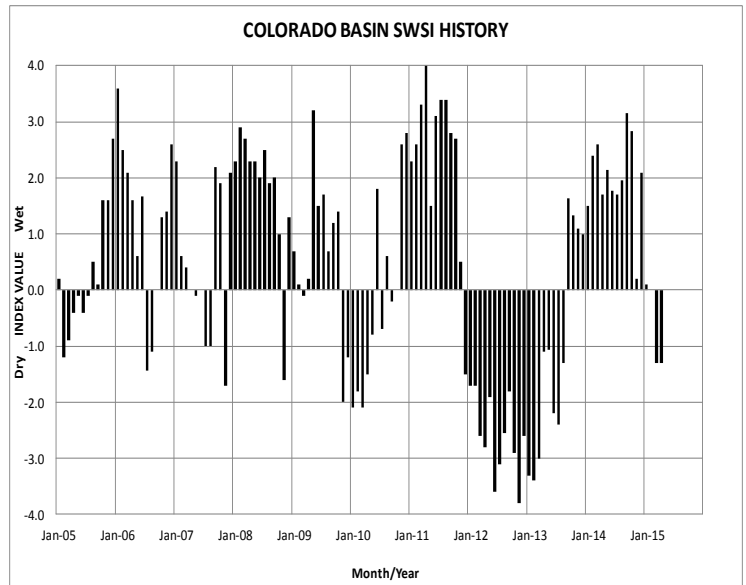
Colorado River flows are running above average likely due to the higher precipitation. Roaring Fork and Eagle River flows are likely to remain consistent at above average to average throughout May. As of May 1<sup>st</sup>, Upper Colorado River Headwaters snowpack has risen and Roaring Fork Basin snowpack has dropped slightly from the previous month to 72 and 56 percent of median snow water equivalent, respectively. As of May 11, the Upper Colorado River Headwaters and the Roaring Fork Basin snowpack have both risen to 85 and 69 percent of median snow water equivalent, respectively. Basin wide (all sites above Lake Powell) percentage was lower, at 49 percent (56% as of May 11). Below average temperatures and a fair amount of precipitation are forecast for May.

Administrative/Management Concerns

There is currently no call on the Colorado River. The Green Mountain Reservoir Administrative Protocol is currently in effect through the end of the irrigation season. A paper fill of Green Mountain is projected for early June with a physical fill expected by mid July. Increased release from Dillon Reservoir resulted in increase flow into Green Mountain Reservoir. Due to the increased flow into Green Mountain, Green Mountain releases have approximately doubled in the first ten days of the month. Williams Fork is filling and Wolford Mountain Reservoir is holding steady.

Public Use Impacts

A decision has not been made about the Coordinated Reservoir Operation (CROS) regarding the peak flow exchange in the 15 mile reach. Projected flows as of early May were below the minimum of 12,900 cfs at Cameo although recent precipitation may change that forecast. A Voluntary Program, CROS was established in 1995 as part of the recovery program to enhance spring peak flows for endangered fish to a section of the Colorado River upstream of Grand Junction, Colorado. In average snowpack years, reservoir operators simultaneously release water to provide an enhanced peak flow that creates habitat conditions that benefit endangered Colorado Pikeminnow, Razorback Sucker, Humpback Chub, and Bonytail.



Basinwide Conditions Assessment

The SWSI value for the month was -3.4. April precipitation was well 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 71% of average for the combined 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 April decreased to 79%.

Snowpack for the Yampa, White, and North Platte and Laramie River basins was well below normal at 55% of average. The snow water equivalent (SWE) as of May 1st was 65% of average for the North Platte and Laramie River basins and 52% 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 May through July period are 37% of average for the North Platte River near Northgate, 45% of average for the Yampa River near Maybell, 28% of average for the Little Snake River near Lily, and 44% of average for the White River near Meeker

All Division 6 stream gages will be operational by the 1st week of May.

Outlook

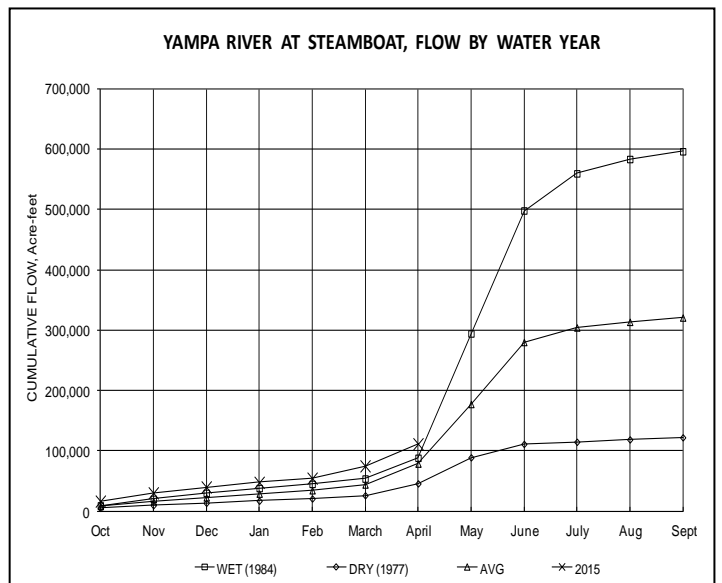
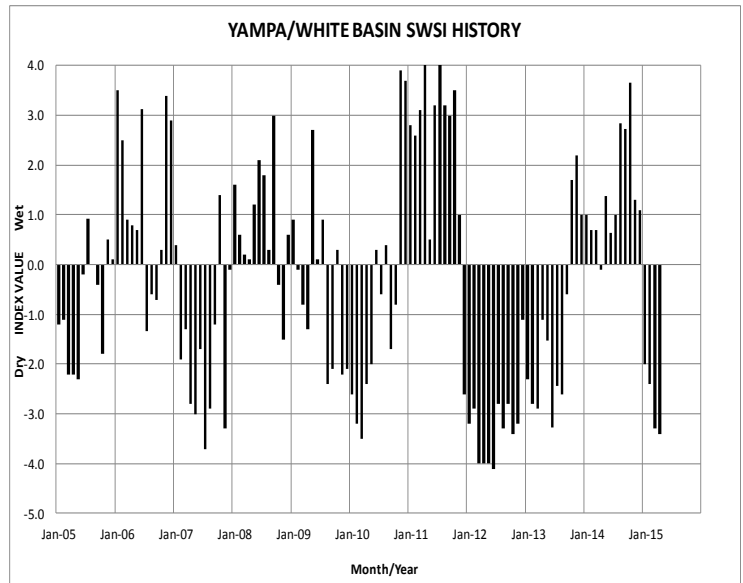
As of April 30th Fish Creek Reservoir was storing approximately 3,493 AF, 83.8% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 9,428 AF at the end of April 2015. The capacity of Yamcolo Reservoir is 8,700 AF. On April 30th Elkhead Creek Reservoir was storing 21,982 AF. The capacity of Elkhead Creek Reservoir is 24,778 AF On April 30th, 2015; Stagecoach Reservoir was storing 36,400 AF which is 109% 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

Boating on the reservoir began May 1st. Anglers are reporting that Powerbait or worms are doing well for trout. People are catching 22"-24" rainbows from the shore with the inlet and coves along the shallows hitting best.

Steamboat Lake is reporting that fishing is hot right now. The lake is free of ice and anglers are doing well from the shore.



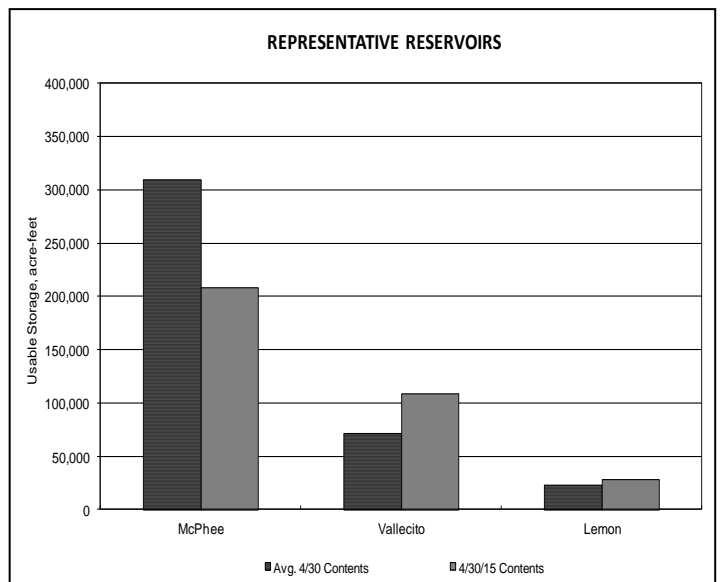
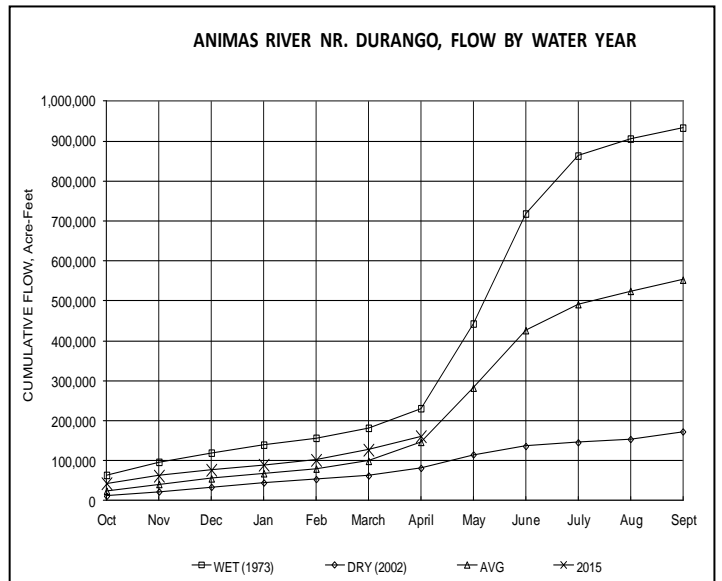
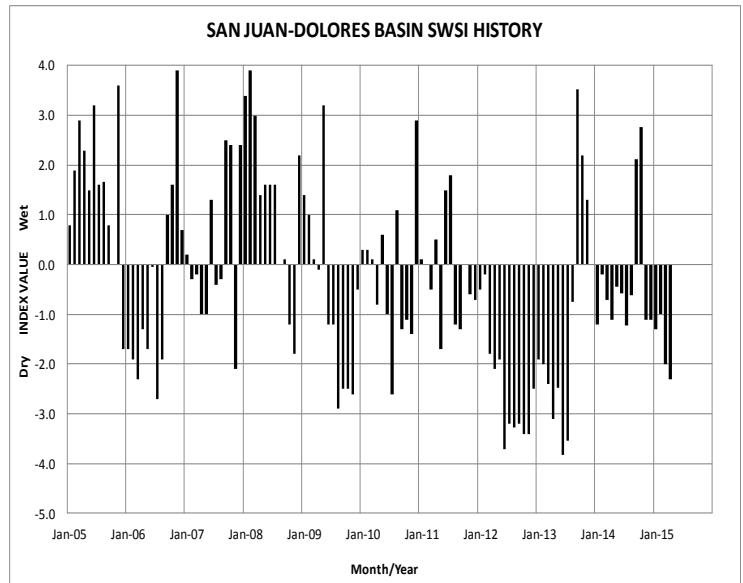


Basinwide Conditions Assessment

The SWSI value for the month was -2.3. Flow at the Animas River at Durango averaged 551 cfs (65% of average). The flow at the Dolores River at Dolores averaged 358 cfs (48% of average). The La Plata River at Hesperus averaged 32.5 cfs (41% of average). Precipitation in Durango was 0.99 inches for the month, 69% of the 30-year average of 1.44 inches. Precipitation to date in Durango, for the water year, is 8.59 inches, 76% of the 30-year average of 11.28 inches. The average high and low temperatures for the month of April in Durango were 63o and 31o. In comparison, the 30-year average high and low for the month is 63o and 31o. At the end of the month Vallecito Reservoir contained 109,214 acre-feet compared to its average content of 65,726 acre-feet (166% of average). McPhee Reservoir was up to 208,607 acre-feet compared to its average content of 310,647 (67% of average), while Lemon Reservoir was up to 28,500 acre-feet as compared to its average content of 22,929 acre-feet (124% of average).

Outlook

Precipitation (0.99 inches) was below average for April in Durango. There were 69 years out of 121 years of record where there was more precipitation than this year. The flows in the rivers within the basin fell below average. There were 81 out of 104 years of record where the total flow past the Animas River at Durango stream gauge was more than this year. There were 88 out of 104 years of record where the total flow past the Dolores stream gauge was more than this year and 87 out of 98 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year. On April 30, the NRCS SNOTEL sites reported an average snow-water equivalent within the basin at 40%. End of last month the snow-water-equivalent was 56% of average.



## ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - May-15

The SWSI for each basin is based on probability of nonexceedance (PN) curves for each of three components: reservoir storage, snowpack, and precipitation (total accumulated for the season). The weighting, or importance, for each component in the SWSI calculation varies by basin as shown below.

**Winter SWSI Component Weights**

Basin	Reservoir Storage	Snowpack	Precipitation (cumulative)
South Platte	0.55	0.27	0.18
Arkansas	0.15	0.51	0.34
Rio Grande	0.05	0.63	0.32
Gunnison	0.1	0.54	0.36
Colorado	0.15	0.51	0.34
Yampa/White	None	0.6	0.4
San Juan/Dolores/Animas	0.1	0.54	0.36

The PN curves were developed in the 1980s and are generally based on a period of record of 1950-1979. As reservoir storage (and streamflow for the summer SWSI) is affected by human action, the reservoir storage PN curves may not reflect current practices for reservoir operation. DWR and NRCS are currently considering options for modifying the SWSI to address this and other concerns about its computation.

### SWSI BY HUC FROM NRCS NATIONAL WATER & CLIMATE CENTER

Included below is the SWSI generated by the NRCS National Water and Climate Center, based on data as of May 1. The SWSI below is a predictive indicator of surface water availability for the spring and summer water use seasons. It is calculated by combining reservoir storage with forecasts of spring and summer streamflow, based on current snowpack and other hydrologic variables. The scale of -4 to +4 is the same as shown on Page 1.

