COLORADO
WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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April 2013

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 Office in each stream basin.

The statewide SWSI values for March (April 1) range from a high value of -1.8 in the Rio Grande Basin to a low value of -3.2 in the Arkansas Basin. Drought conditions continue to be widespread throughout the state. The changes in SWSI values compared to last month were mixed depending on location. With the exception of reservoir storage in the Rio Grande Basin[1], all components of the SWSI (reservoir storage, cumulative precipitation, and snowpack) are at or below normal for April 1.

The following SWSI values were computed for each of the seven major basins for April 1, 2013, and reflect the conditions during the month of March. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10.

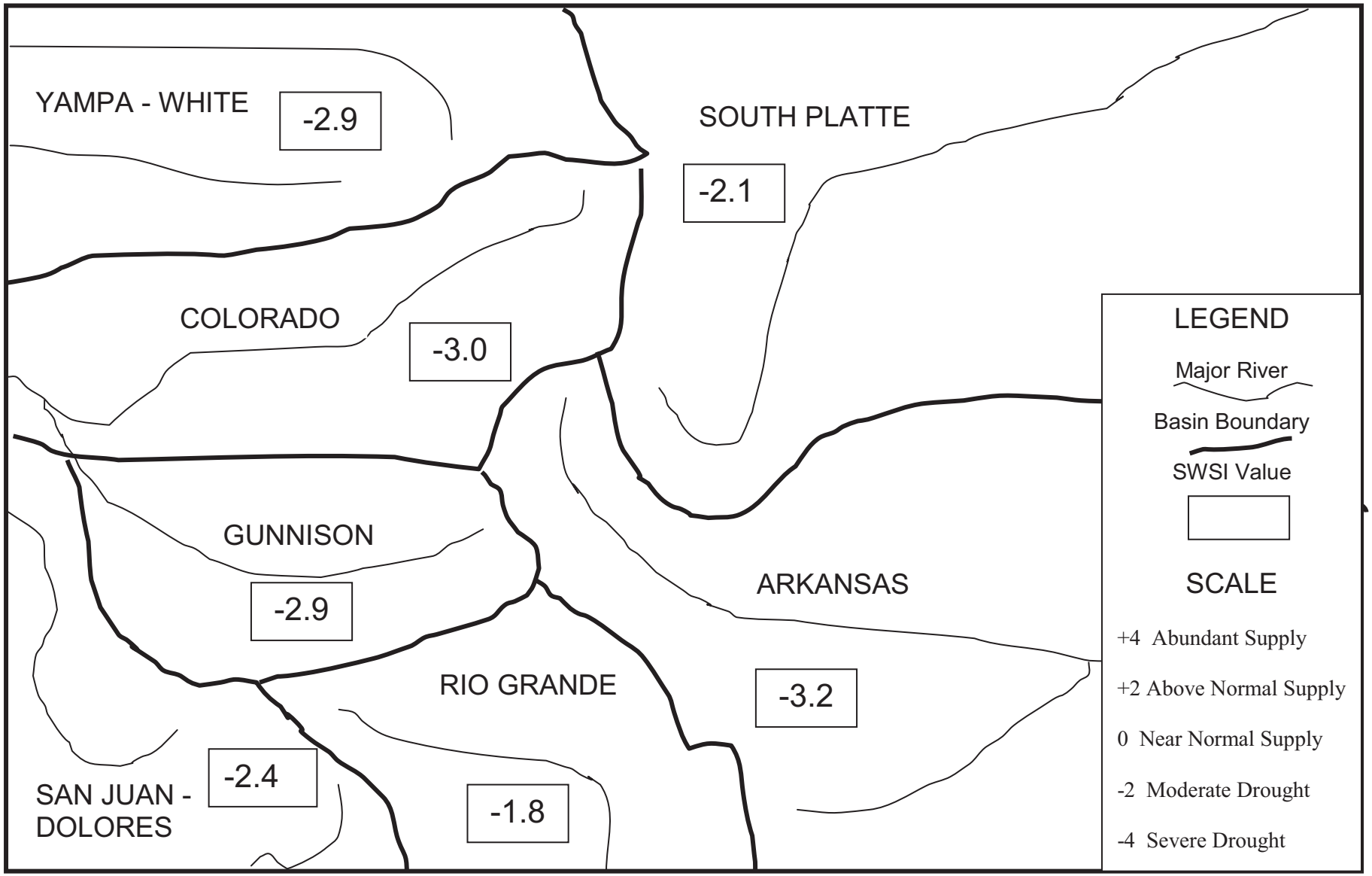
Basin	April 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	-2.1	0.0	-2.8
Arkansas	-3.2	0.1	-0.2
Rio Grande	-1.8	-0.8	-0.1
Gunnison	-2.9	-0.1	-0.7
Colorado	-3.0	0.4	-0.4
Yampa/White	-2.9	-0.1	1.1
San Juan/Dolores	-2.4	-0.4	-0.6

SWSI Scale

-4	-3	-2	-1	0	1	2	3	4
Severe Drought		Moderate Drought		Near Normal Supply		Above Normal Supply		Abundant Supply

[1] Compared to a more recent period of record, reservoir storage in the Rio Grande Basin is probably less than normal. See page 10 for a discussion of the age of PN curves used to develop the SWSI.

SURFACE WATER SUPPLY INDEX FOR COLORADO

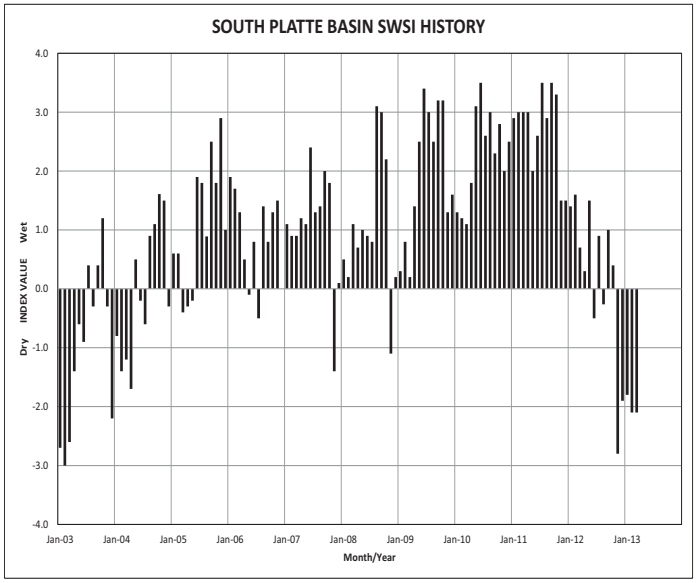


April 1, 2013

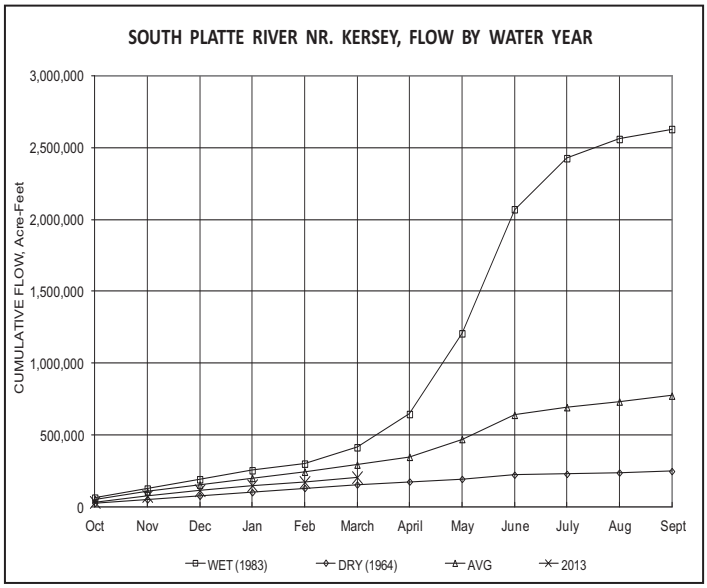
Basinwide Conditions Assessment

The SWSI value for the month was -2.1. Cumulative storage in the major plains reservoirs (Julesburg, North Sterling, and Prewitt) is at 88% of capacity. Cumulative storage in the major upper-basin reservoirs (Cheesman, Eleven Mile, Spinney, and Antero) is at 74% of capacity.

March continued the cool and wetter conditions that began in late February in the South Platte basin. This not only helped conditions on the plains by reducing or eliminating direct flow irrigation demand (allowing storage to continue), but also finally pushed the South Platte snow pack to above both the 2002 and the 2012 snow water equivalent (SNE) levels by the end of the month. The April 1, 2002 SNE was 52% of average; the April 1, 2012 SNE was 57% of average; and the April 1, 2013 SNE was 70% of average. While 70% of average is nothing "to write home about", it is at least better than it has been.



Stream flows at both the Kersey and Julesburg index gages remained below average for March. The Kersey gage monthly mean stream flow was 544 cfs or 79% of the historic mean of 688 cfs. The March 2003 mean flow was 738 cfs, after the Saint Patrick's Day blizzard of 2003. The March Julesburg gage monthly mean stream flow value was 40 cfs or 8% of the historic mean of 522 cfs. This is below the March 2003 mean of 45 cfs.

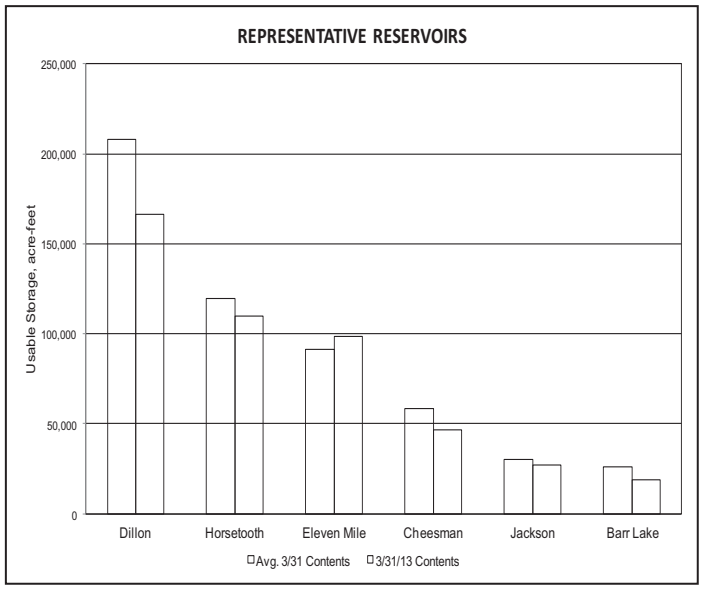


Overall reservoir storage in the basin was at 84% of the end of March average. This compares with an end of March 2003 reading of 58% of average and an end of March 2002 reading of 85% of average.

The mainstem and tributary river calls continued with diversions to storage rights throughout the month. Both the tributary and mainstem calls generally remained stable throughout the month.

Outlook

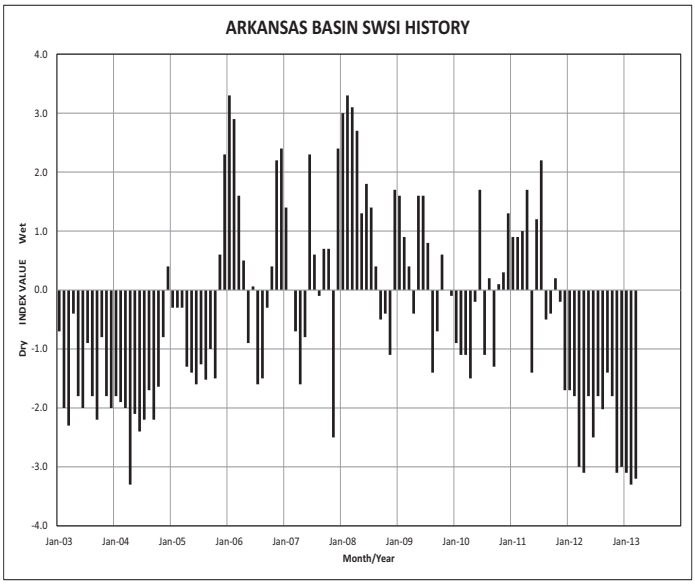
Finally, though some improvement in drought conditions for the lower end of the South Platte basin is expected, the entire basin remains in the severe (D2) or extreme (D3) drought categories.



Basinwide Conditions Assessment

The SWSI value for the month was -3.2. Snowpack accounts for the majority of the SWSI in the Arkansas Basin and was very low with a nonexceedance probability (PN) of 5. Water year cumulative precipitation, the other major component of the Arkansas Basin's winter SWSI, was also very low (PN of 9).

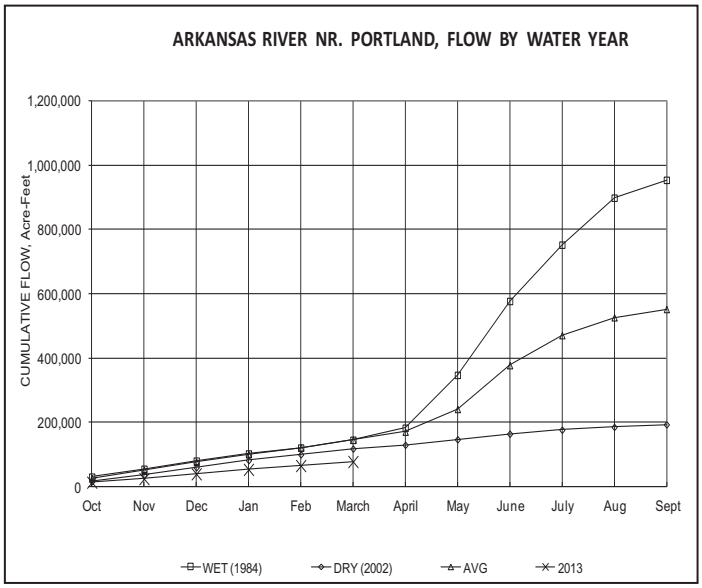
Total distributed reservoir storage following the Pueblo Winter Water Program was 67,168 acre-feet, including 21,983 acre-feet in Pueblo Reservoir, 34,631acre-feet in off-channel reservoirs, and 10,511 acre-feet in John Martin Reservoir (after distribution to accounts). Conservation Storage in John Martin Reservoir through March 31 totaled 6,515 acre-feet. Storage values are only about half of last year for the Pueblo Winter Water Program and a third of last year for Conservation Storage in John Martin Reservoir.

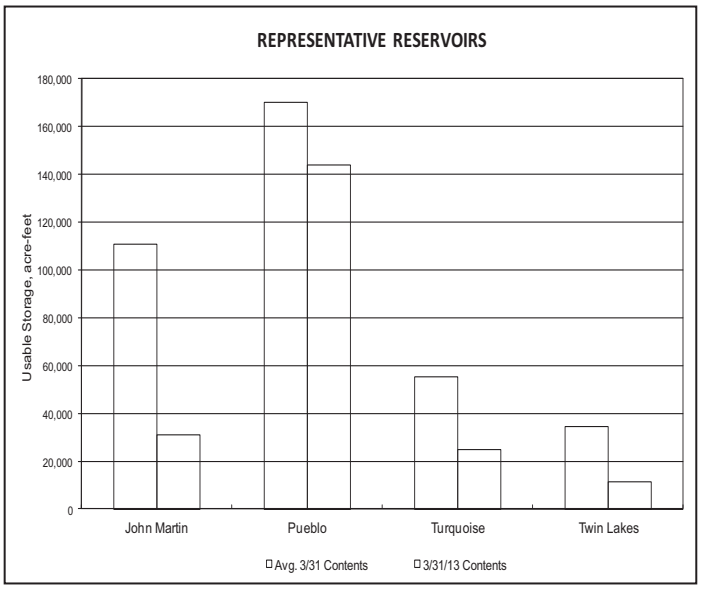


Outlook

The Arkansas River Basin has consistently had one of the lowest percentage of snowpack values among the river basins, the statewide outlook remains poor and a great deal of concern exists about snowmelt runoff for diversions of native water within the basin and for opportunities to import water via the Fry-Ark Project, Twin Lakes and Homestake Tunnel systems as well as through the various other transmountain diversions.

Well Association replacement plans for 2013 were approved with very little agricultural pumping due to lack of replacement source availability.





Basinwide Conditions Assessment

The SWSI value for the month was -1.8. Flow at the gaging station Rio Grande near Del Norte averaged 190 cfs (71% of normal). The Conejos River near Mogote had a mean flow of 61 cfs (78% of normal). Flow at the state line was 76% of normal. Weather conditions in the San Luis Valley were close to the long-term average for precipitation and temperature during March.

A recent study of 10 SNOTEL sites in the upper Rio Grande basin showed the existing snowpack began to decline about March 30. In a normal year, the snowpack would continue to build until April 6. The 2012-13 snowpack never reached average and tracked well below last winter's until the end of March. Therefore, runoff in 2013 is expected to be significantly less than average and 2012.

Outlook

Worse than 2012, better than 2002, and tracking closely with the 2003 runoff which was generally 50% of normal in the upper Rio Grande basin. Current NRCS streamflow forecasts predict the April through September runoff to be only 52% of average on the Rio Grande near Del Norte and 59% of average for the Conejos near Mogote. Other streams in the basin are forecast as low as 26% of normal for the Rio San Antonio and as high as 64% of normal for the Rio Grande below Rio Grande Reservoir. In general, snowpack at lower and intermediate elevations within the basin is very poor. The eastern portion of the basin has some of the poorest snowpack conditions in the entire state. Without significant rainfall during the irrigation season, many of the sub-basins will experience severe drought conditions.

The below normal reservoir storage levels will compound the water availability problem. Soil moisture conditions are poor in most locations around the basin.

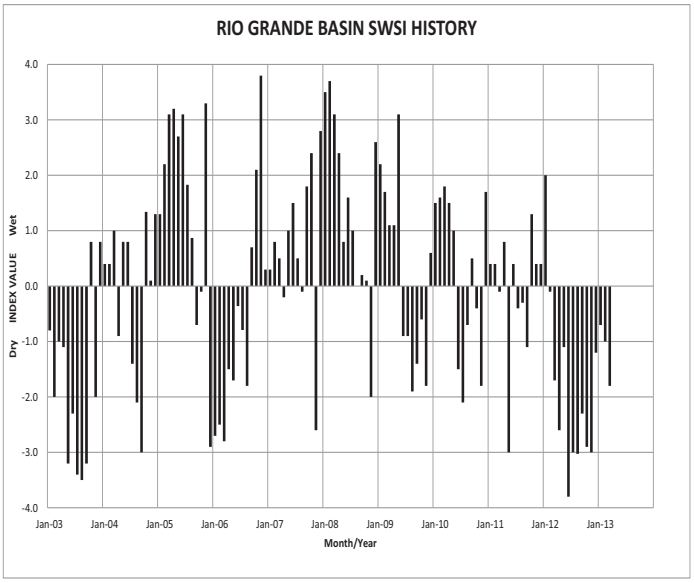
Administrative/Management Concerns

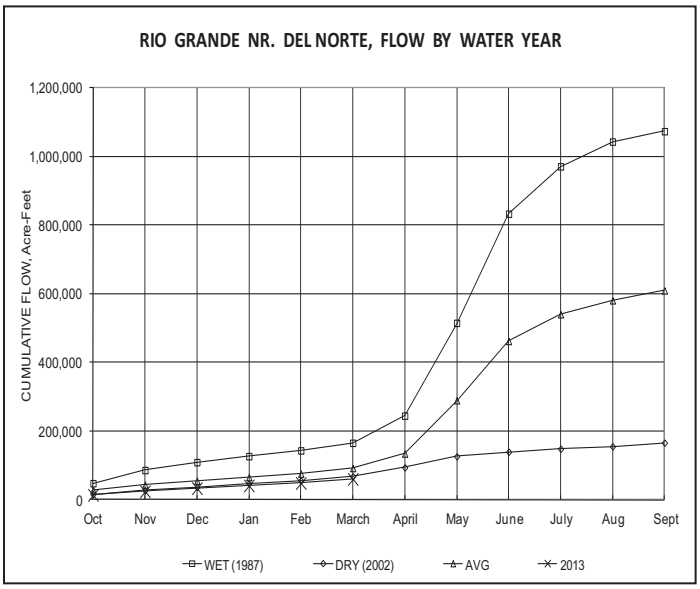
Based on the current forecast, there will be little or no curtailment of water rights on the Rio Grande and the Conejos River this irrigation season. However, due to the lack of available streamflow, many area ditches will not come into priority this season.

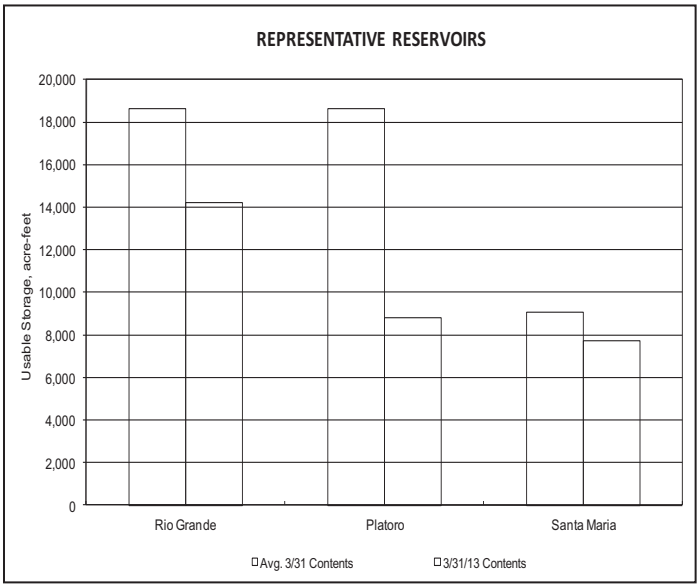
Note: The SWSI report for the Rio Grande Basin from March 2003 was used as a template for this report. Very few changes were required. Water Administrators fear the 2012 – 2013 runoff seasons could mimic 2002 – 2004.

Public Use Impacts

There will be significant impact to area farmers, ranchers, and recreational interests dependent on streamflow. The aquifers will continue to be stressed by pumping as irrigators rely heavily on groundwater to replace surface water not available in 2013. Area reservoirs are already low. Many will be close to drying up this summer.

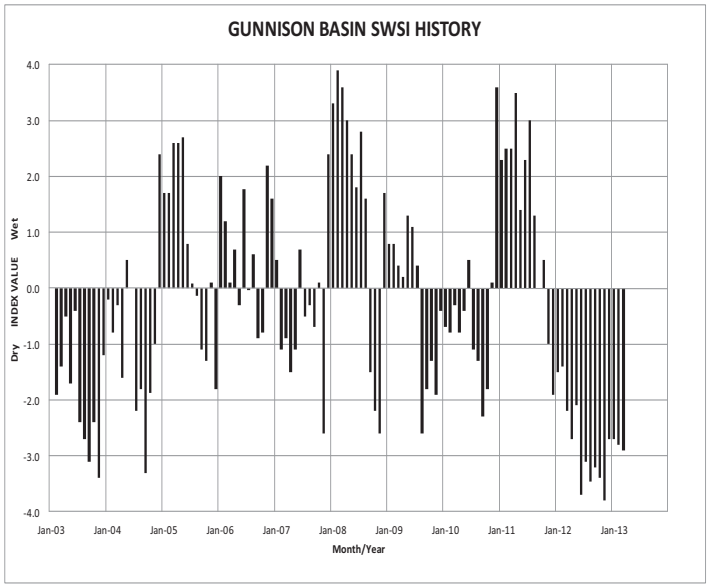






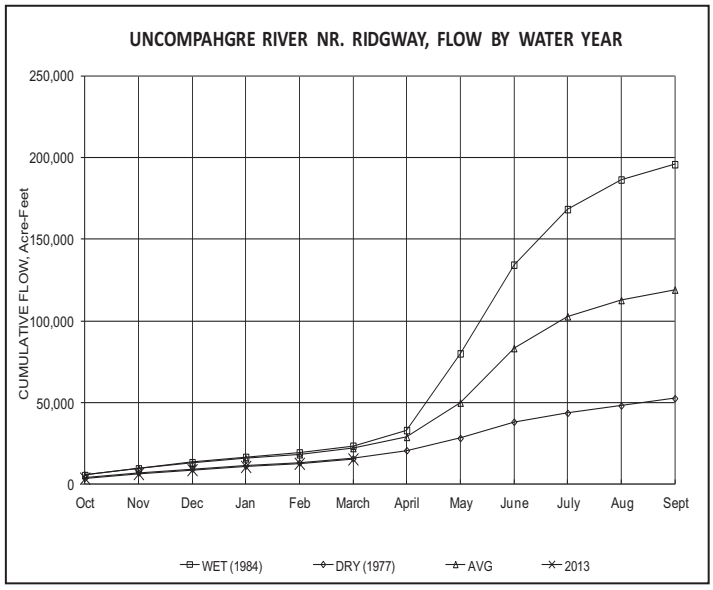
Basinwide Conditions Assessment

The SWSI value for the month was -2.9. Unfortunately, March remained dry in the Gunnison basin with less than 70% of average precipitation in most of the basin. As a result, snowpack conditions in the basin fell to 67% of average on April 1st. Snowpack on April 1st, however, is better than in 2012 due to March temperatures 1 to 3 degrees cooler than average that prevented the snowpack from melting like it did during March of 2012. More positive news is that between April 1st and 14th the Gunnison basin saw a marked improvement in snowpack caused by a few significant storms. The basin average now sits at 73% of the average peak and as of April 14th and is still rising, which is great since we have passed the typical peak of the accumulation season in most areas. Conditions are fairly similar basin wide, but the area that has improved the most with recent storms is the East River and Taylor Park drainages where they have picked up more than 2 inches of SWE in the first two weeks of April. Division of Water Resources staff continue to measure snow on the Grand Mesa and report that there appears to be 5 inches more SWE at the Park Reservoir Snotel gage than what is reported.



Outlook

April 1st Colorado Basin River Forecast Center (CBRFC) streamflow forecasts for Gunnison basin streams generally fall between the mid-40 and 50% range, with Tomichi Creek the lowest again this year at 34% of the 30 year average. The good news is that given the amount of precipitation received in the first two weeks of April, these forecasts should improve come May 1st.

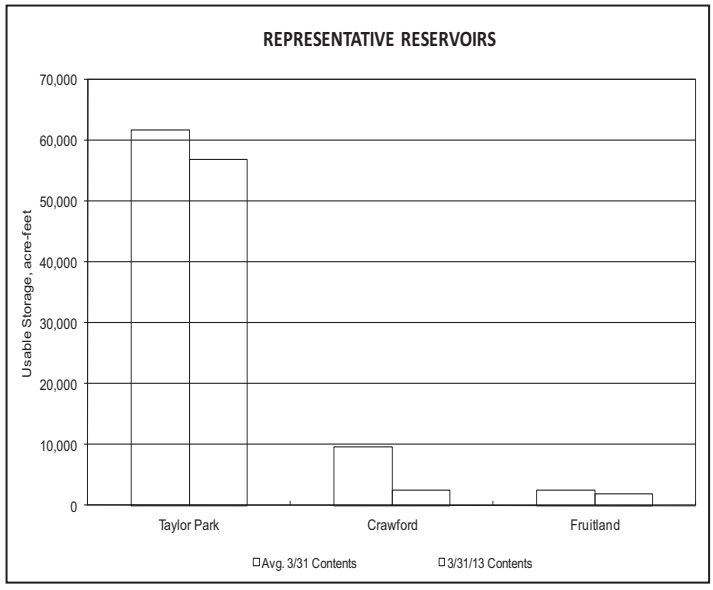


Administrative/Management Concerns

So far, even though high snowpack, as reported by Snotel gages, is much below average, runoff has been delayed to an extent that irrigators should be able to use the excess, which was not the case in 2012 when many streams peaked in late March and early April.

The Upper Gunnison River Water Conservancy District (UGRWCD) allocated funds for the purchase of up to 4,500 acre-feet of water from the Aspinall Unit to be used by the Uncompahgre Valley Water Users (UVWUA) at the Gunnison Tunnel. In exchange, the UVWUA, signed an agreement to only place a limited call when inflow into the Aspinall Unit does not cover Gunnison Tunnel diversions. This limited call would call down to Silver Jack Reservoir (1960 adjudication), preventing it from storing. The UGRWCD and Colorado River District attempted to make a deal for the purchase of additional water out of Ridgway Reservoir to forestall an April-May call by the Montrose & Delta Canal, which can call out many irrigation rights in Ouray County, but the UVWUA and Tri-County (operator of Ridgway) could not come to an agreement on call protection provisions and their relation to the filling of Ridgway Reservoir.

DWR and the Redlands Power Canal Co. are discussing the requirements for DWR to shepherd water released at Crystal Dam to their diversion since they do not have a water right for the fish ladder and screen and cannot make an efficient diversion while letting over 100 cfs past their structure. The USBR will likely release enough to cover Canal Diversions and a minimum of fish screen flows, but we shall see what discussions with the USFWS about reductions to endangered fish flow targets produce as well.



Pubic Use Impacts

The April-July inflow forecast for Blue Mesa Reservoir was reduced to 315,000 acre-feet (47% of average) on April 1st Levels at many reservoirs are projected to be lower than they have been since filling, which could impact many public uses, including boating access.

Basinwide Conditions Assessment

The SWSI value for the month was -3.0. Snowpack, which results in the majority of the SWSI in this basin had a PN of 12.

Outlook

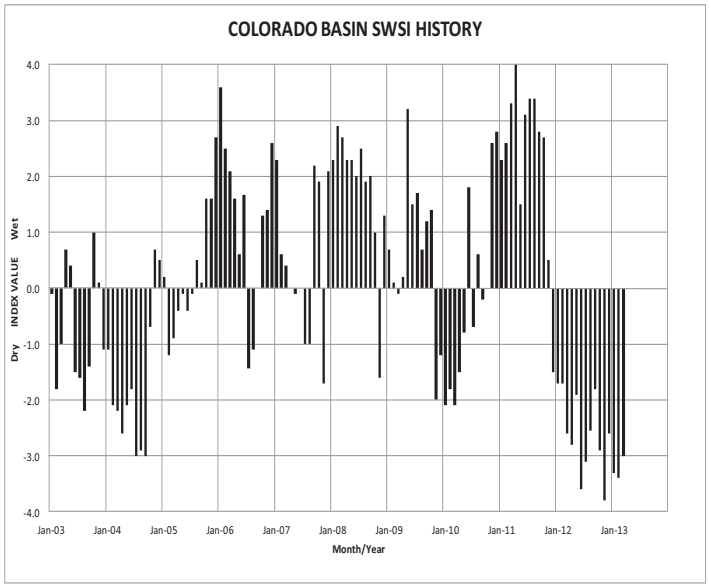
Below average temperatures in late March – early April have suppressed flows at most gages on the Colorado and Roaring Fork Rivers. Flows will increase as snowmelt run-off begins and upstream reservoir releases increase, but will continue to run below average through April. Below average precipitation throughout March resulted in only slight improvement in snowpack conditions with the Upper Colorado River and Roaring Fork Basin snowpack reporting 77 percent of average snow water equivalent respectively as of April 1st. The western Colorado forecast through the month of April calls for below average chance of precipitation.

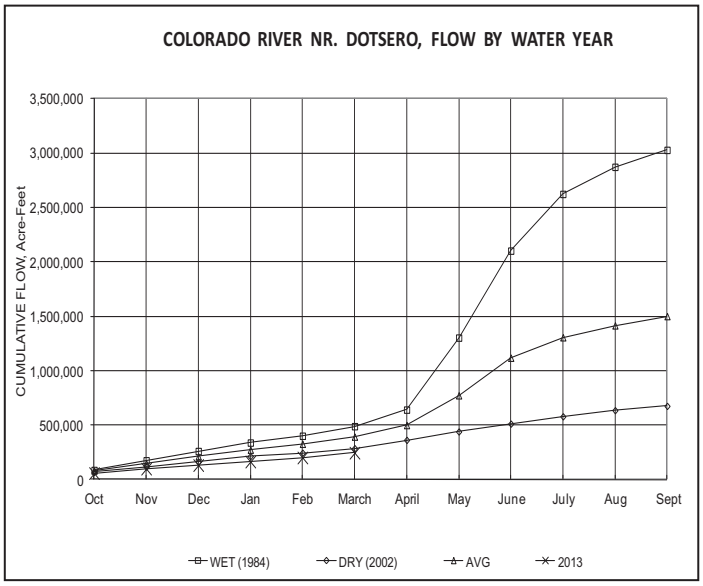
Administrative/Management Concerns

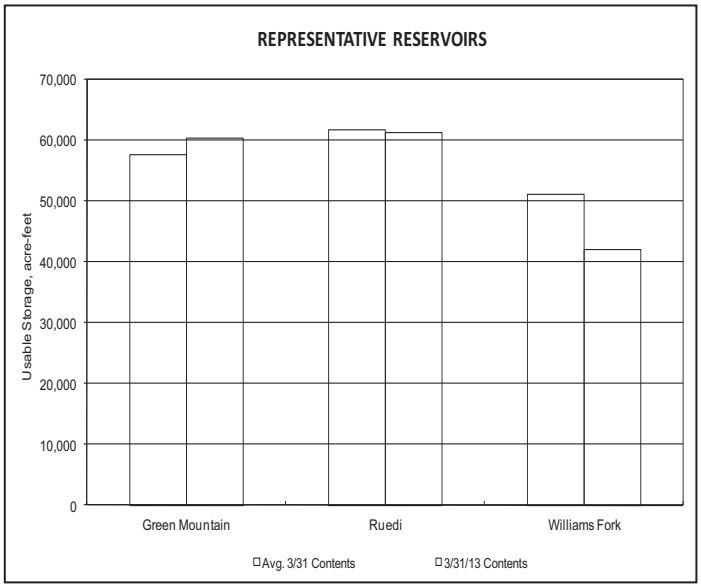
Grand Valley Irrigators initiated diversions in late March, and will likely place a call in early April. A relaxation (reduction) of the Shoshone Power Plant call was in effect from March 14th through 29th. This resulted in savings of approximately 14,000 acre-ft of upstream reservoir storage. Green Mountain, Williams Fork, and Ruedi Reservoir releases will fluctuate in accordance with Shoshone call relaxation and/or Grand Valley Irrigation calls.

Public Use Impacts

Sunlight Mountain Resort extended the season until April 7th following snow received in late March. Winter Park and Aspen/Snowmass are projecting a closing date of April 21st, while Loveland and Arapahoe Basin are projecting their season closings into early May to Mid June. Recent significant snowfall in early April could further extend these dates.







Basinwide Conditions Assessment

The SWSI value for the month was -2.9. 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 84% 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 remained at 78%.

Snowpack for the Yampa and White River basins increased slightly to 78% of average and the North Platte basin was at 80% of average as of March 31st. The snow water equivalent (SWE) as of March 31st was 82% of average for the Laramie and North Platte River basins and 78% 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 44% of average for the North Platte River near Northgate, 53% of average for the Yampa River near Maybell, 44% of average for the Little Snake River near Lily, and 54% of average for the White River near Meeker.

All Division 6 stream gages are scheduled to re-open by the end of April.

Outlook

As of March 31st, Fish Creek Reservoir was storing approximately 1,320 AF, 32% of th capacity of 4,167 AF. Yamcolo Reservoir was storing 4,610 AF compared to a capacity of 9,580 AF. Elkhead Creek Reservoir was storing 17,585, compared to a capacity of 24,778 AF. Stagecoach Reservoir was storing 29,400 AF, 80% of capacity.

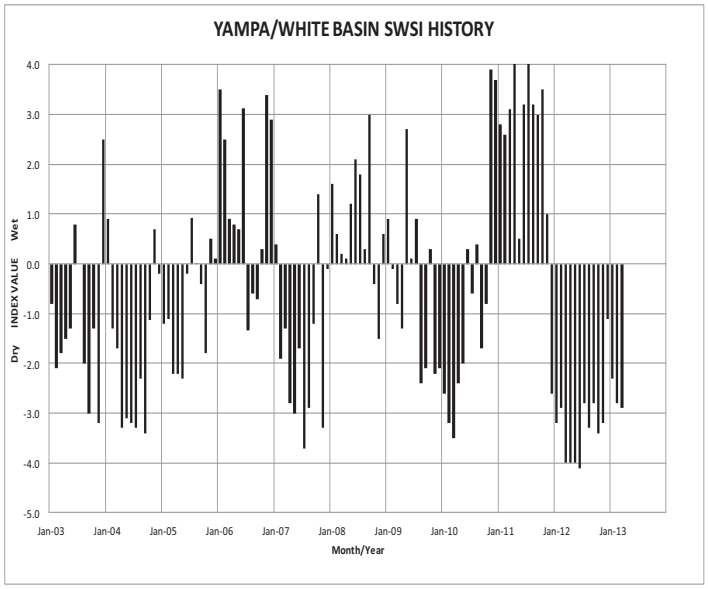
Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir for irrigation purposes, and Elkhead Creek Reservoir for municipal, industrial, recreational, and fish recovery releases. Stagecoach Reservoir is primarily used for recreation though a significant amount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

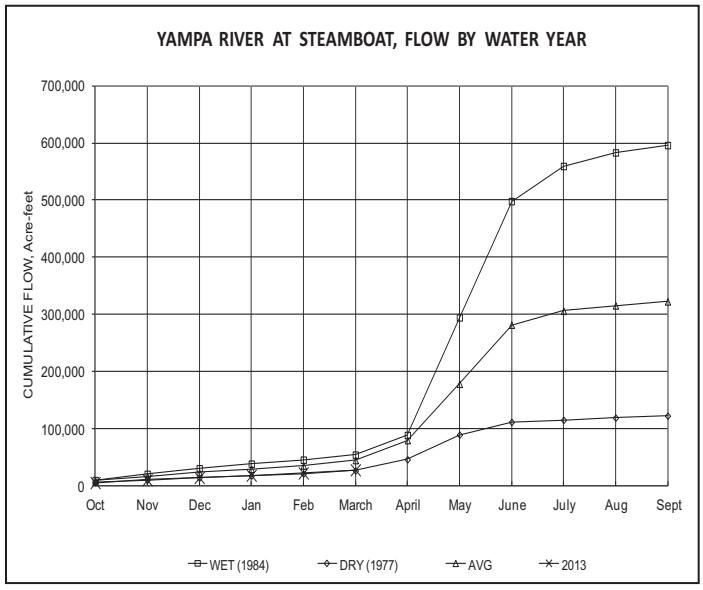
Public Use Impacts

Steamboat Ski Resort will close for the season on April 14 with slightly above average total snowfall of 327 inches since late October 2012.

Ice fishing at Stagecoach Reservoir has ended for the season as ice pulls away from the shoreline. Fishing is reported as great in the tailwaters. The reservoir will open for boating May 1, conditions permitting.

Steamboat Lake is still useable for winter recreation but variable spring conditions exist. There remains an 18 inch base of snow. The lake is still iced over with slush on top and some ice pulling away from shore so caution is advised.



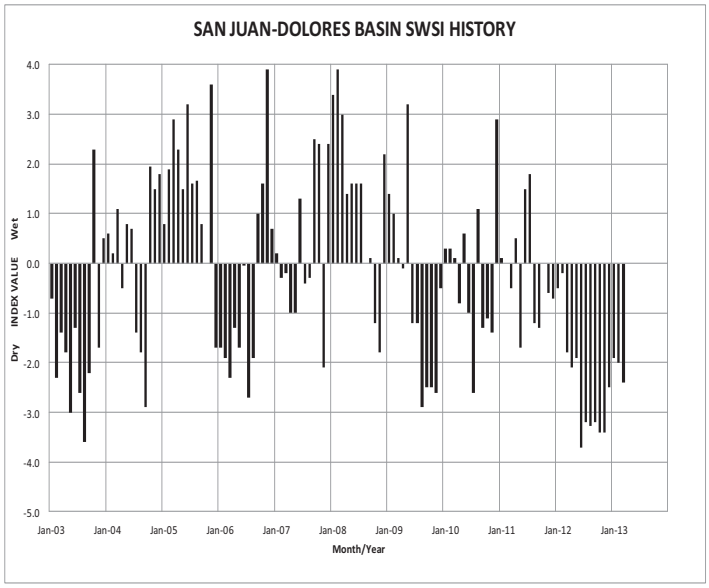


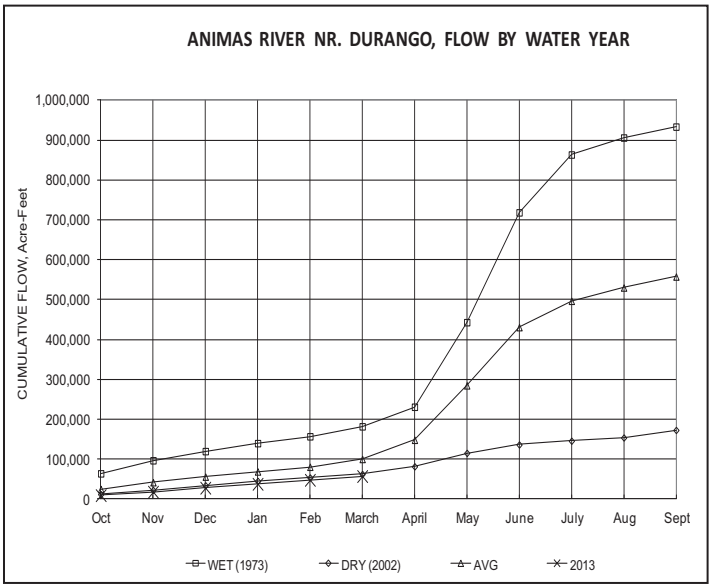
Basinwide Conditions Assessment

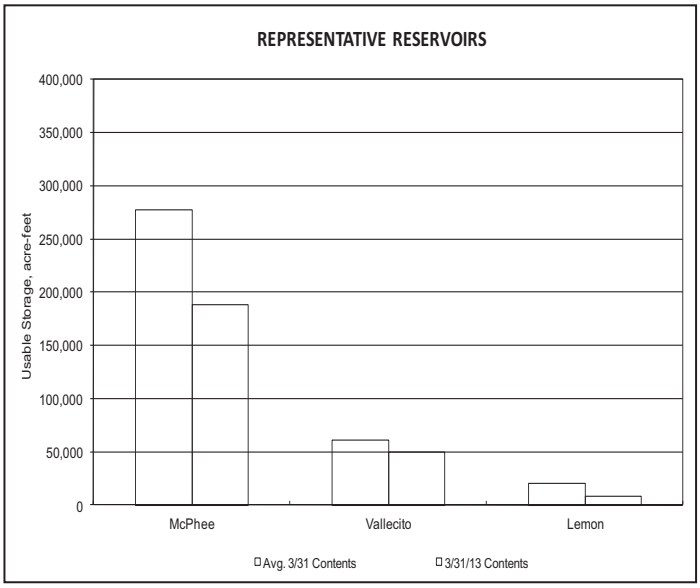
The SWSI value for the month was -2.4. Flow at the Animas River at Durango averaged 154 cfs (51% of average). The flow at the Dolores River at Dolores averaged 59 cfs (44% of average). The La Plata River at Hesperus averaged 6.1 cfs (38% of average). Precipitation in Durango was 0.73 inches for the month, 52% of the 30-year average of 1.41 inches. Precipitation to date in Durango, for the water year, is 5.41 inches, 54% of the 30-year average of 9.99 inches.

The average high and low temperatures for the month of March in Durango were 53° and 20°. 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 49,680 acre-feet compared to its average content of 56,027 acre-feet (89% of average). McPhee Reservoir was up to 188,307 acre-feet compared to its average content of 280,591 (67% of average), while Lemon Reservoir was up to 8,430 acre-feet as compared to its average content of 20,812 acre-feet (41% of average).

Precipitation (0.73-inches) was below average for March in Durango. This March, there was only one day where measurable precipitation was recorded. There are 88 years out of 119 years of record where there was more precipitation than this year. The flows on the Animas River were below average this March. There were 98 out of 103 years of record where the total flow past the Durango stream gauge was more than this year. The other basins within the division did not fare much better. The NRCS is reporting snow-water-equivalent of 74% of average at the end of the month which was slightly lower than the 81% of average reported at the end of February.







ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - Apr-13

The SWSI for each basin is based on probability of nonexceedance (PN) curves for each of three components: reservoir storage, snowpack, and water year cumulative precipitation. 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	Water Year Cumulative Precipitation
South Platte	0.55	0.27	0.18
Arkansas	0.15	0.51	0.34
Rio Grande	0.05	0.63	0.32
Gunnison	0.10	0.54	0.36
Colorado	0.15	0.51	0.34
Yampa/White	None	0.60	0.40
San Juan/Dolores/Animas	0.10	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 April 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. The Upper Arkansas Basin reflects extreme drought due to the drawdown of water storage in Homestake Reservoir for maintenance.