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; www.water.state.co.us

January 2014

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 reservoir storage, snowpack, 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 December (January 1) range from a minimum of 0.0 in the San Juan / Dolores basin to a maximum of 1.1 in the South Platte River basin. All of the SWSI values are 0 or above indicating normal to above normal supply conditions.

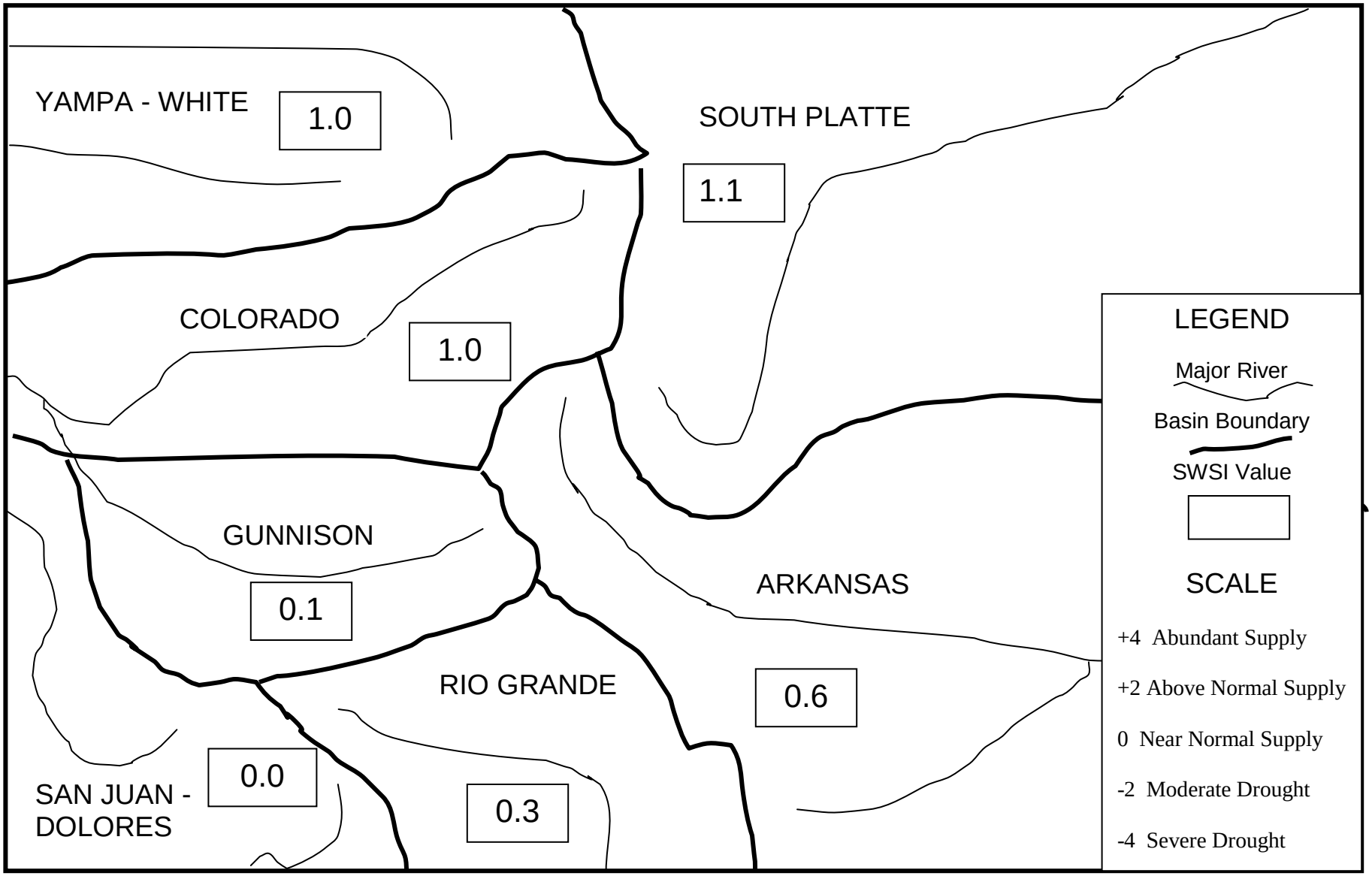
The following SWSI values were computed for each of the seven major basins for January 1, 2014. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10. The NRCS SWSI indicates variability in the level of surface water supply across smaller watersheds in the north half of Colorado, where in some cases, reservoir storage and streamflow levels reflect different drought conditions.

Basin	January 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	1.1	0.3	3.0
Arkansas	0.6	0.6	3.6
Rio Grande	0.3	-1.0	1.5
Gunnison	0.1	-0.3	1.1
Colorado	1.0	-0.1	3.6
Yampa/White	1.0	-1.2	2.1
San Juan/Dolores	0.0	-1.3	2.5

SWSI Scale

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

SURFACE WATER SUPPLY INDEX FOR COLORADO



January 1, 2014

Basinwide Conditions Assessment

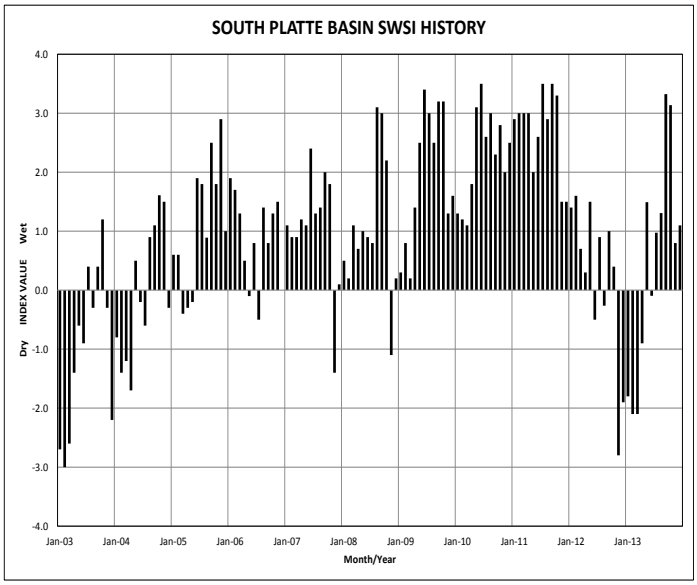
The first two days of December 2013 were very mild in the South Platte basin, but the following two weeks were very cold with well below normal temperatures. Warmer temperatures returned for most of the remainder of the month such that the overall December temperature was less than 30 F below normal. December precipitation was near normal along much of the Front Range, but was below to well below normal over much of the Eastern Plains.

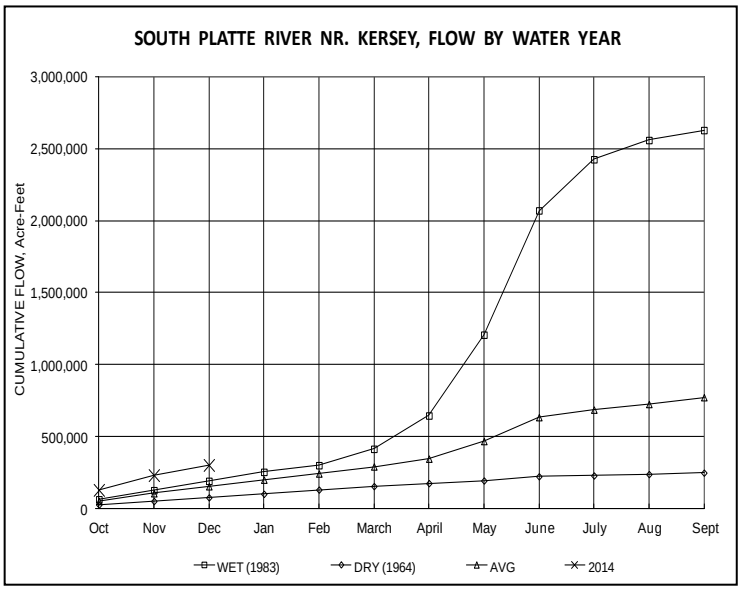
In part due to the cold temperatures, the junior call on most of the South Platte mainstem went off early in December and remained off the rest of the month. The more senior 1909 reservoir call from the north metro Denver area that came on November 29 did remain on for the entire month. There were no calls on the South Platte tributaries during December.

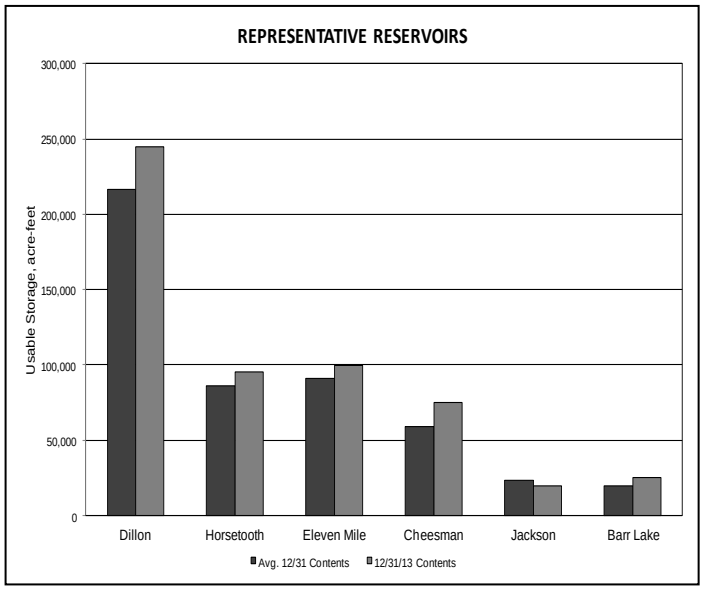
The December stream flows at both the Kersey and Julesburg index gages were well above the long term average. This was probably due to both the cold start to the month discouraging diversions, especially between Kersey and Julesburg, and, at least to some extent, continued drainage from the September storms. The Kersey gage monthly mean stream flow was 1,152 cfs as compared to the historic December mean flow of 682 cfs. The December monthly mean stream flow at the Julesburg gage was 596 cfs as compared to the historic December mean flow of 397 cfs.

Overall reservoir storage in the basin by the end of December was very good at 105% of average. Though some reservoirs were below (and above) the end of December average, overall storage was at about 75% of capacity. This compares to an average storage of 72% of capacity and storage at 52% of capacity last year.

Amazingly, the South Platte basin snow water equivalent was exactly 100% of average on January 1, 2014. Though much of the winter remains ahead, the near normal reservoir storage and snow pack numbers indicate that water supplies for the 2014 irrigation season are at least starting 2014 near “normal”.







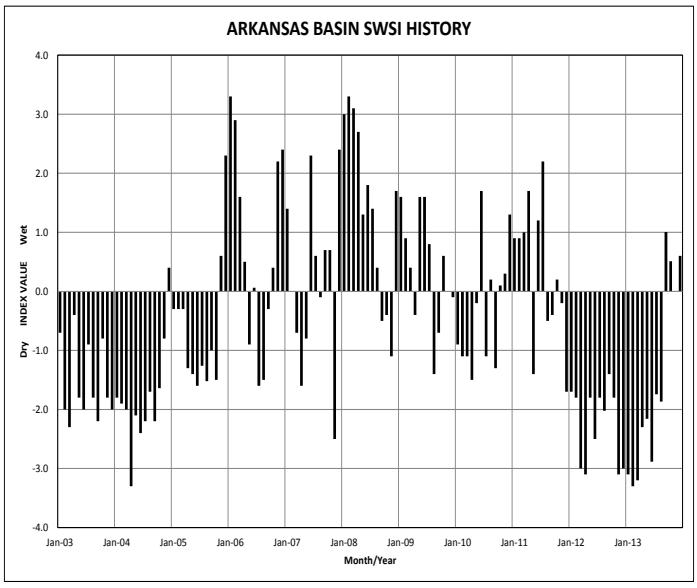
Basinwide Conditions Assessment

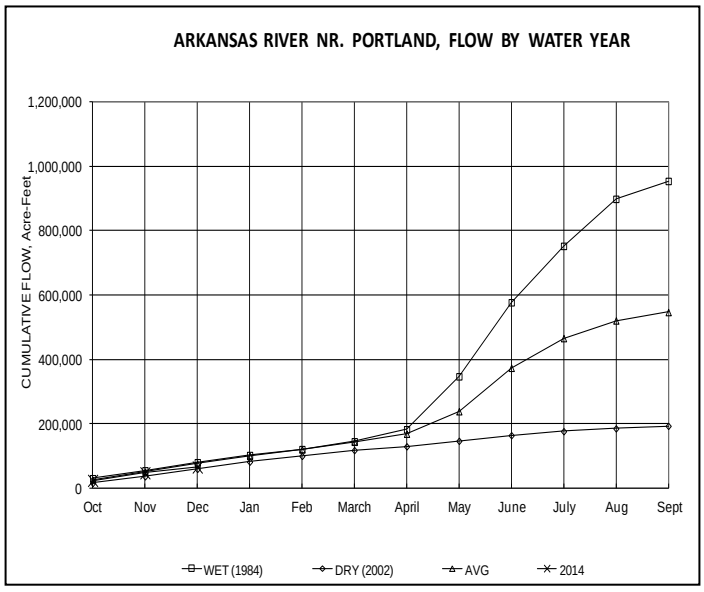
The SWSI value for the month was 0.6. The Pueblo Winter Water system grand total was 46,778 acre-feet at the end of December representing a significant increase from last year's storage to date, which was 28,214 acre-feet. The previous five-year average for this period is 56,846 acre-feet and the average since 1992 for this period has been 61,097 acre-feet.

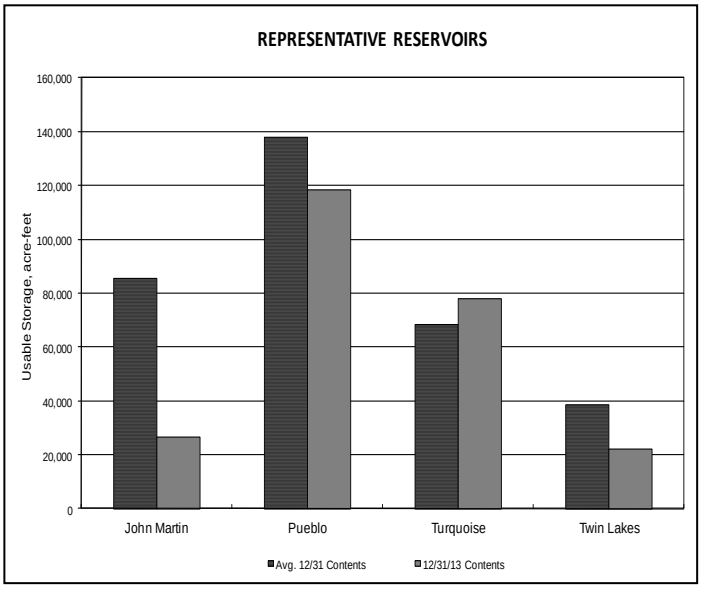
Conservation storage in John Martin Reservoir is about 73% below last year. Storage since November 1st has been 4,334 acre-feet while storage a year ago for the same time period was 1,945 acre-feet.

Administrative / Management Concerns

The Arkansas River Compact Administration meeting was held in Lamar, Colorado on December 17th and 18th.







Basinwide Conditions Assessment

The SWSI value for the month was 0.3. Flow at the gaging station Rio Grande near Del Norte averaged 216 cfs (113% of normal) during December. The Conejos River near Mogote had a mean flow of 45 cfs (88% of normal) during the month. For the year, streamflow in the San Luis Valley was generally poor to fair, with annual runoffs in the range of 50% to 80% of long-term averages. This makes four years in a row of below normal runoff in the upper Rio Grande basin.

Precipitation in the upper Rio Grande Basin was just 56% of normal during December. The cold and dry conditions of December followed a very encouraging November (136% of average precipitation). Alamosa received 0.17 inches of precipitation during December, 0.18 inches below normal. Alamosa's total precipitation of 10.19 inches during 2013 was 2.88 inches above the annual average. For the year, the average temperature was 1.8 degrees below normal due to the brutally cold months of January and December when the average temperatures were below 10 degrees.

Outlook

Stream flow in the basin should be slightly above average for the next few months as the residual effects of the late summer rainfall are felt. Currently, the NRCS forecasts the 2014 runoff to be in the range of 66% (the Rio San Antonio in the far southern end of the San Luis Valley) to 99% (Ute Creek near Fort Garland) of average for key streams in the Upper Rio Grande Basin. Recent National Weather Service climate forecasts call for warmer than normal conditions in the San Luis Valley for the remainder of the winter. The NWS is non-committal towards late winter and spring precipitation.

Administrative/Management Concerns

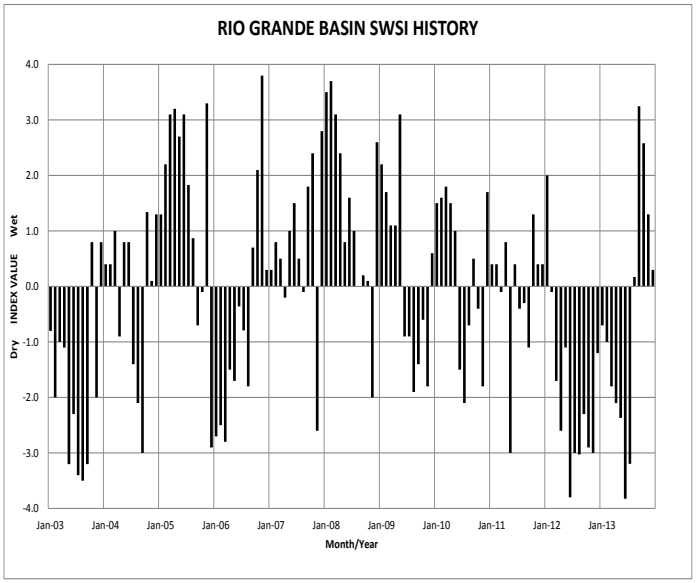
Pursuant to the provisions of the Rio Grande Compact, Colorado delivered approximately 130,000 acre-feet to New Mexico and Texas and easily met the delivery requirement for 2013. A small delivery credit will be available for the 2014 delivery requirement. Closed Basin Project delivery to the Rio Grande totaled 8,000 acre-feet.

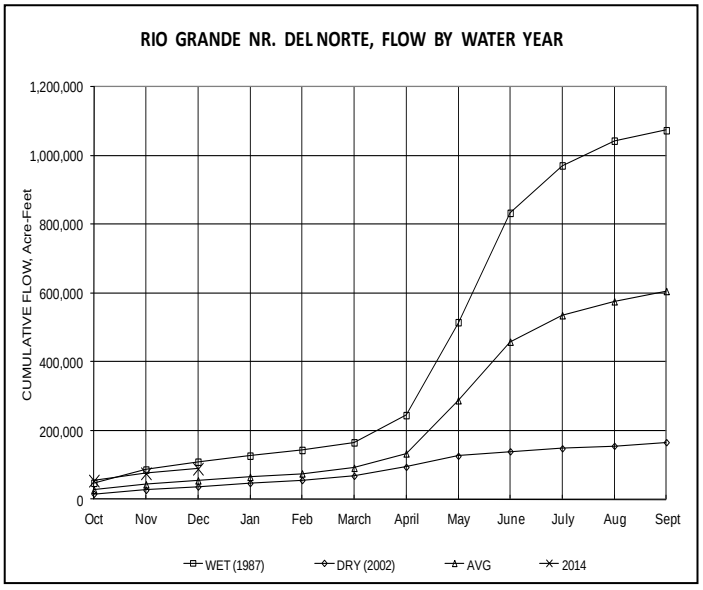
2013 saw well below average runoff during April through July as the marginal snowpack came out in an erratic pattern. Splendid monsoonal activity during August and September provided a great deal of relief to the parched Valley. Streamflow increased dramatically in the central and northern parts of the Valley. Many stream gauges experienced peak flow during September rather than the normal May or June peak. Mid-November snowstorms blanketed the Valley and surrounding mountains, jump-starting the winter snowpack and plummeting night-time temperatures below zero. In the end, the Rio Grande near Del Norte had annual flows of 74% of normal. The Conejos near Mogote annual volume was 55% of normal. The southern drainages in the basin were heavily affected by the poor snowpack and lack of rainfall and recorded annual runoff at 40 to 60% of normal. The autumn rainfall benefitted the northern drainages much more. Reservoir storage is generally poor, but inflow is encouraging after the rainfall.

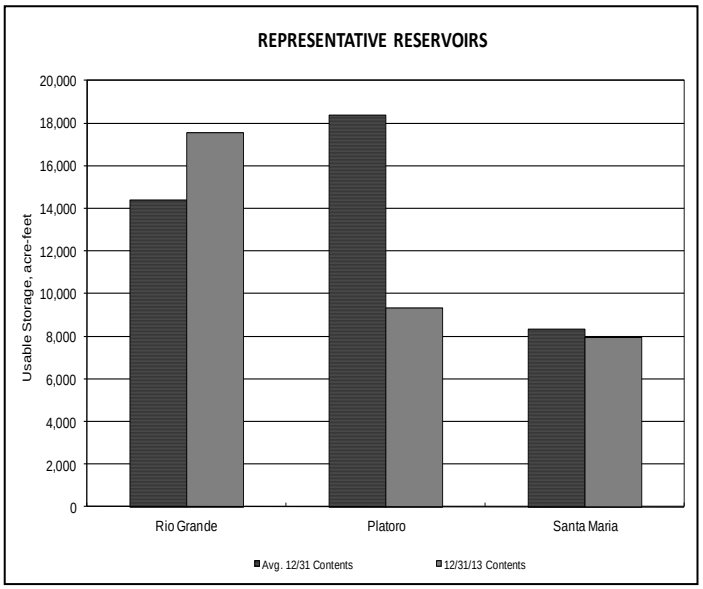
Groundwater Management Subdistrict No. 1 continued well depletion replacement in 2013 with a mixture of reservoir releases, headgate bypasses, and Closed Basin Project production delivered to the Rio Grande. The subdistrict encompasses approximately 200,000 irrigated acres north of the Rio Grande in Alamosa, Rio Grande and Saguache counties. The State Engineer has met with local water users to review the draft Groundwater Use Rules that will be filed with the Division 3 Water Court in 2014. This will most likely result in the formation of another five or six subdistricts in the future.

Public Use Impacts

In summary, 2013 was a topsy-turvey year for runoff. Low precipitation during the irrigation season parched rangeland forcing reservoir releases and massive well pumping from the Valley's aquifers. These aquifers will be in a stressed condition when the next irrigation season arrives. Crop yields were good in areas with sufficient water supplies. Commodity prices were excellent.

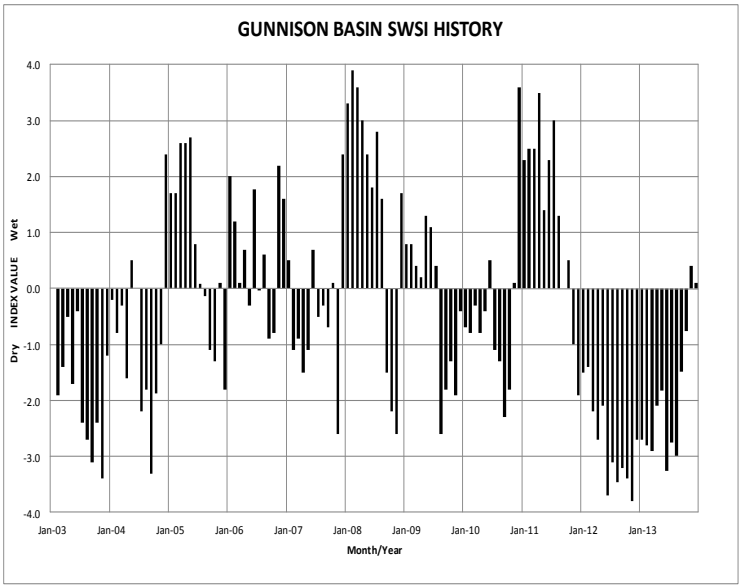






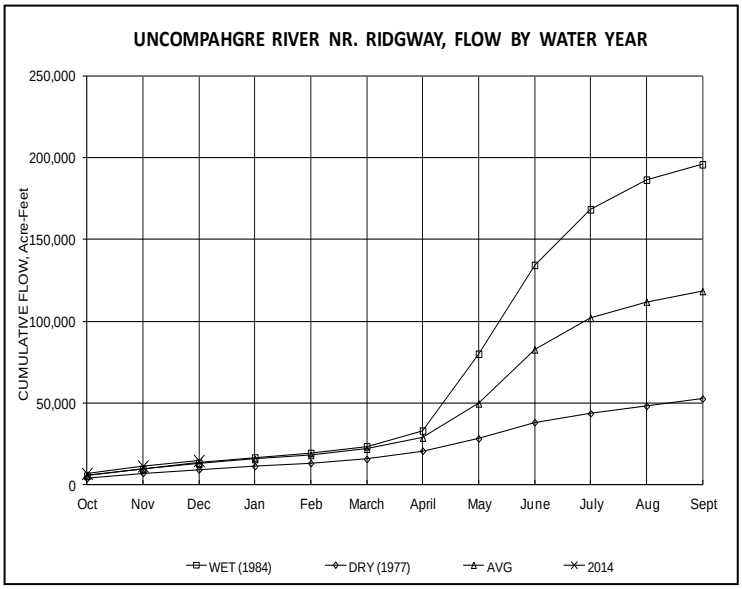
Basinwide Conditions Assessment

The SWSI value for the month was 0.1. Unfortunately, although temperatures were around 3 degrees colder than average in December, the storm pattern that brought much greater than average precipitation to the Gunnison basin in November changed to a more northwest flow favoring areas north of the Gunnison. As a result, most of the Gunnison basin received somewhere between 70 and 90% of average precipitation in December. Average snow water equivalent (SWE) for the basin dropped from 120% to 108% of the 30-year median. The North Fork Gunnison River basin has received the most snow and contains a SWE of 112% of the median, while other areas such as the Taylor River contain less at 103%. The good news is that almost all Snotel sites still sit above the 30-year median for their location and conditions remain a huge improvement from where we sat at the same time in both 2011 and 2012, as the January 1st SWE is 140% of 2013 and 158% of 2012.



Outlook

The Climate Center continues to predict neutral El Nino Southern Oscillation (ENSO) conditions for Spring 2014, which has resulted in 30-day and 90-day forecasts including equal chances of below or above average precipitation in the Gunnison basin.

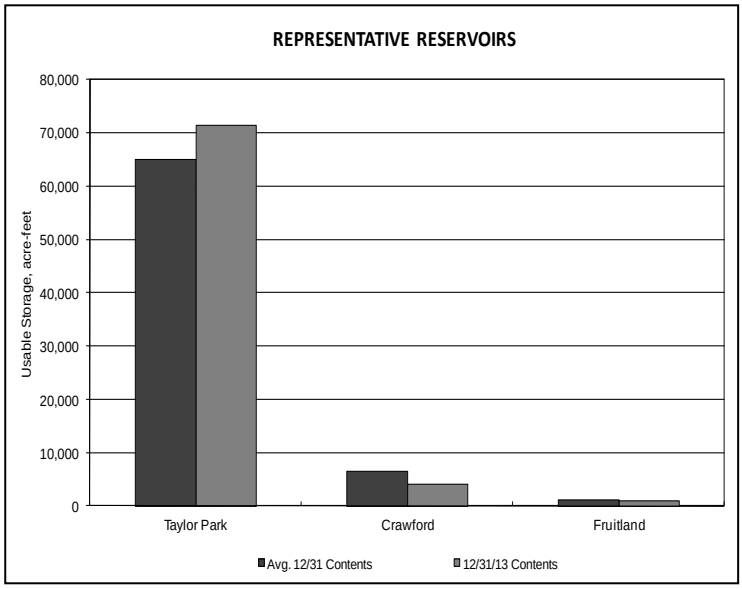


Administrative/Management Concerns

Taylor Park Reservoir continues to fill and already contains 10,000 acre-feet of second fill on January 1st. This is a far cry from the situation last year when Taylor Park still had 26,000 acre-feet to go to complete their 1st fill and the Reservoir inflow was barely enough to keep the Reservoir level steady. The main benefit of second fill, which is owned by the Upper Gunnison River Water Conservancy District, is that it helps fill the Gunnison Tunnel demand and keeps the UVWUA from dipping into their first fill. This is a particular benefit in the early season and will make a huge difference at the start of the irrigation year because the Uncompahgre Valley Water Users Association (UVWUA) will most likely not need to place a call on the Gunnison in the early season even if the remaining snowpack season is dry.

Blue Mesa Reservoir has continued to fill and now contains 380,800 acre-feet, 54,000 acre-feet higher than last year at the same time.

In 2013, the City of Ouray submitted a letter to the Division Engineer's Office requesting a re-tabulation of their municipal rights. They claim that although their rights were not included in the original adjudication in Water District 68, that they should have been tabulated as such because they were not allowed to obtain a decree for municipal uses in the original adjudication and their appropriation dates are senior to the large irrigation diversions in the lower Uncompahgre. The Division Engineer's Office and the Attorney General's Office have spent a significant time researching the legislative and judicial history surrounding early adjudications and hopes to provide an answer to the City in January.



Public Use Impacts

Despite the decline in snowfall during December, Gunnison basin ski areas enjoyed their best Holiday season in years. In fact, Telluride and Crested Butte skier visits were up by almost 25% from the previous year during December.

Basinwide Conditions Assessment

The SWSI value for the month was 1.0.

Outlook

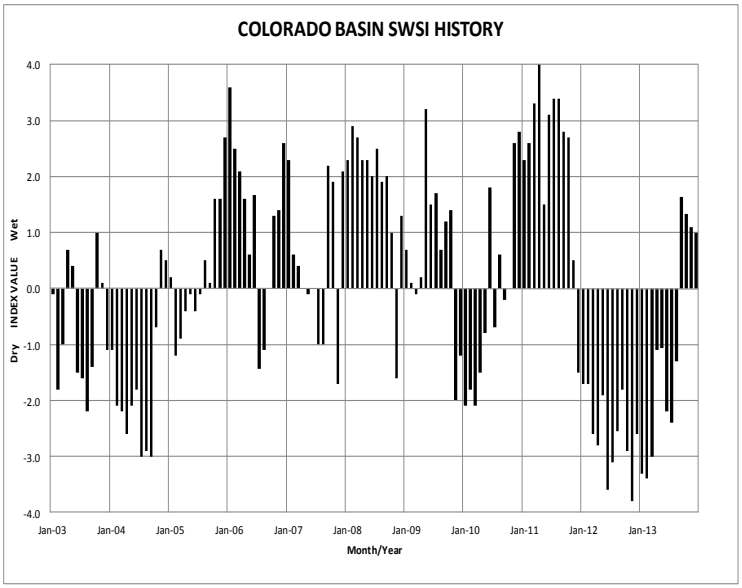
Colorado River flows will hover near average through January. Despite a slight increase in lower Fryingpan flow, Roaring Fork river flows are below average thus far in January. As of January 1st, Upper Colorado River and Roaring Fork Basin snowpack declined to 104 and101 percent of average snow water equivalent respectively. Below average precipitation is forecast for western Colorado through the month of January.

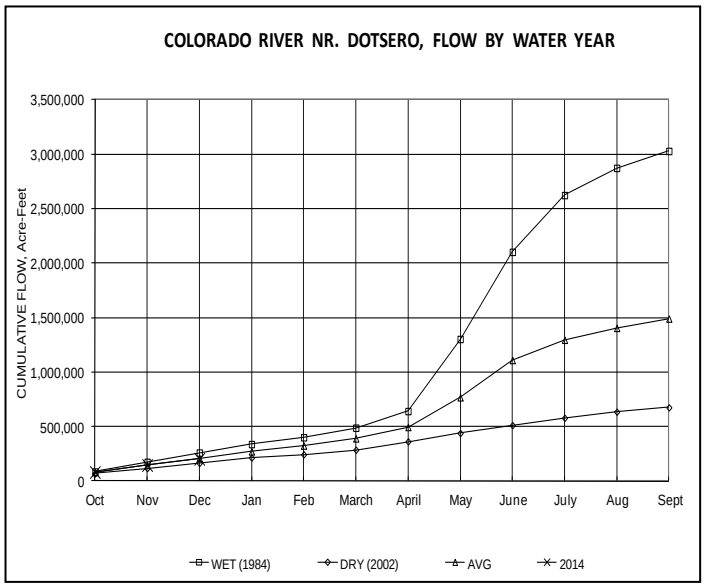
Administrative/Management Concerns

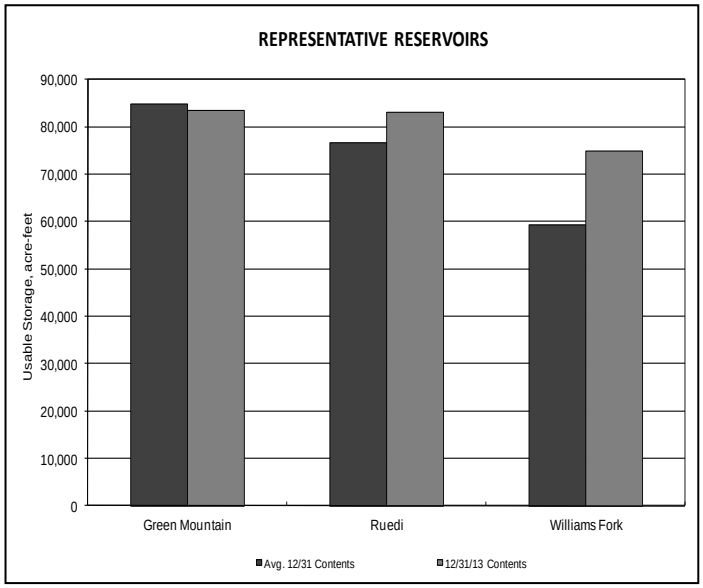
The Ruedi Reservoir winter minimum release rate of 90 cfs will increase to 115 cfs due to above average reservoir storage and basin snow pack. Green Mountain reservoir releases were increased in late December to account for increased Dillon Reservoir release The Government Highline canal has resumed diversion for winter power generation. Adams and Moffat Tunnel diversions will likely continue at a constant rate through January.

Public Use Impacts

The Water Rights Protection Act (H.R. 3189) is likely to be voted on by the House of Representatives in late January. The bill aims to prevent federal agencies from demanding water rights, legally obtained and paid for by private businesses, in exchange for land use permits necessary to those businesses. Supporters include many ski areas and ski associations which have acquired water rights necessary for their operations. Opponents, including conservation and recreation organizations, argue the bill would prevent federal agencies from protecting fish, wildlife and recreation on the nation's rivers.







Basinwide Conditions Assessment

The SWSI value for the month was 1.0. December precipitation was slightly 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 93% 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 December was 107%.

Snowpack for the combined basins as of January 1st, 2013 was at 111% of average, highest by percentage in the state. The snow water equivalent (SWE) as of December 31, 2013 was 107% of average for the North Platte River basin and 107% of average for the Yampa River basin and White River basin.

NRCS predicts above 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 102% of average for the North Platte River at Northgate, 103% of average for the Yampa River near Maybell, 101% of average for the Little Snake River near Lily, and 93% of average for the White River near Meeker.

Due to extremely cold temperatures and consistent snowfall, all Division 6 stream gages were either closed for the winter season or ice/snow-affected at the end of December 2013.

Outlook

As of December 31st Fish Creek Reservoir was storing approximately 3,361 AF, 81% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 5,010 AF at the end of December 2013. The capacity of Yamcolo Reservoir is 9,580 AF. On December 31st Elkhead Creek Reservoir was storing 18,186. The capacity of Elkhead Creek Reservoir is 24,778 AF. On December 31, 2013, Stagecoach Reservoir was storing 33,700 AF, 100% of capacity.

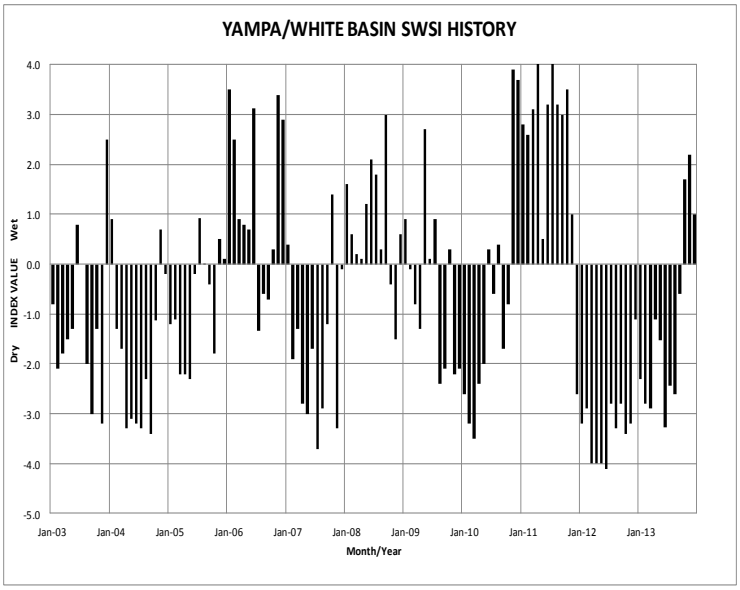
Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir for irrigation purposes, and Elkhead Creek Reservoir for municipal, industrial, recreational, and fish recovery releases. Stagecoach Reservoir is primarily used for recreation though a significant amount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

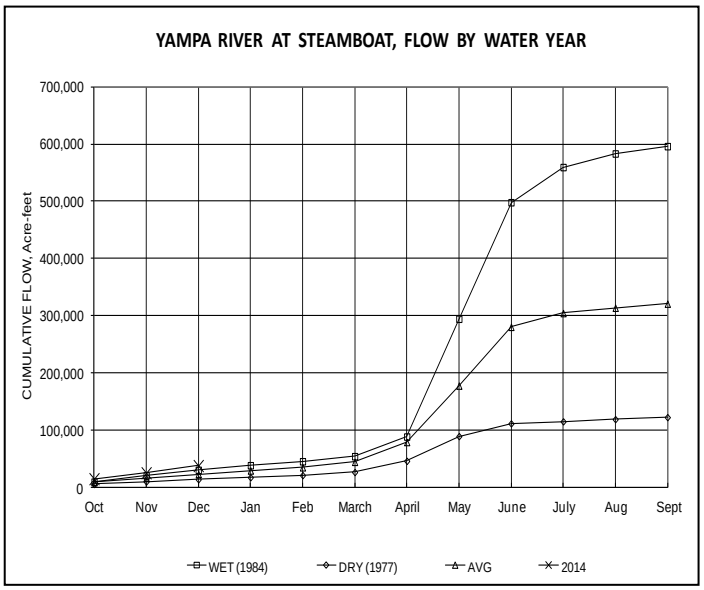
Public Use Impacts

December snowfall helped Steamboat Ski Resort to have very good conditions with a 40 inch base and 148 inches of snowfall since late October.

Stagecoach Reservoir is covered by approximately 8–12 inches of ice with 6 inches of snow on top of an indeterminate depth of slush. Tailwaters are open to fishing again as of January 1st. As always, anglers should use extreme caution when venturing onto the ice. Ski trails will be groomed when there is 18 inches of snow depth.

Steamboat Lake is reporting 16 inches of ice in the Marina area. Caution is advised. Roads are all closed in the park except for the Marina access.



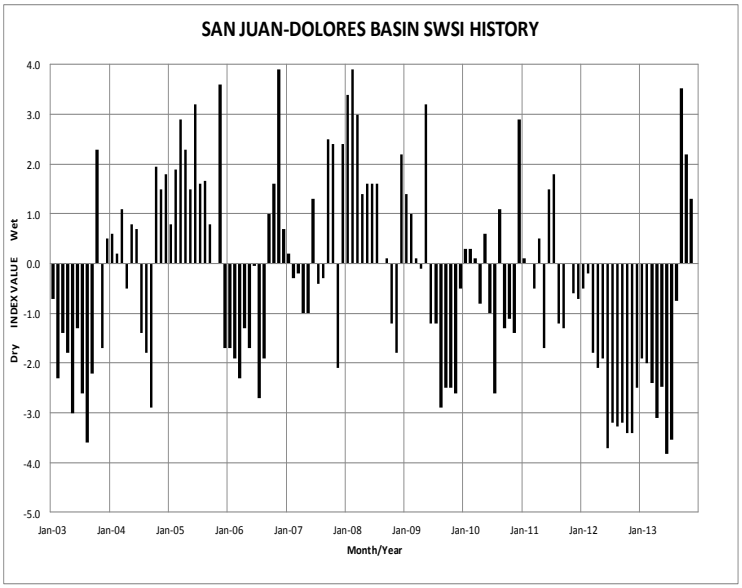


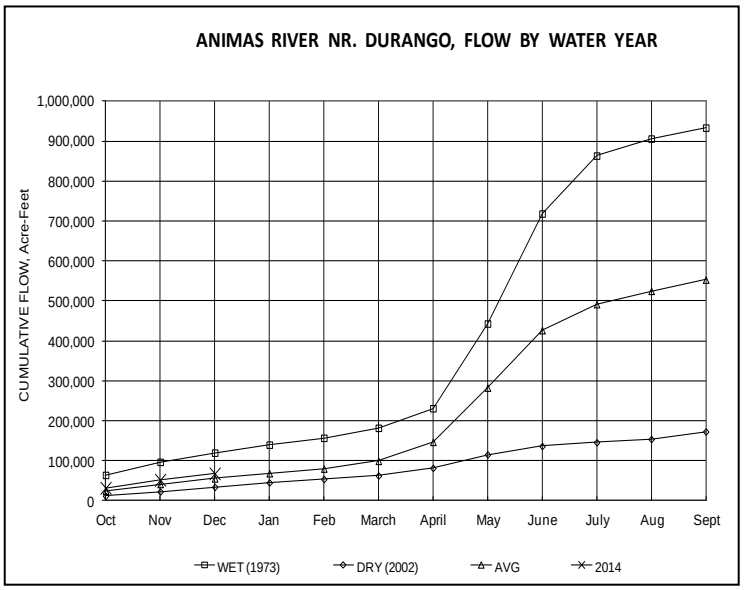
Basinwide Conditions Assessment

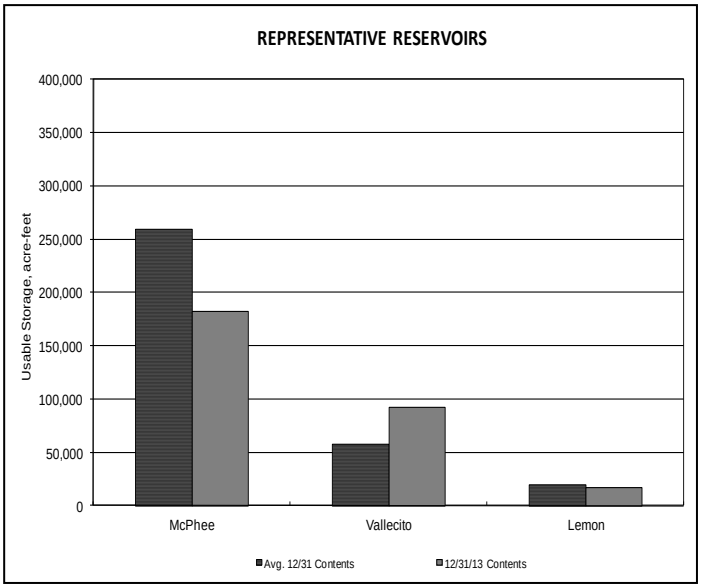
The SWSI value for the month was 0.0. Flow at the Animas River at Durango averaged 255 cfs (115% of average). The flow at the Dolores River at Dolores averaged 62 cfs (107% of average). The La Plata River at Hesperus averaged 10.0 cfs (123% of average). Precipitation in Durango was 0.46 inches for the month, 26% of the 30-year average of 1.76 inches. Precipitation to date in Durango, for the water year, is 4.61 inches, 91% of the 30-year average of 5.07 inches. The average high and low temperatures for the month of December in Durango were 41° and 14°. In comparison, the 30-year average high and low for the month is 41° and 14°. At the end of the month Vallecito Reservoir contained 92,505 acre-feet compared to its average content of 53,343 acre-feet (173% of average). McPhee Reservoir was up to 182,342 acre-feet compared to its average content of 264,268 (69% of average), while Lemon Reservoir was up to 17,170 acre-feet as compared to its average content of 19,640 acre-feet (87% of average).

Outlook

Precipitation (0.46 inches) was well below average for December in Durango. There were 101 years out of 119 years of record where there was more precipitation than this year. The flows on the Animas River were above average this December. There were 25 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 fared about the same. There were 38 out of 103 years of record where the total flow past the Dolores stream gauge was more than this year and 26 out of 97 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year. The end of month content in Vallecito Reservoir is the highest ever when compared to the same period. On December 31, the NRCS SNOTEL sites reported an average snow-water equivalent within the basin at 102%. Last month the snow-water-equivalent was 133%.







ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - Jan-14

The SWSI for each basin is based on probability of nonexceedance (PN) curves for each of three components: reservoir storage, snowpack, and 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	Precipitation (Water Year 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 January 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 observed streamflow. The scale of -4 to +4 is the same as shown on Page 1.