# COLORADO
# WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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January 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 December (January 1) range from a high value of +2.6 in the Arkansas River Basin to a low of -1.1 in the Rio Grande and San Juan / Dolores basins. Snowpack and precipitation in the southwest part of the state are notably below normal resulting in the negative SWSI values in the Rio Grande and San Juan / Dolores basins.

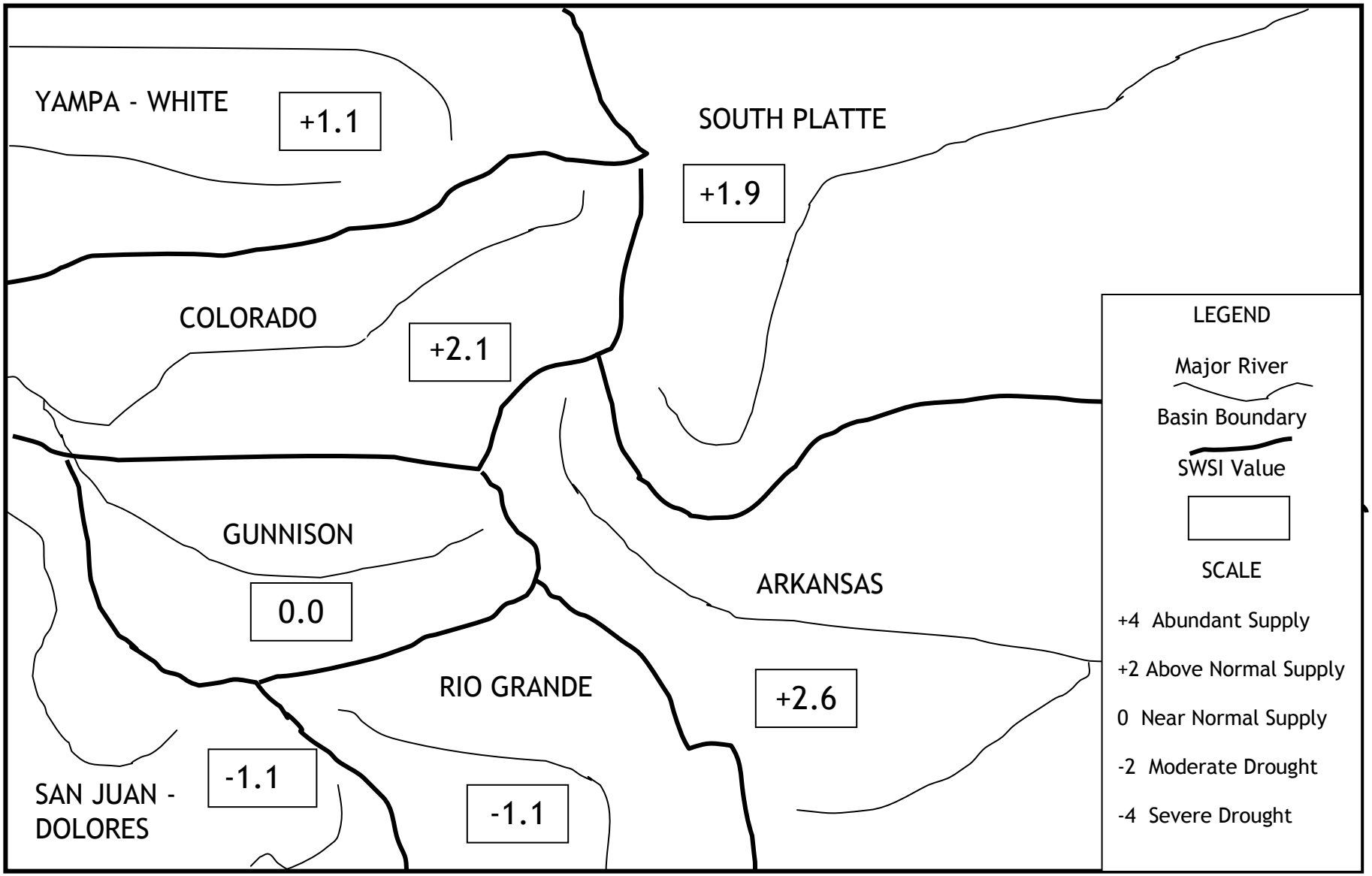
The following SWSI values were computed for each of the seven major basins for January 1, 2015. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10.

| Basin | January 1 SWSI | Change from Previous Month | Change from Previous Year |
|---|---|---|---|
| South Platte | 1.9 | 0.4 | 0.8 |
| Arkansas | 2.6 | 0.0 | 2.0 |
| Rio Grande | -1.1 | 0.9 | -1.4 |
| Gunnison | 0.0 | 1.3 | -0.1 |
| Colorado | 2.1 | 1.9 | 1.1 |
| Yampa/White | 1.1 | -0.2 | 0.1 |
| San Juan/Dolores | -1.1 | 0.0 | -1.1 |

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, 2015**

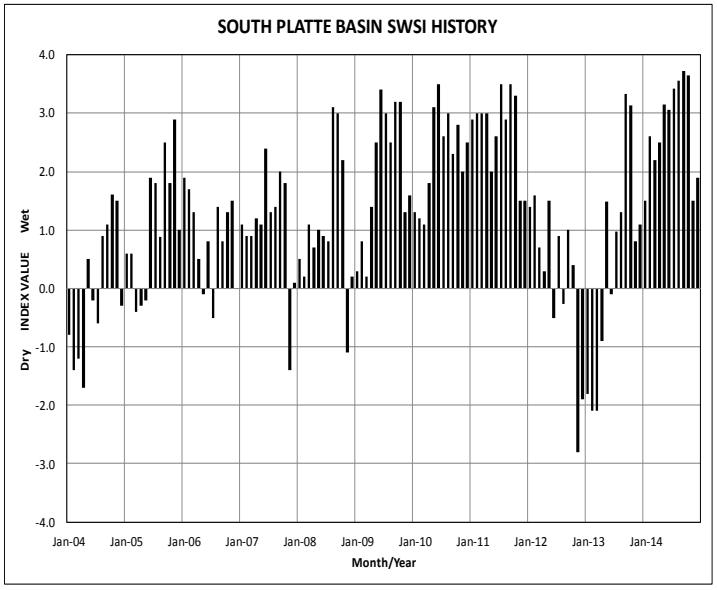
Basinwide Conditions Assessment

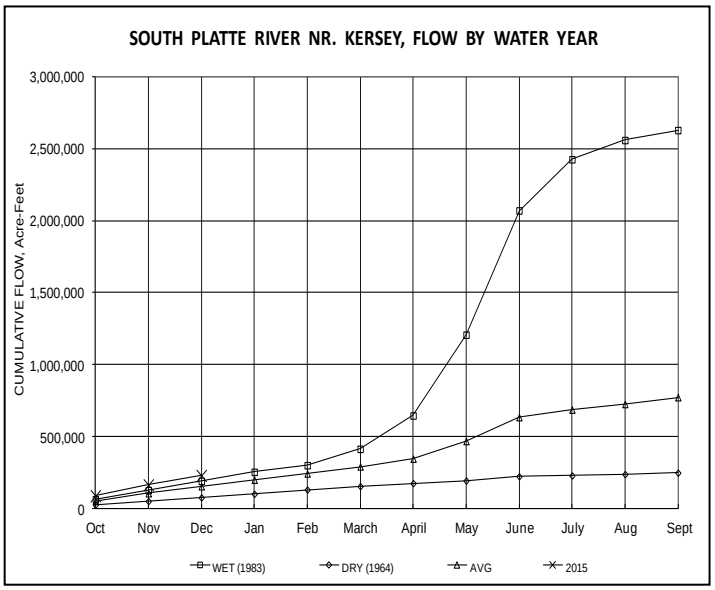
The SWSI value for the month was 1.9. December 2014 was yet another month of contrasts for precipitation and temperature in northeast Colorado. Precipitation was near normal over most of the mountains and Front Range, but much heavier than normal over most of the eastern portion of the area. The overall temperature for the month, as in November, was greatly influenced by one extreme week of very cold temperatures. The average temperature over most of northeast Colorado for December was near to slightly above normal. However, temperatures the last week of December were much colder than normal, making what was mostly a very mild December appear much more average than it actually was.

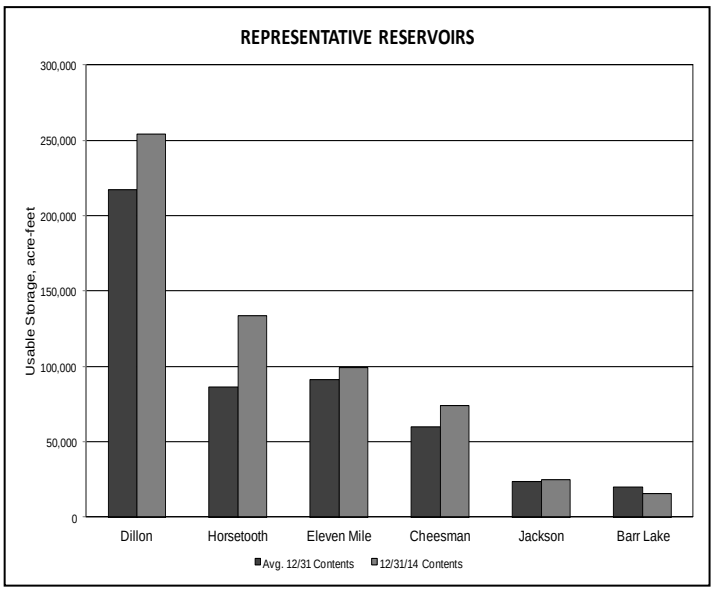
December continued the trend of above average stream flow along the South Platte as flows at both the Kersey and Julesburg gages were above the historic mean. December made the 15th month out of the last 16 months that flow at the Kersey gage was the historic mean. The monthly mean stream flow at Kersey was 155% of the historic mean flow or 1060 cfs compared to the historic mean of 682 cfs. The Julesburg gage flows were above the historic mean for the 7th month in a row. The monthly mean stream flow at Julesburg was 462% of the historic mean flow or 1750 cfs compared to the historic mean of 379 cfs. This flow at Julesburg is extraordinary because it is so large and because it marks the second month in a row of the mean monthly flow at Julesburg exceeding the mean monthly flow at Kersey.

As has been the case since September, the well above average flows in the South Platte basin in December again resulted in free river conditions over pretty much the entire basin for almost all of December. On the South Platte mainstem, the Strontia Springs Reservoir call that began on November 25 ended on December 1, thus the entire mainstem was under free river conditions for all of December. Boulder Creek was under call for 1 day (Christmas Eve). The only other calls in the South Platte system were the calls on Ralston and South Boulder Creeks that began in November.

The abundant water supply conditions continued to keep the storage situation in the South Platte basin in excellent shape. Overall storage at the end of December was at about 82% of capacity. This compares to an average storage of about 66% of capacity at the end of December.



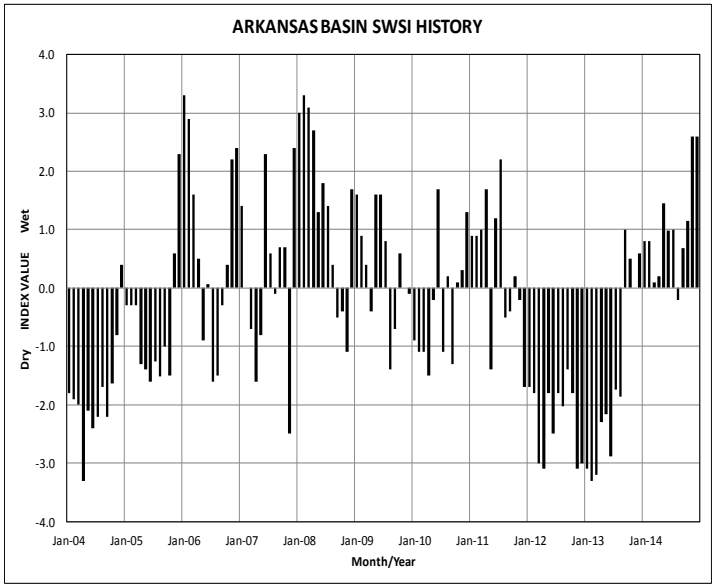
Basinwide Conditions Assessment

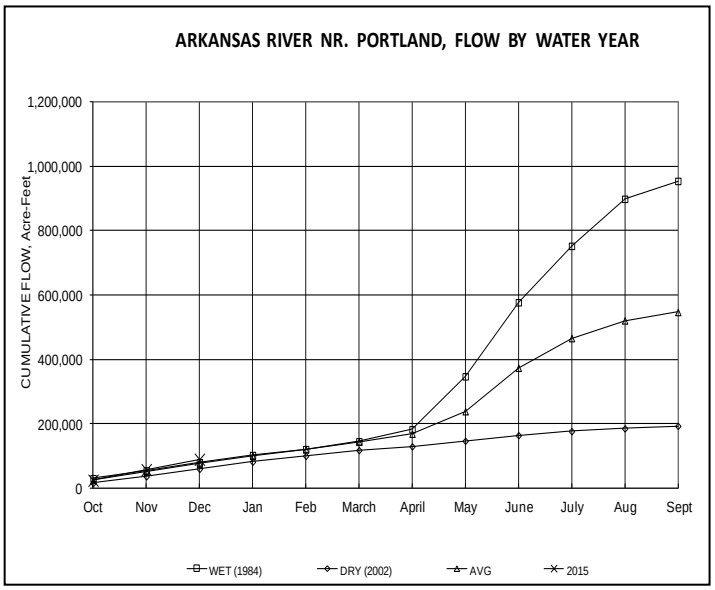
The SWSI value for the month was +2.6. The Pueblo Winter Water system grand total was 53,744 acre-feet at the end of December representing an increase from last year's storage to date, which was 46,778 acre-feet. The previous five-year average for this period is 46,777 acre-feet and the average since 1994 for this period has been 57,890 acre-feet.

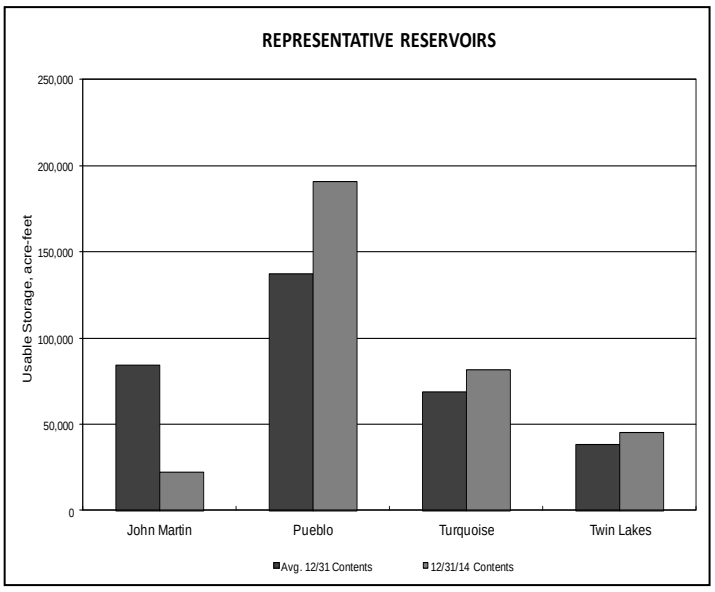
Conservation storage in John Martin Reservoir is about 49% above last year. Storage since November 1st has been 6,478 acre-feet while storage a year ago for the same time period was 4,340 acre-feet.

Administrative / Management Concerns

The Arkansas River Compact Administration meeting was held in Lamar, Colorado on December 16th and 17th. The State Engineer and Division Engineer will hold their second public meeting regarding whether to do rule-making in the Arkansas River Basin for wells with water right changes after the initial date of the Kansas v. Colorado lawsuit in 1985. These Rules would explore the possibility of having the option for owners of this type of well to operate under State Engineer approved replacement plans, similar to the current plans done pursuant to the 1996 Use Rules for pre-lawsuit wells, as an alternative to Water Court decreed plans for augmentation.



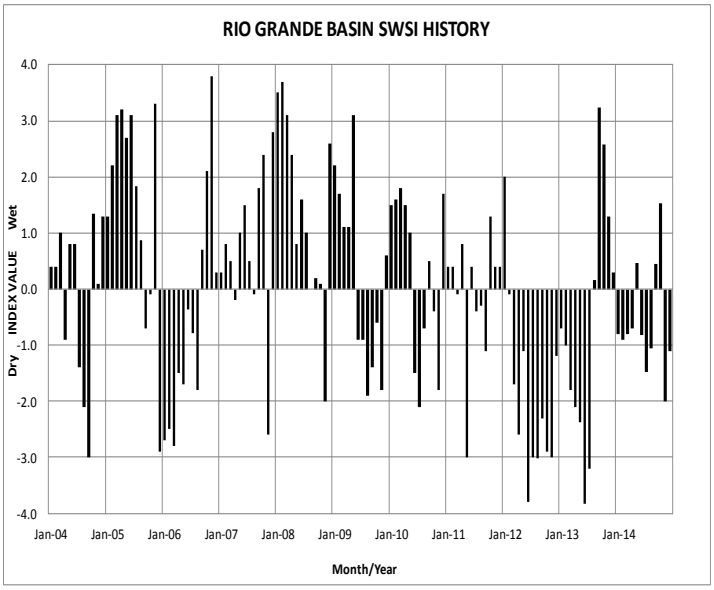



Basinwide Conditions Assessment

The SWSI value for the month was -1.1. The melting of the early snowfall has generally increased streamflow levels in the upper Rio Grande basin. Flow at the gaging station Rio Grande near Del Norte averaged 204 cfs (107% of average). The Conejos River near Mogote had a mean flow of 56 cfs 88% of normal). The general situation for 2014 was that the more northern drainages of the San Luis Valley, such as Saguache Creek, experienced above normal annual runoff (about 120%). The central streams, such as the Rio Grande, received near-average runoff. But the southern streams such as the Conejos River, La Jara Creek, and the Rio Culebra had poor annual runoff (70 to 80%).

Precipitation during December in Alamosa was 0.21 inches, 0.13 inches below normal. Snowstorms were scarce during during December, and so far, snowpack accumulation in the higher elevations of the basin is well below normal and the poorest in the state.

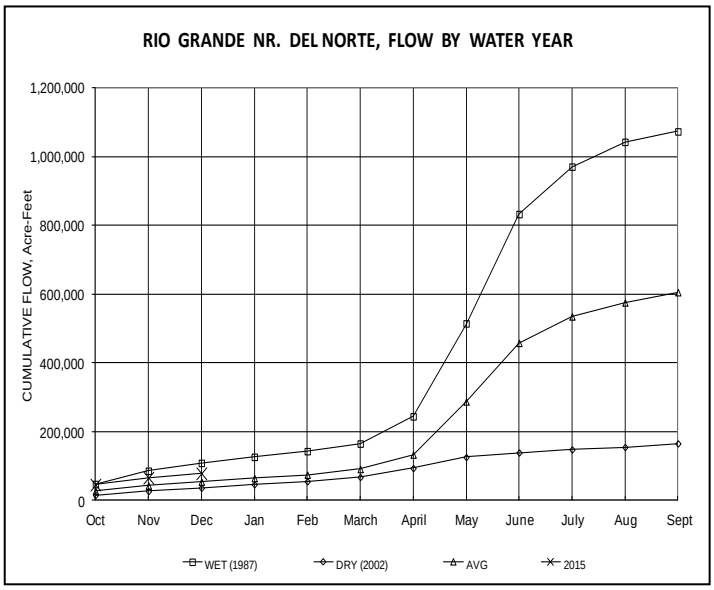



Outlook

The dry conditions may persist for awhile, but National Weather Service forecasts are predicting above normal precipitation for most of Colorado with the southwestern portion of the State getting the most benefit.

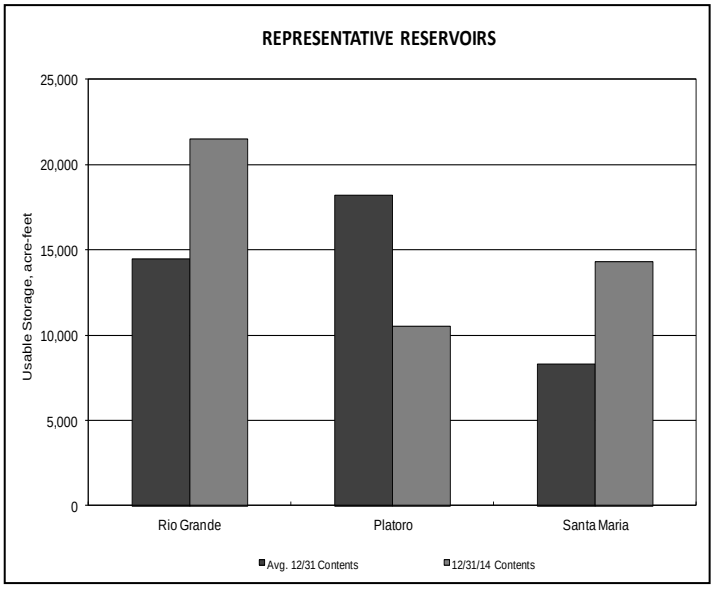
Administrative/Management Concerns

Colorado exceeded the annual water delivery requirement to New Mexico and Texas under the Rio Grande Compact during 2014. Individually, the Conejos basin is just under with their delivery requirement, while the Rio Grande is expected to over-deliver more than 5000 acre-feet.




Public Use Impacts

In summary, 2014 started out with plentiful snowpack from the November, 2013 storms. January and February snowfall was very disappointing with the exception of one big storm at the end of each month. March and April snowpack accumulation was marginal but a storm at the start of May brought huge benefit to the northern part of the San Luis Valley. This set up most of the upper Rio Grande Basin for a near-normal runoff with the exception of the southern drainages that languished through another poor runoff season. The summer weather was very mild, so crop yields were generally good, but commodity prices were down from the previous year. Monsoon rain patterns held off until September and October but still produced enough increased streamflow to get a few ditches back in priority before the end of irrigation season on November 1. The annual temperature in the SLV was above normal and the precipitation was below normal.



Basinwide Conditions Assessment

The SWSI value for the month was 0.0. As a result of December precipitation between 110-150% of the 30-year average, snow water equivalent (SWE) values for the basin, calculated from an average of Gunnison Snotel sites has risen to 97% of the 30-year median. The basin above Taylor Park Reservoir continues to be in the best shape at 122% of the median, while areas on the west side of the Grand Mesa lag behind at 74% of the median based on the Park Reservoir Snotel. Measurements taken by the City of Grand Junction indicate that areas west of Park Reservoir may contain even less with one location reporting 2" SWE vs. an average of 8". Areas in between, such as the basins above Blue Mesa, Paonia and Ridgway Reservoirs, are closer to the median at 106%,100%, and 107% of the 30-year median.

Outlook

The January, February and March outlook from the National Weather Service places the Gunnison basin on the northern fringe of areas expected to have above average precipitation while on the eastern fringe of areas in Utah expected to experience greater than average temperatures.

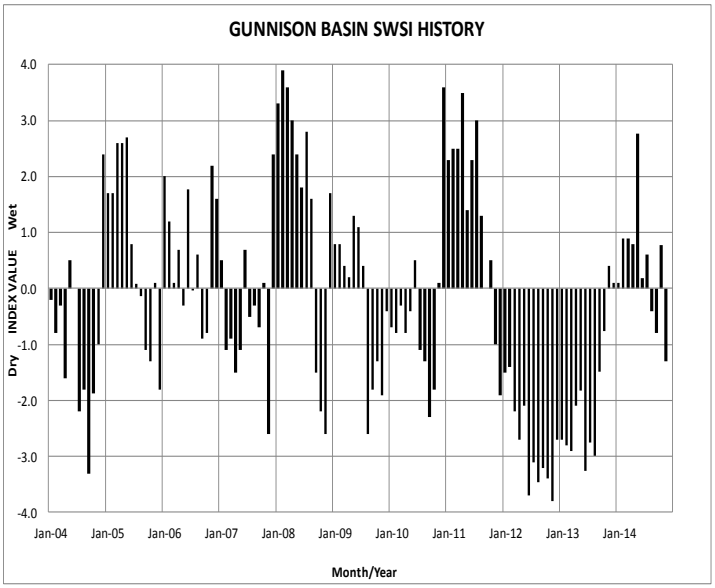
Administrative/Management Concerns

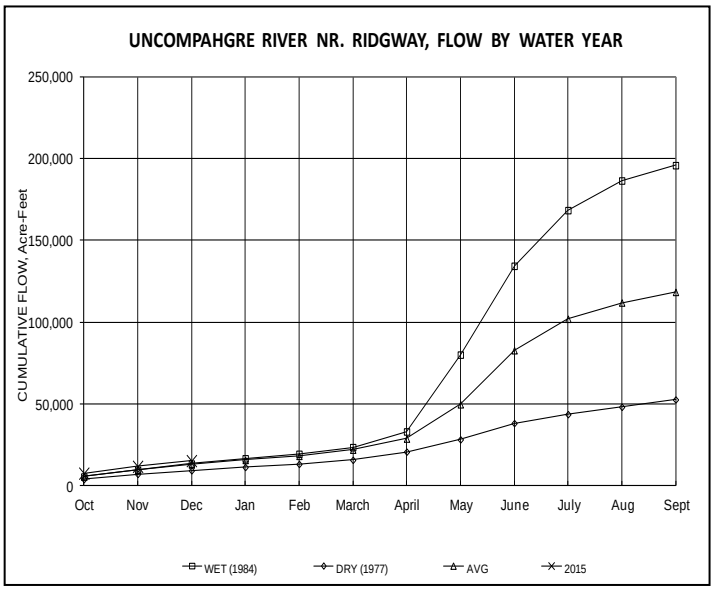
The Division of Water Resources continues to answer questions from water providers regarding the need, or lack thereof if they are simply running irrigation water through a turbine during the irrigation season, to change their water rights for installation of hydropower generation on their canals. Another major water project, the Fire Mountain Canal, has begun exploring installing turbines on its canal while the Uncompahgre Valley Water Users are in the process of construction and exploration for multiple additional stations such as the Shavano Falls Hydro on the M&D Canal. These entities are using innovative arrangements with construction companies and local electric cooperatives to take advantage of the large amounts of fall and flow rates in their system to generate additional revenue for operations.

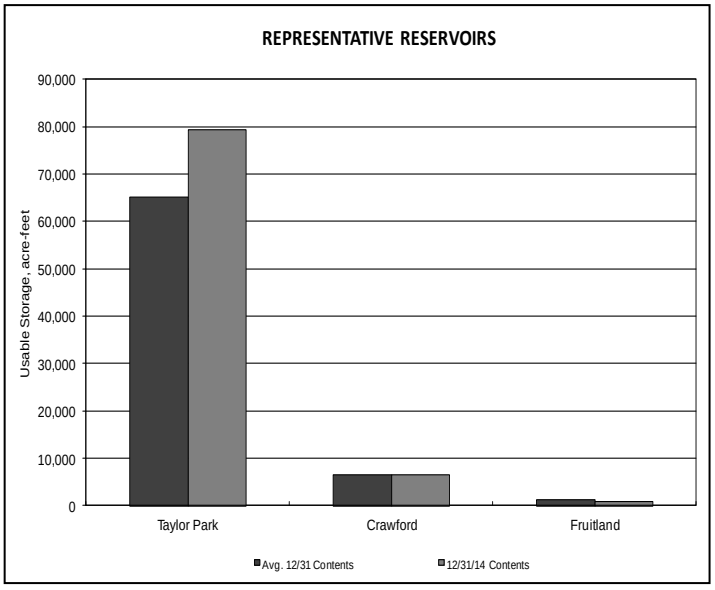
Taylor Park continues to accrue second fill water and contained 13,000 acre-feet on January 1st. Larger than normal releases from Crystal Dam have reduced Blue Mesa Reservoir to 7488.95 feet (572,980 acre-feet), which is over a foot below the target intended to prevent icing in the Upper Gunnison, but is 192,000 acre-feet greater than the storage in Blue Mesa on the same date last year. Blue Mesa will continue to decline in storage while releases at Crystal remain above 1,100 cfs. The first water supply forecast from the Colorado Basin River Forecast Center (CBRFC) will not be released until later January, at which time we will have the first estimate of what the releases might be this spring to meet the Aspinall Re-operations ROD. In the 2014 attempt to meet ROD flows, water that bypassed the power units at all three Aspinall Unit Reservoirs, through bypass tubes and spillways, is estimated to equal to approximately $5,000,000 in power generation revenue.

Pubic Use Impacts

Flows through Black Canyon National Park and the Gunnison Gorge continue at much greater than average due to the additional releases at Crystal Dam. Skiing at basin resorts has been good with attendance reported above average with Crested Butte and Telluride containing enough snowpack to open all but the steepest terrain during the busy Holiday season.



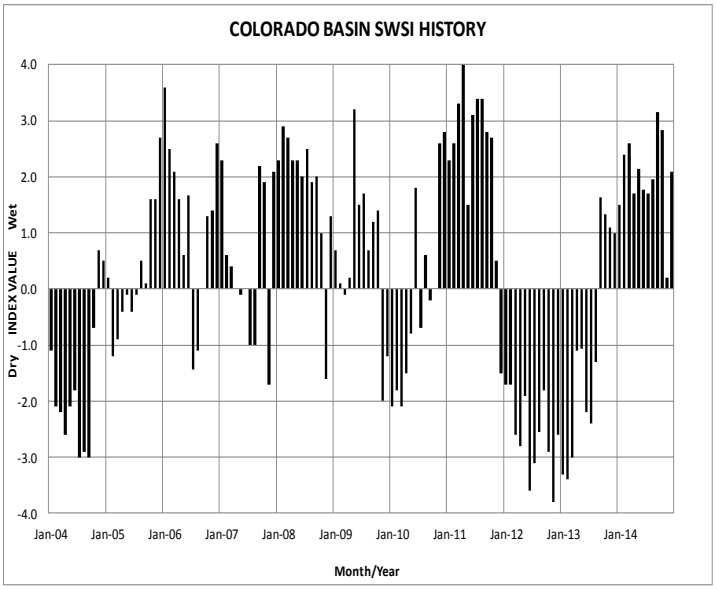



Basinwide Conditions Assessment

The SWSI value for the month was +2.1.

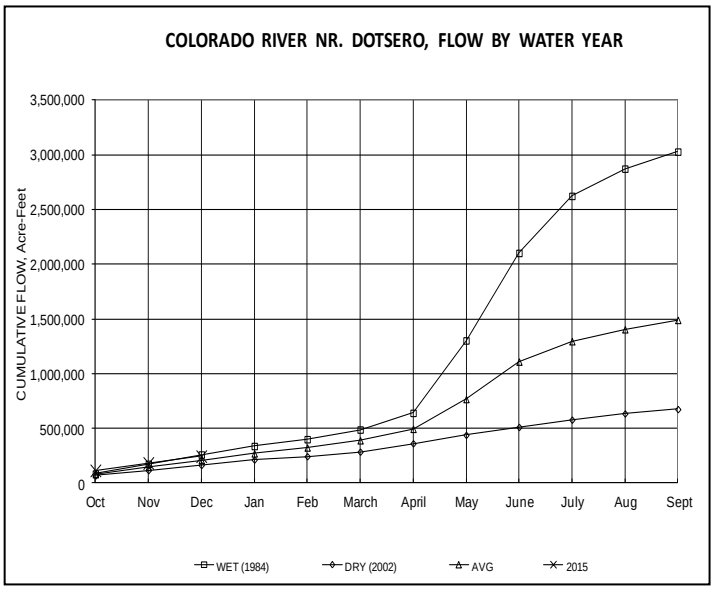
Outlook

Based on early January trends and near average temperature forecasts, Colorado River flows should continue near average, with Roaring Fork and Eagle River flows continuing slightly above average throughout January. As of January 1st, Upper Colorado River and Roaring Fork Basin snowpack was 117 and 110 percent of median snow water equivalent respectively. However, below normal precipitation in late December and early January, will likely decrease snowpack percentages by Feb 1st. Forecasts call for near average temperatures and slightly below average precipitation for western Colorado through January.




Administrative/Management Concerns

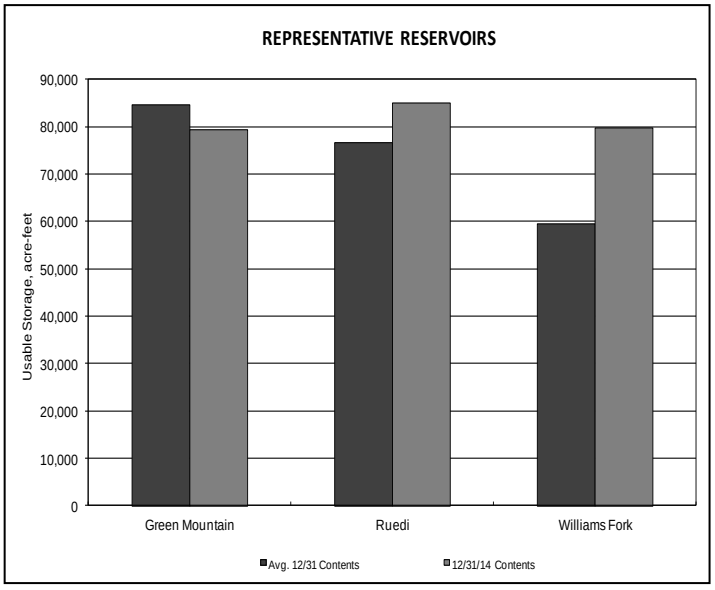
The senior Shoshone power right call on the Colorado mainstem at Dotsero remains in effect – likely to continue through January. The Green Mountain Power call, initiated in early January will also remain in effect. Ruedi Reservoir releases were increased in early January and should remain unchanged. Wolford Mount Reservoir releases, increased slightly in late December, and unchanged Willow Creek Reservoir releases will likely remain steady through January.




Public Use Impacts

The draft Colorado Water Plan was submitted to the CWCB last month including conditions for future additional transmountain diversions. East Slope water officials relinquished considerable position to incorporate the "seven-point framework" identifying conditions for a new transmountain diversion. Among these conditions would be acceptance of no firm yield, "hydrologic risk", and triggers to manage diversions.

Discussion and feedback will continue from local roundtables, constituencies, and the public with the finalized plan due in December 2015.



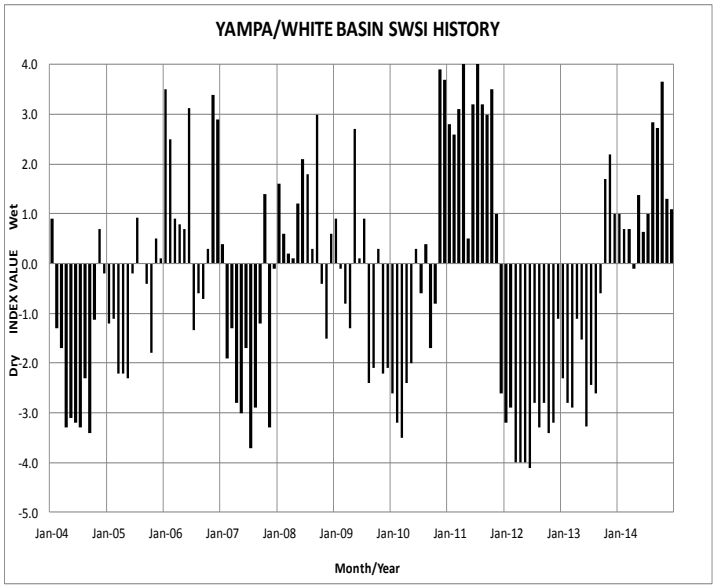
Basinwide Conditions Assessment

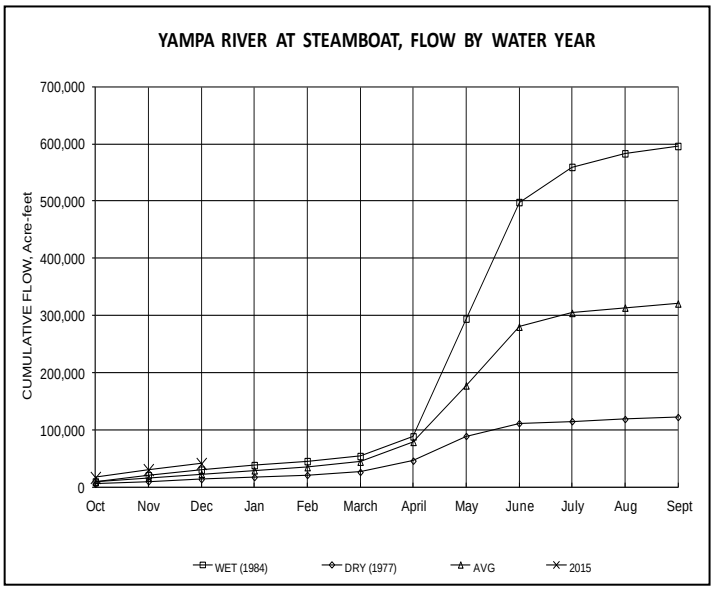
The SWSI value for the month was +1.1. December precipitation was slightly below average in the Yampa, White, and North Platte River basins. Precipitation for the month, as measured at the SNOTEL sites operated by NRCS, was reported at 96% of average for the Yampa, White, and North Platte River basins. Total precipitation for the water year as a percent of average to date in the combined basins at the end of December was also 96%.

Snowpack for the combined basins as of January 1st, 2015 was at 103% of average. The snow water equivalent (SWE) as of December 31, 2014 was 102% of average for the North Platte River basin and 107% of average for the Yampa River basin and White River basin.

NRCS predicts below to slightly 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 93% of average for the North Platte River at Northgate, 102% of average for the Yampa River near Maybell, 83% of average for the Little Snake River near Lily, and 98% 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 2014.




Outlook

As of December 31st Fish Creek Reservoir was storing approximately 3,769 AF, 91% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 5,900 AF at the end of December 2014. The capacity of Yamcolo Reservoir is 8,700 AF. On December 31st Elkhead Creek Reservoir was storing 21,982 AF. The capacity of Elkhead Creek Reservoir is 24,778 AF. On December 31, 2014, Stagecoach Reservoir was storing 33,500 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 126 inches of snowfall since late October.

Stagecoach Reservoir is covered by approximately 2–8 inches of ice with 4 inches of slush/snow on top. As always, anglers should use extreme caution when venturing onto the ice and snowmobiles are not recommended.

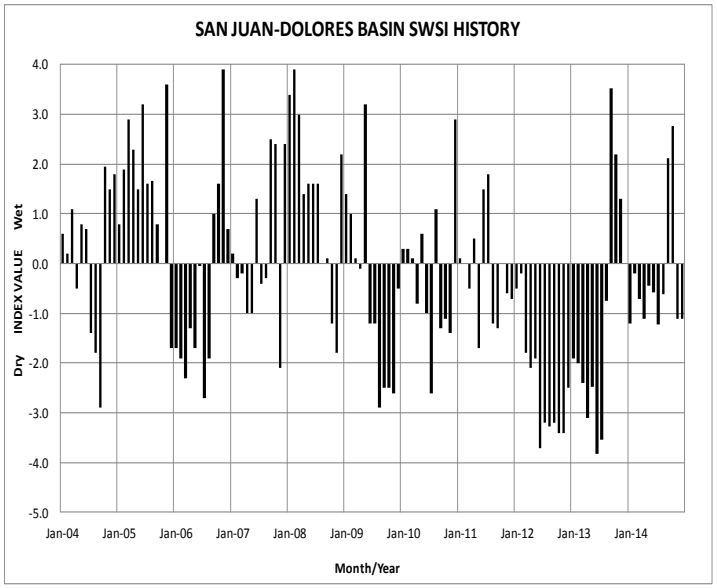
Steamboat Lake is reporting 12-14 inches of clear ice with slush below a snow layer. Fishing in the Marina area has been reported as great. Caution is advised. Roads are all closed in the park except for the Marina access.

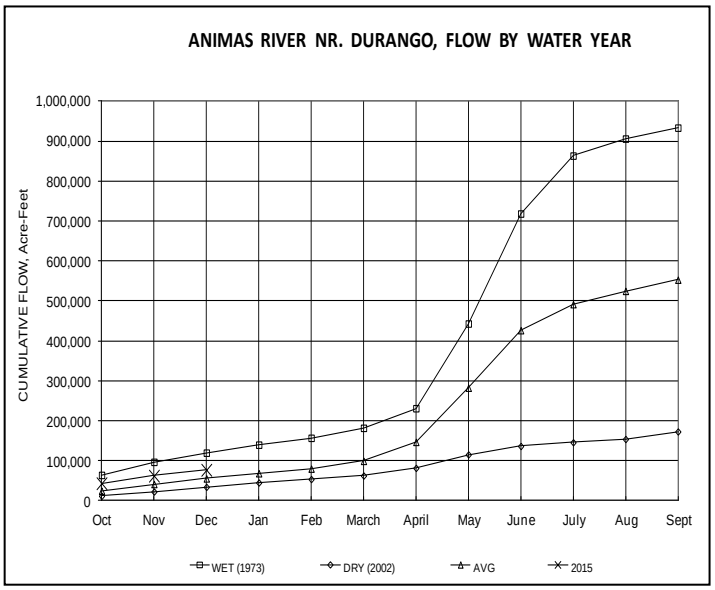
Basinwide Conditions Assessment

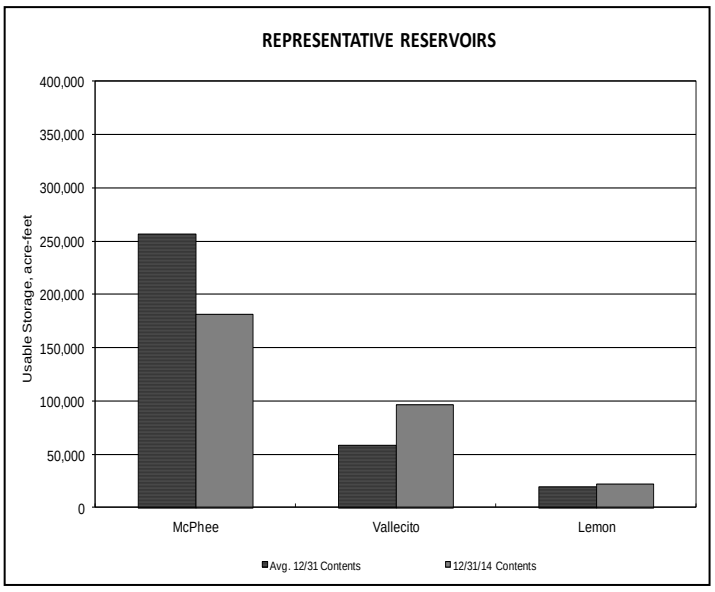
The SWSI value for the month was -1.1. Flow at the Animas River at Durango averaged 255 cfs (114% of average). The flow at the Dolores River at Dolores was estimated to average 61 cfs (105% of average). The La Plata River at Hesperus averaged 10.0 cfs (122% of average). Precipitation in Durango was 0.92 inches for the month, 55% of the 30-year average of 1.68 inches. Precipitation to date in Durango, for the water year, is 2.70 inches, 53% of the 30-year average of 5.06 inches. The average high and low temperatures for the month of December in Durango were 44° and 20°. In comparison, the 30-year average high and low for the month is 40° and 14°. At the end of the month Vallecito Reservoir contained 96,372 acre-feet compared to its average content of 53,887 acre-feet (179% of average). McPhee Reservoir was up to 181,336 acre-feet compared to its average content of 261,443 (69% of average), while Lemon Reservoir was up to 21,860 acre-feet as compared to its average content of 19,590 acre-feet (112% of average).

Outlook

Precipitation (0.92 inches) was below average for December in Durango. There were 81 years out of 120 years of record where there was more precipitation than this year. The flows in the rivers within the basin were above average. The Animas River was above average. There were only 32 out of 104 years of record where the total flow past the Durango stream gauge was more than this year. There were 38 out of 104 years of record where the total flow past the Dolores stream gauge was more than this year and 45 out of 98 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year. On December 31, the NRCS SNOTEL sites reported an average snow-water equivalent within the basin at 76%. End of last month the snow-water-equivalent was 67%.



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

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

**Summer 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 October 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.