COLORADO
WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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September 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 streamflow, reservoir storage, and precipitation for the summer period of May through October (June 1 through November 1). During the summer period, streamflow 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 August (September 1) range from a high value of 1.3 in the South Platte Basin to a low value of -3.0 in the Gunnison Basin. Dry conditions improved due to above average precipitation in August with the exceptions of the Arkansas and Yampa White basins. Streamflows, the major component of the summer SWSI, were below the 20th percentile for the following basins: Arkansas River, Gunnison River, Yampa/White rivers. In the remaining basins, streamflows were at or below normal for the month.

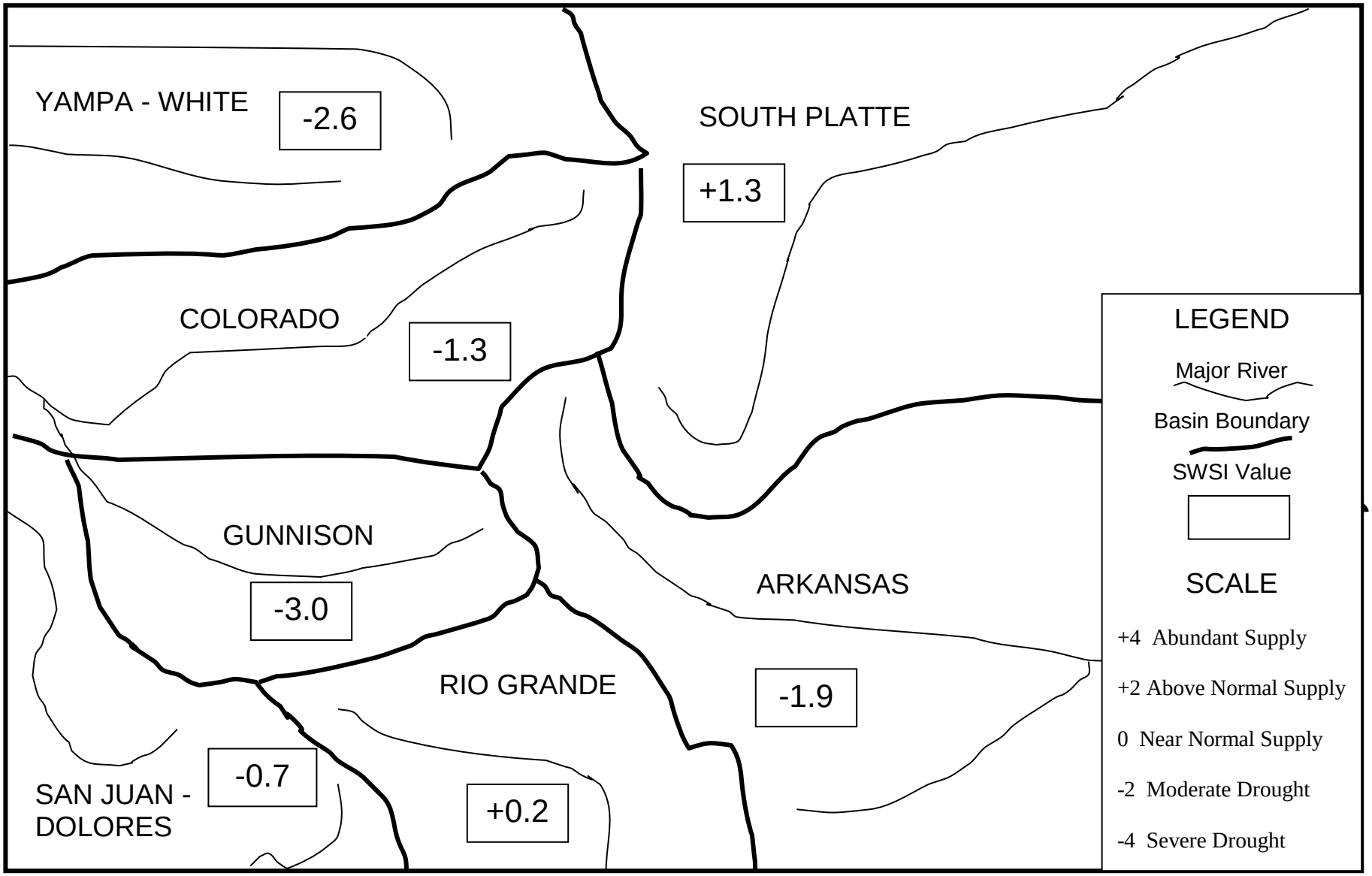
The following SWSI values were computed for each of the seven major basins for September 1, 2013. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10. The NRCS SWSI indicates variability in the level of surface water supply across smaller watersheds in the north half of Colorado, where in some cases, reservoir storage and streamflow levels reflect different drought conditions.

Basin	September 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	1.3	0.3	1.6
Arkansas	-1.9	-0.1	0.2
Rio Grande	0.2	3.4	3.2
Gunnison	-3.0	-0.2	0.5
Colorado	-1.3	1.1	1.2
Yampa/White	-2.6	-0.2	0.7
San Juan/Dolores	-0.7	2.8	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



September 1, 2013

Basinwide Conditions Assessment

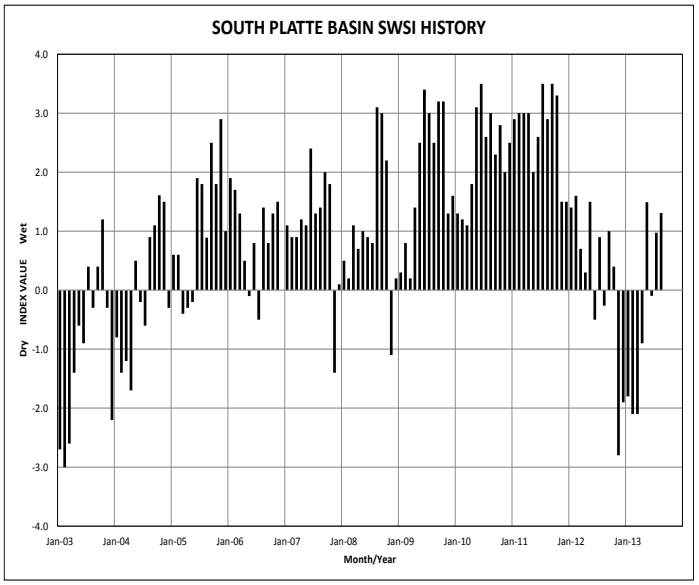
The SWSI value for the month was 1.3. Overall, August 2013 was warmer than normal and, depending on location, either wetter or dryer than normal. Generally, the foothills and mountains were wetter than normal and the plains dryer than normal, though there some higher elevation locations that were dryer than normal and lower elevations that were wetter than normal.

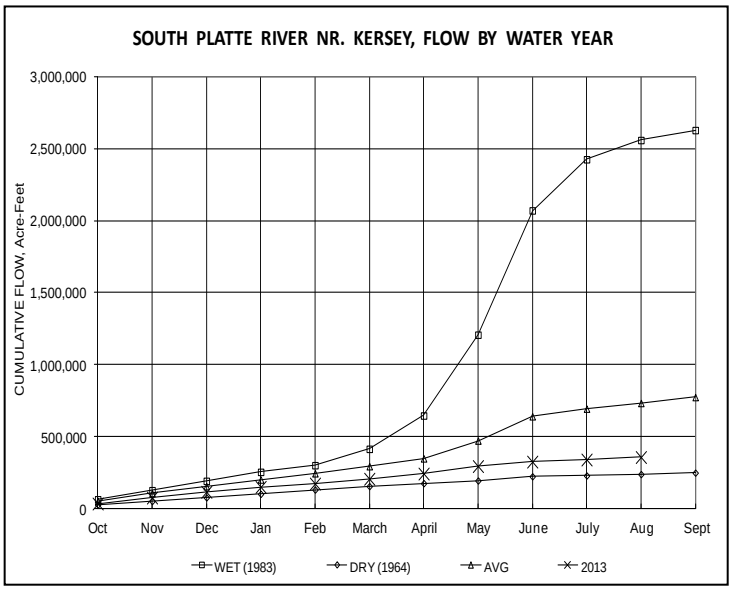
The August stream flows at the Kersey and Julesburg index gages continued the below to well below historic trend that began in March of 2012. The Kersey gage monthly mean stream flow was 281 cfs or 55% of the historic August mean flow of 509 cfs. However, this is a bit misleading as the flow was above the average from August 4 through 6 (peaking at a day average of 1,070 cfs on August 5th) while the rest of the month was almost always below a day average of 250 cfs. The August gage monthly mean stream flow at Julesburg was 37 cfs or 21% of the historic mean of 180 cfs. There were no above average flows at Julesburg in August – the highest day average flow was a whopping 46 cfs.

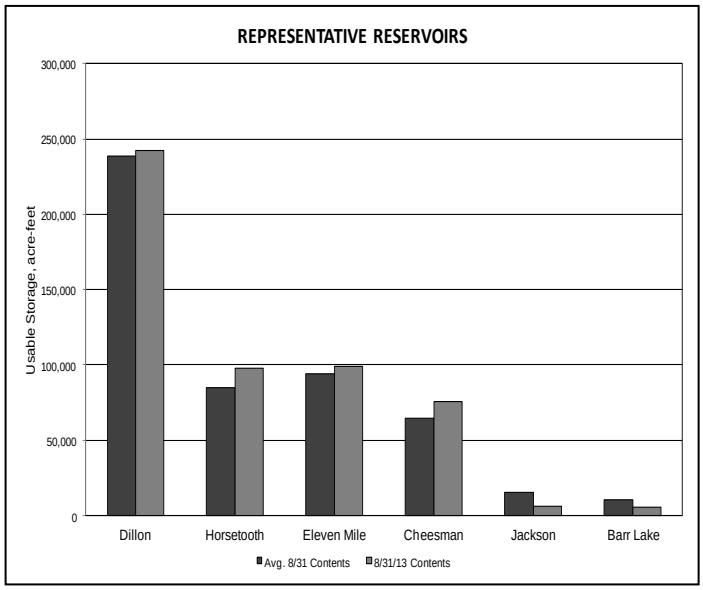
The end of August overall reservoir storage in the South Platte basin was at 87% of the end of August average. However, when expressed as a percent of capacity, storage was at 53%. This compares to an average percent of capacity of 62%. Also, several of the larger plains reservoirs were at less than 20% of capacity (with a couple at 6% of capacity) by the end of August. This is good in that it means there has been water to mostly finish the irrigation season, but bad in that it means virtually the full combined capacity of 253,000 AF will need to be filled before next irrigation season.

The mainstem river calls in Water Districts 1 and 2 were able to go fairly junior early in August due to the higher stream flows before returning to a more typical August call pattern. The calls in District 64 were typical to slightly more senior. The tributary calls were typical to slightly more junior for August. The South Platte Compact call was on for the entire month.

The August precipitation continued the July movement to less severe drought ratings for 2013 in northeast Colorado. At the end of August the northern mountains/foothills area had been moved from abnormally dry to no drought rating at all. Most of the rest of northeast Colorado had moved to the “abnormally dry” (D0) or the “moderate drought” (D1) category. There were several relatively small areas of “severe drought” (D2), but the only remaining area of the “extreme” (D3) drought category was a small sliver on the Colorado-Kansas/Nebraska border.



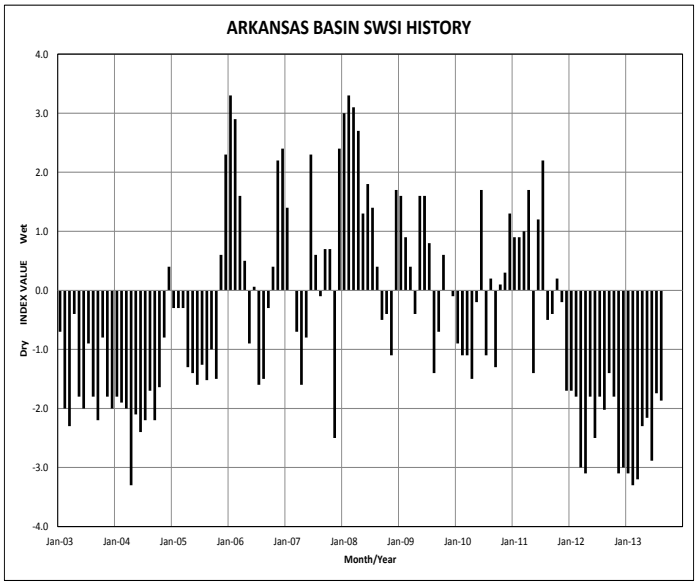


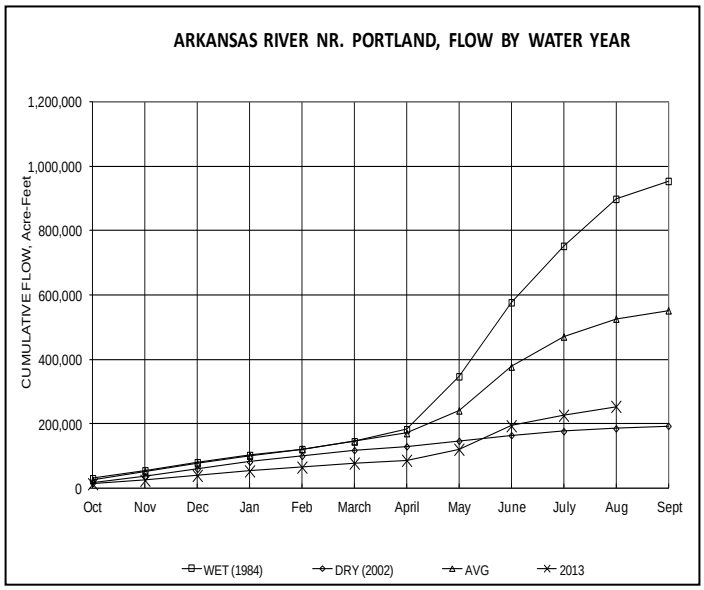


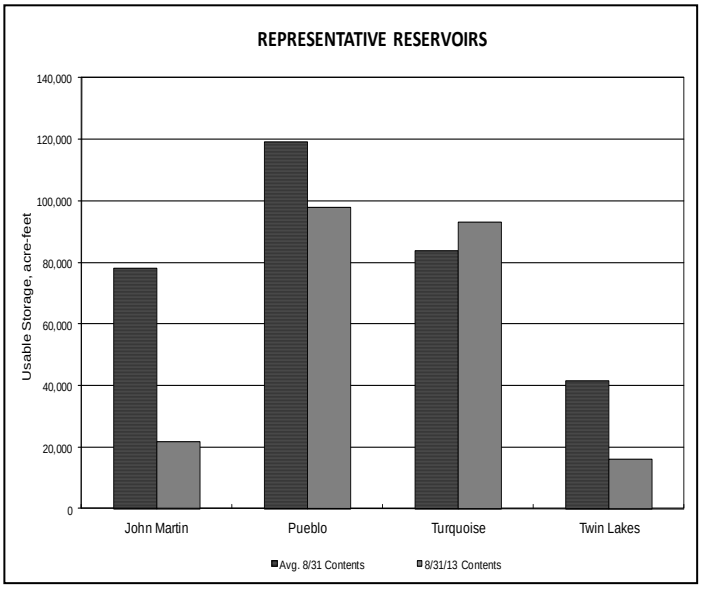
Basinwide Conditions Assessment

The SWSI value for the month was -1.9. River calls during August ranged from a senior call of 4/15/1884 Fort Lyon to 6/9/1890 Colorado Canal in the area above the Fort Lyon Canal. Below Fort Lyon Canal, the Purgatoire River began to flow due to large rain events as far up as the head of the Purgatoire River Basin. These large flows allowed two Conservation Storage events to occur in John Martin Reservoir and provided some much needed relief to the lower basin. The inflows to John Martin Reservoir included an increase in the permanent fisheries pool in John Martin of about 10% through storage of Colorado Parks and Wildlife's Muddy Creek Reservoir right.

The central part of the basin still exhibited substantial drought impacts in August. For example, Oak Creek and Hardscrabble Creek are still in severe drought. Both creek systems are virtually dry. Generally the lower south side Water District 12 in Fremont County had not seen very much rain. The Pikes Peak area had seen some recent rains and for the first time in 2 years, most of the rights on Four Mile Creek were able to briefly divert water. The upper district around Howard and Coaldale has had a pretty good season and has been getting hit with some thunderstorms lately. Some of the rains have been damaging.

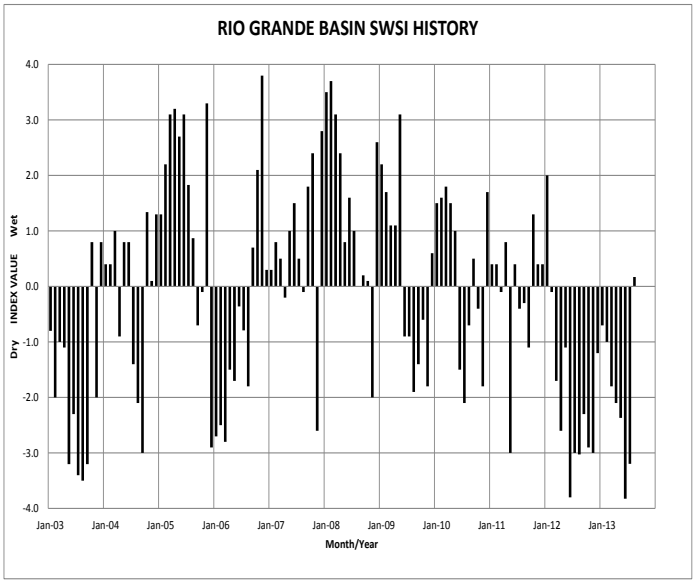






Basinwide Conditions Assessment

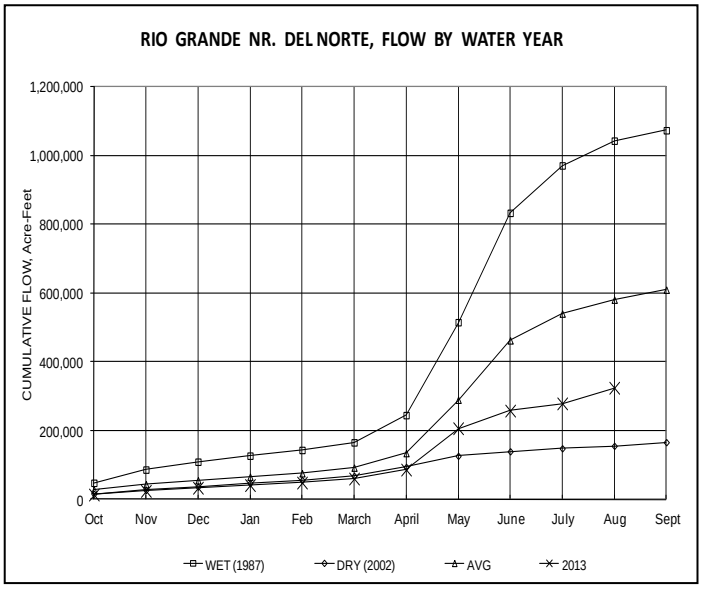
The SWSI value for the month was 0.2. Flow at the gaging station Rio Grande near Del Norte averaged 740 cfs (112% of normal). The Conejos River near Mogote had a mean flow of 162 cfs (75% of normal). Precipitation in Alamosa was 2.47 inches, well above the norm of 1.27 inches. The advent of August brought much-needed precipitation to the San Luis Valley and the surrounding mountains. The prairie and foothills came alive with green grass and wildflowers replacing the grey hue seen in June and July. The frequent rain did not stop the trend of warmer than normal temperatures. The average temperature was one and a half degree above normal.



Outlook

Rainfall throughout the basin benefited area stream flow levels immensely! Most area streams were near or above average flow for August; a remarkable change from June and July. Soil moisture conditions in the basin are much better.

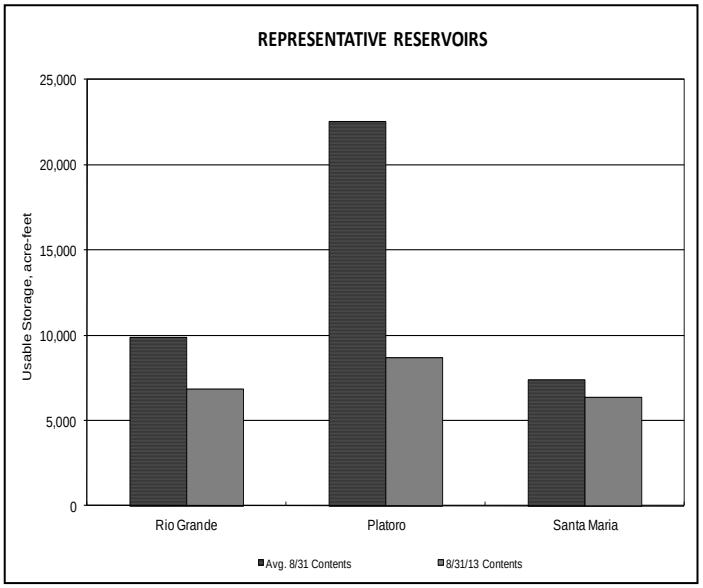
The expected annual runoff at the Rio Grande near Del Norte gauge increased by 45,000 acre-feet due to the July and August rains. Early forecasts suggested this would be the fourth worst annual runoff in the 120-year history of the gauge. The recent increase in runoff due to the rainfall dropped that estimate to the twelfth worst year.



National Weather Service forecasters are calling for above normal temperatures in the region for the next several months, but are uncommitted to drier or wetter conditions. This basin desperately needs a good snowpack for 2014.

Administrative/Management Concerns

Deliveries of water to the State line required by the Rio Grande Compact have been increased due to the rain's unexpected impact on Index gage flow. The curtailment percentage for the Rio Grande was increased during August and early September in an effort to keep up with the rising delivery obligation. The Conejos has not had a curtailment in place this year due to the low index and delivery requirement.



Public Use Impacts

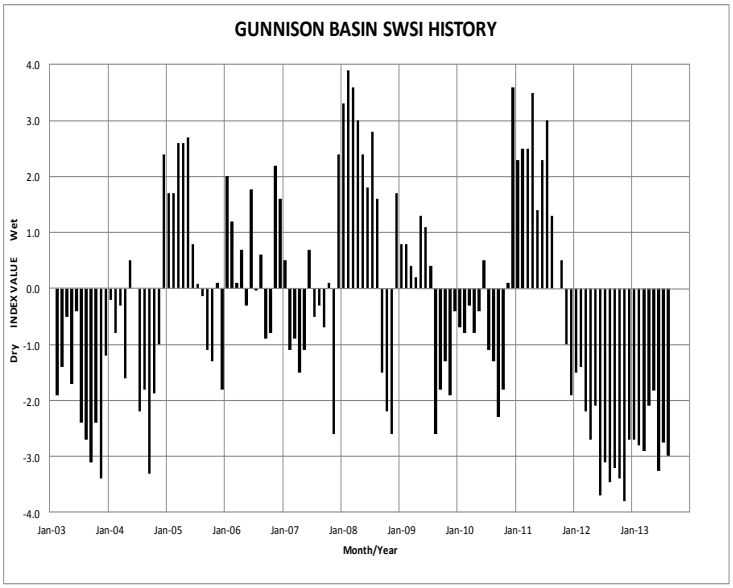
The rainfall during August became a hindrance to many farmers and ranchers. They had great difficulty finding enough dry days to get their alfalfa, grain or hay put up after it was cut.

Basinwide Conditions Assessment

The SWSI value for the month was -3.0. Monsoon conditions continued through August with only the Tomichi and Cochetopa Creek drainages receiving less than 100% of average precipitation during the month. The heaviest precipitation fell in the lower Gunnison and Uncompahgre basins which received upwards of 150% of average precipitation during August. Some farmers could use a respite from the moisture in order to complete their final cutting of hay. Residents in the Uncompahgre valley were surprised to see significant white above 11,000 feet in the San Juans during the third week of August, hopefully this is an indicator of things to come.

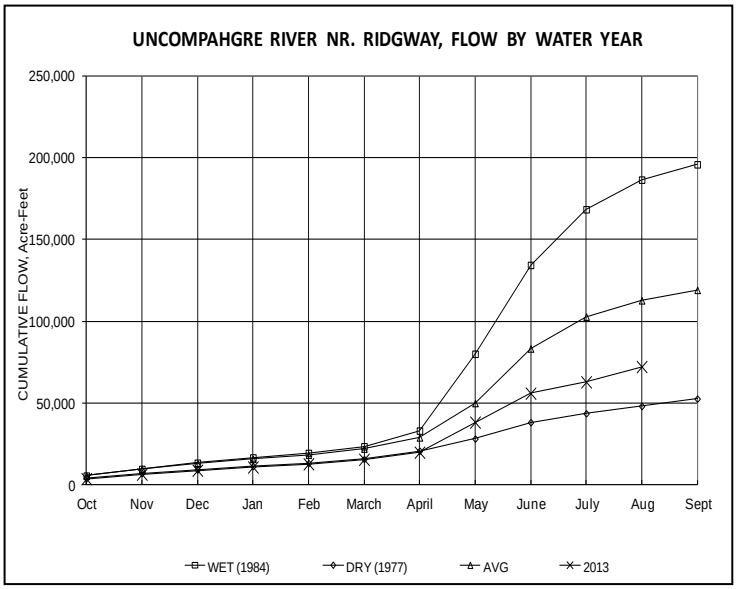
Outlook

Climate Center forecasts indicate that the Gunnison basin has equal chances of below or above average precipitation for the next 90 days, but similar to last month, continues to be on the edge of the area in the southwestern U.S. with a greater chance for above average precipitation in the next 30 days. Hopefully the area of above average precipitation stays further north than the forecast shows going into the snow accumulation season.



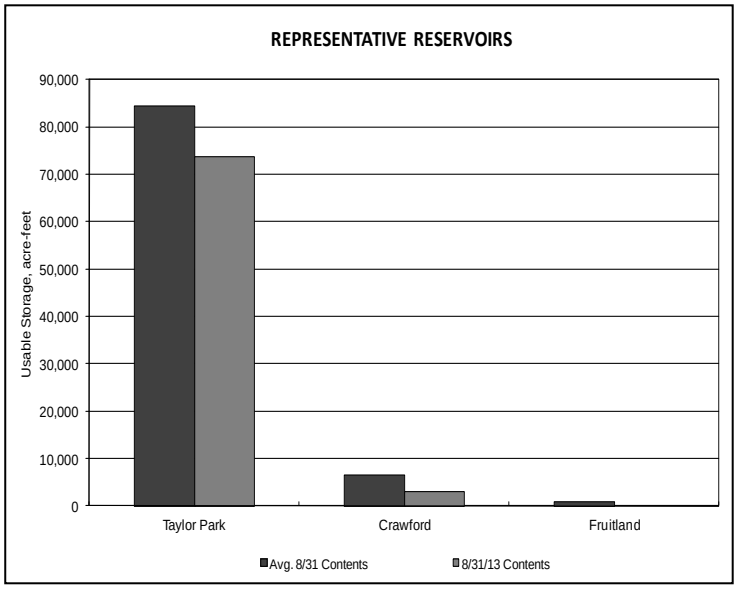
Administrative/Management Concerns

Rainfall in early August caused Aspinall Unit (AU) inflows to exceed Gunnison Tunnel diversions on all but three days between August 1st and August 15th. In fact, during that period, a net increase of 1,400 acre-feet occurred in the Taylor Park 2nd fill account, which is very unusual for this time of year. Inflows to the AU have consistently been short of Tunnel diversions since August 15th, but only by an average of 182 cfs, which is lower than average for August. Despite the fact it seemed extremely unlikely back in March, it is now likely that the Uncompahgre Valley Water Users Association (UVWUA) will begin the 2014 water year with a full Taylor Park's first fill right. This is possible because of storage moved into Blue Mesa Reservoir during the year based on an agreement formalized in the decree for Case No. 86CW203. The UVWUA raised the delivery to their users to 80% in parts of August due to the more favorable conditions, allowing some valley farmers to plant soil health crops going into fall.



Most other areas in the basin received rainfall in late July that helped reduce the depth of call on tributaries, however, this is not quite as true in northern areas, such as the North Fork Gunnison River drainage where Paonia Reservoir received only 0.8" of precipitation in August. Comparatively, Silver Jack and Ridgway Reservoirs, in the south, received 4.5" and 2.75", respectively, during the same period.

The August 10th 24-month study from the USBR predicts that Blue Mesa Reservoir will reach a low point in storage at 278,000 acre-feet in October 2013, which is 48,000 acre-feet lower than the minimum reached in 2012, but is slightly higher than the 262,000 acre-feet record low (since filling) of 2002. These numbers highlight that despite recent rains, the 51% of average April to July runoff received from snowpack had a significant impact on Reservoir storage during 2013.



Public Use Impacts

Side tributary flash floods, caused by the many storms in July and August, deposited a significant amount of material in the Gunnison River through the Gunnison Gorge, thus altering or completely changing many of the rapids in this popular recreation area.

Basinwide Conditions Assessment

The SWSI value for the month was -1.3.

Outlook

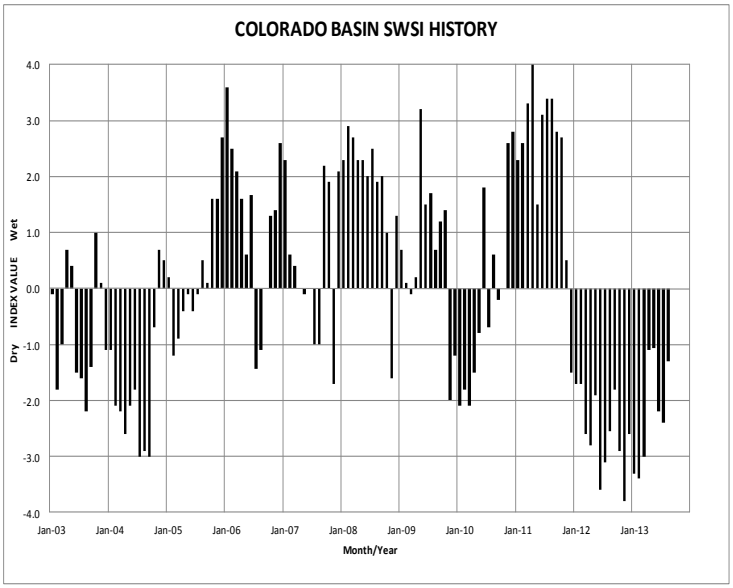
The Colorado River will likely run average flows through the month of September. Roaring Fork, Blue, and Eagle River flows will run above average early in the month and then fall to at or below average. Short term flow increases are likely with seasonal precipitation. The Colorado basin forecast calls for slightly below-average chance of precipitation through the month of September.

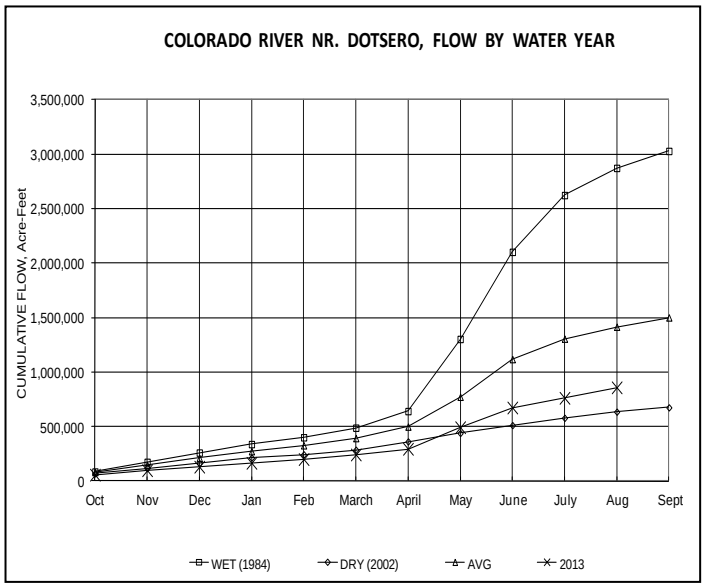
Administrative/Management Concerns

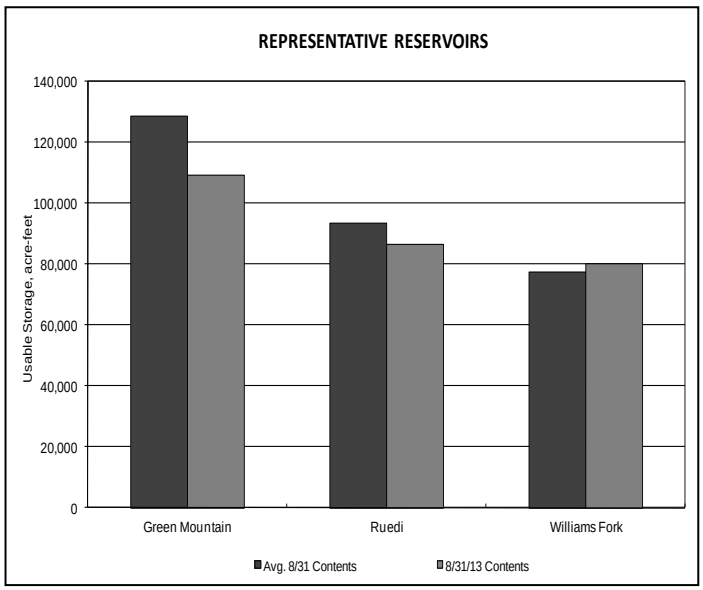
Ruedi Reservoir releases were decreased significantly in early September, prompted by the Fish and Wildlife Service and low inflow volume. The release rate of around 110 cfs is likely to remain throughout September. Shoshone Power plant returned to full operational status (2nd turbine repaired in early September). The continuing call scenario by the Grand Valley Irrigators was interrupted by significant precipitation beginning in late August and continuing well into September. Accordingly, Green Mountain releases have been decreased significantly, and the call removed to a free river condition as of September 14th. The Grand Valley Irrigation and/or Shoshone power calls will likely resume in mid-late September and drive upper Colorado and Roaring Fork basin administration through the remainder of the month.

Public Use Impacts

A decreased release of 7.48 maf is required for water year 2014 under the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead. These Interim Guidelines also identify (Lake Mead) reservoir levels which would result in delivery shortages – specifically to the lower Colorado Basin.







Basinwide Conditions Assessment

The SWSI value for the month was -2.6. August 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 80% 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 August was 85%.

Flow in the major rivers of the Yampa, White, and North Platte River basins was also below average during the early weeks of August. However later in the month, flows were trending closer to average as they neared typical baseflow levels.

Outlook

As of August 31st, Fish Creek Reservoir was storing 3,507 AF which is 84% of capacity. Yamcolo Reservoir was storing 2,504 AF at the end of August 2013. The capacity of Yamcolo Reservoir is 9,580 AF. On August 31st, Elkhead Creek Reservoir was 96% full and storing 23,840 AF. On August 31st, 2013, Stagecoach Reservoir was 94% full and storing 34,200 AF.

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.

Administrative/Management Concerns

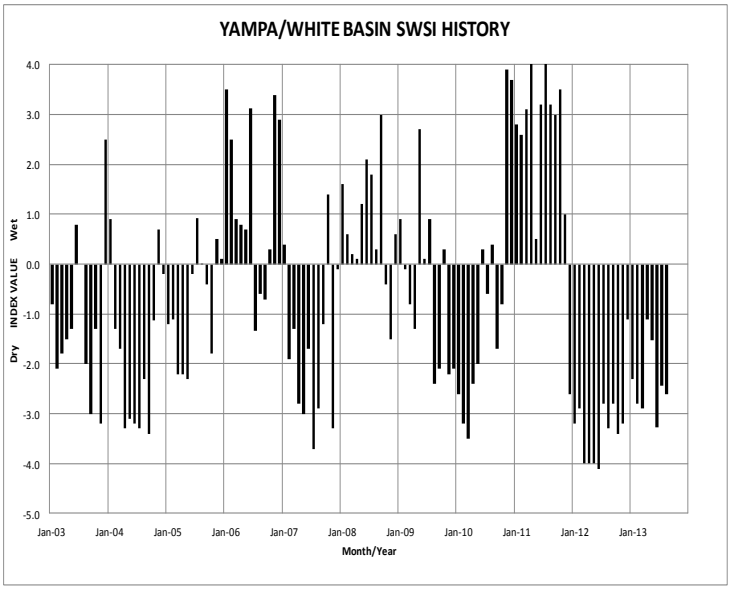
Currently there are no streams under administration in the Little Snake River basin (WD 55). All other districts in Division 6 currently have streams on call, although some are being released as irrigation is shut off or reduced either for haying or end of season. The CWCB placed a call for the instream flow right on the Elk River in Water District 58 on August 22nd. That call was released September 10th as heavy rains increased stream flow.

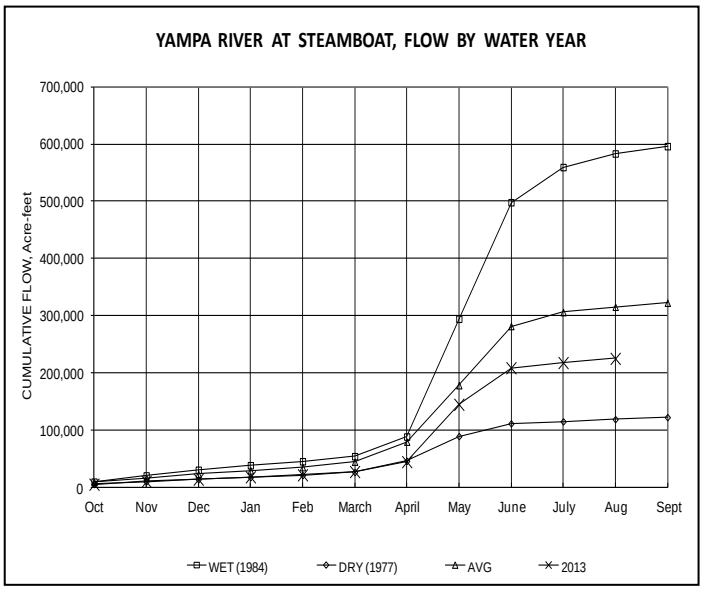
Public Use Impacts

To maintain flow on the Yampa River through Steamboat Springs, the Colorado Water Trust is leasing water from the Upper Yampa Water Conservancy's Stagecoach Reservoir. Releases began during August and are ongoing depending upon flows of the Yampa River through Steamboat Springs.

Steamboat Lake water level is slightly higher than normal with the reservoir remaining very close to full the entire summer.

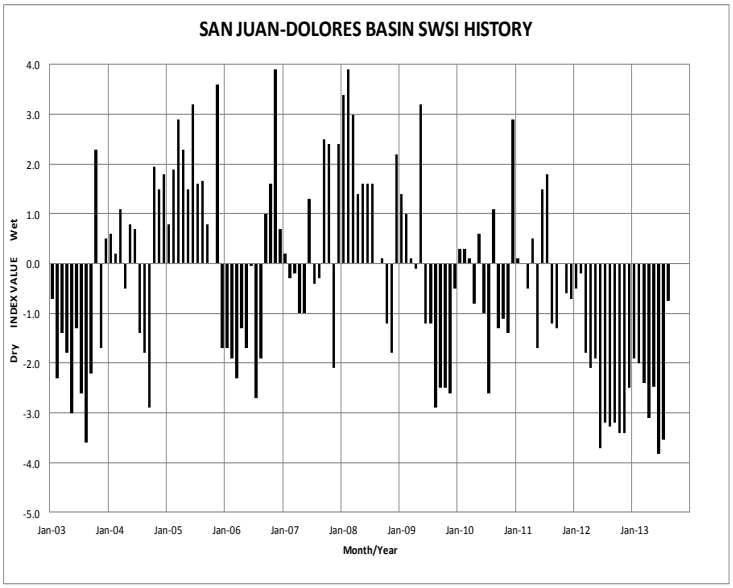
At Stagecoach State Park, tailwaters fishing will be closed beginning September 16, 2013 for a restoration project.





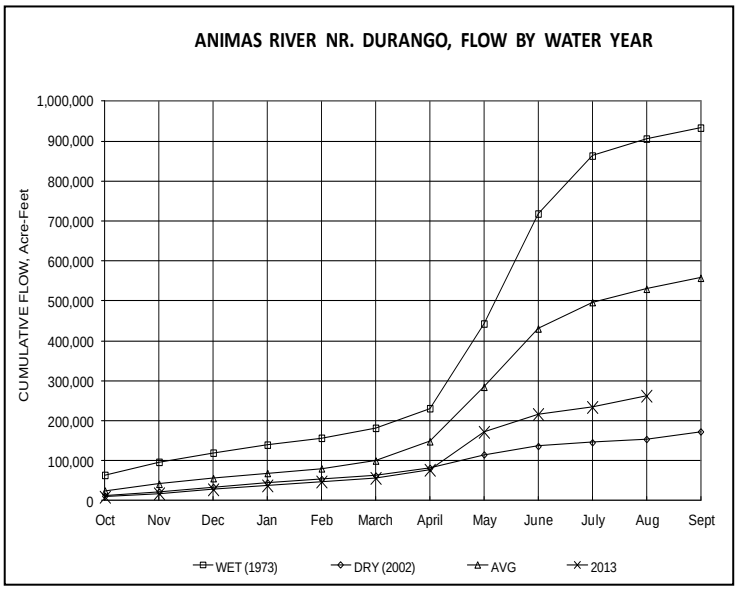
Basinwide Conditions Assessment

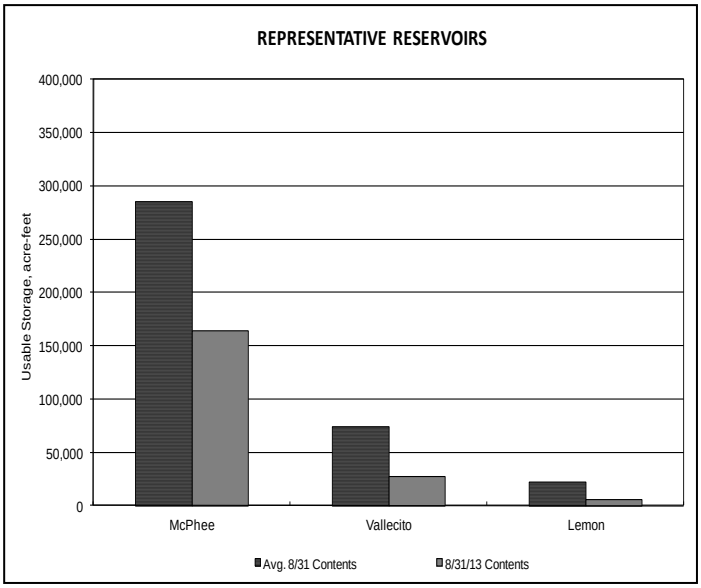
The SWSI value for the month was -0.7. Flow at the Animas River at Durango averaged 459 cfs (79% of average). The flow at the Dolores River at Dolores averaged 179 cfs (73% of average). The La Plata River at Hesperus averaged 13.2 cfs (58% of average). Precipitation in Durango was 2.70 inches for the month, 102% of the 30-year average of 2.64 inches. Precipitation to date in Durango, for the water year, is 10.8 inches, 62% of the 30-year average of 17.55 inches. The average high and low temperatures for the month of August in Durango were 83° and 53°. In comparison, the 30-year average high and low for the month is 84° and 52°. At the end of the month Vallecito Reservoir contained 27,220 acre-feet compared to its average content of 70,761 acre-feet (38% of average). McPhee Reservoir was up to 163,642 acre-feet compared to its average content of 293,866 (56% of average), while Lemon Reservoir was up to 6,060 acre-feet as compared to its average content of 22,088 acre-feet (27% of average).



Outlook

Precipitation (2.70-inches) was near average for August in Durango. There are 43 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 August. There were 60 out of 102 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. There were 63 out of 103 years of record where the total flow past the Dolores stream gauge was more than this year and 68 out of 97 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year.





ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - Sep-13

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	Streamflow	Precipitation (this month only)
South Platte	0.65	0.25	0.1
Arkansas	0.35	0.55	0.1
Rio Grande	0.05	0.9	0.05
Gunnison	0.3	0.6	0.1
Colorado	0.25	0.7	0.05
Yampa/White	0	0.9	0.1
San Juan/Dolores/Animas	0.1	0.85	0.05

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 September 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. "Streamflow Only" notes are for watersheds without a reservoir contributing to the SWSI calculation.