

# COLORADO

## WATER SUPPLY CONDITIONS UPDATE

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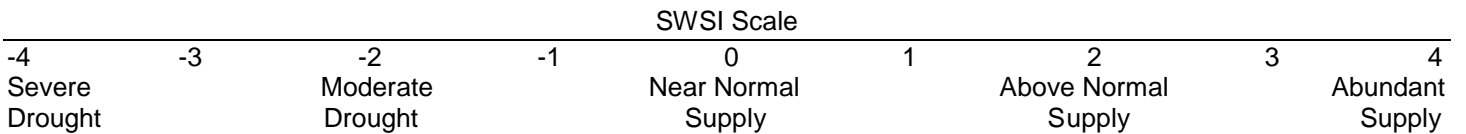
August 2013

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.

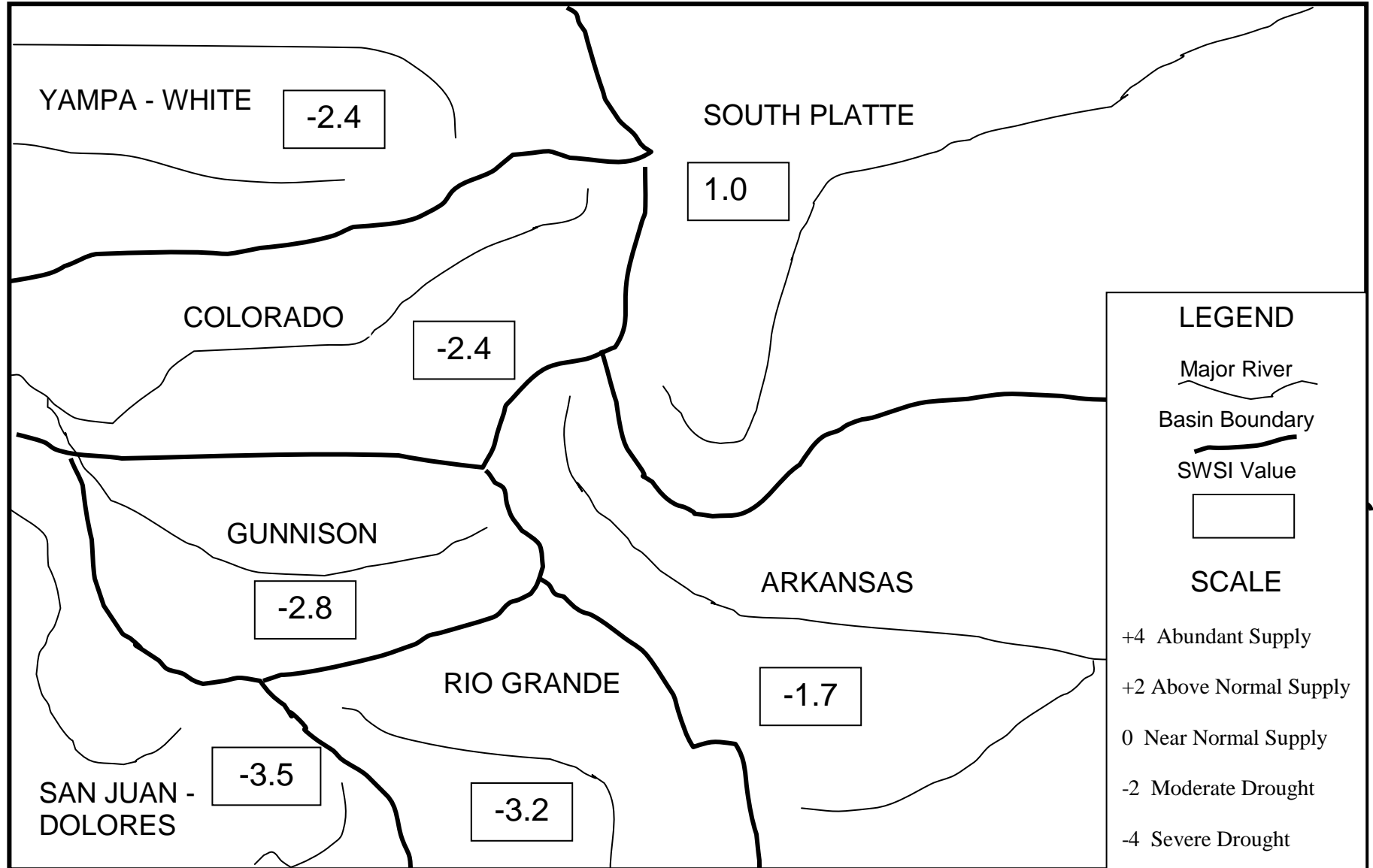
The statewide SWSI values for July (August 1) range from a high value of 1.0 in the South Platte Basin to a low value of -3.5 in the San Juan/Dolores Basin. The SWSI increased this month compared to last in each basin, with above average precipitation across the state. There was very little precipitation statewide in June, but this represents 10 percent or less of the SWSI in each basin. Low streamflows are the driver of the negative SWSIs in each basin, reflecting drought conditions statewide.

The following SWSI values were computed for each of the seven major basins for August 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	August 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	1.0	1.1	0.1
Arkansas	-1.7	1.1	0.1
Rio Grande	-3.2	0.6	-0.2
Gunnison	-2.8	0.5	0.3
Colorado	-2.4	-0.2	0.7
Yampa/White	-2.4	0.8	0.4
San Juan/Dolores	-3.5	0.3	-0.3



# SURFACE WATER SUPPLY INDEX FOR COLORADO



August 1, 2013

Basinwide Conditions Assessment

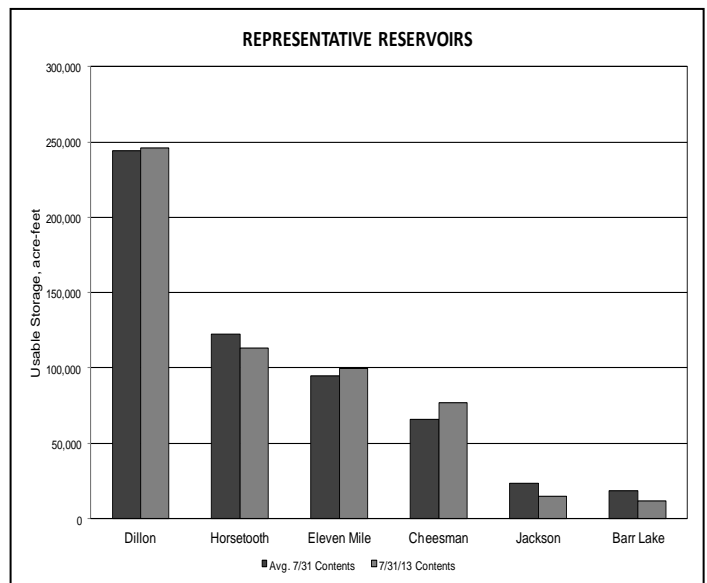
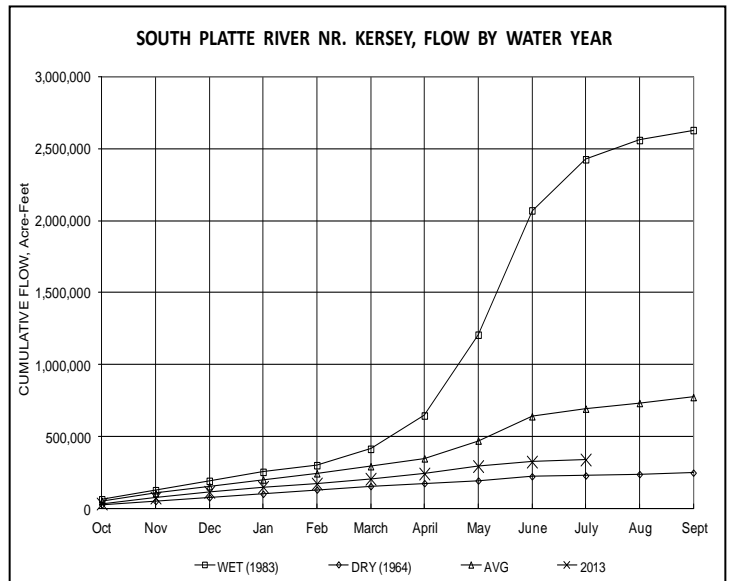
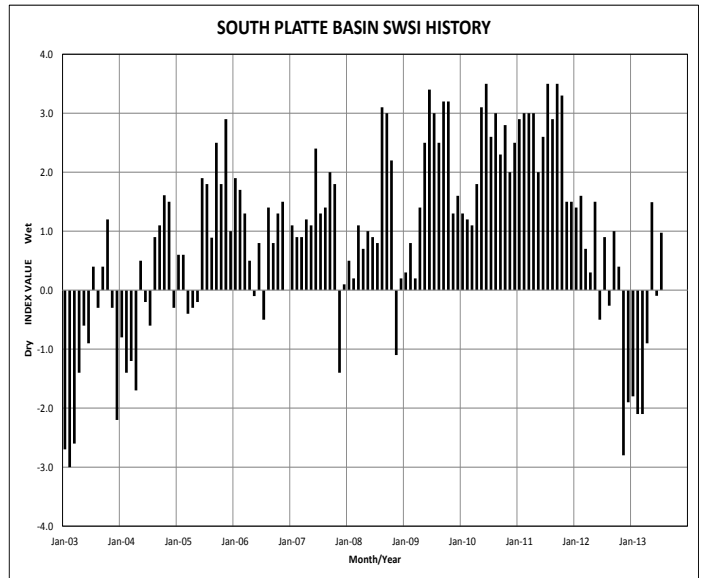
The SWSI value for the month was 1.0. June and July 2013 repeated, to a certain extent, the same pattern as June and July 2012. Like June 2012, June 2013 was warm to hot and dry while like July 2012, July 2013 was cooler and wetter. Overall, most of the basin received near normal precipitation for July 2013. There were certainly pockets that received only 50% of normal precipitation, but other pockets that received close to 200% of normal precipitation. July 2013 temperatures in the South Platte basin were also near normal, but did seem to vary with elevation. Most of the foothill and mountain areas were slightly warmer than normal, while much of the plains area, especially the South Platte valley, was slightly cooler than normal.

The July 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 236 cfs or 36% of the historic July mean flow of 664 cfs. The July Julesburg gage monthly mean stream flow was 36 cfs or 12% of the historic mean of 295 cfs. An interesting indication of the current “dryness” is that the Kersey July mean flow was below the Julesburg July historic mean flow.

The end of July overall reservoir storage in the South Platte basin was at 88% of the end of July average. However, when expressed as a percent of capacity, storage was at 67%. This compares to an average percent of capacity of 77% and a July 2012 percent of capacity of 58%. Also, the concern of June about the large decline of storage in the large reservoirs east of Kersey was relieved in July. The July decline was almost exactly average. This did not replace the 40,000 AF above average decline in June, but should allow most users to finish the irrigation season with reasonable reservoir supplies.

The mainstem river calls, especially in Water Districts 1 and 64, continued to be more senior than is typical of July. The calls in District 2 were somewhat more senior than typical, but were aided by monsoon thunderstorm rains producing runoff from the hardened surfaces in metro Denver. However, there was no free river at all and the South Platte Compact call was on for the entire month.

The July precipitation created another swing in the see-saw drought ratings for 2013 in northeast Colorado. By the end of July, much of the Front Range moved back into the “abnormally dry” (D0) rating (last seen at the end of May) from the “moderate drought” (D1) category at the end of June (previously seen at the end of April). Likewise, the rest of northeast Colorado saw a shift to lower drought ratings with a significant reduction in the “extreme” (D3) drought category.

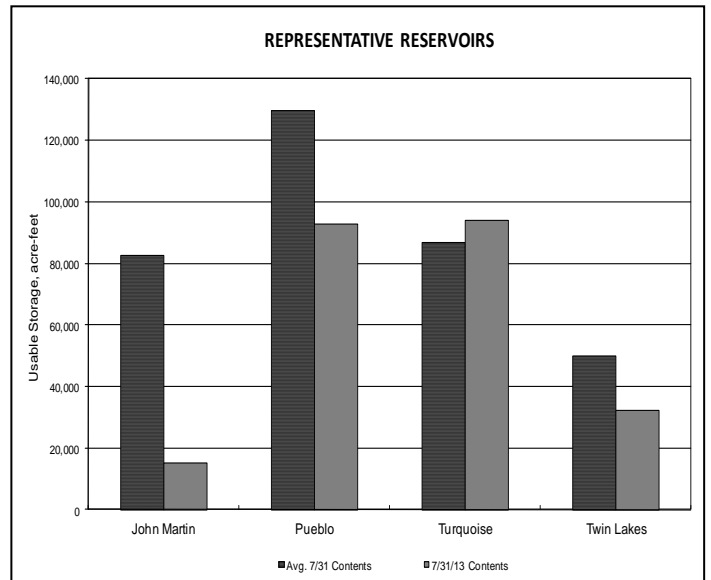
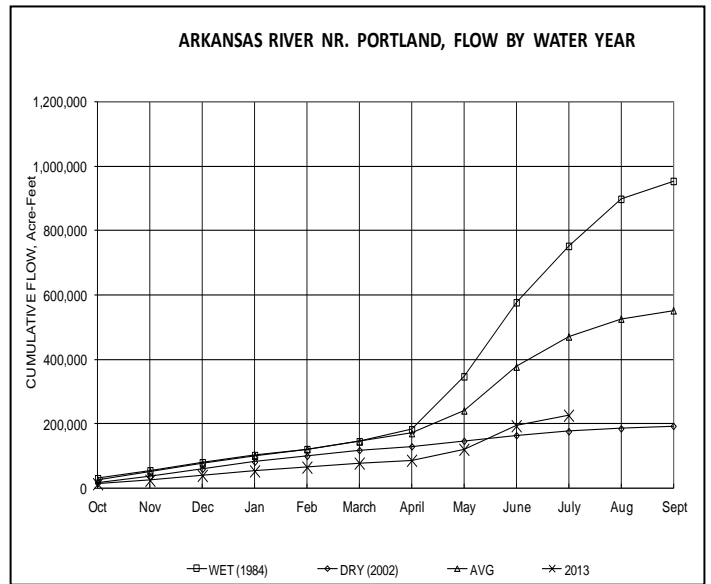
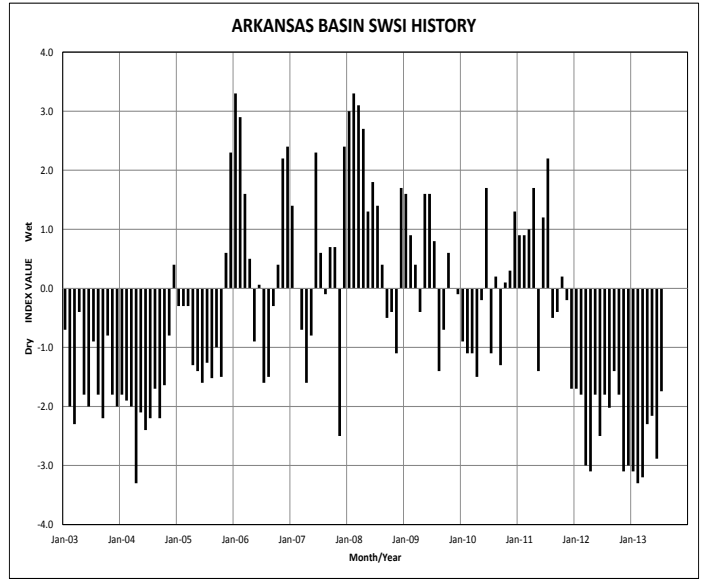


Basinwide Conditions Assessment

The SWSI value for the month was -1.7, a substantial improvement from last month. Runoff was fairly poor in the first half of July. Flows through the Arkansas River at Portland gage averaged only a little over 530 cfs. Although this was well below the historical average, these flows were significantly better than 2012. Seasonal monsoon rain events began to help break the abysmal cycle on some of the tributaries such as the Purgatoire, Apishapa, Huerfano and St. Charles Rivers where very little water supply had reached mainstem Arkansas River ditches for quite some time. Rainfall runoff events also increased on Fountain Creek toward the end of the month raising concerns about flooding issues from the burn scar areas on the Waldo Canyon and Black Forest fire sites.

Administrative Concerns

Kansas again elected not to run any of their water from John Martin Reservoir due to poor river conditions on the Arkansas River and in Kansas so far this season. This includes the Offset Account which is used to offset depletions from post-Compact well pumping in Colorado, primarily for the Lower Arkansas Water Management Association (LAWMA) which represents well owners near or below John Martin Reservoir. Limited well pumping due to poor replacement supplies has made a notable difference in the lower basin where well pumping was higher during the 2012 drought and helped soften the loss of reduced surface water supplies.



Basinwide Conditions Assessment

The SWSI value for the month was -3.2. Flow at the gaging station Rio Grande near Del Norte averaged 341 cfs (25% of normal). The Conejos River near Mogote had a mean flow of 136 cfs (29% of normal). Precipitation in Alamosa was 0.80 inches, just 0.17 inches below normal. The average temperature in Alamosa during July was one degree warmer than normal.

In general, the entire upper Rio Grande basin suffered through a poor runoff month during July, 2013. Streamflow was in the 20% to 40% of normal range. Sporadic rainstorms provided only temporary increases in runoff.

Outlook

Stream flow levels throughout the basin improved dramatically after the first of August when consistent rain came to the San Luis Valley and surrounding mountains. The National Weather Service (NWS) predicted the short term increase in precipitation that was a very welcome departure from the hot, dry conditions of May, June, and July. The NWS models do not indicate a sure bet for above normal precipitation for this basin in the next six months. However, the models do not indicate below normal precipitation as they have for the past two years. Streamflow should remain near normal as long as the rain continues. The increase in streamflow was a welcome opportunity for many ditches to turn back on for a few days.

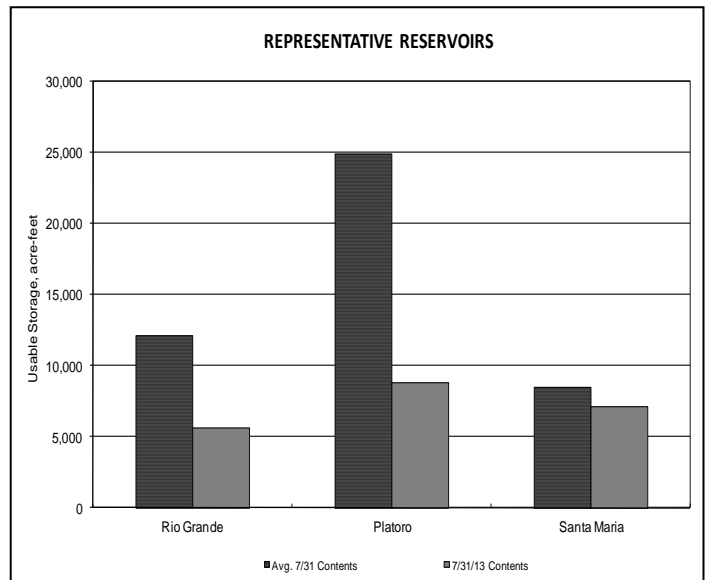
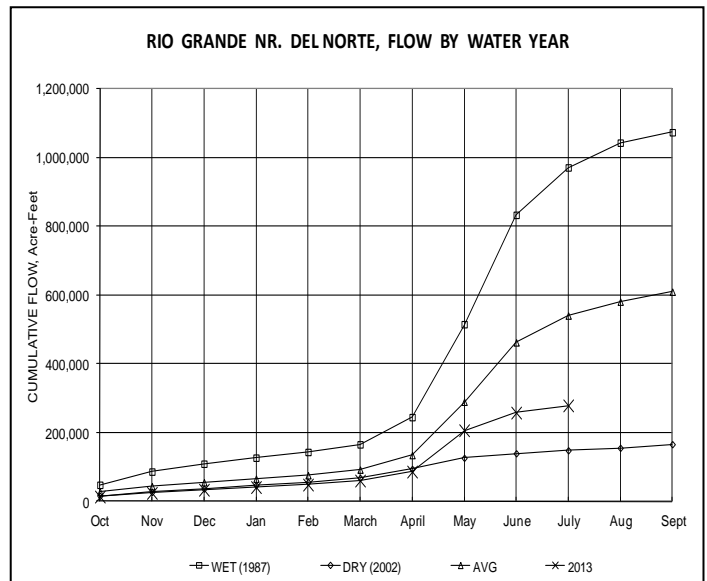
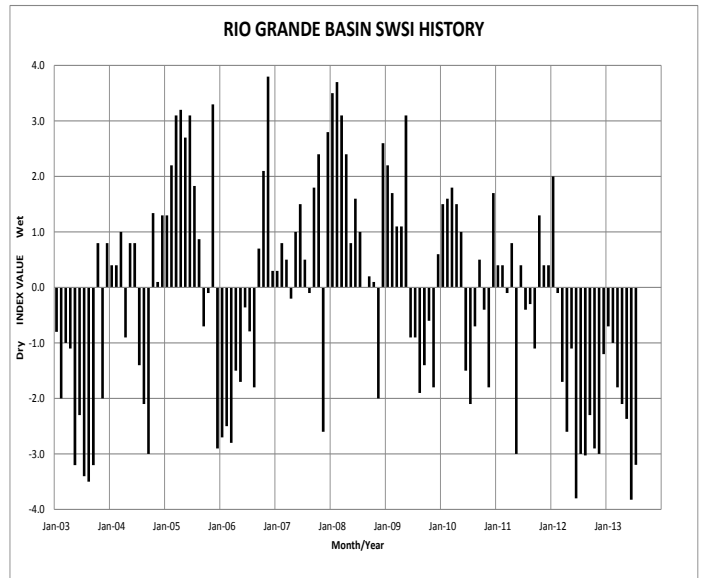
Reservoir storage is very low in this basin. A large change in the climate pattern must occur before reservoirs, including the groundwater aquifers, can return to normal operating levels.

Administrative/Management Concerns

The increase in streamflow at the upper index gaging stations on the Rio Grande and Conejos systems required water administrators to adjust the expected annual index volumes. Fortunately for the irrigators, this did not require an increase in the curtailment to meet Compact delivery requirements. Colorado expects to have a slight over-delivery for 2013.

Public Use Impacts

Fire! The West Fork complex wildfire began the third week of June and raged out-of-control until containment efforts and rainfall stopped the progression. About 110,000 total acres were burned in three separate units from Wolf Creek Pass to Rio Grande Reservoir. Although the fire never jumped State Highway 149 or moved down into the town, there were several day evacuations of homes and businesses near South Fork. As of the end of July, the fires were about 70% contained with most burning occurring back within the fire line. Tainted runoff from burned areas has raised water quality and flash flooding concerns. Four new gaging stations have been installed in the area to monitor potential flooding.



Basinwide Conditions Assessment

The SWSI value for the month was -2.8. Monsoon conditions that everyone was hoping would arrive did so in a big way during the second week of July and have continued into the early part of August. In fact, most of the Gunnison basin received more than 150% of average precipitation during July, with no area receiving less than 110%. This rain not only reduced the use of storage, but helped to improve range conditions throughout the basin. Seasonal cumulative precipitation rose, but remains below normal at 70-89% of the average.

Outlook

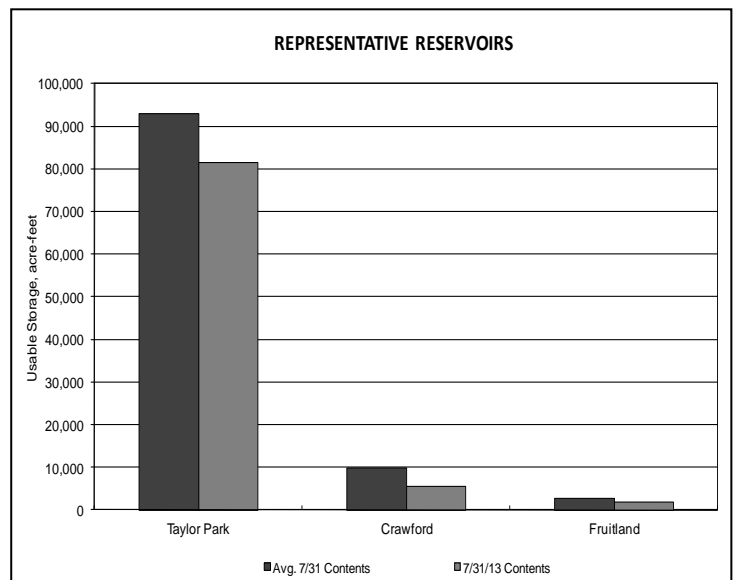
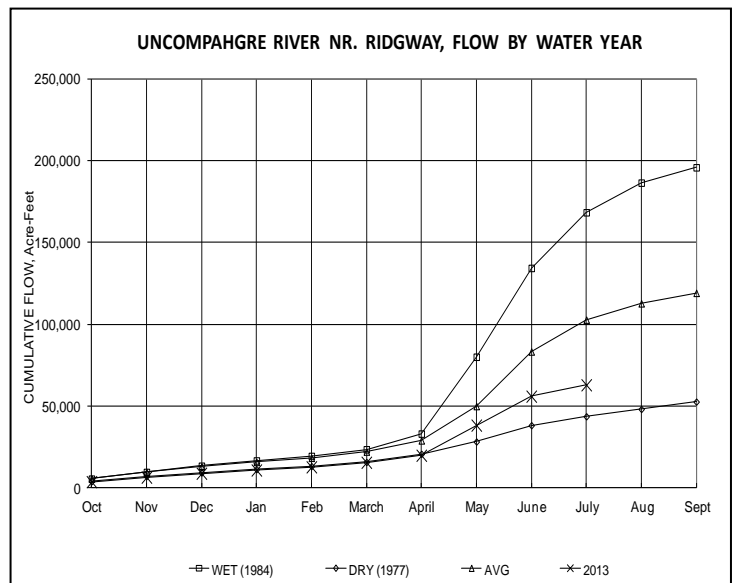
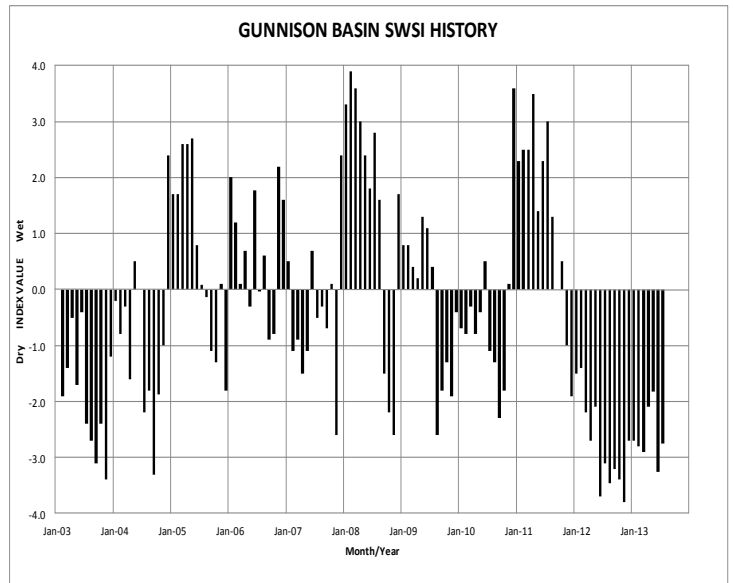
Climate Center forecasts indicate that the Gunnison basin has equal chances of below or above average precipitation for the next 90 days, but similar to last month, continues to be on the edge of the area in the southwestern U.S. with a greater chance for above average precipitation. Hopefully that area of above average precipitation continues to stay further north than shown by the forecasts.

Administrative/Management Concerns

Gunnison Tunnel diversions exceeded Aspinall Unit inflows for all but 7 days during July, but the bigger story is that on July 28th, inflows began exceeding diversions by a significant amount due to heavy rainfall above the Aspinall Unit. In fact, although we used all 4,500 acre-feet of the UGRWCD contract water and a net of over 8,000 acre-feet of Taylor Park second fill from the 1st through the 28th, the remaining five days of July saw the second fill gain 1,400 acre-feet. This trend has continued into early August and it now is certain that the Uncompahgre Valley Water Users will not place a call with the Gunnison Tunnel this year. In fact, they may start the 2014 water year with Taylor Park's first fill right full, based on accounting rules for storage of Taylor Park first fill in the Aspinall Unit that are included in the 86CW203 decree for Taylor Park's second fill. The UVWUA call, which was placed on the Uncompahgre on June 26th, was removed on August 3rd because the UVWUA was not able to keep their system tight, as evaluated by DWR using flows at the Olathe and Delta Uncompahgre River gages, due to all of the rain in late July.

Most other areas in the basin received rainfall in late July as well, which helped to reduce the depth of call on many tributaries and reduce the farmers and ranchers need to divert water significantly. Many streams, including the Cimarron and San Miguel Rivers in particular, experienced flash flooding from the heavier storms. For instance, the Cimarron River flow increased from 27 cfs to 1,930 cfs in a span of 45 minutes on July 17th.

Crystal Dam reduced their additional releases to meet the Aspinall Unit Operations endangered fish flow targets to 300 cfs on July 15th, however, due to precipitation; the 890 cfs flow target at Whitewater has been exceeded by no less than 300 cfs since the last week of July. The July 10th 24-month study from the USBR predicts that Blue Mesa Reservoir will reach a low point of 288,000 acre-feet in October 2013, which is approximately 39,000 acre-feet lower than the minimum reached in 2012. These numbers highlight that despite recent rains, a good snow year will still be needed for the Aspinall Unit to begin recovering from the multi-year drought as April-July inflows to the Unit were only 52% of average at 349,000 acre-feet in 2013.



Basinwide Conditions Assessment

The SWSI value for the month was -2.4.

Outlook

Colorado River flows are likely to run slightly below average through the month of August with Roaring Fork, Blue, and Eagle River flows running significantly below average. Short term flow increases are likely with seasonal precipitation. The Colorado basin forecast calls for 40-50 percent chance of above-average temperature and precipitation through the month of August.

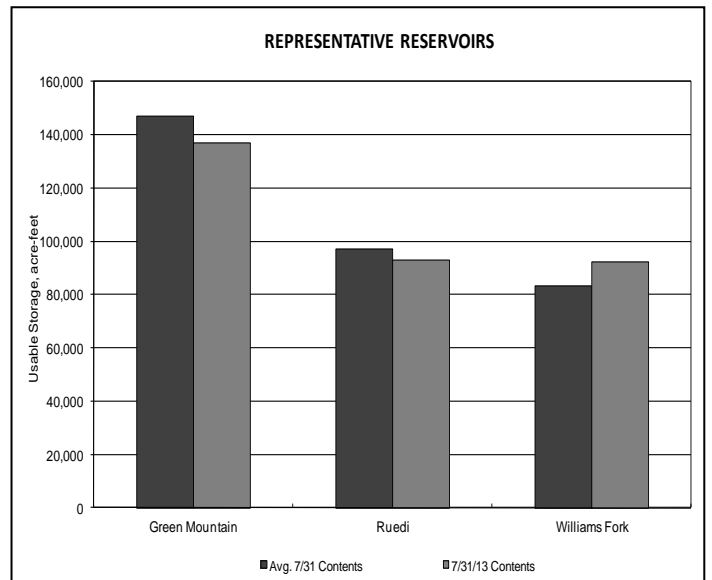
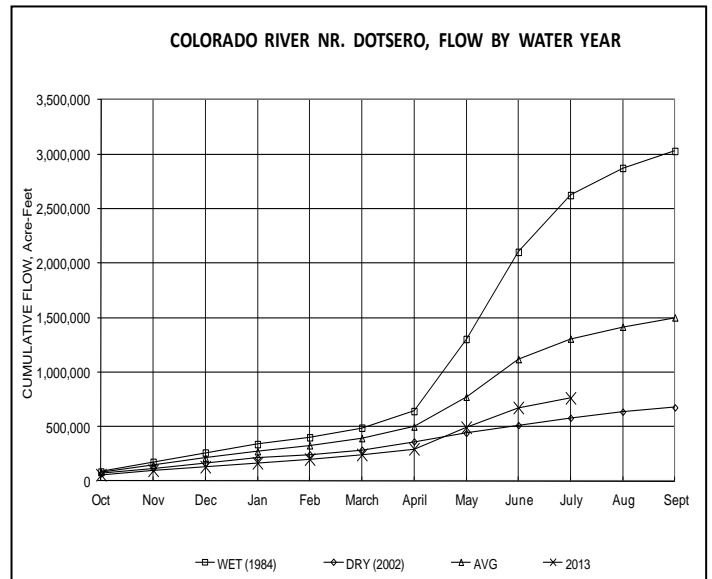
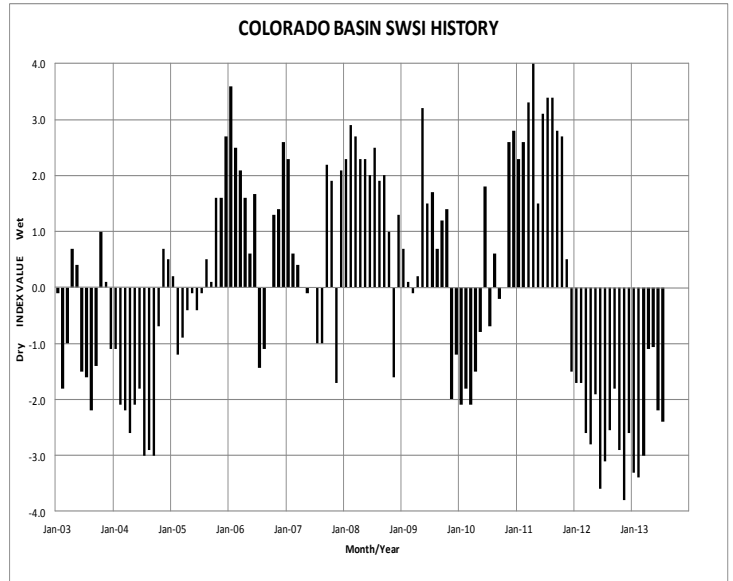
Administrative/Management Concerns

The Ruedi Reservoir storage right call ended on July 22nd, with storage reaching 93 percent of capacity. Reservoir releases increased by 110 cfs in late July to benefit fish habitat in the 15-mile reach, and satisfy contract water releases. The Shoshone Power call was removed on July 18th in accordance with the loss of 1 turbine. As a result, the Shoshone Outage Protocol was initiated July 21st, with increased Green Mountain Reservoir release to maintain a flow of 1250 cfs at Dotsero. The Shoshone Power call was re-initiated on August 12th only to be removed the next day due to maintenance issues. The Grand Valley Irrigators initiated calls on July 22nd starting with the Grand Valley Irrigation Company (junior 119 cfs). The Grand Valley Water Users Association (730 cfs) prompted significant Green Mountain Reservoir releases to bypass all inflow, fully replace for Silt and Colorado-Big Thompson project depletions, and satisfy HUP releases. Green Mountain releases have, and will continue to fluctuate dependent on Colorado River Flow variations in the Grand Valley resulting from intermittent monsoonal precipitation. Release of 50 cfs from Green Mountain was substituted from Williams Fork and Wolford Mountain reservoirs on August 1st. The Grand Valley Irrigation calls will likely continue to drive upper Colorado and Roaring Fork basin administration through the month of August.

Public Use Impacts

Significantly dry conditions over the past two years may result in an operational release tier change for Lake Powell. A projected January 1, 2014 lake elevation of between 3525 and 3575 feet, combined with a minimum Lake Mead elevation of 1,025 feet, would initiate a release reduction from the current 8.23 maf to 7.48 maf for water year 2014.

Many conservation groups are warning of “drastic” cutbacks in Lake Powell releases, and an “unprecedented water crisis”. However, Central Arizona Project and Arizona’s Department of Water Resources have planned for, and are expecting a shortage declaration in accordance with a potential 9 percent reduction in Lake Powell releases.



Basinwide Conditions Assessment

The SWSI value for the month was -2.4. July precipitation was above 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 124% 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 July increased slightly to 84%.

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

Outlook

As of July 31st, Fish Creek Reservoir was storing 4,055 AF, 97% of capacity. Yamcolo Reservoir was storing 2,547 AF out of a capacity of 9,580 AF. Elkhead Creek Reservoir remained full and was storing 24,062 AF. Stagecoach Reservoir was 98% full and storing 35,700 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

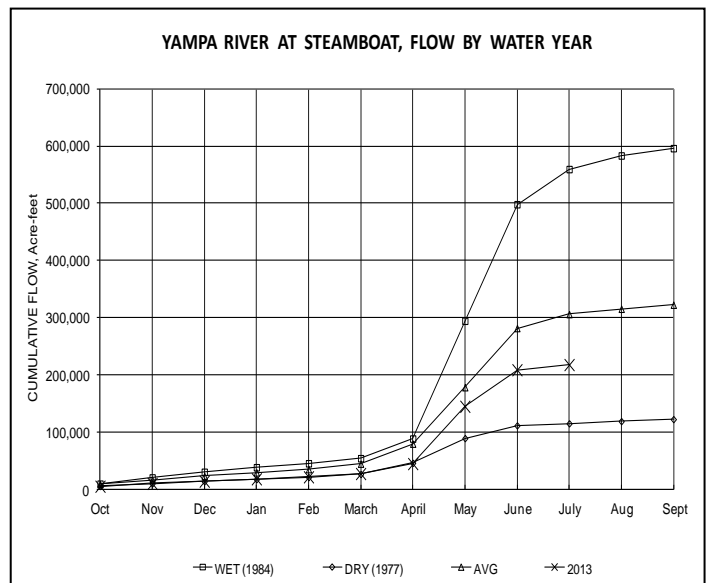
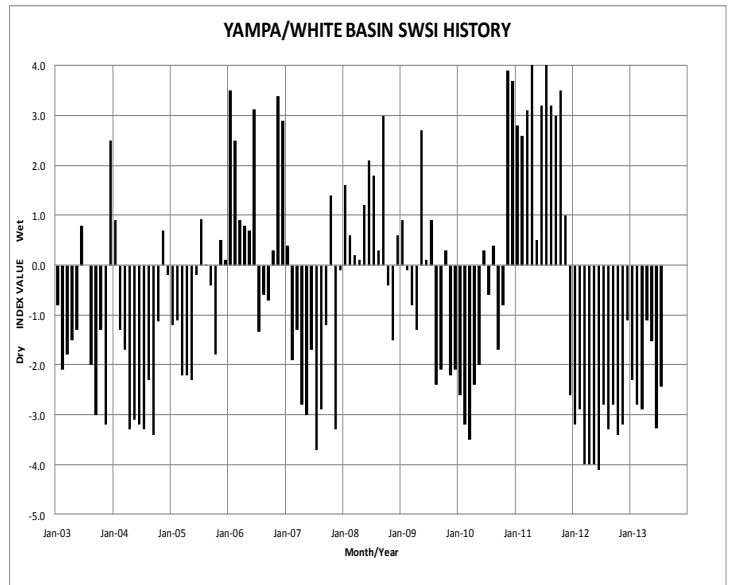
Typical administration has occurred this summer throughout all of Division 6. Currently there are no streams under administration in the Little Snake River basin. All other districts in Division 6 currently have streams on call, although calls are being released at a higher rate than during July. Irrigation is shut off or reduced either for haying or end of season.

Public Use Impacts

To maintain flow on the Yampa River through Steamboat Springs, the Colorado Water Trust is once again leasing water from the Upper Yampa Water Conservancy's Stagecoach Reservoir. Releases began during July and are ongoing.

Routt County and National Forest Service fire restrictions have been lifted. Moffat and Rio Blanco Counties remains under Stage 1 fire restrictions as July rainfall did not alleviate the dry conditions.

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



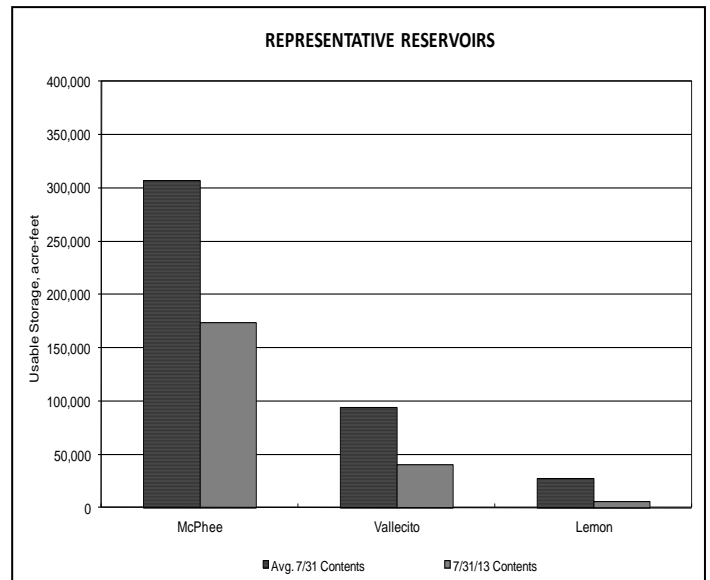
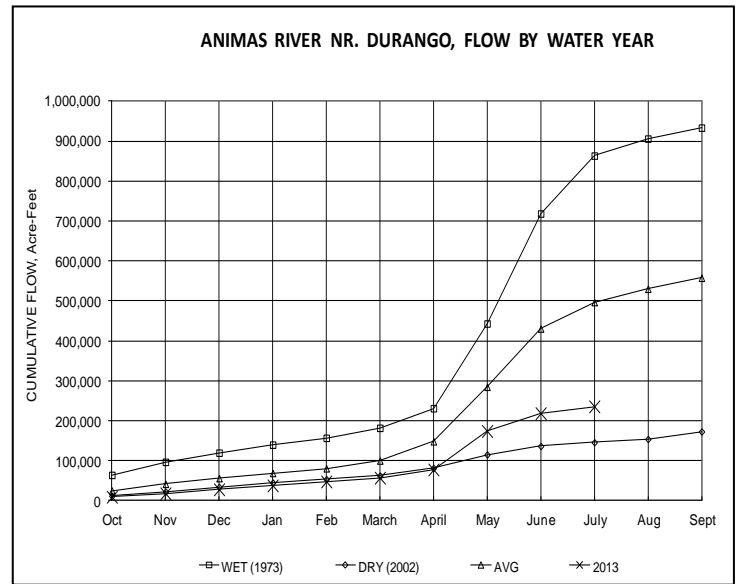
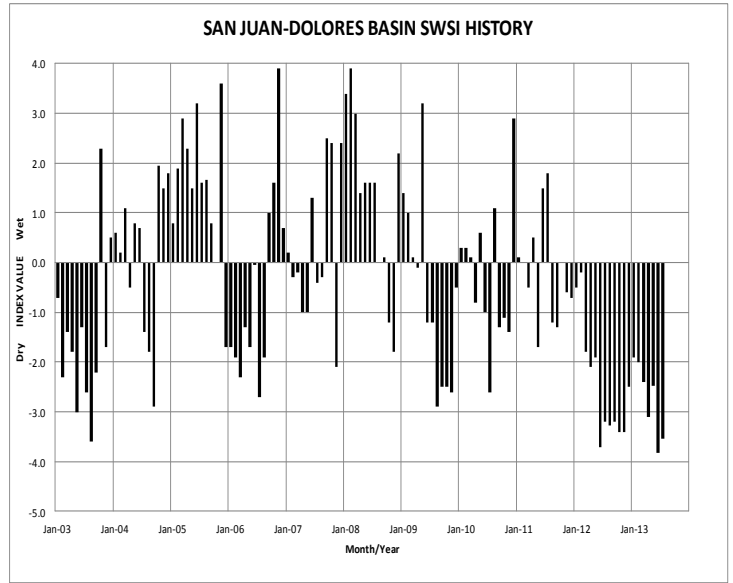


Basinwide Conditions Assessment

The SWSI value for the month was -3.5. Flow at the Animas River at Durango averaged 277 cfs (24% of average). The flow at the Dolores River at Dolores averaged 98 cfs (25% of average). The La Plata River at Hesperus averaged 6.9 cfs (19% of average). Precipitation in Durango was 1.36 inches for the month, 68% of the 30-year average of 2.00 inches. Precipitation to date in Durango, for the water year, is 8.10 inches, 53% of the 30-year average of 15.18 inches. The average high and low temperatures for the month of July in Durango were 86° and 55°. In comparison, the 30-year average high and low for the month is 86° and 53°.

As of the end of July, Vallecito Reservoir contained 40,640 acre-feet compared to its average content of 89,769 acre-feet (45% of average). McPhee Reservoir was up to 173,277 acre-feet compared to its average content of 317,963 (54% of average), while Lemon Reservoir was up to 5,470 acre-feet as compared to its average content of 27,564 acre-feet (20% of average).

Precipitation (1.36-inches) was well below average for July in Durango. There are 82 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 July. There were 100 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 98 out of 103 years of record where the total flow past the Dolores stream gauge was more than this year and 95 out of 96 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 - Aug-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 August 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.

