COLORADO
WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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October 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 September (October 1) range from -1.5 in the Gunnison Basin to 3.5 in the San Juan / Dolores Basin. The SWSI increased dramatically in each basin due to the heavy precipitation in September.

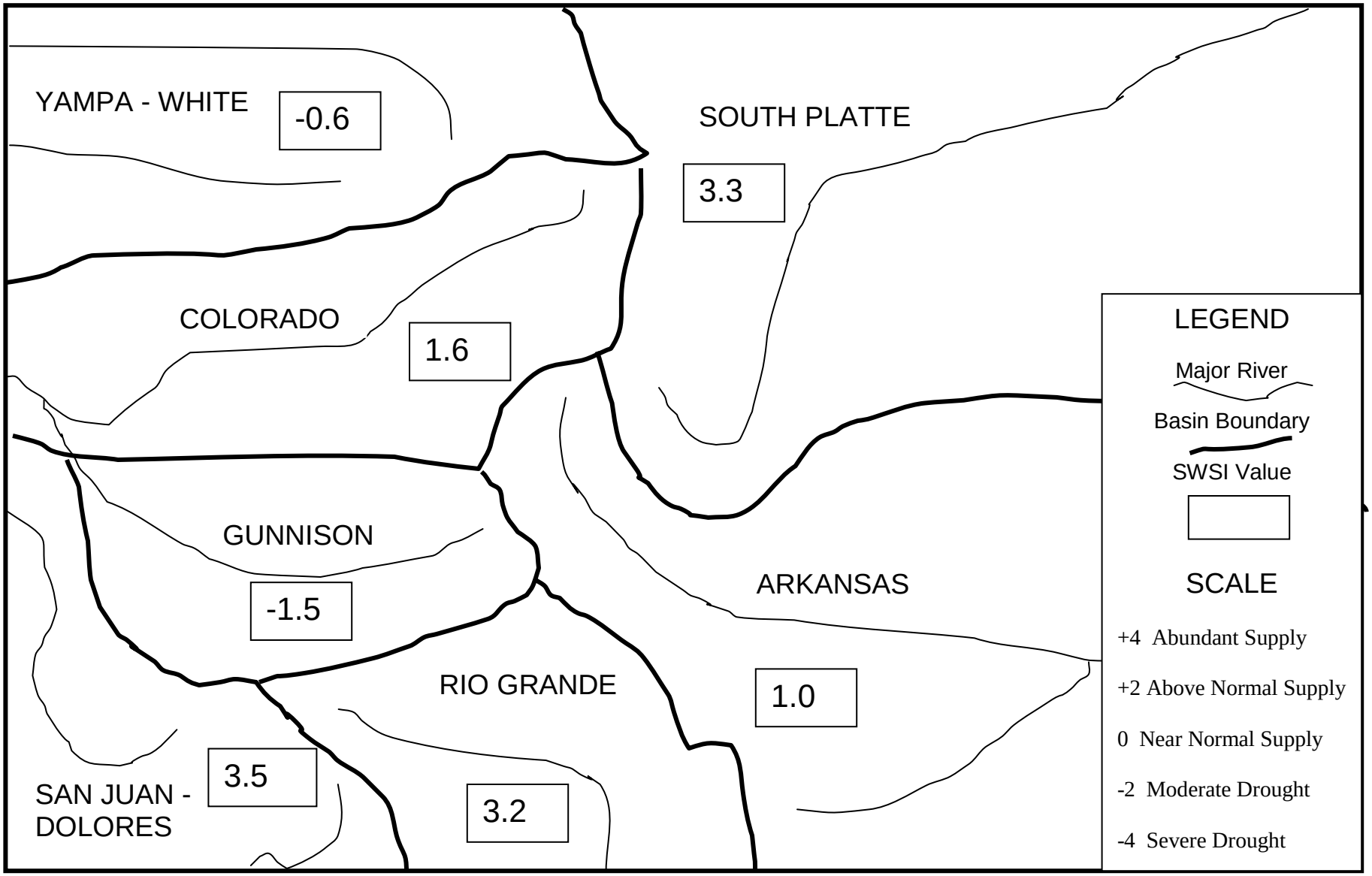
The following SWSI values were computed for each of the seven major basins for October 1, 2013. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10. The NRCS SWSI indicates variability in the level of surface water supply across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

Basin	October 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	3.3	2.0	2.3
Arkansas	1.0	2.9	2.4
Rio Grande	3.2	3.1	5.5
Gunnison	-1.5	1.5	1.7
Colorado	1.6	2.9	3.4
Yampa/White	-0.6	2.0	2.2
San Juan/Dolores	3.5	4.3	6.7

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



October 1, 2013

Basinwide Conditions Assessment

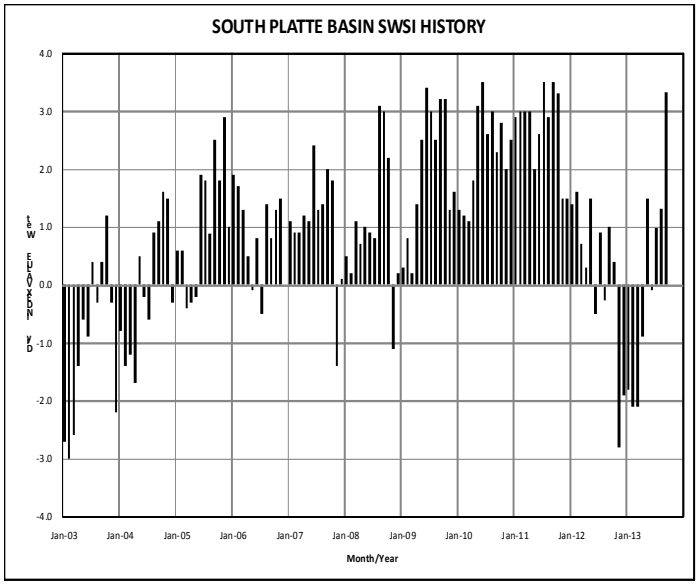
The SWSI value for the month was 3.3. September 2013 will be remembered in the South Platte as the "13 flood" in much the same way the "65 flood" and the "35 flood" are remembered. During the week of September 9 through 15 water supply conditions changed from not very good to way too much water along the Front Range and subsequently along the mainstem to Nebraska.

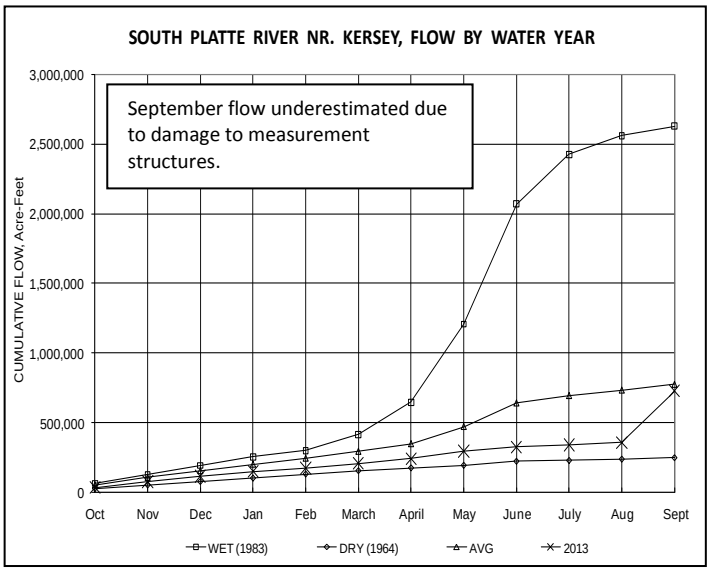
As with the historic floods just mentioned, the "13 flood" caused significant damage to homes and businesses as well as water diversion structures and stream flow gages in an area more-or-less bounded by the Cache la Poudre River on the north, Clear Creek on the south, the continental divide on the west and Greeley on the east. Though there was high water and significant damage outside of this area, the damage within this area was catastrophic. It was initially feared that the loss of human life would be in the double or triple digits. Though any loss of life is tragic, thankfully the final toll was that only 7 people lost their lives in the "13 flood".

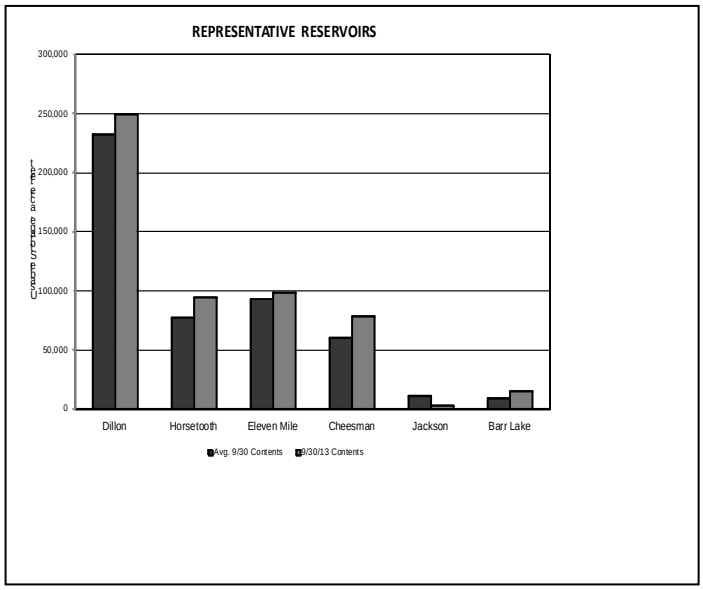
From a water structures standpoint, most of the damage was on Boulder Creek, Saint Vrain Creek, Little Thompson River, Big Thompson River, and the South Platte mainstem downstream of the St. Vrain-South Platte confluence. Certainly there was damage in other areas, but the damage along these Front Range tributaries was almost total destruction of structures. The damage was less severe downstream on the South Platte only because it took time for the flood "wave" to migrate downstream and some structure owners were able to take preventative measures to lessen damage to their structures.

Total September stream flows at the Kersey index gage are unknown as the gage was lost prior to the peak of the flood "wave" reaching that location the evening of Friday, September 13. The last transmitted flow was 28,800 cfs. (The USGS stream flow gage at Fort Morgan did survive the event with a peak flow of 50,600 cfs the evening of September 14). The peak flow for this event at the Julesburg gage was 21,400 cfs during the afternoon of September 18. (The hydrograph of the Julesburg gage is quite interesting as, because that area received much less precipitation than the Front Range, it shows almost no increase in a flow of 80 to 90 cfs until the day before the peak when it begins a very rapid rise.)

River calls prior to the "13 flood" were somewhat more senior than normal. From the flood to the end of September, the South Platte basin was in a free river condition. Unfortunately the flood damage has prevented many reservoirs from taking advantage of the free river, with the exception of the Poudre River basin where they were able to store because of less infrastructure damage



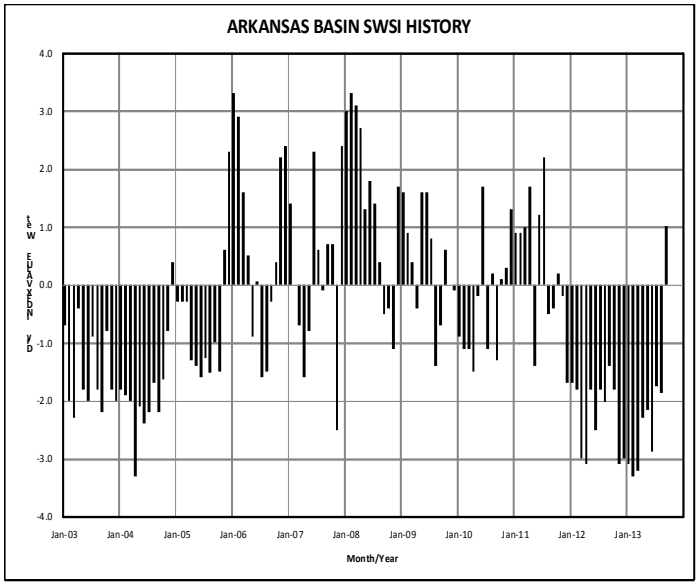


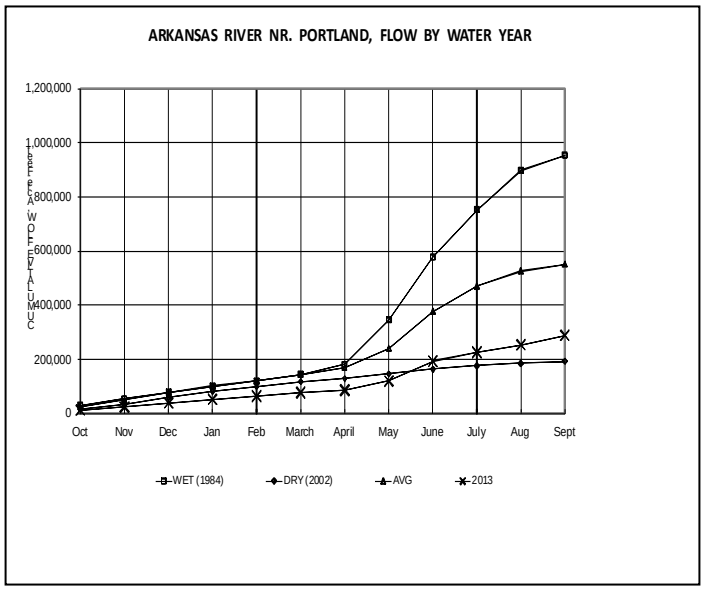


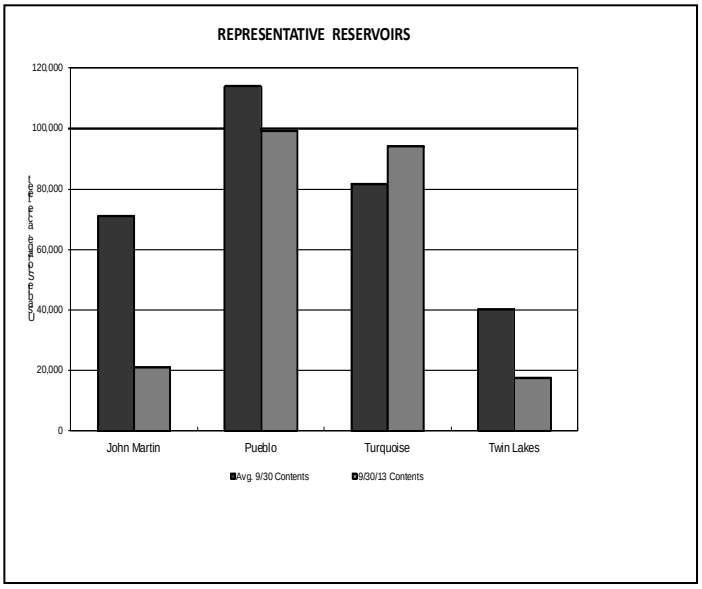
Basinwide Conditions Assessment

The SWSI value for the month was 1.0. River calls during September again 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 continued to flow well due to large rain events in August and September and resulted in even more junior calls below John Martin Reservoir for part of the month.

Improved surface water conditions in August and September were a huge benefit to ground water associations attempting to get replacements supplies and stream depletions caused by wells in balance by the end of the irrigation season to avoid reduced pumping being repeated again in 2014. Small increases in approved pumping were approved by the State Engineer that will allow farmers to start a winter wheat crop or finish some hay crops in 2013.







Basinwide Conditions Assessment

The SWSI value for the month was 3.2. Flow at the gaging station Rio Grande near Del Norte averaged 1347 cfs (271% of average). The Conejos River near Mogote had a mean flow of 172 cfs (115% of normal). Alamosa received 2.98 inches of precipitation during the month, 2.07 inches above average. September was warmer than normal for the San Luis Valley.

Multiple rainfall events at mid-month resulted in three times the average rainfall during September in Alamosa, by far the rainiest September in the past 50 years. These events increased streamflow in portions of the upper Rio Grande basin. Quite a few gauging stations in the northern part of the Valley experienced peak 2013 flow as a result. However, the southern part of the Valley did not receive that same plentiful rainfall during August and September.

Outlook

Weather forecasters predict warmer than normal temperatures for the autumn and winter in the San Luis Valley, but are unsure of a particular trend in precipitation.

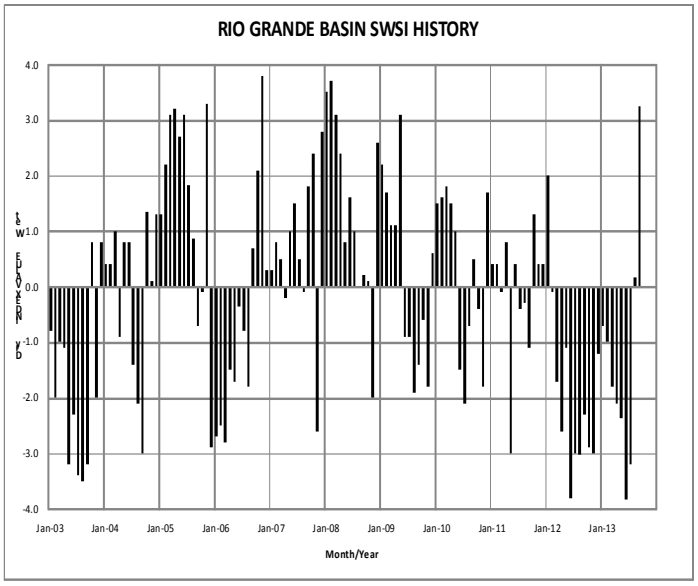
Administrative/Management Concerns

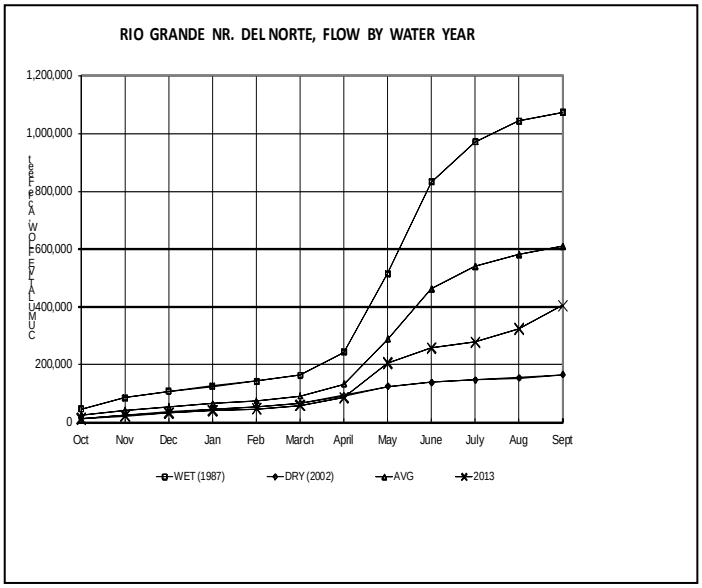
In an effort to meet Rio Grande Compact delivery requirements to New Mexico and Texas, a curtailment of 18% of the native flow in the Rio Grande was set during September. The curtailment will be passed through diverters and on to the State Line to help make required delivery to New Mexico and Texas.

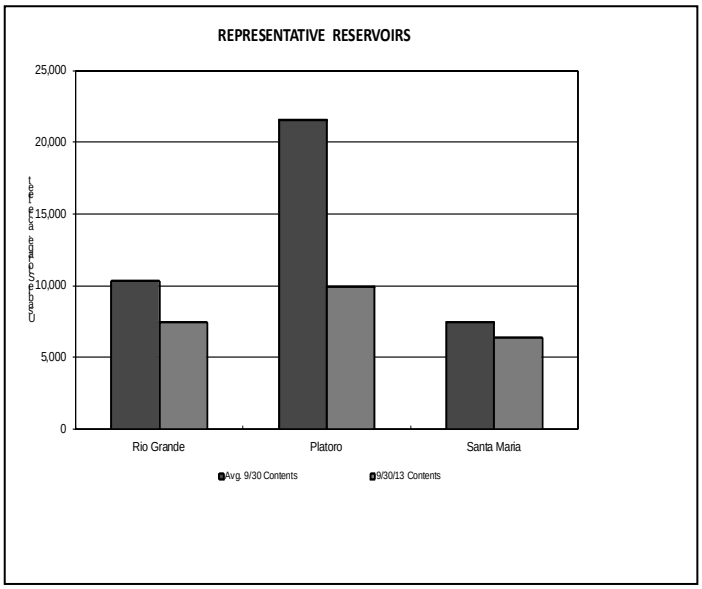
Much more water flowed down the Rio Grande this summer than anyone expected. The May 1, 2013 NRCS forecast of the April through September flows for the Rio Grande near Del Norte led to a projected annual volume of 295,000 acre-feet, about 48% of the long-term average. The current outlook is for 450,000 acre-feet.

The same is not true for the Conejos River system where the annual streamflow index increased only 5,000 acre-feet, from 145,000 acre-feet to 150,000 acre-feet. The Conejos River continues to have normal administration, without need for curtailment. It appears the Compact delivery obligation on this river system will be easily met in 2013.

Please Note: The San Luis Valley Well Rules Advisory Committee will meet with the State Engineer at 10:00 a.m. on Thursday, October 24, 2014 at the Inn of the Rio Grande to discuss groundwater use rule promulgation and the recent release of the estimated stream depletion ranges for 4 of the planned response areas in the San Luis Valley.







Basinwide Conditions Assessment

The SWSI value for the month was 1.5. The entire Gunnison basin received more than 150% of average precipitation in September, continuing the trend from July and August. In fact, precipitation during the past three months brought the seasonal precipitation to near normal levels, which has improved soil moisture conditions for the start of winter, which should help increase runoff from whatever snowpack we have in the spring.

Outlook

Climate Center forecasts still indicate that the Gunnison basin has equal chances of below or above average precipitation for the next 90 days, except now it shows the Gunnison basin south of an area of above average precipitation in Wyoming and Montana. Hopefully the current moist pattern remains as we begin the snow accumulation season for water year 2014.

Administrative/Management Concerns

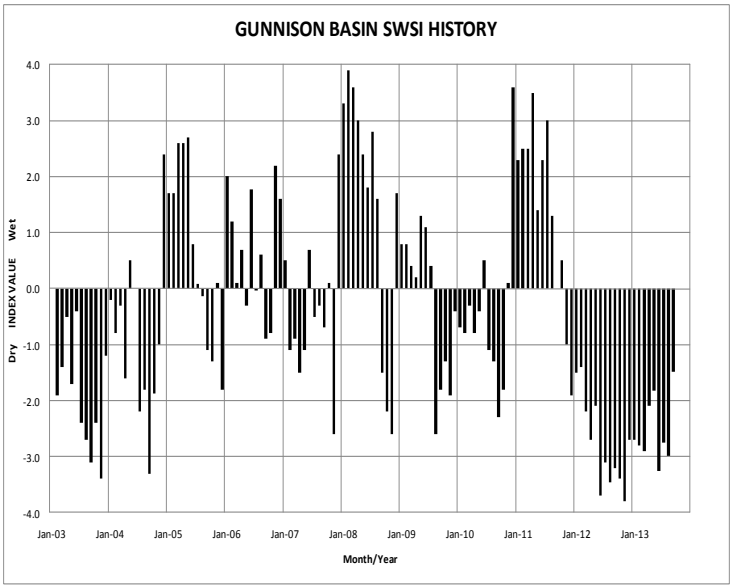
Gunnison Tunnel diversions were met by natural inflow to the Aspinall Unit from September 12th through the end of the month due to the above average precipitation. In fact, during that period, a net increase of 6,200 acre-feet occurred in the Taylor Park 2nd fill account, which is very unusual for this time of year. More importantly for next year, the Uncompahgre Valley Water Users (UVWUA) will begin 2014 at their average year target of 70,000 acre-feet of physical storage and will have a full first fill account (106,230 acre–feet) in Taylor Park. This is possible because of year to year roll over provisions and storage that is moved into Blue Mesa Reservoir throughout the year pursuant to the decree for Case No. 86CW203. UVWUA reduced diversions at the Tunnel earlier this year and increased releases from Ridgway Reservoir to meet their diversion needs from the Uncompahgre since they had more water remaining in Ridgway than usual due to heavy precipitation in Uncompahgre River basin.

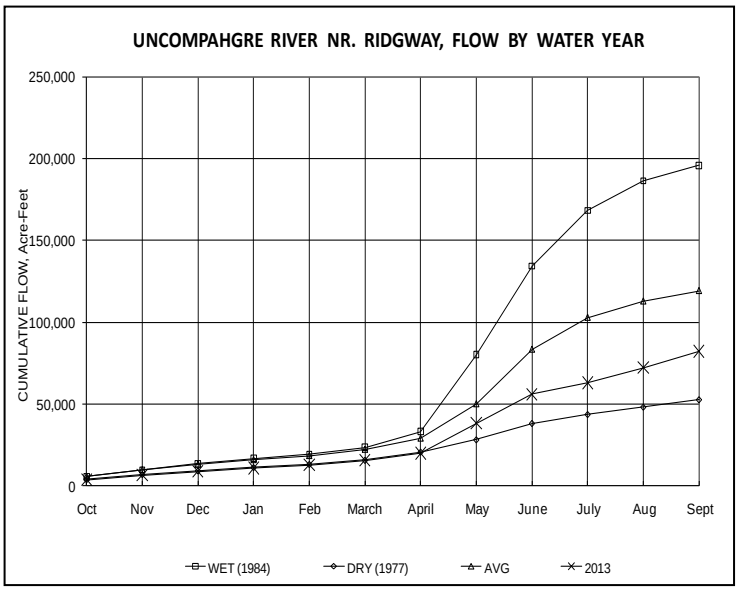
Although the September 13th 24-month study from the USBR predicts that Blue Mesa Reservoir will reach a low point in storage at 295,000 acre-feet in October 2013, the good news is that appears unlikely as the Reservoir currently sits at 351,000 acre-feet and continues to rise. If the Reservoir remains at this volume it will begin 2014 at a much lower than average level, but with 25,000 acre-feet more than last year.

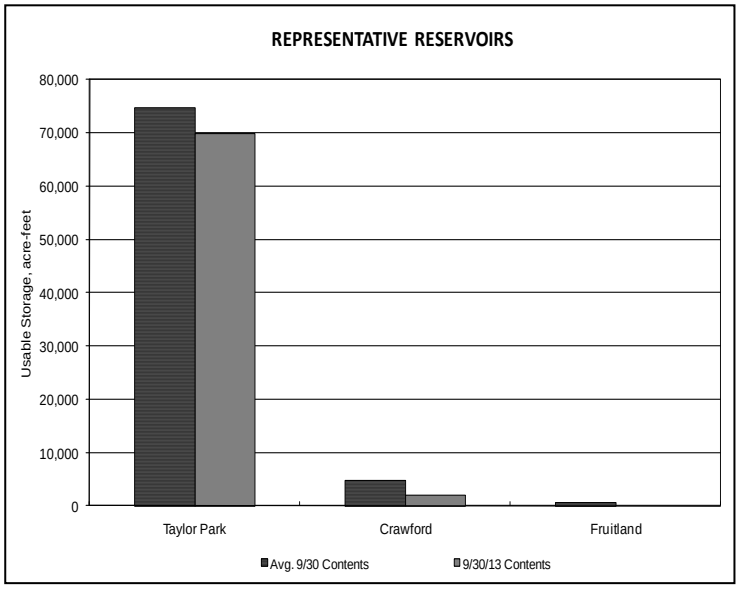
Unlike last month, the rainfall fell basin wide and many calls, even in the North Fork Gunnison River basin were taken off in September. Storage volumes remaining in Grand Mesa Reservoirs, although lower than average, is above the same period last year as well.

Public Use Impacts

Gunnison basin ski areas are hoping the cool wet weather in the beginning of October continues and they have a good start to the season in November.







Basinwide Conditions Assessment

The SWSI value for the month was 1.6.

Outlook

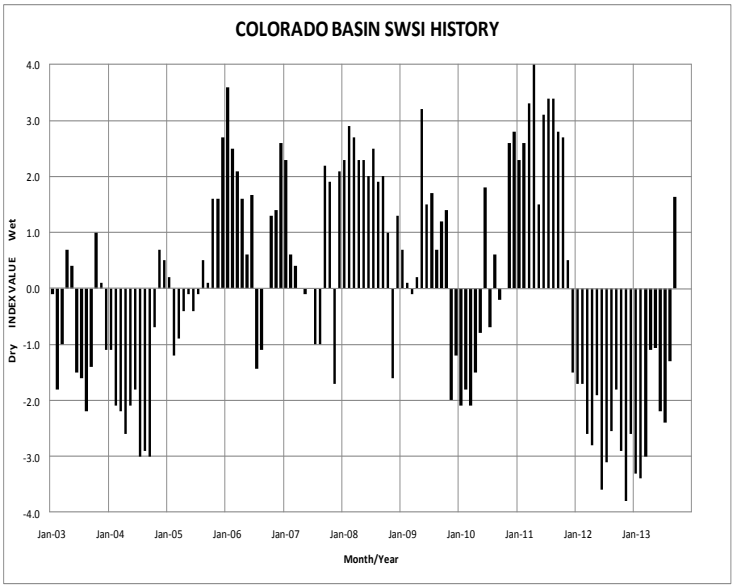
The Colorado River will likely run average flows through the month of October. Roaring Fork and Blue River flows will remain significantly above average, but continue to decline following heavy precipitation over the past six weeks. Eagle River flows will remain slightly elevated, falling towards average throughout October. Short term flow increases will be less likely with precipitation as temperatures decline. The Colorado basin forecast calls for average chance of precipitation through the month of October.

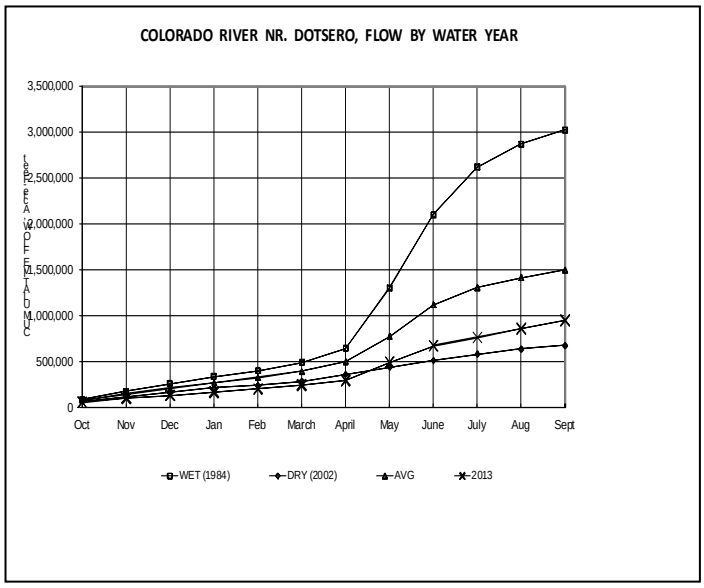
Administrative/Management Concerns

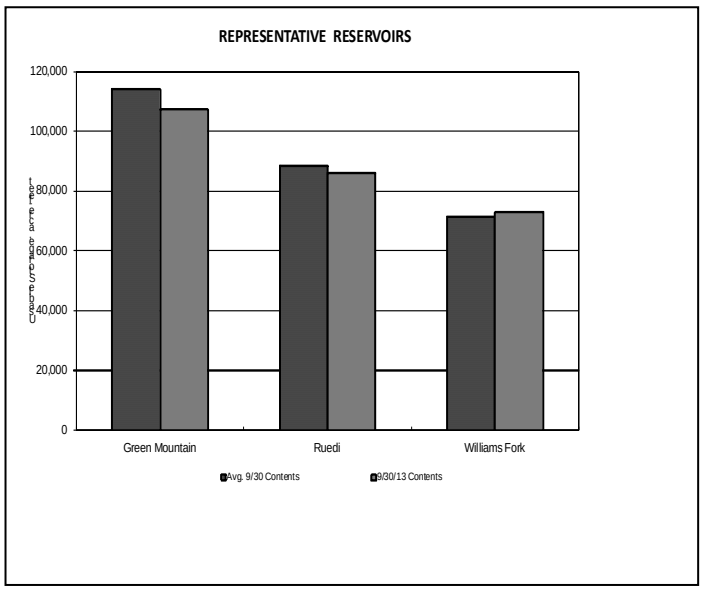
Ruedi Reservoir releases were decreased significantly in early October, ramping down for minimum flow releases for the winter. Shoshone Power plant is currently at full operation following maintenance shut-downs earlier this month. Significant precipitation continuing into October has prevented a Grand Valley Irrigation Call through the end of the irrigation season. Lack of a call placed by Shoshone invoked Green Mountain releases increases to maintain the 1250 cfs flow rate required by the Shoshone Outage Protocol. Green Mountain releases will further increase to evacuate storage for spring 2014 runoff. The increase in Granby Reservoir storage will continue with Moffat Tunnel diversions discontinued due to heavy precipitation and reservoir filling in the St. Vrain and Big Thompson basins.

Public Use Impacts

Recent heavy precipitation has prompted early openings of Arapahoe Basin and Loveland Ski areas with enough snow for mid-October openings.



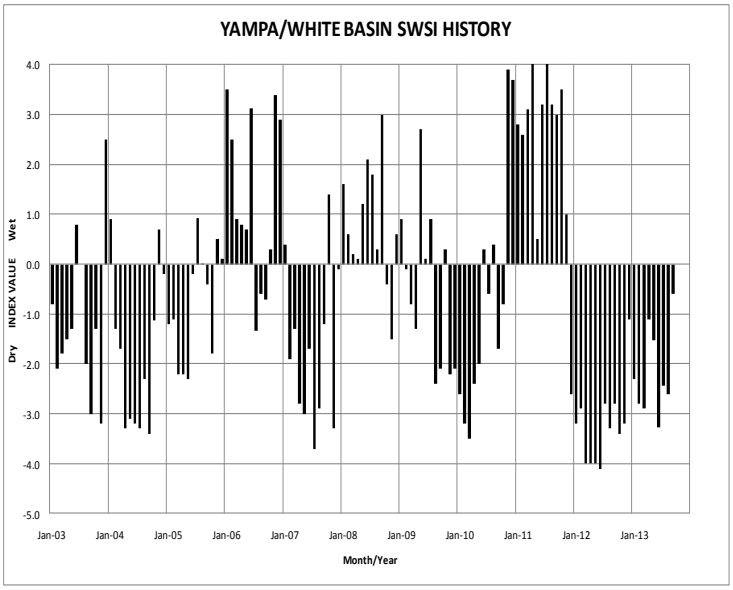




Basinwide Conditions Assessment

The SWSI value for the month was -0.6. September precipitation was double the 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 201% 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 September increased from 85% to 93%.

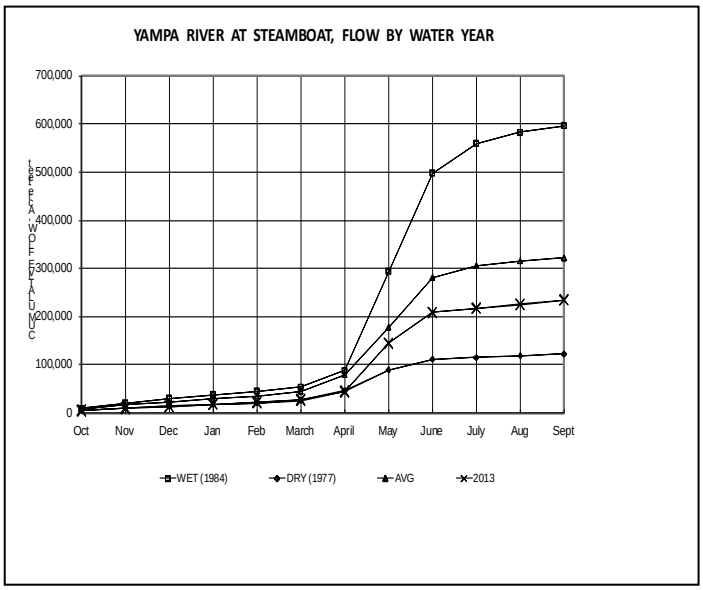
Flow in the major rivers of the Yampa, White, and North Platte River basins was also well above average during September due to the increased precipitation.



Outlook

As of September 30th, Fish Creek Reservoir was storing 3,230 AF which is 77% of capacity. Yamcolo Reservoir was storing 3,213 AF at the end of September 2013. The capacity of Yamcolo Reservoir is 9,580 AF. On September 30th, Elkhead Creek Reservoir was 76% full and storing 18,801 AF. Data for Stagecoach Reservoir was not available.

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.



Public Use Impacts

At Steamboat Lake the swimming areas are closed for the season. Water level is reported as normal for this time of year. Boating will remain open as conditions allow. Fishing is reported as very good both on shore and boat.

At Stagecoach State Park, tailwaters fishing is closed through the end of the year. The Marina boat ramp is open through October. The reservoir water level is reported as 4 feet below full.

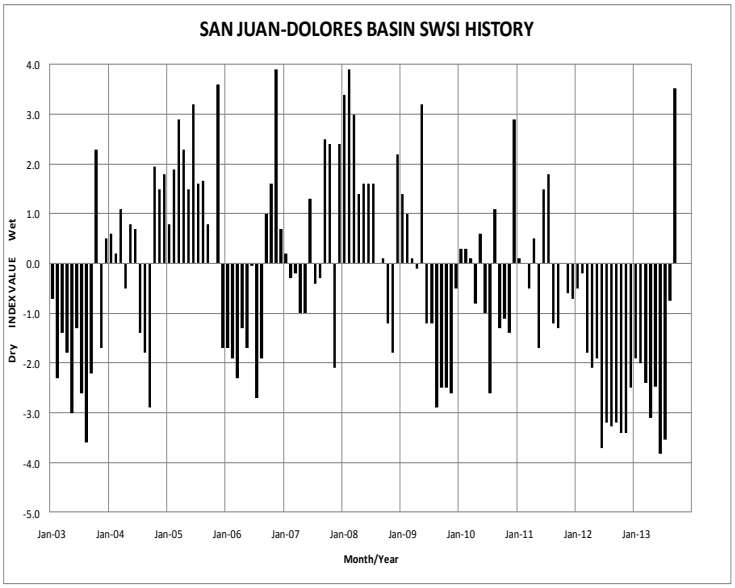
Moffat County is currently the only county in Division 6 with fire restrictions in place.

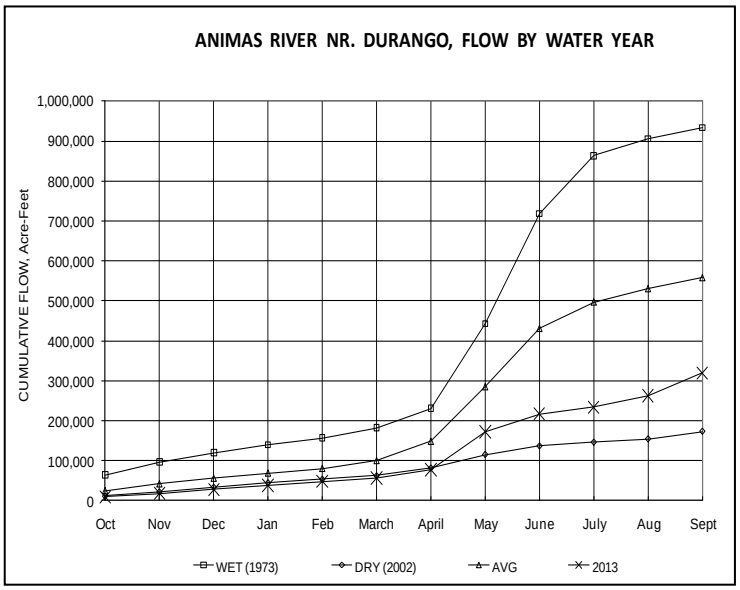
Basinwide Conditions Assessment

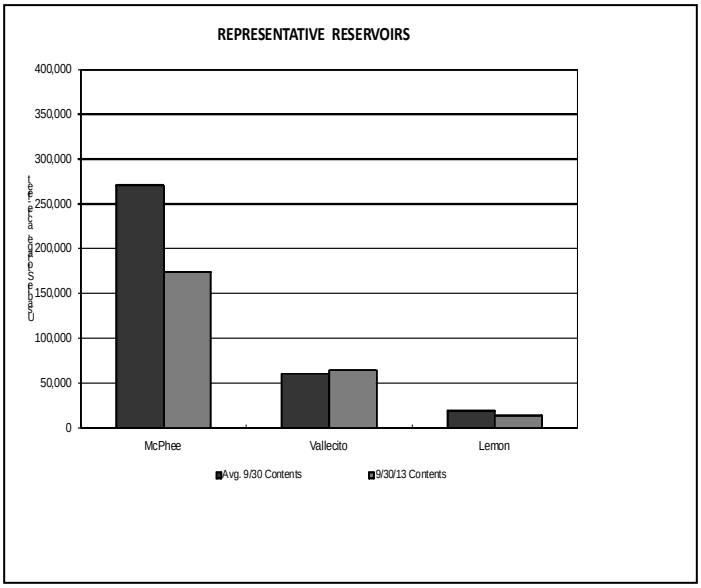
The SWSI value for the month was 3.5. Flow at the Animas River at Durango averaged 954 cfs (208% of average). The flow at the Dolores River at Dolores averaged 426 cfs (237% of average). The La Plata River at Hesperus averaged 48.3 cfs (244% of average). Precipitation in Durango was 5.90 inches for the month, 261% of the 30-year average of 2.26 inches. Precipitation to date in Durango, for the water year, is 16.70 inches, 86% of the 30-year average of 19.48 inches. The average high and low temperatures for the month of September in Durango were 75° and 47°. In comparison, the 30-year average high and low for the month is 76° and 44°. At the end of the month Vallecito Reservoir contained 64,680 acre-feet compared to its average content of 57,751 acre-feet (112% of average). McPhee Reservoir was up to 174,063 acre-feet compared to its average content of 277,764 (63% of average), while Lemon Reservoir was up to 13,870 acre-feet as compared to its average content of 19,114 acre-feet (73% of average)

Outlook

Precipitation (5.90 inches) was well above average for September in Durango. There was only 1 year (1927 with 7.36-inches) out of 119 years of record where there was more precipitation than this year. The flows on the Animas River were above average this September. There were 7 out of 103 years of record where the total flow past the Durango stream gauge was more than this year. On the other hand the total flow for the water year at the Animas River at Durango gage ranked 98 out of 102 years of record. Overall the water year was very dry with a very wet September. The other basins within the division fared about the same. There were 6 out of 104 years of record where the total flow past the Dolores stream gauge was more than this year and 8 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 - Oct-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.