COLORADO
WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
ROOM 818, 1313 SHERMAN ST., DENVER, CO 80203
303-866-3581; www.water.state.co.us

November 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 October (November 1) range from a minimum of -0.8 in the Gunnison basin to a maximum of 3.1 in the South Platte basin.

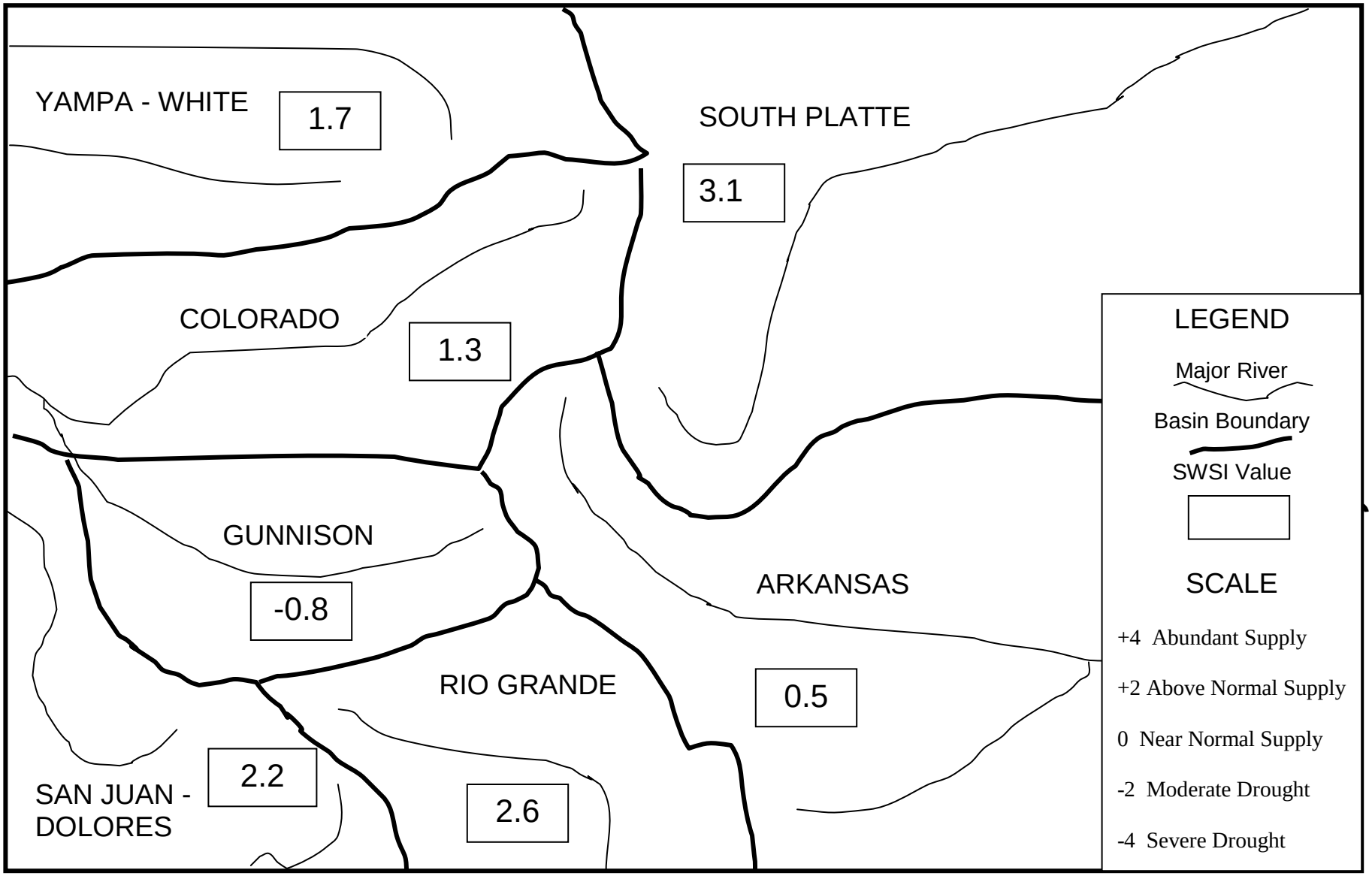
The following SWSI values were computed for each of the seven major basins for November 1, 2013. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10. The NRCS SWSI indicates variability in the level of surface water supply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

Basin	November 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	3.1	-0.2	2.7
Arkansas	0.5	-0.5	2.3
Rio Grande	2.6	-0.7	5.5
Gunnison	-0.8	0.7	2.6
Colorado	1.3	-0.3	4.2
Yampa/White	1.7	2.3	5.1
San Juan/Dolores	2.2	-1.3	5.6

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



November 1, 2013

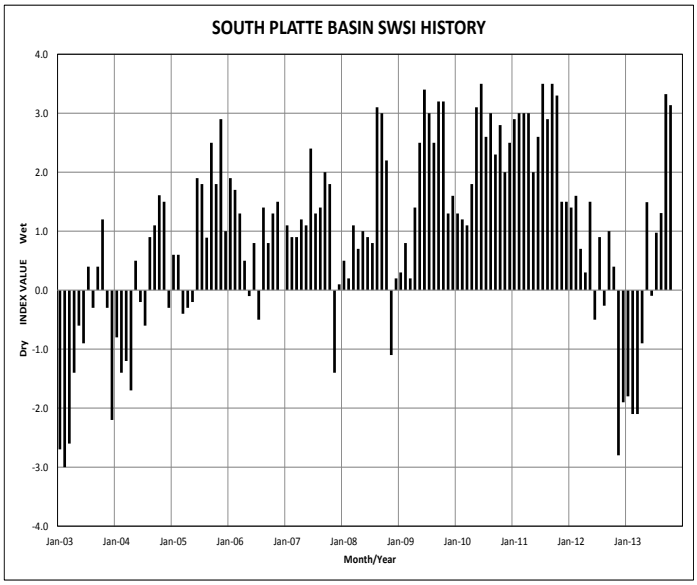
Basinwide Conditions Assessment

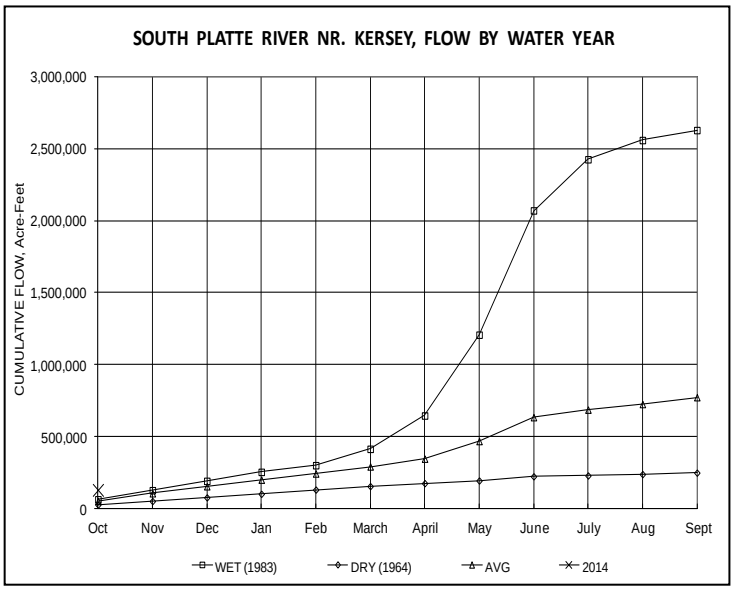
The SWSI value for the month was 3.1. October 2013 was occupied almost exclusively with recovery from the September 2013 floods. Though by no means complete, good progress was made in many areas. Thankfully, there were no significant precipitation events during October in the South Platte basin to complicate these efforts.

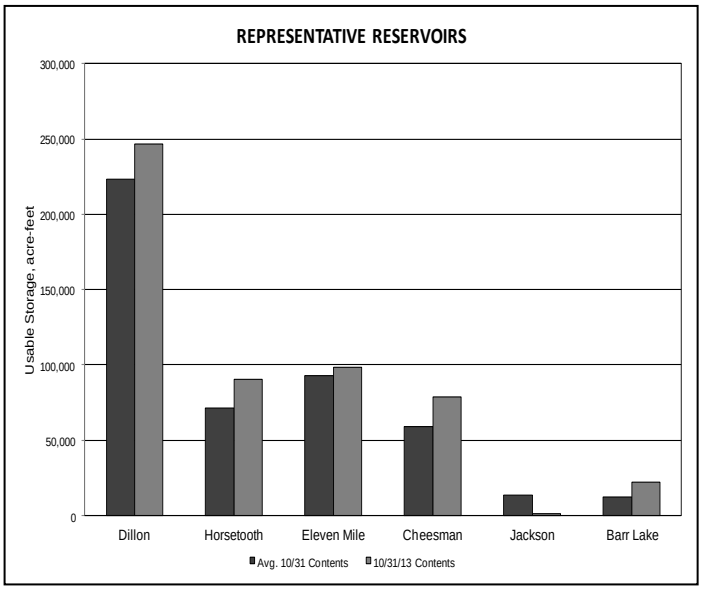
By the end of October, all the diversion structures along the mainstem of the South Platte that divert water to the major reservoirs had been repaired enough to permit diversions to storage. This is good news as it, combined with the good flow conditions, should provide a significant amount of water in storage by the beginning of the 2014 irrigation season.

The August stream flows at the Kersey and Julesburg index gages were both well above the long term average as the basins above them continued to drain the large volumes of water from the September storms. The Kersey gage monthly mean stream flow was 2,074 cfs as compared to the historic October mean flow of 669 cfs. The October monthly mean stream flow at the Julesburg gage was 1604 cfs as compared to the historic October mean flow of 301 cfs.

Most of the South Platte mainstem and almost all tributaries remained under free river conditions through the end of October. The Cache la Poudre was the main exception as the upper end of the Poudre was under call for most of the month. The South Platte above metro Denver was also under call for the last week and a half of October.





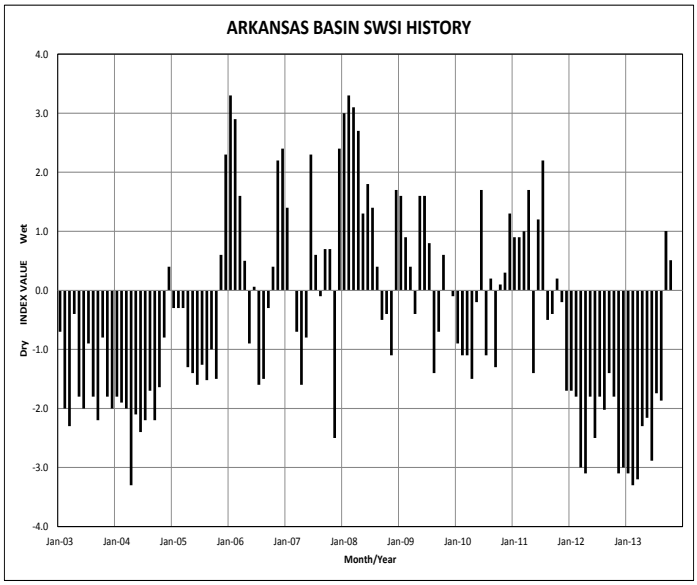


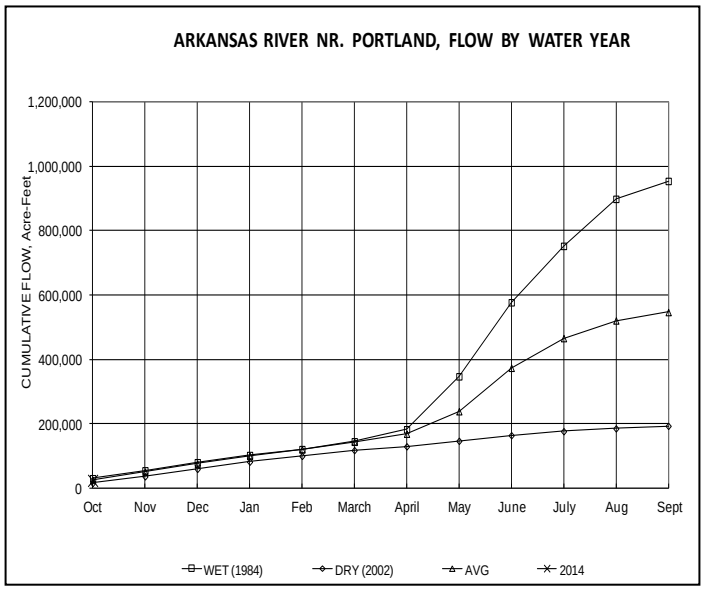
Basinwide Conditions Assessment

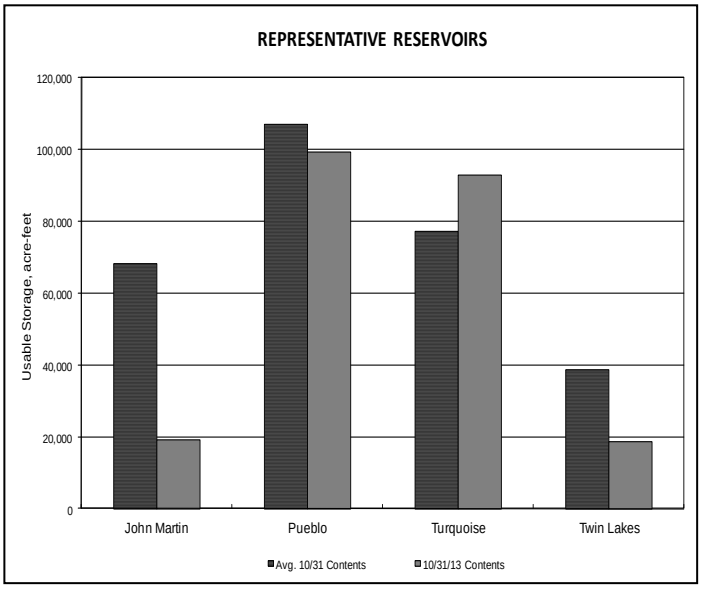
The SWSI value for the month was 0.5. The river call for October began with a split call with the Rocky Ford Highline (3-11-1886) as the call upstream of John Martin Reservoir and the Amity Canal (2-21-1887) being the call below John Martin Reservoir split with a call by the X-Y Canal for flows in the river below the Amity Canal. The month ended nearly the same with the call above John Martin Reservoir relaxing slightly to the Oxford Farmers Ditch (2-25-1887) call. The late season monsoon moisture continued to contribute to cause stream flows to be higher than the last few years primarily as a result of lagged return flow accretions in the river.

A meeting of the Winter Water Board of Directors was held on October 18, 2013. Planning for the upcoming storage season which runs from November 15, 2013 through March 14, 2014 was the topic at this meeting. A presentation on the implementation of the updated Livingston Transit Loss models for Pueblo Reservoir to John Martin Reservoir and for below John Martin Reservoir was presented by Jim Brannon on behalf of work he did for Division of Water Resources this summer.

Winter Compact storage in John Martin Reservoir began at midnight on October 31, 2013. Storage in Trinidad Reservoir began on October 15, 2013.







Basinwide Conditions Assessment

The SWSI value for the month was 2.6. Flow at the gaging station Rio Grande near Del Norte averaged 880 cfs (188% of normal). The Conejos River near Mogote had a mean flow of 124 cfs (92% of normal). In general, streamflow in the upper Rio Grande Basin was above normal as a result of the August and September rainfall. The southern end of the San Luis Valley did not receive the same autumn rains as the rest of the upper Rio Grande basin, thus streamflow during October was slightly below average for the Conejos River and its tributaries.

Precipitation during October in Alamosa was 0.53 inches, 0.15 inches below normal. October precipitation was much more sporadic than August and September. A rain and snowfall event on October 15 resulted in white-capped peaks around the Valley.

Outlook

Natural Weather Service long-term forecasts call for above normal temperatures this winter. They are non-committal as to precipitation. Southern Colorado would surely appreciate a heavy snowpack this winter.

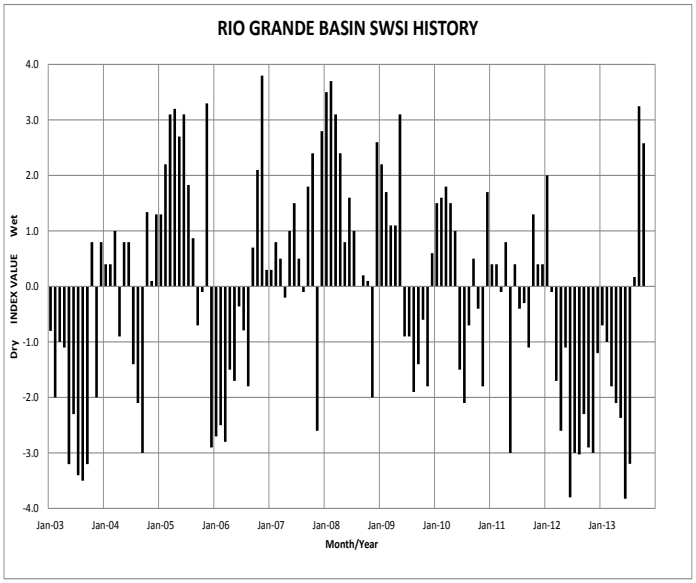
Administrative/Management Concerns

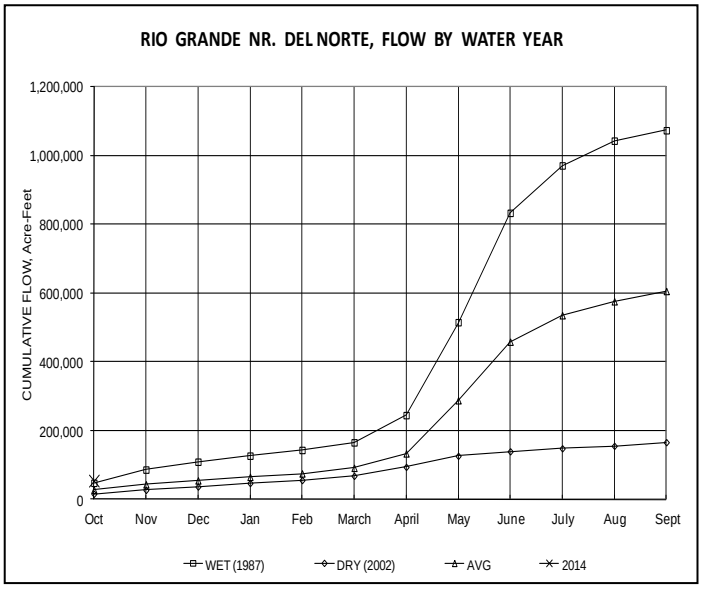
Reservoirs in the basin reduced outflows and began storing inflow as October came to a close. Current reservoir storage in the upper Rio Grande basin is dismal.

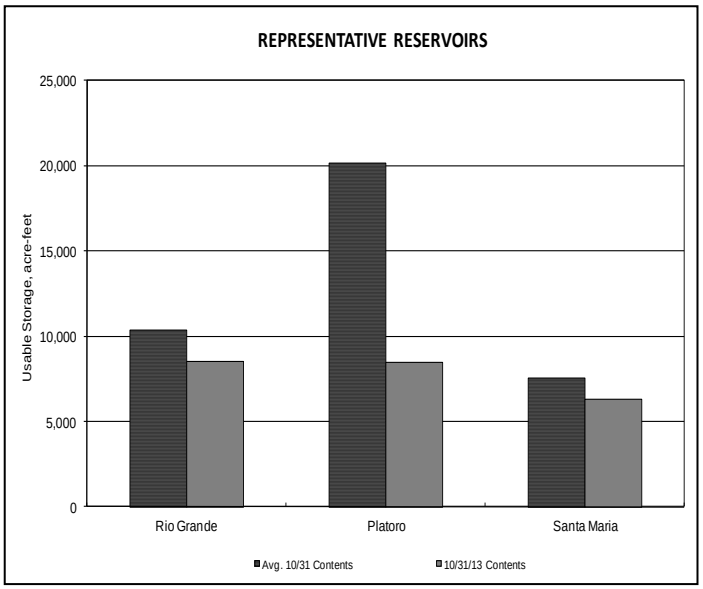
Pursuant to SEO Policy 2010-1, irrigation season closed for the majority of the San Luis Valley on November 1. In order to reduce over delivery to the downstream states under the Rio Grande Compact, the Conejos River and its tributaries will continue diversions until mid-November. The decrees allowing diversions from the Rio Grande for recharge use will not be used this year.

Public Use Impacts

The weather was sufficiently mild to allow those ditches in priority to continue diversion for irrigation throughout October. The August and September precipitation improved soil moisture conditions immensely. The high country has received a fair amount of snowfall so far.







Basinwide Conditions Assessment

The SWSI value for the month was -0.8. Precipitation in the Gunnison basin varied widely in October with western areas receiving over 110% of the 30-year average, while eastern areas such as Cochetopa Creek received less than 70% of the average for the month. Temperatures in October were 3 degrees below average, which meant that precipitation in the higher elevations fell as snow. As a result, snowpack in the basin above Ridgway Reservoir sits at 220% of average on November 1st. Areas in the east, such as the basin above Taylor Park Reservoir, received less snow and sit at 137% of average on the same date. Although snowpack on November 1st is rarely a good predictor of conditions during the entire season, water users are hoping it is a sign of things to come.

Outlook

Due to neutral El Nino Southern Oscillation (ENSO) conditions predicted by the Climate Center, they continue to forecast that during the next 90 days the Gunnison basin will be between areas of above average precipitation to the north and below average precipitation to the south.

Administrative/Management Concerns

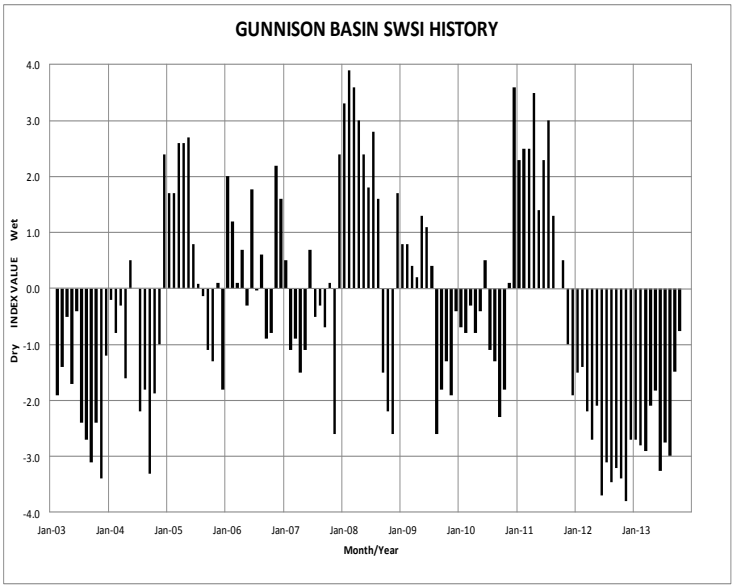
Gunnison Tunnel diversions were met by natural inflow to the Aspinall Unit for the entire month of October. As a result, Taylor Park carried over a full amount of first fill when combining the 71,203 acre-feet physically in Taylor Park and the 35,178 acre-feet they are allowed to carryover in the Aspinall Unit. 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 Case No. 86CW203 decree. This is important, because the Uncompahgre Valley Water Users (UVWUA) began 2014 above their average year target of 70,000 acre-feet of storage in Taylor Park. UVWUA turned off the Gunnison Tunnel as of October 31st and will only run approximately 100 cfs for one day every two weeks to refill Fairview Reservoir.

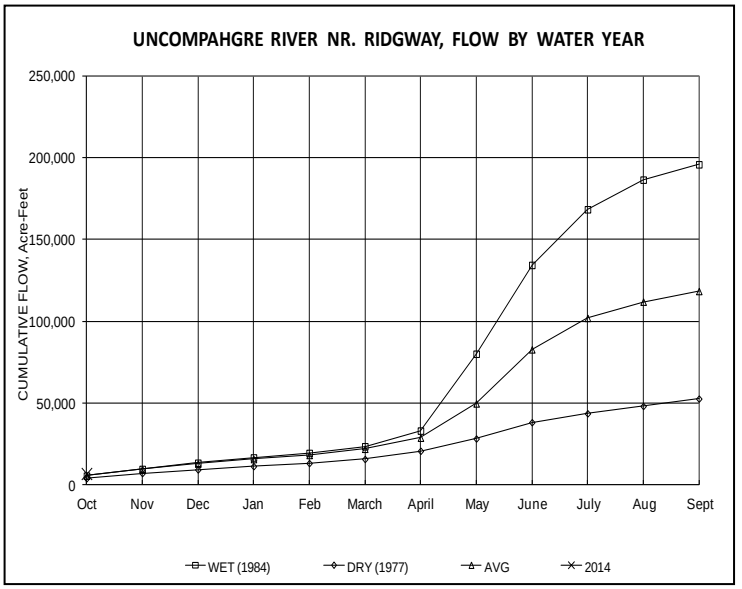
Blue Mesa Reservoir reached a low point in storage in October of 348,000 acre-feet, which is much higher than previously predicted (295,000 acre-feet) due to the basin-wide precipitation in October and September. Thankfully, this is 22,000 acre-feet more than remained in the reservoir at the end of 2012. The November 24-month study from the USBR predicts that Blue Mesa will reach 754,000 acre-feet in July of 2014, which is 300,000 acre-feet more than the peak in 2013. These forecasts are prepared assuming average snowpack during the winter season.

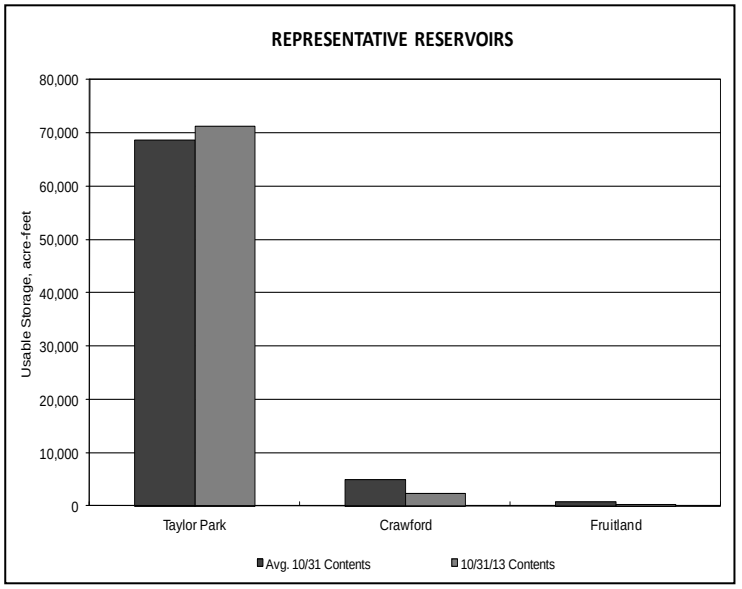
Storage remaining in the Grand Mesa Reservoirs on November 1st was at 35% of capacity, which is much above the 17% of capacity they were at the same time last year. The significant precipitation received during the last two months of the water year eliminated the call on some streams and allowed many Grand Mesa Reservoirs to store water.

Public Use Impacts

Gunnison basin ski areas have enjoyed an early start to the accumulation season and have begun to make snow with the cooler weather in October in anticipation of a good season.







Basinwide Conditions Assessment

The SWSI value for the month was 1.3.

Outlook

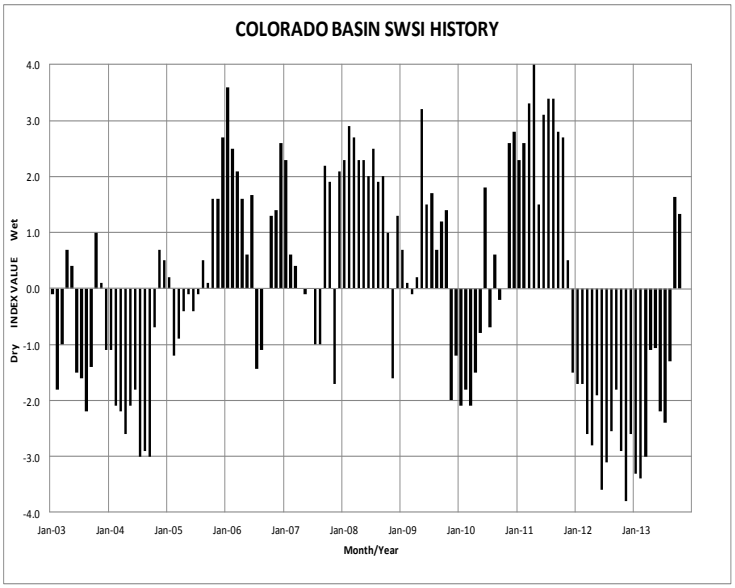
Above average temperatures throughout November, have kept most gages active basin-wide. Many upper elevation gages will become inaccurate or ice-affected as temperatures decline. The Colorado River should run average or slightly below average flows through the month of November. Roaring Fork and Eagle River flows have fallen and will remain slightly below average. The Blue River should remain slightly elevated throughout November. The Colorado basin forecast indicates a slightly below average chance of precipitation through the month of November.

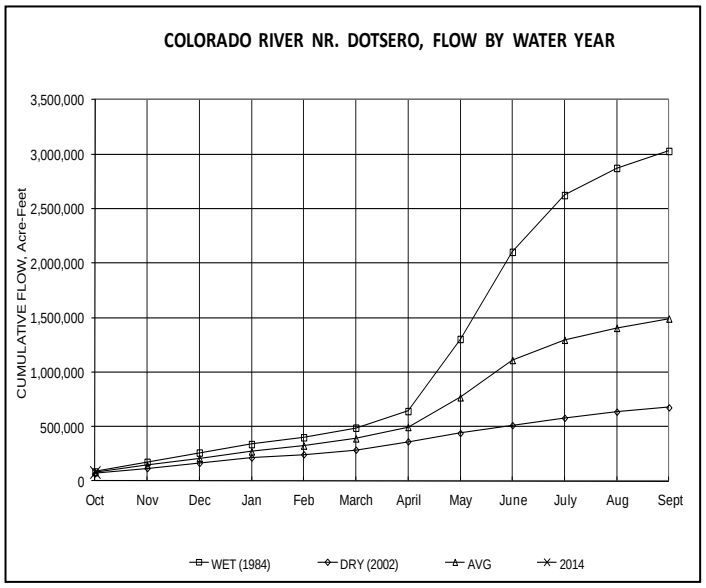
Administrative/Management Concerns

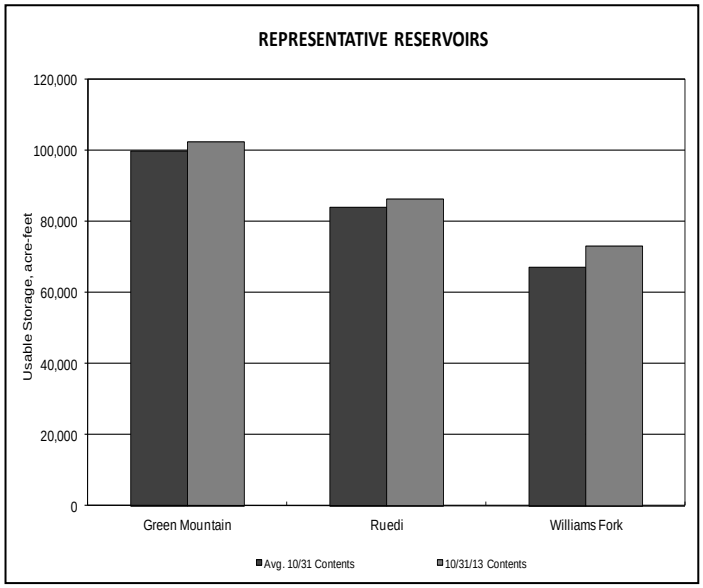
Winter minimum Ruedi Reservoir release was decreased briefly in late October to accommodate a fish survey of the lower Fryingpan River by Colorado Parks & Wildlife. Green Mountain reservoir releases were ramped up temporarily to accommodate power plant generator testing in late October as well. Though decreased following testing, releases will remain above the minimum to evacuate storage for spring 2014 runoff. Shoshone Power plant will remain off for maintenance and inspections through the end of November. All Grand Valley Irrigation canals are off with the end of the irrigation season. Government Highline will resume diversion for winter power flow operations in early December. Last month's report incorrectly referenced Moffat Tunnel diversions discontinued. Adams Tunnel diversions were stopped and remain off with heavy precipitation and reservoir filling in the St. Vrain and Big Thompson basins. Moffat Tunnel diversions have resumed for final filling of Gross Reservoir.

Public Use Impacts

In addition to Arapahoe Basin and Loveland, Breckenridge, Copper Mountain, Keystone, and Winter Park ski areas have opened for the season. Snowmass/Aspen currently has a projected opening date of November 28th.



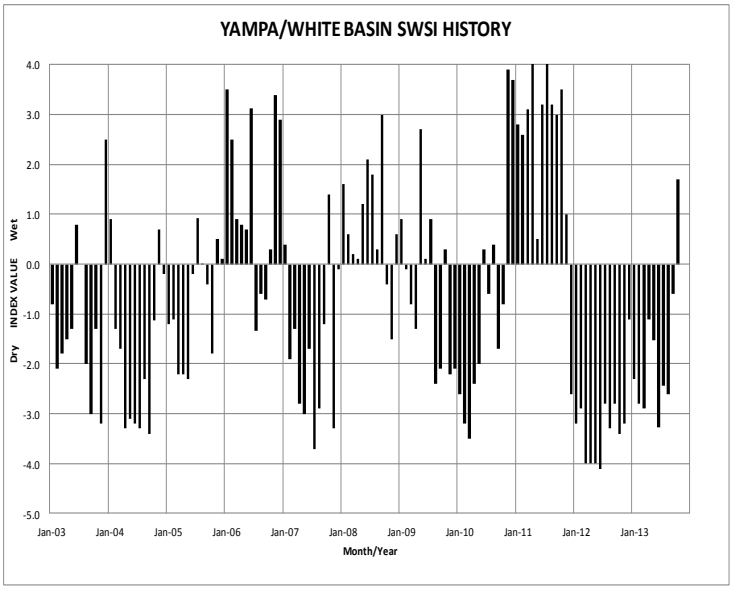




Basinwide Conditions Assessment

The SWSI value for the month was 1.7. October 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 148% of average for the Yampa and White River Basins and 156% of average for the North Platte and Laramie River basins. Given that October is the first month of water year 2014 total precipitation for the water year as a percent of average to date is equal to the previously stated October figures. Snowpack in the Yampa, White, and North Platte River basins is also off to a good start with the snow water equivalent for the Yampa and White River basins at 252% of average and 178% of average for the North Platte and Laramie River basins.

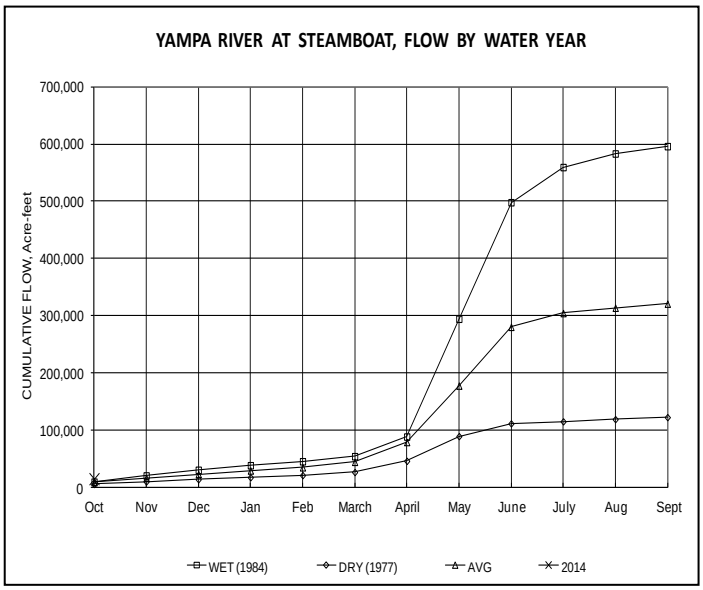
Flow in the major rivers of the Yampa, White, and North Platte River basins was also above average during October due to the increased precipitation. All seasonal gaging stations in Division 6 are now closed for winter.



Outlook

As of October 31st, Fish Creek Reservoir was storing 3,365 AF which is 81% of capacity. Yamcolo Reservoir was storing 3,917 AF at the end of October 2013. The capacity of Yamcolo Reservoir is 9,580 AF. On October 31st, Elkhead Creek Reservoir was 74% full and storing 18,186 AF. Data for Stagecoach Reservoir was not available for the end of October however the end of September report showed the reservoir at 33,400 AF, 92% full.

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

Steamboat Lake is closed to boating. Water level is reported as normal for this time of year. Fishing is reported as very good both on shore and boat.

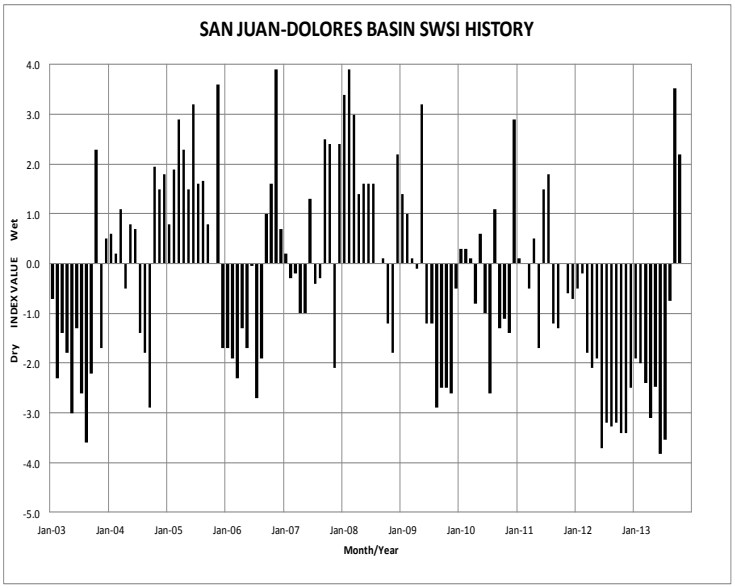
At Stagecoach State Park, tailwaters fishing is closed through the end of the year. The reservoir is closed to boating until May 1st, 2014. The reservoir water level is reported as just below full.

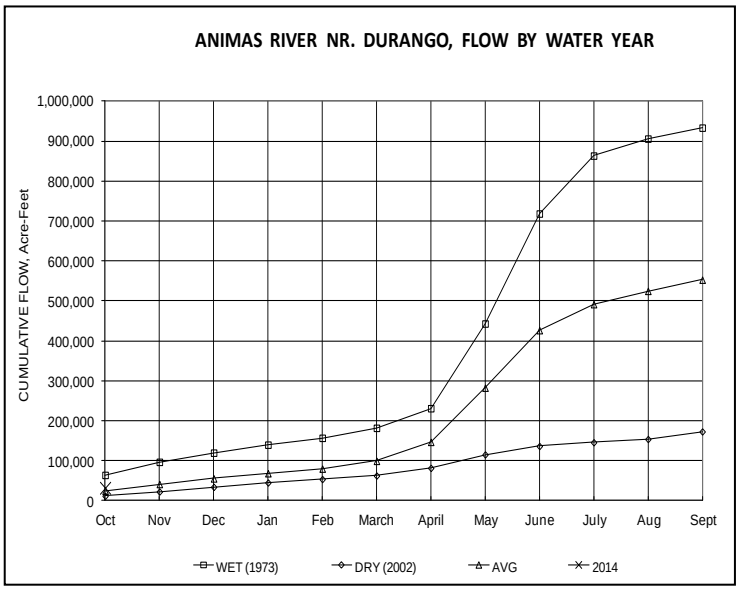
Basinwide Conditions Assessment

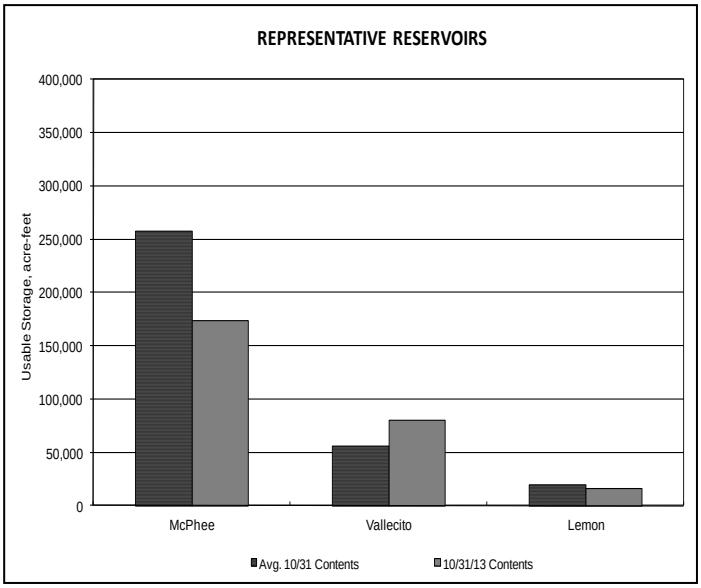
The SWSI value for the month was 2.2. Flow at the Animas River at Durango averaged 523 cfs (126% of average). The flow at the Dolores River at Dolores averaged 183 cfs (137% of average). The La Plata River at Hesperus averaged 18.0 cfs (116% of average). Precipitation in Durango was 1.44 inches for the month, 74% of the 30-year average of 1.99 inches. Precipitation to date in Durango, for the water year, is 1.44 inches, 74% of the 30-year average of 1.99 inches. The average high and low temperatures for the month of October in Durango were 60o and 28o. In comparison, the 30-year average high and low for the month is 65o and 34o. At the end of the month Vallecito Reservoir contained 80,263 acre-feet compared to its average content of 51,651 acre-feet (155% of average). McPhee Reservoir was up to 173,399 acre-feet compared to its average content of 267,027 (65% of average), while Lemon Reservoir was up to 16,150 acre-feet as compared to its average content of 19,259acre-feet (84% of average)

Outlook

Precipitation (1.44 inches) was slightly below average for October in Durango. There were 58 years out of 119 years of record where there was more precipitation than this year. The flows on the Animas River were above average this October. There were 21 out of 103 years of record where the total flow past the Durango stream gauge was more than this year. The other basins within the division fared about the same. There were 19 out of 105 years of record where the total flow past the Dolores stream gauge was more than this year and 25 out of 97 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year. The NRCS is reporting an estimated snow-water-equivalent of 226% of average at the end of the month.







ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - Nov-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 November 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.