

# COLORADO

## WATER SUPPLY CONDITIONS UPDATE

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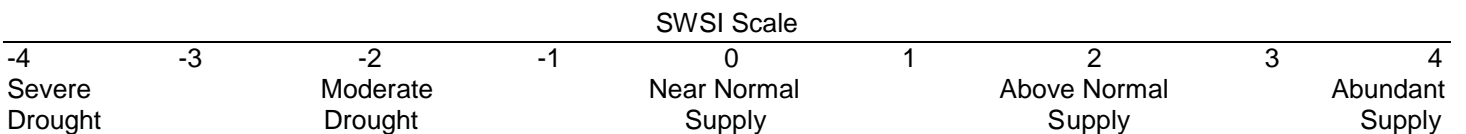
December 2013

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 reservoir storage, snowpack, and precipitation for the winter period of November through April (December 1 through May 1). During the winter period, snowpack is the primary component in all basins except the South Platte basin, where reservoir storage is given the most weight. The enclosed narratives are provided by the Division Office in each stream basin.

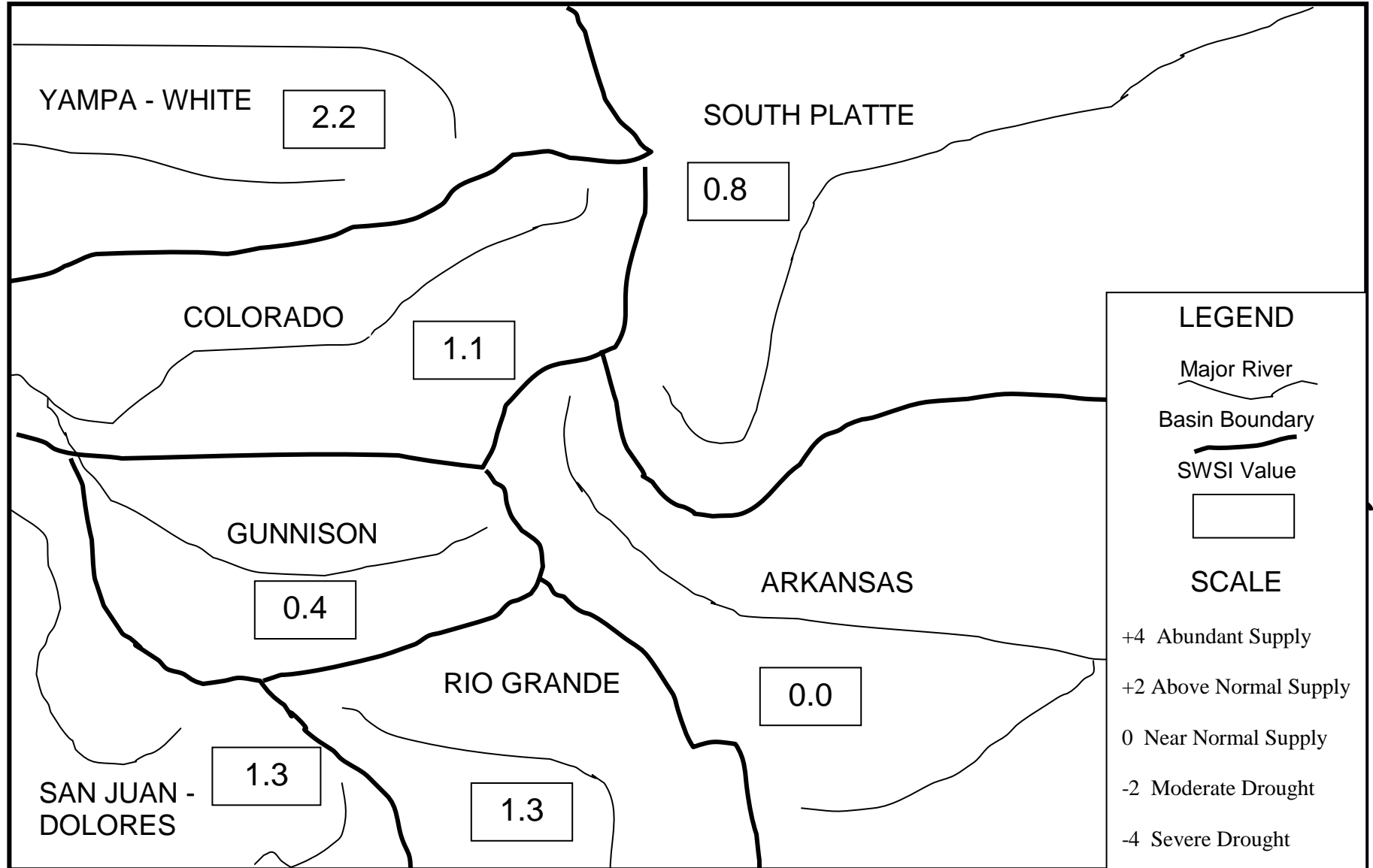
The statewide SWSI values for November (December 1) range from a minimum of 0.0 in the Arkansas River basin to a maximum of 2.2 in the White/Yampa basin. All of the SWSI values are 0 or above indicating normal to above normal supply conditions.

The following SWSI values were computed for each of the seven major basins for December 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	December 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	0.8	-2.3	3.6
Arkansas	0.0	-0.5	3.1
Rio Grande	1.3	-1.3	4.3
Gunnison	0.4	1.2	4.2
Colorado	1.1	-0.2	4.9
Yampa/White	2.2	0.5	5.4
San Juan/Dolores	1.3	-0.9	4.7



# SURFACE WATER SUPPLY INDEX FOR COLORADO



December 1, 2013

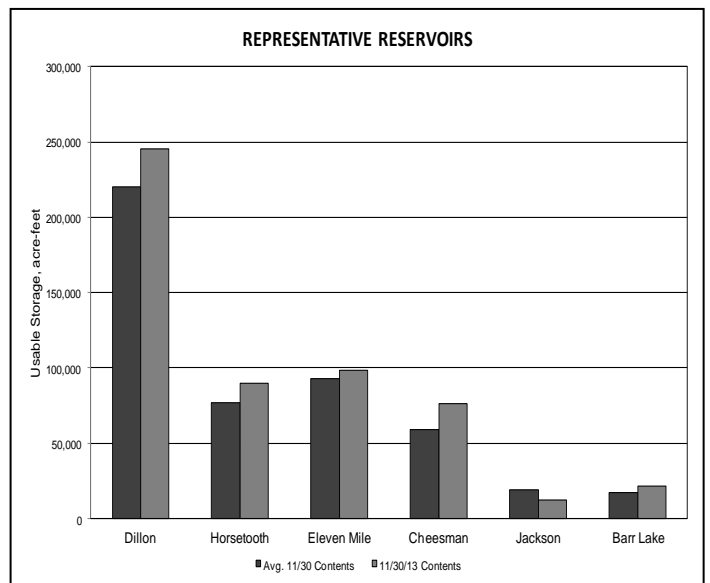
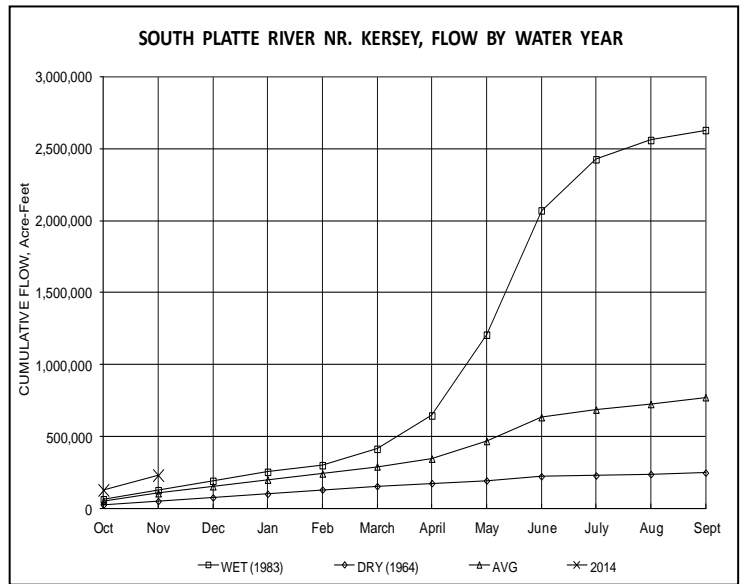
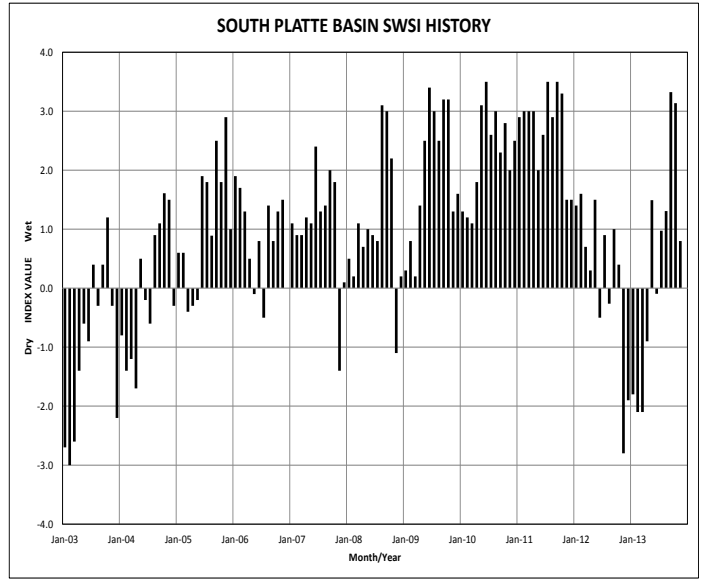
Basinwide Conditions Assessment

The SWSI value for the month was 0.8. Things in November 2013 were starting to settle down toward “normal” after the September 2013 floods. Much time and energy is still being spent (and will continue for months into the future) on diversion structure/ditch flood damage repair and rebuilding.

As an example of things returning more toward “normal”, calls began to come on starting November 7 through the end of the month for most of the South Platte mainstem. These calls were junior (1972 to 1995 dates) recharge rights, but a more senior 1909 call from the north metro Denver area also came on November 29. There was also a “normal” call on South Boulder Creek from November 4 through 14.

The November stream flow at the Kersey index gage was well above the long term average as the basin above it continued to drain from the September storms. However, because of the diversions between Kersey and Julesburg, flow at the Julesburg gage was actually below the long term average. The Kersey gage monthly mean stream flow was 1,666 cfs as compared to the historic November mean flow of 740 cfs. The November monthly mean stream flow at the Julesburg gage was 233 cfs as compared to the historic November mean flow of 335 cfs.

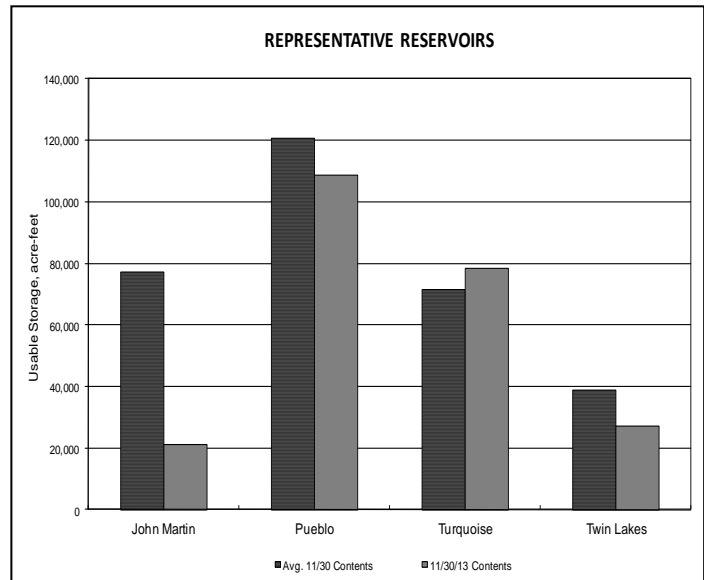
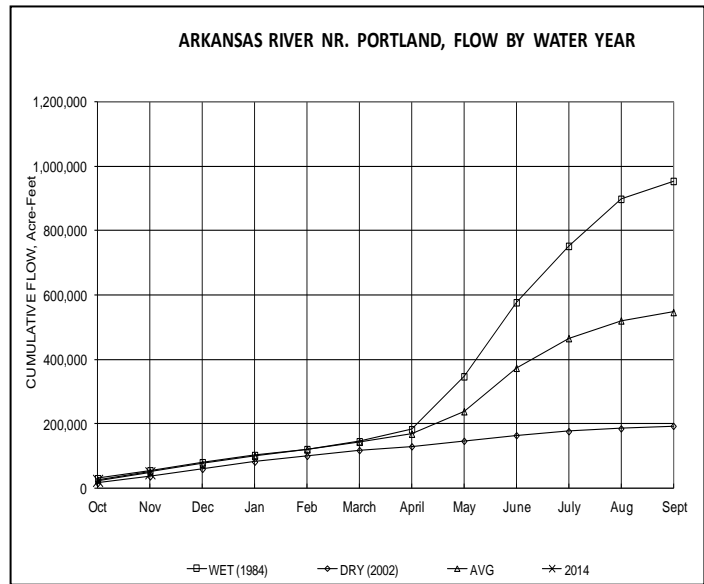
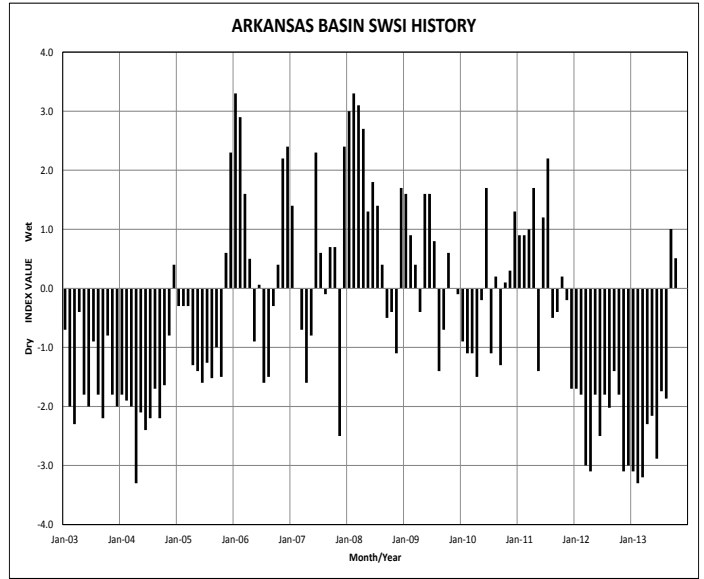
Overall reservoir storage in the basin by the end of November was very good at 107% of average. Though some reservoirs were below (and above) the end of November average storage, overall storage was at about 71% of capacity. This compares to an average storage of 67% of capacity and 48% of capacity last year.



Basinwide Conditions Assessment

The SWSI value for the month was 0.0, neither wet nor dry. Winter Compact storage began in John Martin Reservoir on November 1, 2013. The Pueblo Winter Water Program began operation on November 15, 2013 with storage taking place initially in Pueblo and John Martin Reservoirs and under the Fort Canal system in Adobe Reservoir. Storage in John Martin Reservoir during November totaled approximately 2,846 acre-feet for Conservation Storage and 1,805 acre-feet for Winter Water participants. Storage overall under the Pueblo Winter Water Program in November totaled approximately 20,295 acre-feet in all storage locations.

The benefit of monsoon rains and early snows have begun to be felt on the winter storage programs. The Pueblo Winter Water Program storage was about double what it was in November 2012 and Conservation Storage in John Martin Reservoir was more than double the amount stored during the same period in 2012. Both reservoirs still stored water at rates lower than the average from the prior five years and below the long term averages, but the amounts were much closer to those averages than in 2012.



Basinwide Conditions Assessment

The SWSI value for the month was 1.3. Flow at the gaging station Rio Grande near Del Norte averaged 358 cfs (132% of normal). The Conejos River near Mogote had a mean flow of 72 cfs (80% of normal). In general, streamflow in the upper Rio Grande Basin was above normal as a continuing influence from 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 November was slightly below average for the Conejos River and its tributaries.

Precipitation during November in Alamosa was a generous 1.63 inches, 1.21 inches above average. The vast majority of that November precipitation was the result of a record-setting four-day snowstorm beginning on the 22nd. Temperatures plummeted after that event to a low of -12 degrees.

Outlook

National Weather Service long-term forecasts call for above normal temperatures this winter. They are now predicting below normal precipitation this winter for northern New Mexico. The area of influence sneaks up into southern Colorado but does not encompass the entire San Luis Valley. Still room for optimism.

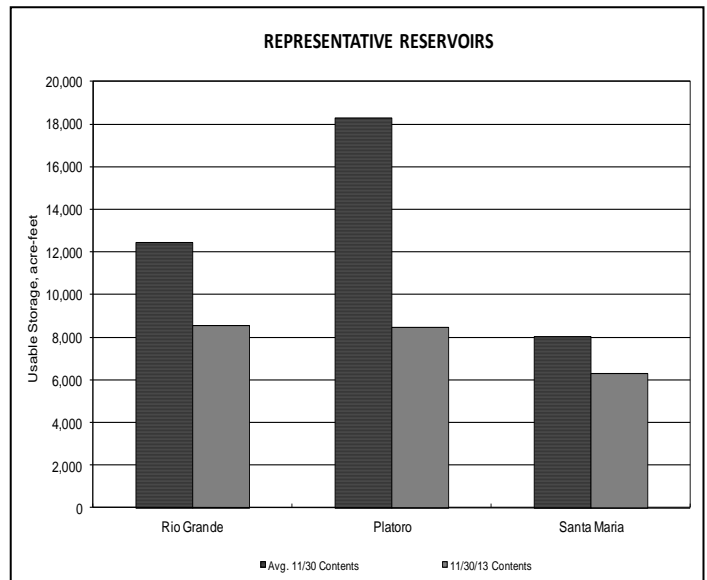
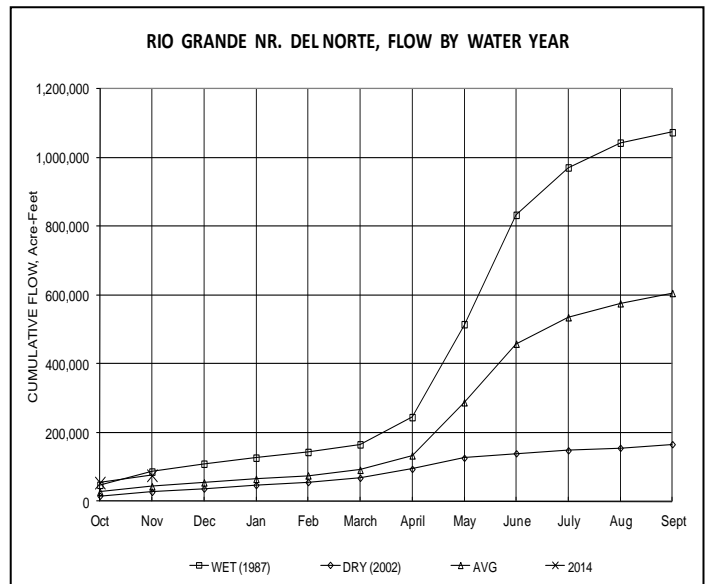
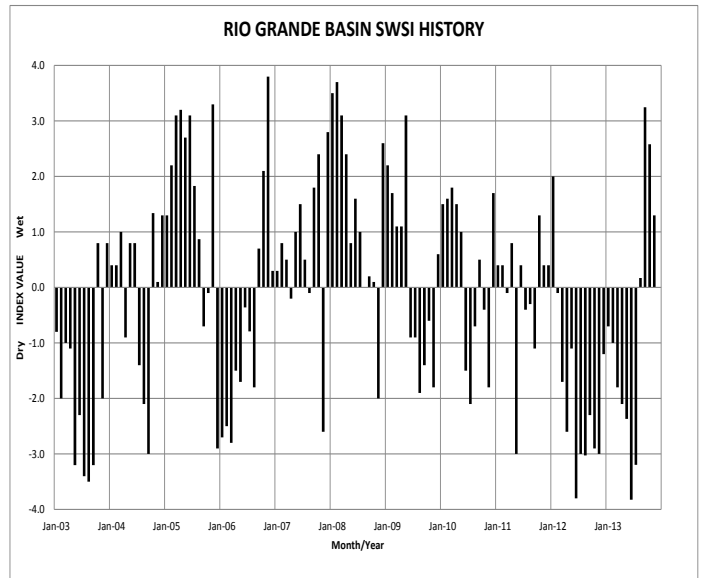
Administrative/Management Concerns

Monday, November 18 was the last official day of irrigation season diversions from the Conejos River and its tributaries. Pursuant to SEO Policy 2010-1, the irrigation season closed for the majority of the San Luis Valley on November 1. Native streamflow reaching the stateline is booked as part of the annual Rio Grande Compact delivery requirement which will be easily met for 2013. Division 3 reservoirs have seen an increase in storage since the end of the irrigation season, but all still have plenty of empty storage space.

Irrigation well users faced a December 2, 2013 deadline to submit annual metered use information to the Division office. Please contact the office at (719) 589-6683 with any questions regarding this requirement.

Public Use Impacts

The very mild November gave way to heavy snowfall in the upper Rio Grande basin beginning November 22. This blanket of white gold was a boon to the winter 2013-14 snowpack.



Basinwide Conditions Assessment

The SWSI value for the month was 0.4. November precipitation was between 100-109% over the entire Gunnison basin while temperatures were generally near normal during the same period. As a result, snow water equivalent (SWE) for the basin, according to the Colorado Basin River Forecast Center, sits at 120% of the 30-year median. Areas in the east, such as the basin above Taylor Park Reservoir, have received less snow and sit right at the median SWE value on December 1st. Soil moisture conditions throughout the basin are great and base flows in most streams have come up to average or slightly above average for December. Conditions are a huge improvement from where we sat at the same time in both 2011 and 2012, as the December 1st SWE is 140% of 2011 and 280% of 2012.

Outlook

The Climate Center continues to predict neutral El Nino Southern Oscillation (ENSO) conditions for Spring 2014, which has resulted in a 30-day forecast including equal chances of below or above average precipitation. Models, however, are apparently indicating that the southwest US, including the Gunnison basin, may get below average precipitation during the next 90-days. Hopefully this forecast does not hold and the current pattern continues into 2014.

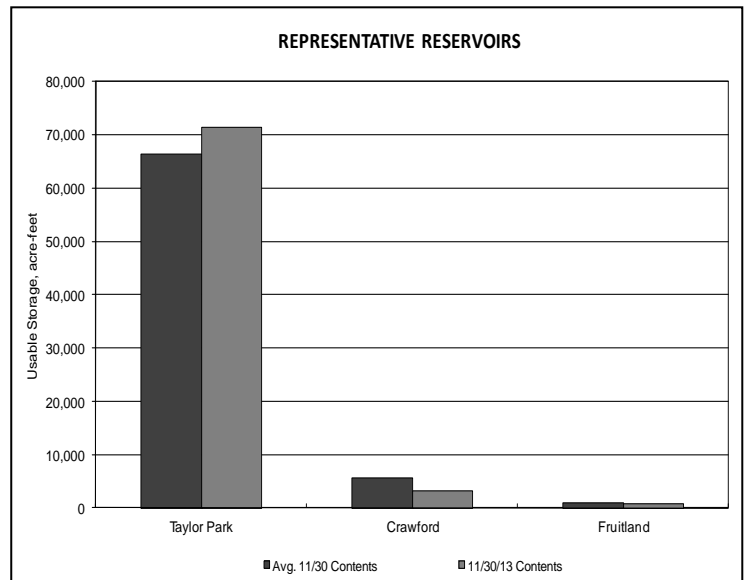
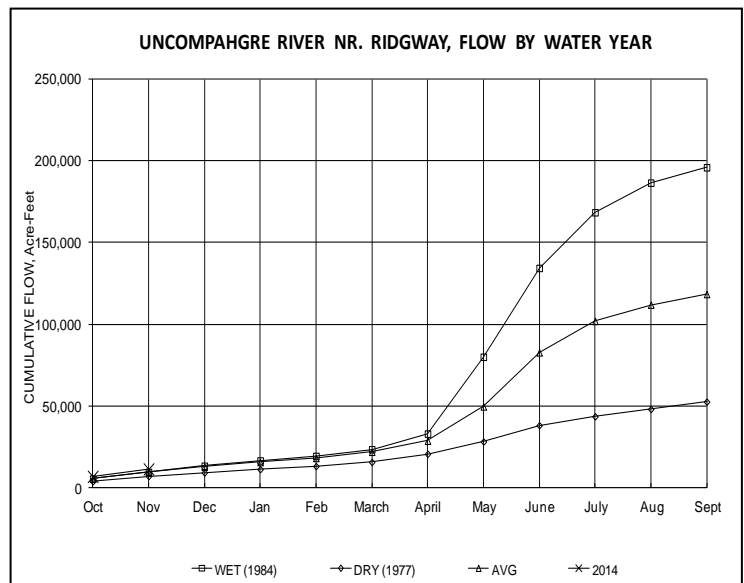
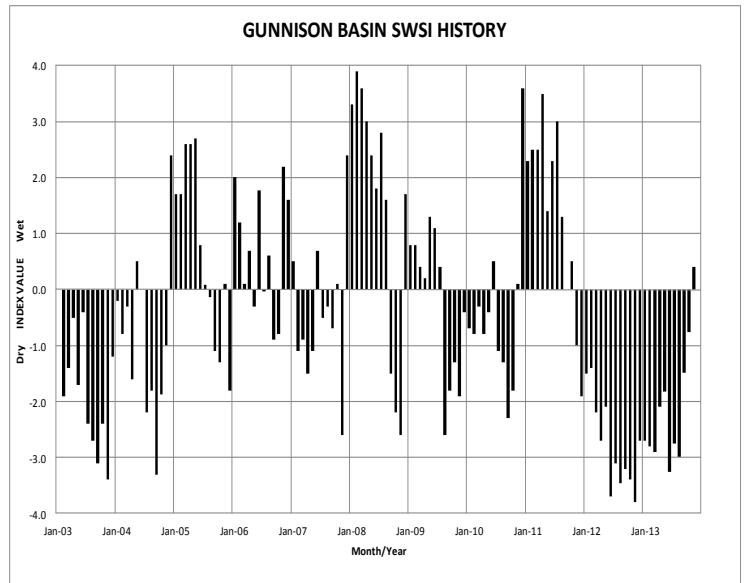
Administrative/Management Concerns

Taylor Park Reservoir began building their 2nd fill storage on November 1st, as you may remember from last month that they carried over a full amount of first fill on November 1st. A month later, on December 1st, the 2nd fill account already contains 5,333 acre-feet. This is a much better situation than last year when Taylor Park still had 20,000 acre-feet to go to complete their 1st fill on December 1st.

Blue Mesa Reservoir has continued to fill and now contains 367,000 acre-feet. The December 24-month study from the USBR has improved further and now predicts that Blue Mesa will reach 786,000 acre-feet in July of 2014, which is 330,000 acre-feet more than the peak in 2013. These forecasts are prepared assuming average snowpack during the remaining winter season.

Public Use Impacts

Gunnison basin ski areas enjoyed a great Thanksgiving with Crested Butte and Telluride having more snow at the end of November than they have had since 2008.



Basinwide Conditions Assessment

The SWSI value for the month was 1.1.

Outlook

Significantly low temperatures in early December reduced Colorado River flows to well below average. Roaring Fork and Eagle River flows have continued near average thus far in December. As of December 15th, Upper Colorado River and Roaring Fork Basin snowpack reporting indicates 114 and 112 percent of average snow water equivalent respectively. Slightly below-average temperatures and precipitation are forecast for western Colorado through the month of December.

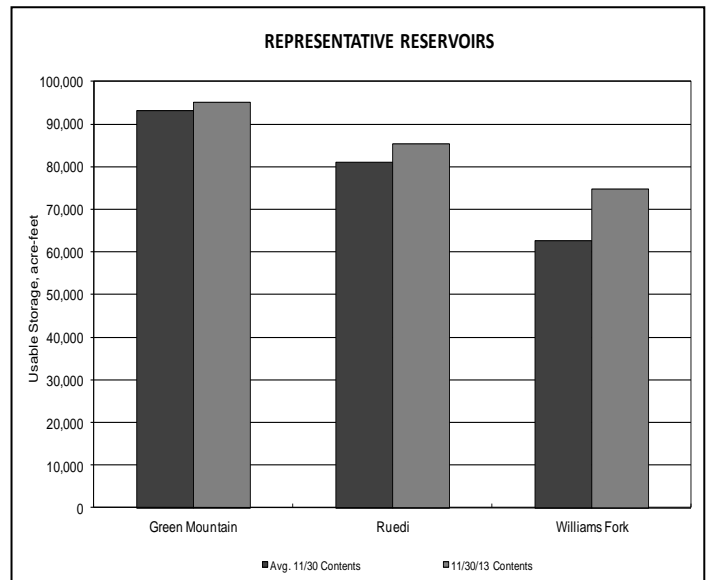
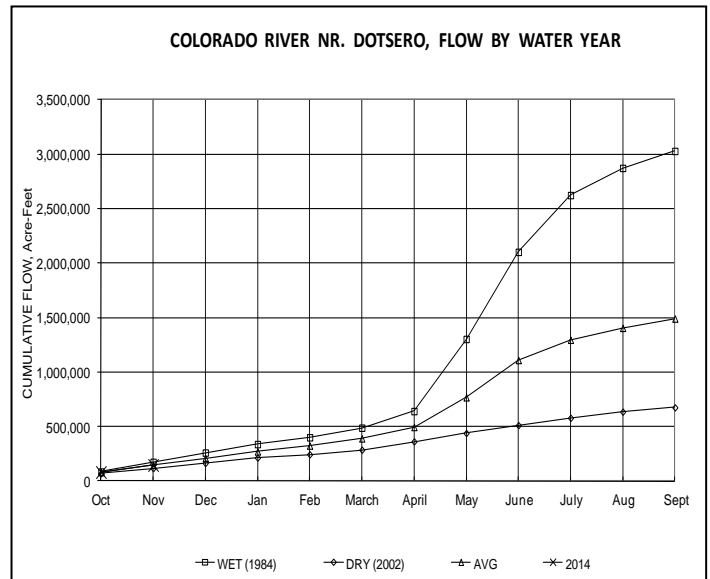
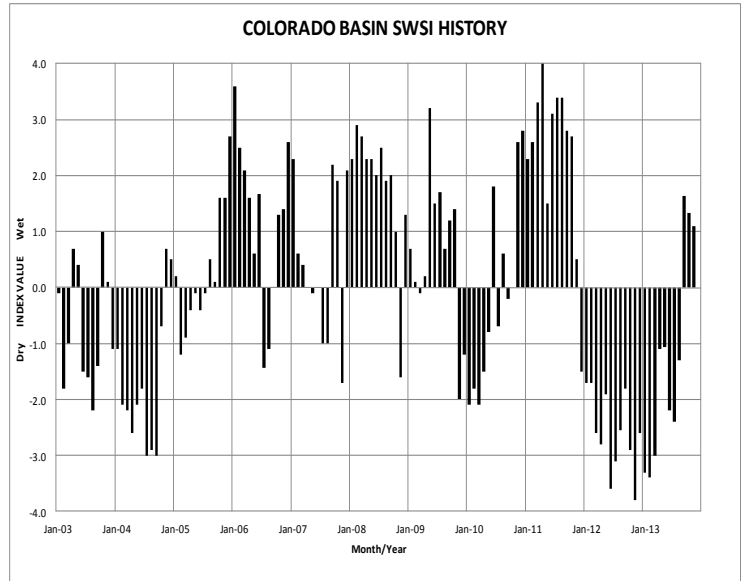
Administrative/Management Concerns

The Ruedi Reservoir winter minimum release rate of 90 cfs will continue through December. Though increased briefly to meet the Shoshone Powerplant call, Green Mountain reservoir releases have declined from decreased C-BT Project depletions and reduced Dillon Reservoir releases by Denver Water. The Government Highline canal has resumed diversion for winter power generation. Adams Tunnel diversions were resumed in late November, although the diversion rate will vary due to lingering impacts from flooding in early September. Moffat Tunnel diversions will likely continue through December.

Public Use Impacts

The Colorado River Basin Roundtable will formally submit its position to preclude West Slope water from new water storage and delivery projects, to the Interbasin Compact Committee. The South Platte, Metro, and Arkansas basin roundtables are requesting development of state water projects including Colorado River for municipal uses on both the East and West slopes.

The City of Glenwood Springs is again considering application for a recreational in-channel flow right on the Colorado River to protect, and potentially expand the existing whitewater park features. The application would seek a minimum flow of 4,000 cfs during the annual period May 11 – July 6, and a 2,500 cfs minimum flow during the periods April 30 – May 11 and July 7-23.



Basinwide Conditions Assessment

The SWSI value for the month was 2.2. November 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 87% of average for the Yampa and White River Basins (118% of average for the water year to date) and 85% of average for the North Platte and Laramie River basins (121% of average for water year to date). The snow water equivalent for the Yampa and White River basins is at 122% of average and 117% of average for the North Platte and Laramie River basins.

Cold weather has frozen over the rivers in Division 6 that have open gaging stations operated by DWR and therefore gage data is not accurate.

Outlook

As of November 30th, Fish Creek Reservoir was storing 3,410 AF which is 82% of capacity. Yamcolo Reservoir was storing 4,496 AF at the end of November 2013. The capacity of Yamcolo Reservoir is 9,580 AF. On November 30th, Elkhead Creek Reservoir was 74% full and storing 18,186 AF. Stagecoach Reservoir was storing 33,760 AF at the end of November which is 93% full.

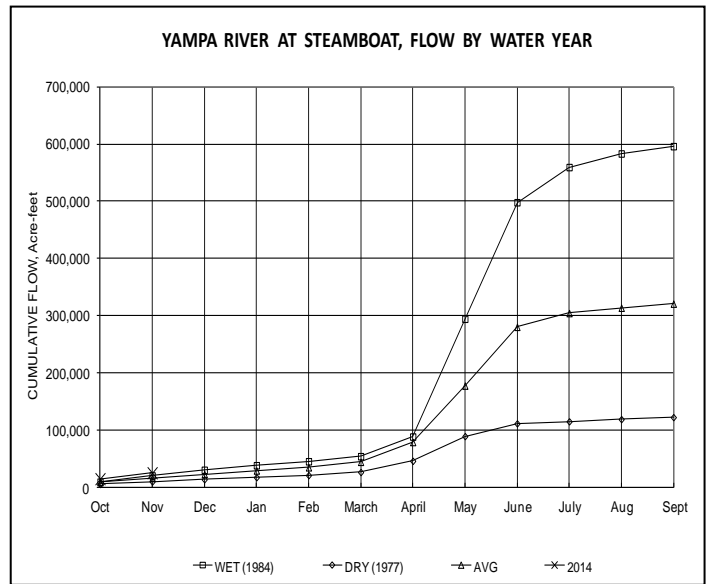
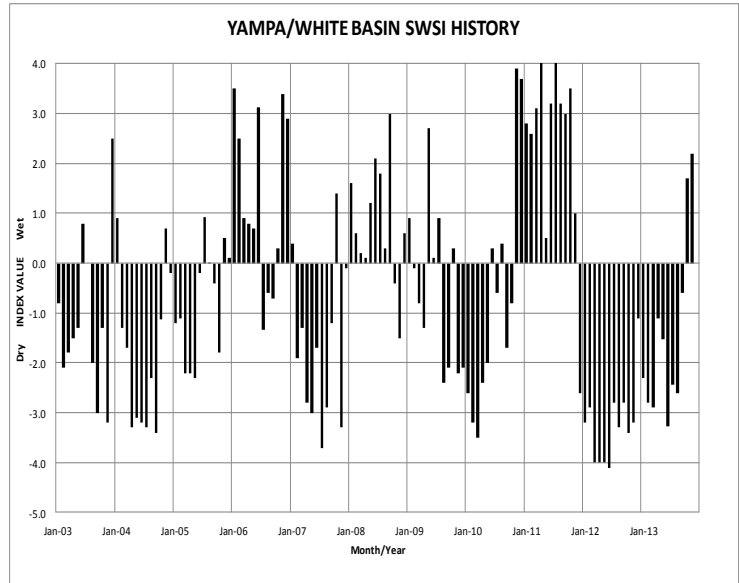
Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir for irrigation purposes, and Elkhead Creek Reservoir for municipal, industrial, recreational, and fish recovery releases. Stagecoach Reservoir is primarily used for recreation though a significant amount of stored water is allocated for municipal, industrial, irrigation and augmentation uses.

Public Use Impacts

Steamboat Ski Resort opened on November 27th with excellent conditions due to 98 inches of snowfall since October 1st.

As of November 23rd Steamboat Lake was not iced over yet and conditions were deemed unsafe at that time. Call ahead for updated conditions.

At Stagecoach State Park the reservoir is frozen over however it is difficult to determine the ice thickness and so extreme caution is urged. Grooming of trails for skiing will occur once there is 18 inches of snow depth.



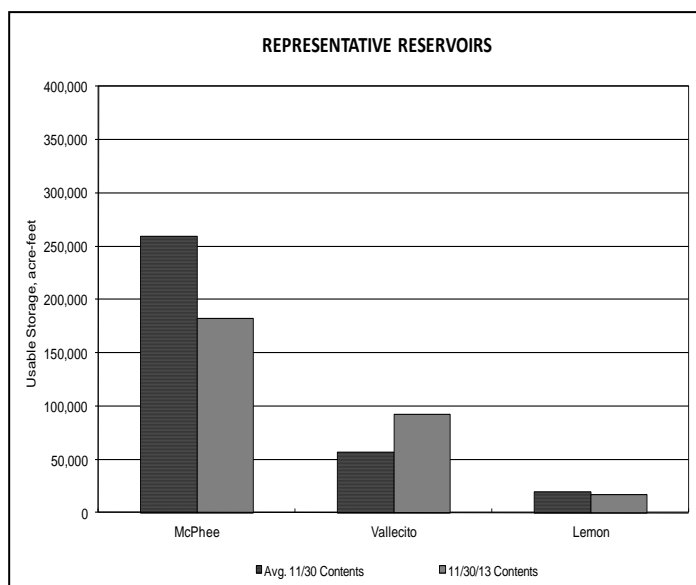
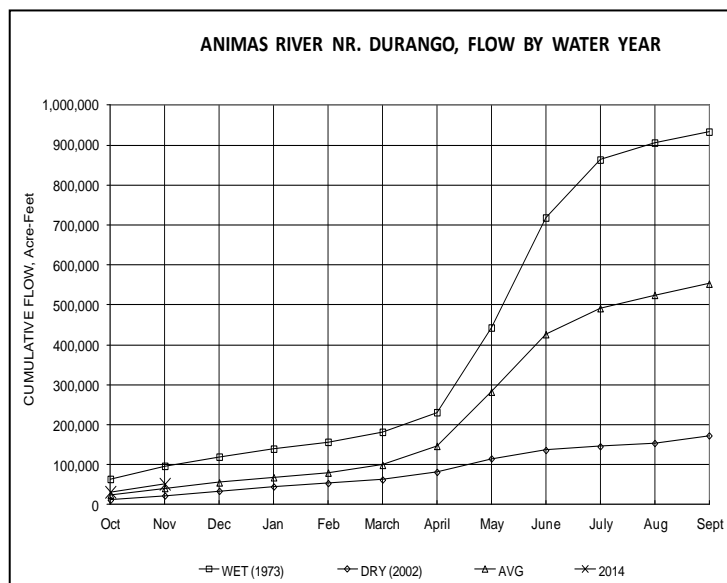
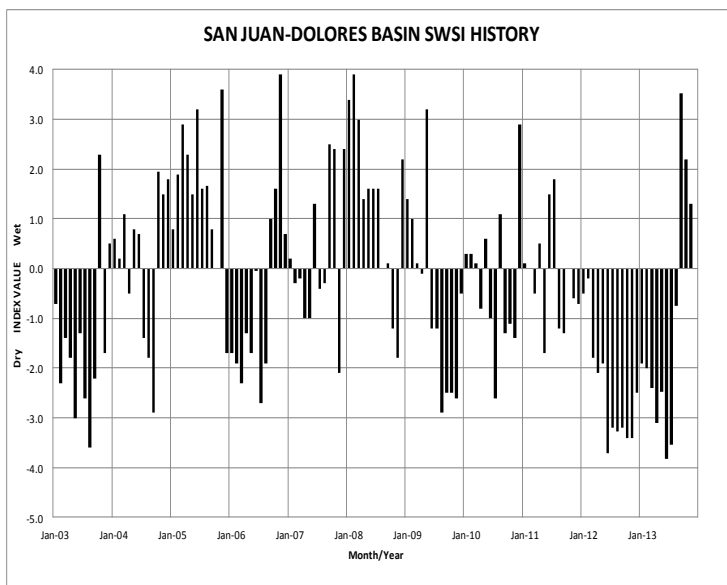


Basinwide Conditions Assessment

The SWSI value for the month was 1.3. Flow at the Animas River at Durango averaged 327 cfs (115% of average). The flow at the Dolores River at Dolores averaged 108 cfs (131% of average). The La Plata River at Hesperus averaged 11.8 cfs (112% of average). Precipitation in Durango was 2.71 inches for the month, 154% of the 30-year average of 1.75 inches. Precipitation to date in Durango, for the water year, is 4.15 inches, 124% of the 30-year average of 3.33 inches. The average high and low temperatures for the month of November in Durango were 53° and 26°. In comparison, the 30-year average high and low for the month is 51° and 23°. At the end of the month Vallecito Reservoir contained 88,374 acre-feet compared to its average content of 52,526 acre-feet (168% of average). McPhee Reservoir was up to 179,088 acre-feet compared to its average content of 264,354 (68% of average), while Lemon Reservoir was up to 16,630 acre-feet as compared to its average content of 19,476 acre-feet (85% of average)

Outlook

Precipitation (2.71 inches) was above average for November in Durango. There were 17 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 November. There were 24 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 20 out of 105 years of record where the total flow past the Dolores stream gauge was more than this year and 31 out of 97 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year. The end of month content in Vallecito Reservoir is the highest ever when compared to the same period. On November 30, the NRCS SNOTEL sites reported an average snow-water equivalent within the basin at 133%. Last month the snow-water-equivalent was 226%.



**ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - Dec-13**

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

**Winter SWSI Component Weights**

Basin	Reservoir Storage	Snowpack	Precipitation (Water Year Cumulative)
South Platte	0.55	0.27	0.18
Arkansas	0.15	0.51	0.34
Rio Grande	0.05	0.63	0.32
Gunnison	0.1	0.54	0.36
Colorado	0.15	0.51	0.34
Yampa/White	None	0.6	0.4
San Juan/Dolores/Animas	0.1	0.54	0.36

The PN curves were developed in the 1980s and are generally based on a period of record of 1950-1979. As reservoir storage (and streamflow for the summer SWSI) is affected by human action, the reservoir storage PN curves may not reflect current practices for reservoir operation. DWR and NRCS are currently considering options for modifying the SWSI to address this and other concerns about its computation.

**SWSI BY HUC FROM NRCS NATIONAL WATER & CLIMATE CENTER**

Included below is the SWSI generated by the NRCS National Water and Climate Center, based on data as of December 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.

