
COLORADO

WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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January 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 snowpack, reservoir storage, 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.

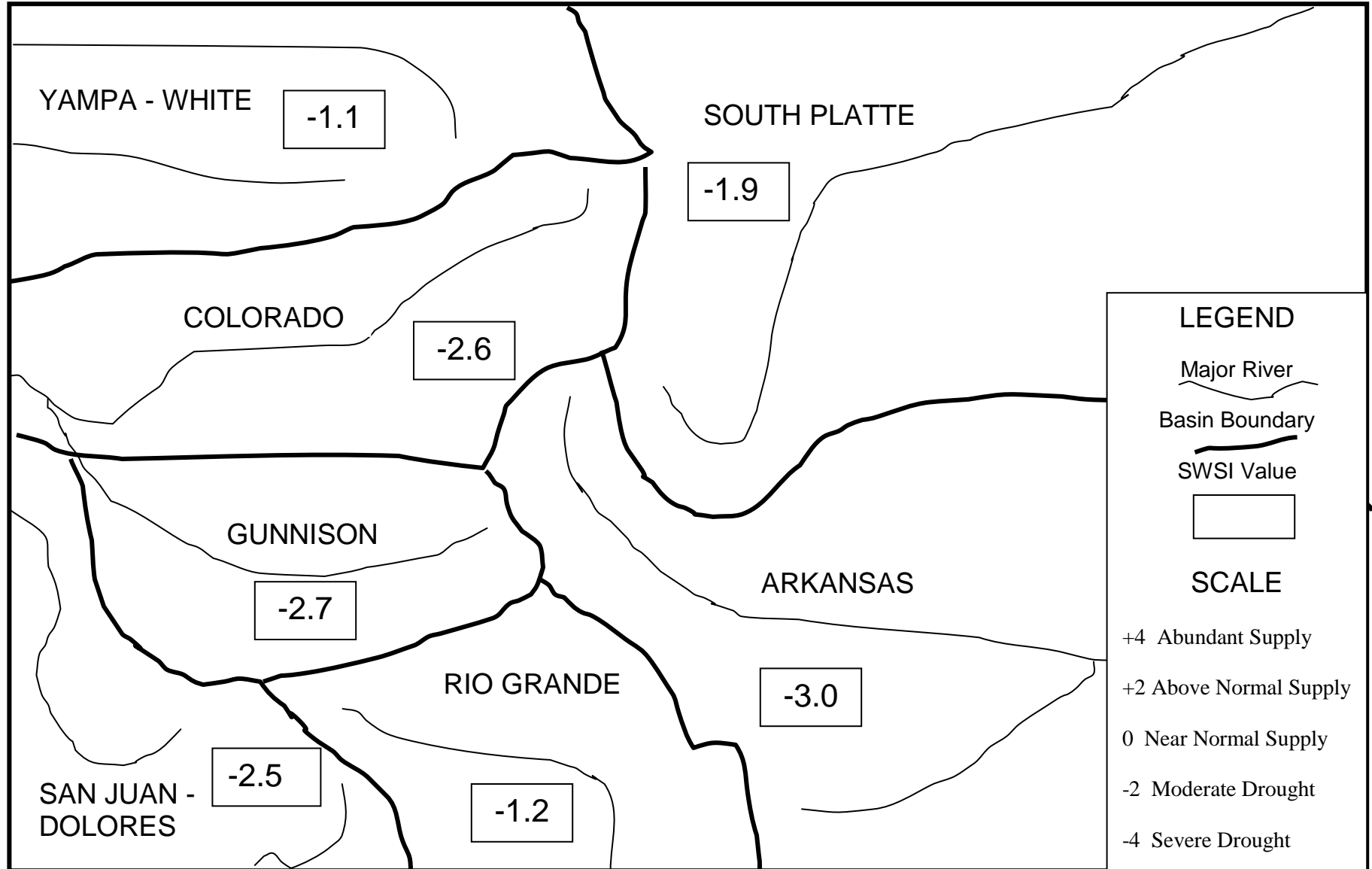
The statewide SWSI values for December (January 1) range from a high value of -1.1 in the Yampa/White Basin to a low value of -3.0 in the Arkansas Basin. Drought conditions improved throughout the state compared to last month. December conditions range from near normal to severe drought. Snow pack improved in all basins compared to December 1, although snowpack is still below normal throughout the state. With the exception of reservoir storage in the Arkansas and Rio Grande Basins, all components of the SWSI (reservoir storage, cumulative precipitation, and snowpack) are below normal for January 1.

The following SWSI values were computed for each of the seven major basins for January 1, 2013, and reflect the conditions during the month of December. Additional information about SWSI calculations and the NRCS National Water and Climate Center SWSI by HUC are included on Page 10.

Basin	January 1 SWSI	Change from Previous Month	Change from Previous Year
South Platte	-1.9	0.9	-3.4
Arkansas	-3.0	0.1	-1.3
Rio Grande	-1.2	1.8	-1.6
Gunnison	-2.7	1.1	-0.8
Colorado	-2.6	1.2	-1.1
Yampa/White	-1.1	2.1	1.5
San Juan/Dolores	-2.5	0.9	-1.8

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



January 1, 2013

Basinwide Conditions Assessment

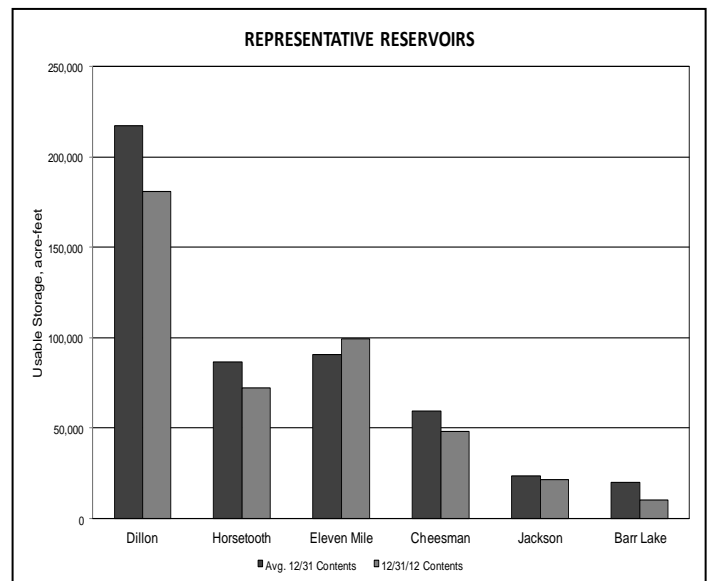
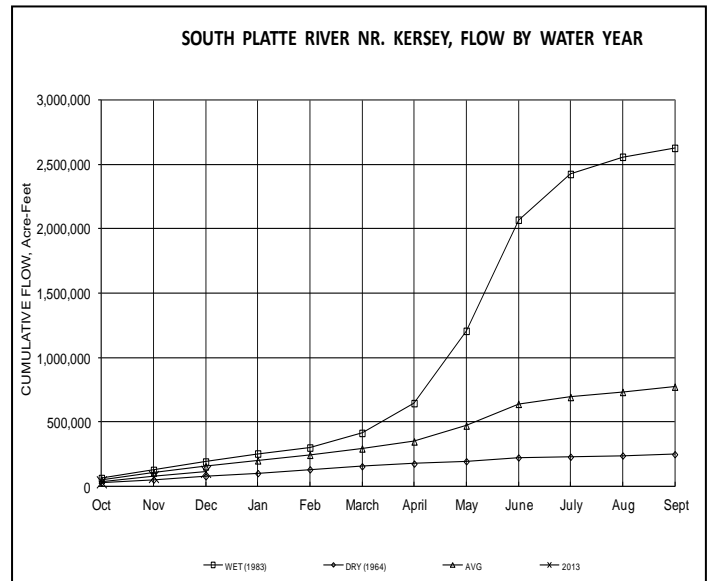
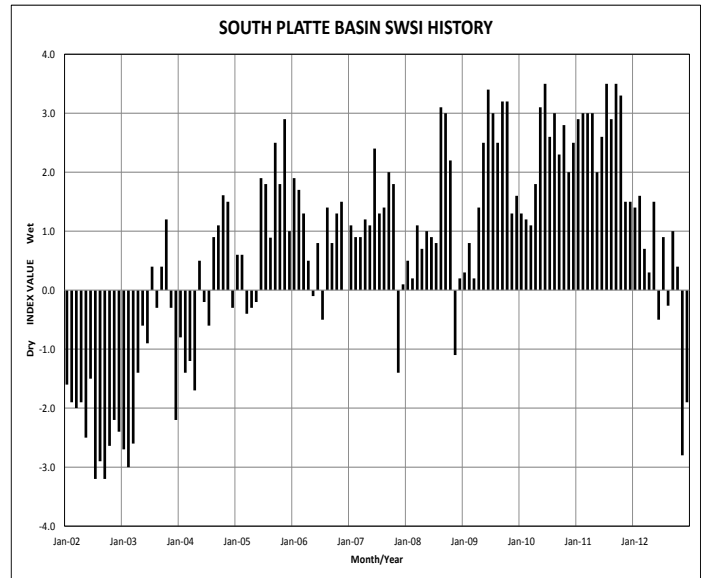
The SWSI value for the month was -1.9. However, the NRCS SWSI by HUC on Page 10 suggests that drought conditions in the basin are more severe. January 1 snowpack is very low with a nonexceedance probability (PN) of 7¹. Cumulative storage in the major plains reservoirs (Julesburg, North Sterling, and Prewitt) is at 48% of capacity. Cumulative storage in the major upper-basin reservoirs (Cheesman, Eleven Mile, Spinney, and Antero) is at 79% of capacity.

December had a split personality in the South Platte basin. The first roughly two thirds of December were warm and dry, but the last one third was cold and not as dry. The mountains experienced several small snow events throughout the month and the snowpack at least increased to slightly above the historic low 2002 reading by the end of the month. The plains only experienced one fairly small snow event centered around Christmas Day that generated between 0.05 and 0.15 inches of precipitation at most locations.

Stream flows at both the Kersey and Julesburg index gages remained below average for December, but Kersey was much closer to average than expected. The Kersey gage monthly mean stream flow was 651 cfs or 95% of the historic mean of 682 cfs and well above the December 2002 mean of 445 cfs. The December Julesburg gage monthly mean stream flow value was 65 cfs or 16% of the historic mean of 397 cfs. This compares to the December 2002 record low mean of 13 cfs.

Outlook

The mainstem and tributary river calls continued with diversions to storage rights throughout the month, but because of the relatively low flow conditions and low water levels at the end of the 2012 irrigation season, progress toward reservoir fills was very slow. This continues to indicate that without some significant runoff producing precipitation, many of the major reservoirs in the basin will not fill before direct flow rights begin diverting next March or April.



¹ At least 93 percent of recorded values are higher than a PN of 7

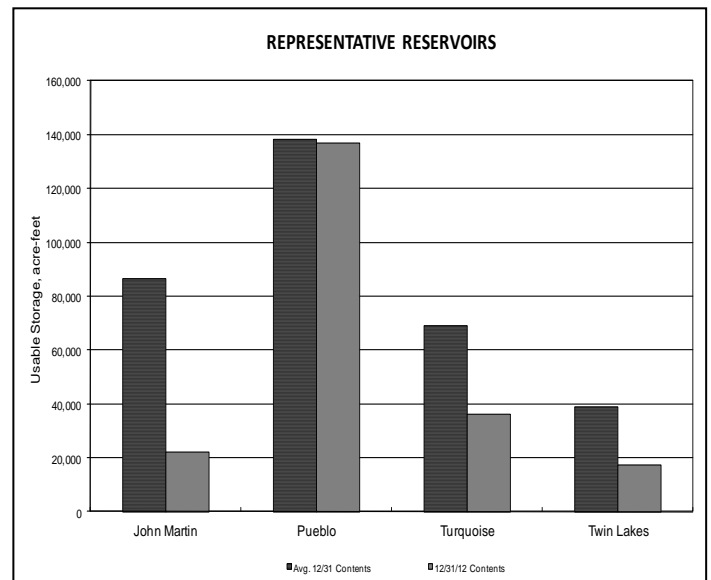
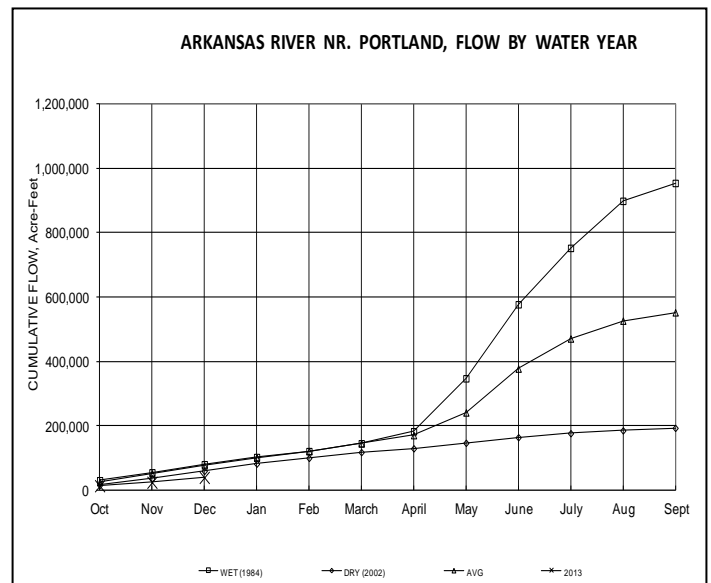
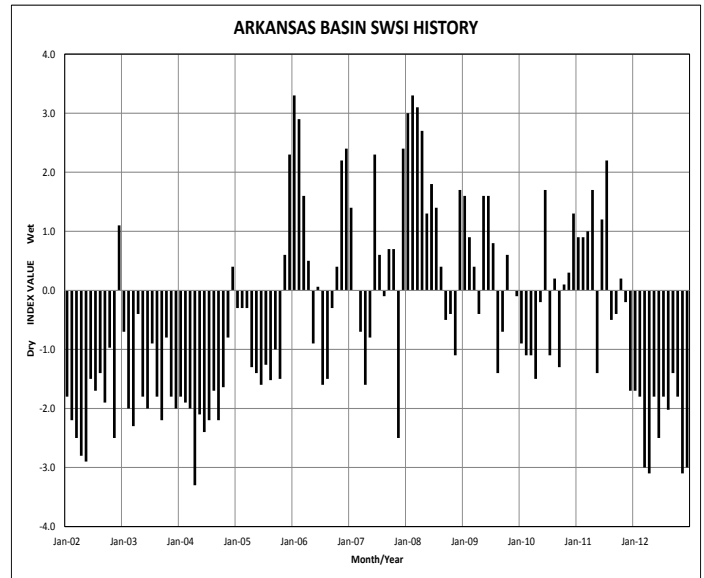
Basinwide Conditions Assessment

The SWSI value for the month was -3.0, the lowest in the state. Snowpack accounts for the majority of the SWSI in the Arkansas Basin and was very low with a PN of 8. Water year cumulative precipitation, the other major component of the Arkansas Basin's winter SWSI, was also very low (PN of 8).

The Pueblo Winter Water system grand total was 28,214 acre-feet at the end of December representing a significant decrease from last year's storage to date, which was 50,823 acre-feet. The previous five-year average for this period is 56,846 acre-feet and the average since 1991 for this period has been 61,097 acre-feet.

Conservation storage in John Martin Reservoir is about 73%, below last year. Storage since November 1st has been 1,945 acre-feet while storage a year ago for the same time period was 7,134 acre-feet.

The Arkansas River Compact Administration meeting was held in Garden City, Kansas on December 5th and 6th.



Basinwide Conditions Assessment

The SWSI value for the month was -1.2, a strong improvement compared to last month's -3.0. Snowpack accounts for the majority of the winter SWSI in the Rio Grande Basin and was still below normal with a PN of 38. Flow at the gaging station Rio Grande near Del Norte averaged 148 cfs (76% of normal) during December. The Conejos River near Mogote had a mean flow of 69 cfs (70% of normal) during the month. For the year, streamflow in the San Luis Valley was poor, with annual runoffs in the range of 50% to 70% of long-term averages. 2012 was the poorest runoff year since 2003.

Alamosa received 0.81 inches of precipitation during December, 0.46 inches above normal. Alamosa's total precipitation of 5.58 inches during 2012 was 1.72 inches below the annual average. For the year, the average temperature was 1.8 degrees above normal even with the brutally cold December when the average temperature was only 12 degrees.

Outlook

Stream flow in the basin should be below average for the next few months. Currently, NRCS forecasts the 2013 runoff to be below normal for key streams in the Upper Rio Grande Basin. Recent National Weather Service climate forecasts call for warmer and drier than normal conditions in the San Luis Valley for the remainder of the winter.

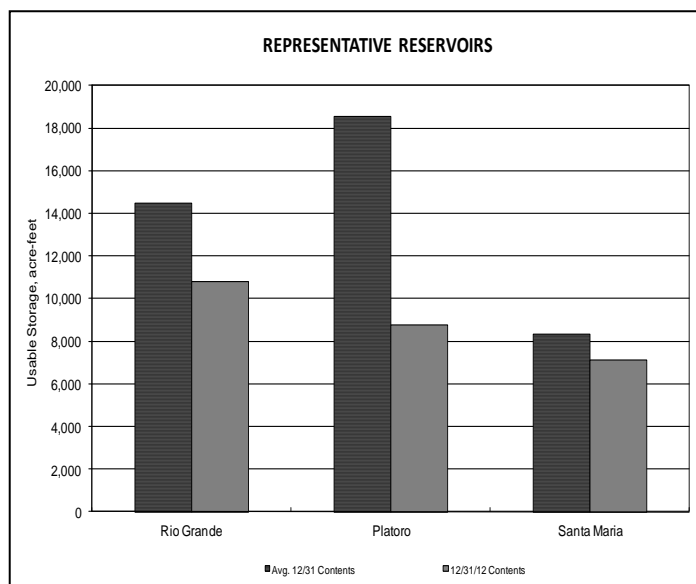
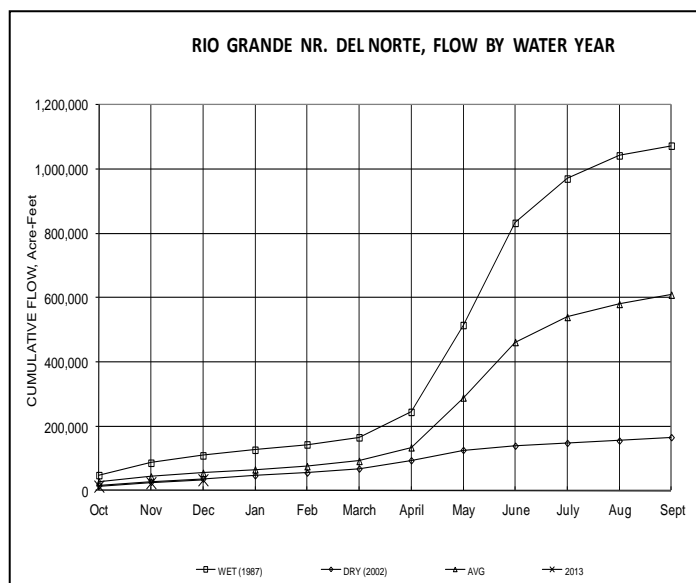
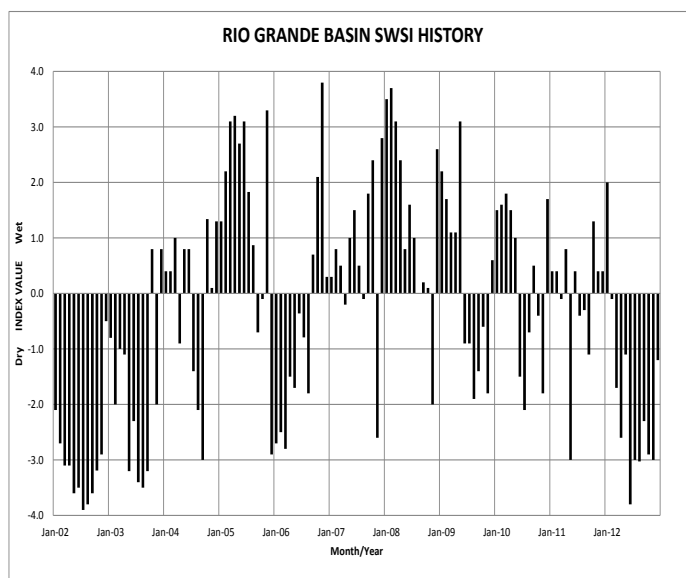
Administrative/Management Concerns

Pursuant to the provisions of the Rio Grande Compact, Colorado delivered approximately 127,000 acre-feet to New Mexico and Texas and met the delivery requirement for 2012. A small delivery credit will be available for 2013. Closed Basin Project delivery to the Rio Grande totaled 9,400 acre-feet.

2012 Summary

2012 saw well above average runoff during March and April as early warm temperatures jump-started the runoff. May runoff was near-average for some drainages as the high snow melted out. Thereafter, most hydrographs went on the sharp decline. Streamflow in the basin was generally very poor from June through October. There was no normal monsoonal activity during July, August, and September. A very warm autumn concluded on December 9 with a snowstorm, bringing bitter cold to the San Luis Valley. In the end, the Rio Grande near Del Norte had annual flows of 65% of normal. The Conejos near Mogote annual volume was 60% of normal. The smaller drainages in the basin were heavily affected by the poor snowpack and rainfall and recorded annual runoff at 40 to 70% of normal. Groundwater Management Subdistrict No. 1 began well depletion replacement in 2012 with a mixture of reservoir releases, headgate bypasses, and Closed Basin Project production delivered to the river. The subdistrict encompasses approximately 200,000 irrigated acres within the Closed Basin and north of the Rio Grande in Alamosa, Rio Grande and Saguache counties.

In summary, 2012 was a poor year for runoff. Low precipitation during the irrigation season parched rangeland and forced reservoir releases and massive well pumping from the Valley's aquifers. These aquifers will already be in a stressed condition with little hope of recovery when the next irrigation season kicks into high gear. Crop yields were good in areas with sufficient water supplies. Commodity prices were not as high as the previous year.



Basinwide Conditions Assessment

The SWSI value for the month was -2.7. Flow at the gaging station Uncompahgre River near Ridgeway was 42 cfs, compared to the long-term average of 53 cfs. Storage in Taylor Park, Crawford, and Fruitland reservoirs totaled 79% of the long term average as of the end of December.

Precipitation in December for the lower basin was well above normal at over 129 percent of average. Unfortunately, however, precipitation in the upper basin areas, especially the Cochetopa Creek and Taylor River basins remained below normal. On January 10th, average snowpack in the basin sits at 62 percent of the 1981 to 2011 average, which is almost exactly the same position it was in 2011. Snotel stations in the Cochetopa Creek, Tomichi Creek and Taylor River drainages indicate the worst conditions with only 42 to 46 percent of average snow water equivalent (SWE), while areas in the north, such as the Grand Mesa are in better condition at around 73 percent. Temperatures in January, particularly in the lower basin valleys, were below normal due to valley inversions late in the month.

Outlook

January 10th NRCS peak snowpack projections predict that with average accumulation during the remaining season, peak Gunnison basin snowpack should reach only 78 percent of the average. Unfortunately, the January through March forecast is not promising as it now predicts below average precipitation, which would mean ending the season at less than 78 percent.

Colorado River Basin Forecast Center (CBRFC) streamflow predictions within the Gunnison basin range from 50 percent on the Uncompahgre to 71 percent on Surface Creek. A bit of positive news is that in 1996 we ended December in a similar position and the peak snowpack recovered to 102 percent. Hopefully this year mimics 1996!

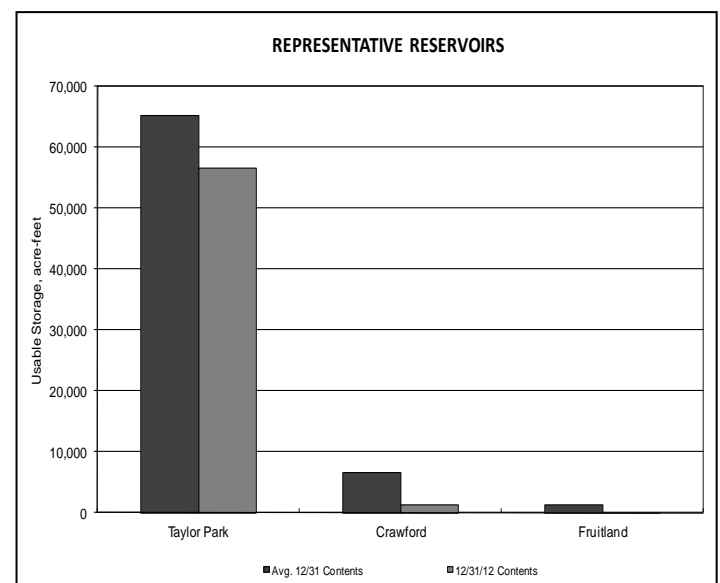
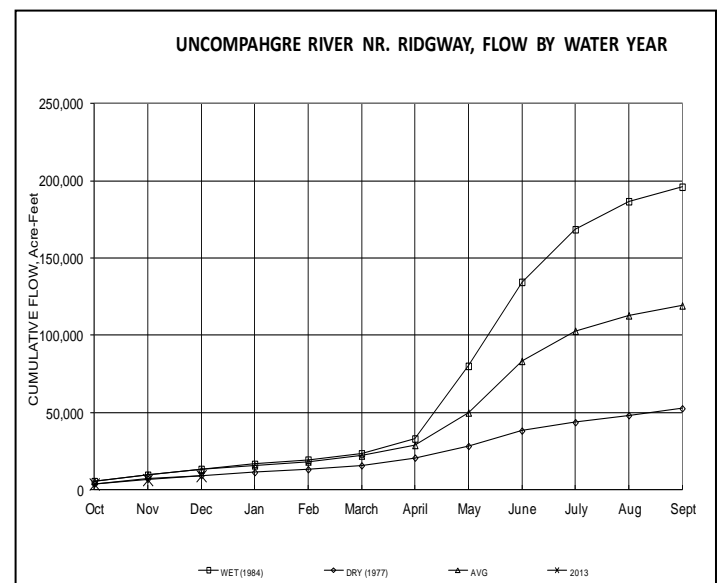
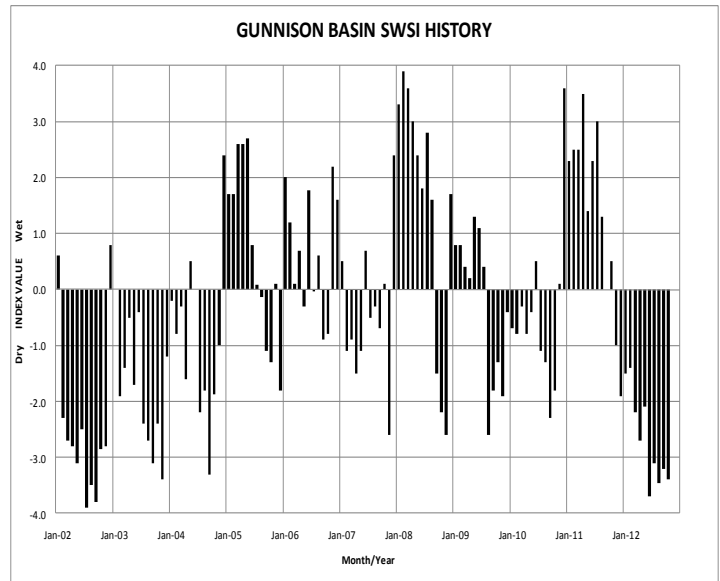
Administrative/Management Concerns

The January 1st forecast for April-July inflow to Blue Mesa Reservoir is 390,000 acre-feet, lower than 2011, which tied the previous minimum January forecast. Since Blue Mesa hit its minimum storage on November 10th, storage has increased by only 3,000 acre feet due to releases from Crystal Reservoir that continue to be maintained above 300 cfs. Water users are anxiously awaiting the January Aspinall Unit Operations Meeting to see what the USBR models predict for reservoir storage in the coming year.

Although repairs to the Redlands Power Canal (RPC) are finished, they currently cannot take water or place a call because of the significant ice in the ditch caused by the low flows during the repair and the extremely cold temperatures.

Pubic Use Impacts

As of mid-January, many streamflow gages in the Gunnison basin were listed as ice affected due to the unseasonably cold weather caused by deep valley inversions, therefore, streamflow readings at most locations this month will not be accurate. Skiing at resorts in the basin improved with multiple storms around Christmas, but continues to be less than ideal with Telluride only having 16 percent of their advanced terrain open due to snow conditions.



Basinwide Conditions Assessment

The SWSI value for the month was -2.6. The snowpack PN was 26.

Many gages on the Colorado and Roaring Fork River have and will continue to experience ice-affected instantaneous and daily flow values while continuing to run below average through January. Free river conditions on the Colorado ended on December 19, 2012 with a Shoshone Hydro Power Plant call.

Outlook

Williams Fork and Green Mountain Reservoirs should remain unchanged through January. Ruedi Reservoir will maintain the minimum flow release of approximately 39 cfs. Continuing lack of significant precipitation is reflected in the Roaring Fork and Upper Colorado River Basin snowpack reporting 68 percent of average snow water equivalent as of January 1st. The western Colorado forecast through the month of January calls for a below average chance of precipitation.

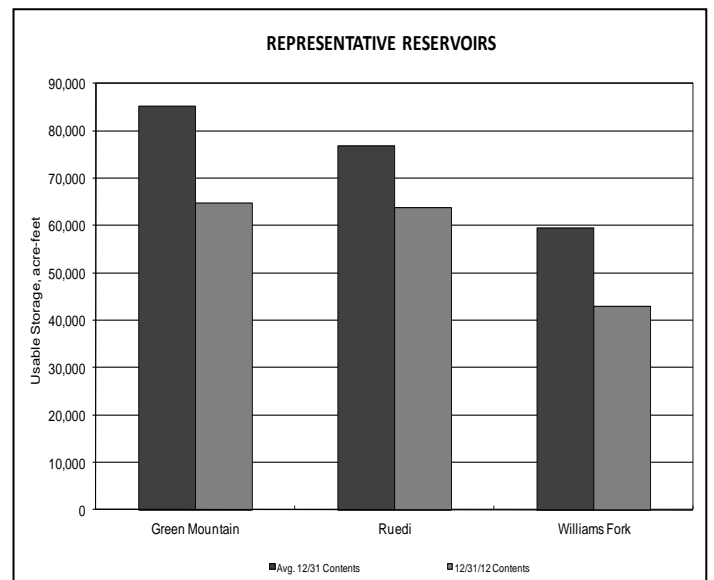
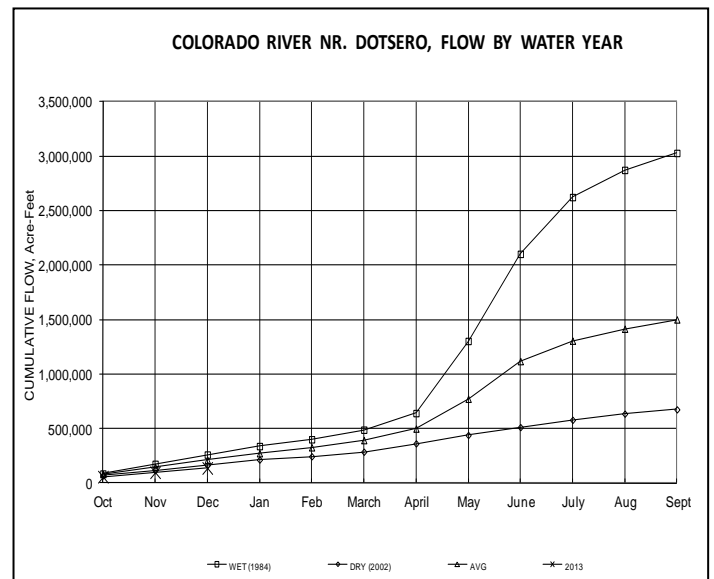
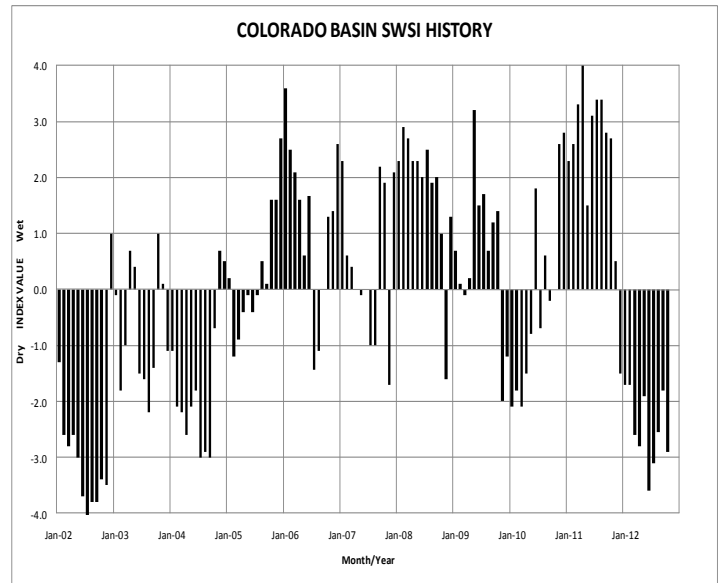
Administrative/Management Concerns

Shoshone Power plant will operate at approximately one-half capacity through January, potentially shutting down for maintenance operations in February. Green Mountain Reservoir will maintain a release rate of 170 cfs - reduced slightly on December 31, 2012. Williams Fork and Ruedi Reservoirs will maintain releases of about 40 cfs. There will likely be no call on the main stem of the Blue River through January.

Public Use Impacts

A controversial U.S. Forest Service water policy that would have required ski resorts to transfer ownership of water rights - primarily used for snowmaking - to the U.S. government was struck down in United States District Court. The decision affects 121 ski areas operating on National Forest Service lands in 13 states.

Ski areas in the Colorado River basin continue to hope for additional snow to improve mediocre terrain from lack of natural snow.



Basinwide Conditions Assessment

The SWSI value for the month was -1.1. December 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 123% 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 December was 81%, the highest in the state. Snowpack for the combined basins as of January 1st, 2013 was at 85% of average, PN of 33. The snow water equivalent (SWE) as of December 31, 2012 was 82% of average for the North Platte River basin and 86% of average for the Yampa River basin and White River basin.

Due to extremely cold temperatures, all Division 6 stream gages are either closed for the winter season or currently ice-affected.

Outlook

NRCS predicts primarily below average spring and summer streamflows in the Yampa, White, and North Platte River basins. The latest runoff forecasts from the NRCS for the April through July period are 69% of average for the North Platte River at Northgate, 70% of average for the Yampa River near Maybell, 65% of average for the Little Snake River near Lily, and 73% of average for the White River near Meeker.

As of December 31st Fish Creek Reservoir was storing approximately 1,697 AF, 41% of its capacity of 4,167 AF. Yamcolo Reservoir was storing 3,983 AF compared to a capacity of 9,580 AF. Elkhead Creek Reservoir was storing 16,983, compared to a capacity of 24,778 AF. Stagecoach Reservoir was storing 28,900 AF, 79% of capacity.

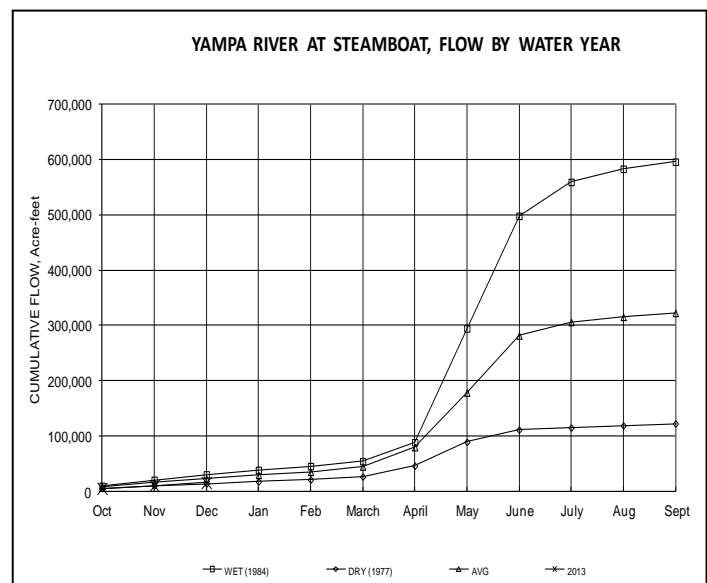
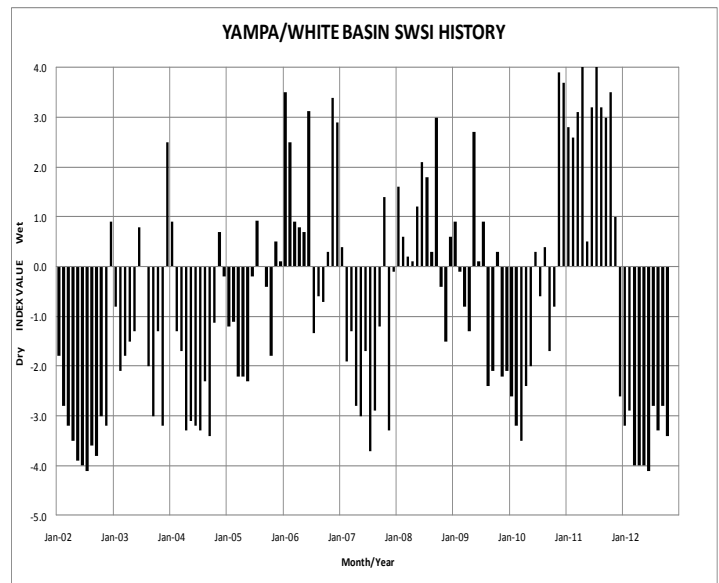
Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir for irrigation purposes, and Elkhead Creek Reservoir for municipal, industrial, recreational, and fish recovery releases. Stagecoach Reservoir is primarily used for recreation though a significant amount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

Public Use Impacts

December snowfall helped Steamboat Ski Resort to have some of the best conditions in the state with a 40 inch base and 147 inches of snowfall since late October.

Stagecoach Reservoir is covered by approximately 8–12 inches of ice with 6-8 inches of slush on top. Fishing is reported as great in most of the prime fishing locations. As always, anglers should use extreme caution when venturing onto the ice.

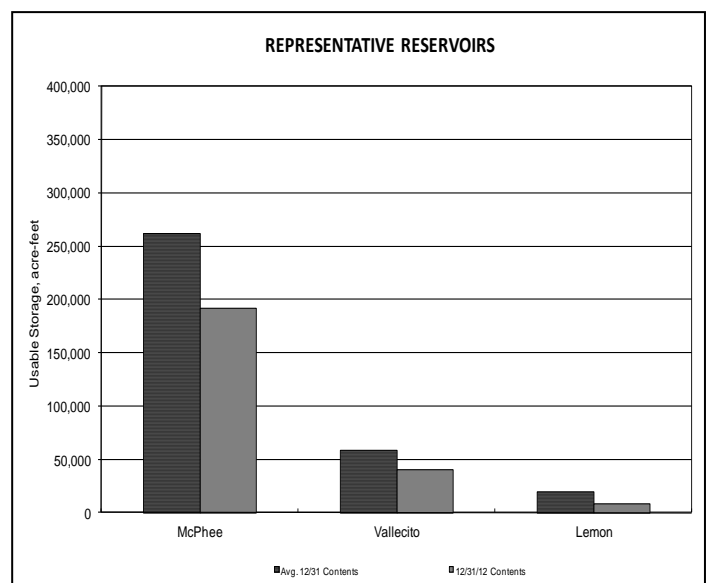
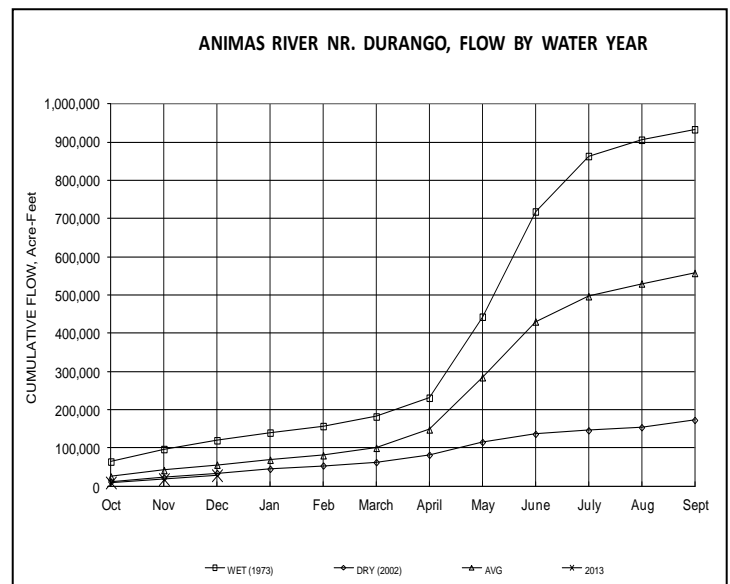
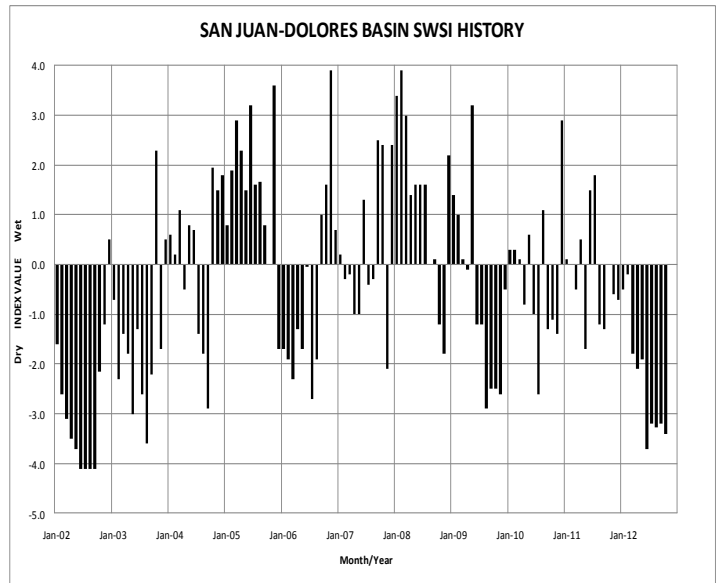
Steamboat Lake is reporting successful fishing at the Marina with approximately 8 inches of ice and the entire lake is iced over. Ski trails are open and being regularly groomed. Snowmobile trails still require more snow before opening. There is about 18-24 inches of snow on the ground.



Basinwide Conditions Assessment

The SWSI value for the month was -2.5. Flow at the Animas River at Durango averaged 166 cfs (74% of average). The flow at the Dolores River at Dolores was estimated to average 32 cfs (59% of average). The La Plata River at Hesperus averaged 3.6 cfs (44% of average). Precipitation in Durango was 0.93 inches for the month, 52% of the 30-year average of 1.78 inches. Precipitation to date in Durango, for the water year, is 1.88 inches, 37% of the 30-year average of 5.09 inches. The average high and low temperatures for the month of December in Durango were 38° and 9°. In comparison, the 30-year average high and low for the month is 41° and 15°. At the end of the month Vallecito Reservoir contained 40,320 acre-feet compared to its average content of 53,219 acre-feet (76% of average). McPhee Reservoir was up to 192,107 acre-feet compared to its average content of 266,078 (72% of average), while Lemon Reservoir was up to 8,0220 acre-feet as compared to its average content of 20,012 acre-feet (40% of average).

Precipitation (0.93-inches) was well below average for December in Durango. There are 80 years out of 118 years of record where there was more precipitation than this year. The flows on the Animas River were well below average this December. There were 93 out of 102 years of record where the total flow past the Durango stream gauge was more than this year. The other watersheds within the division did not fare much better. The NRCS is reporting snow-water-equivalent of 68% of average at the end of the month (PN of 22) which was slightly higher than the 45% of average reported at the end of November.



ADDITIONAL INFORMATION ABOUT COLORADO SWSI CALCULATIONS - Jan-13

The SWSI for each basin is based on probability of nonexceedance (PN) curves for each of three components: reservoir storage, snowpack, and water year 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	Water Year Cumulative Precipitation
South Platte	0.55	0.27	0.18
Arkansas	0.15	0.51	0.34
Rio Grande	0.05	0.63	0.32
Gunnison	0.10	0.54	0.36
Colorado	0.15	0.51	0.34
Yampa/White	None	0.60	0.40
San Juan/Dolores/Animas	0.10	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 January 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 forecasts of spring and summer streamflow, based on current snowpack and other hydrologic variables. The scale of -4 to +4 is the same as shown on Page 1.

