Water Availability Task Force Meeting

May 11, 2011

April (May 1) SWSI Report

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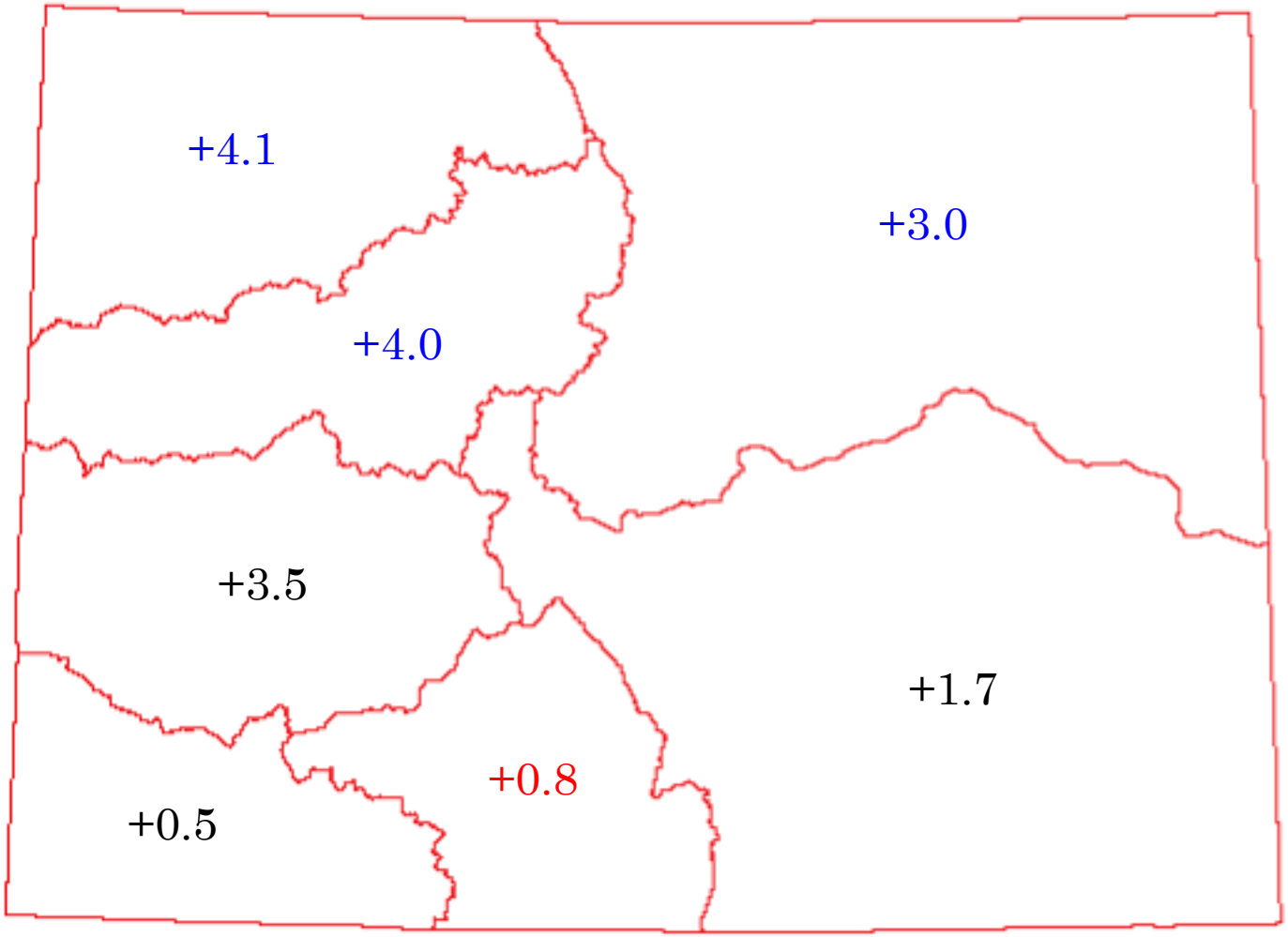
Colorado Division of Water Resources

Winter SWSI

- For the winter period of November – April, the SWSI value is calculated by the Natural Resources Conservation Service (NRCS)

- The components used are Snowpack (P_{SP}), Precipitation (P_{PCP}), and Reservoir Storage (P_{RS}), along with each basin's winter weighting factors

Surface Water Supply Index for Colorado



May 1, 2011

Division 1 – South Platte Basin

$$SWSI = \frac{(0.27 \times P_{SP}) + (0.18 \times P_{PCP}) + (0.55 \times P_{RS}) - 50}{12}$$

- The SWSI value for the month was +3.0, same as last month's value.
- Streamflow on the mainstem of the South Platte dropped to 32% of average as measured at Kersey.
- Snowpack climbed to 156% of average, raising flooding concerns.
- Current snowpack is similar to 1983, which had a peak average daily flow of 5,970 cfs. For comparison, the 2010 peak average daily flow of 3,940 cfs caused noticeable low land flooding and property damage.
- Hoping for a slow, steady melt. May outlook is for dry conditions with equal chance of warm or cool temps.

Division 2 – Arkansas Basin

$$SWSI = \frac{(0.51 \times P_{SP}) + (0.34 \times P_{PCP}) + (0.15 \times P_{RS}) - 50}{12}$$

- The SWSI value for the month was +1.7, up 0.7 from last month's value.
- A slow runoff and low native flows have caused ditches below Pueblo Reservoir and below John Martin Reservoir to expend a considerable amount of reservoir stored water to provide early irrigation.
- High well pumping occurred in March and it is anticipated that high well pumping in April also took place to help meet the surface water shortage.

Division 3 – Rio Grande Basin

$$SWSI = \frac{(0.63 \times P_{SP}) + (0.32 \times P_{PCP}) + (0.05 \times P_{RS}) - 50}{12}$$

- The SWSI value for the month was +0.8, up 0.9 from last month's value.
- Snowpack, precipitation, and streamflow continue to be below average for the basin as a whole, particularly for the Sangre de Cristo region.
- With only the more senior water rights able to divert throughout the summer, massive pumping from the valley's aquifers will be necessary to meet demand.
- Reservoir storage in the basin is generally poor; with not nearly enough water in storage to offset drought conditions.
- Adverse effects predicted for farming, ranching, and recreation industries in the basin.

Division 4 – Gunnison Basin

$$SWSI = \frac{(0.54 \times P_{SP}) + (0.36 \times P_{PCP}) + (0.10 \times P_{RS}) - 50}{12}$$

- The SWSI value for the month was +3.5, up 1.0 from last month's value.
- Above average precipitation (150% of average) and snowpack (139% of average) for April.
- Lower than average temperatures have delayed runoff, increasing possibility of large peak flows and minor flooding if temperatures increase dramatically and stay warm.
- As of May 1, still only a few minor dust on snow events, which if continues will reduce chances for rapid snowpack melt off.

Division 5 – Colorado Basin

$$SWSI = \frac{(0.51 \times P_{SP}) + (0.34 \times P_{PCP}) + (0.15 \times P_{RS}) - 50}{12}$$

- The SWSI value for the month was +4.0, up 0.7 from last month's value.
- Jones Pass, within the Moffat System, had tied the record for snow as of May 1st.
- River flows should continue to be well above average in May with reservoir release increases to open up storage capacity for the anticipated high runoff this season.
- The NOAA Forecast Center has predicted a 50% chance that Roaring Fork River flow will exceed 7,400 cfs, which is 1250 cfs above average.
- The situation as it currently stands, presents a high probability for record Colorado River flows. The potential for localized flooding is high, but obviously depends on the rate and magnitude of temperature increases as spring progresses.

Division 6 – Yampa/White Basin

$$SWSI = \frac{(0.60 \times P_{SP}) + (0.40 \times P_{PCP}) - 50}{12}$$

- The SWSI value for the month was +4.1, up 1.0 from last month's value.
- Precipitation for the month and total precipitation for the water year are both well above average.
- The highest snow depth and snow water equivalent ever recorded in the state of Colorado was measured in early May at a SNOTEL site just northeast of Steamboat Springs.
- Latest runoff forecasts from the NRCS for May through July range from 154% of average (White River near Meeker) to 226% of average (Little Snake River near Lily).
- Preparing for potential flooding conditions given high runoff forecast.

Division 7 – San Juan/Dolores Basin

$$SWSI = \frac{(0.54 \times P_{SP}) + (0.36 \times P_{PCP}) + (0.10 \times P_{RS}) - 50}{12}$$

- The SWSI value for the month was +0.5, up 0.5 from last month's value.
- Precipitation for the month and for the water year to date are below average (81% and 75% of the 30-year average for Durango, respectively).
- Snowpack was also slightly below average at 95% of normal.
- Lower than normal temperatures kept base flow in the rivers below average within the basin (64% to 79% of average)

Questions?

COLORADO
WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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May 2011

The Surface Water Supply Index (SWSI) developed by this office and the U.S.D.A. Natural Resources Conservation Service 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 statewide SWSI values for April (May 1) range from a high value of +3.3 in the Colorado Basin to a low value of -0.5 in the San Juan/Dolores Basin. Three of the basins (Arkansas, Colorado and Yampa/White) experienced a gain from the previous month's value, two of the basins (Rio Grande and San Juan/Dolores) experienced a loss from the previous month's value, and the remaining two basins (South Platte and Gunnison) experienced no change from the previous month's value.

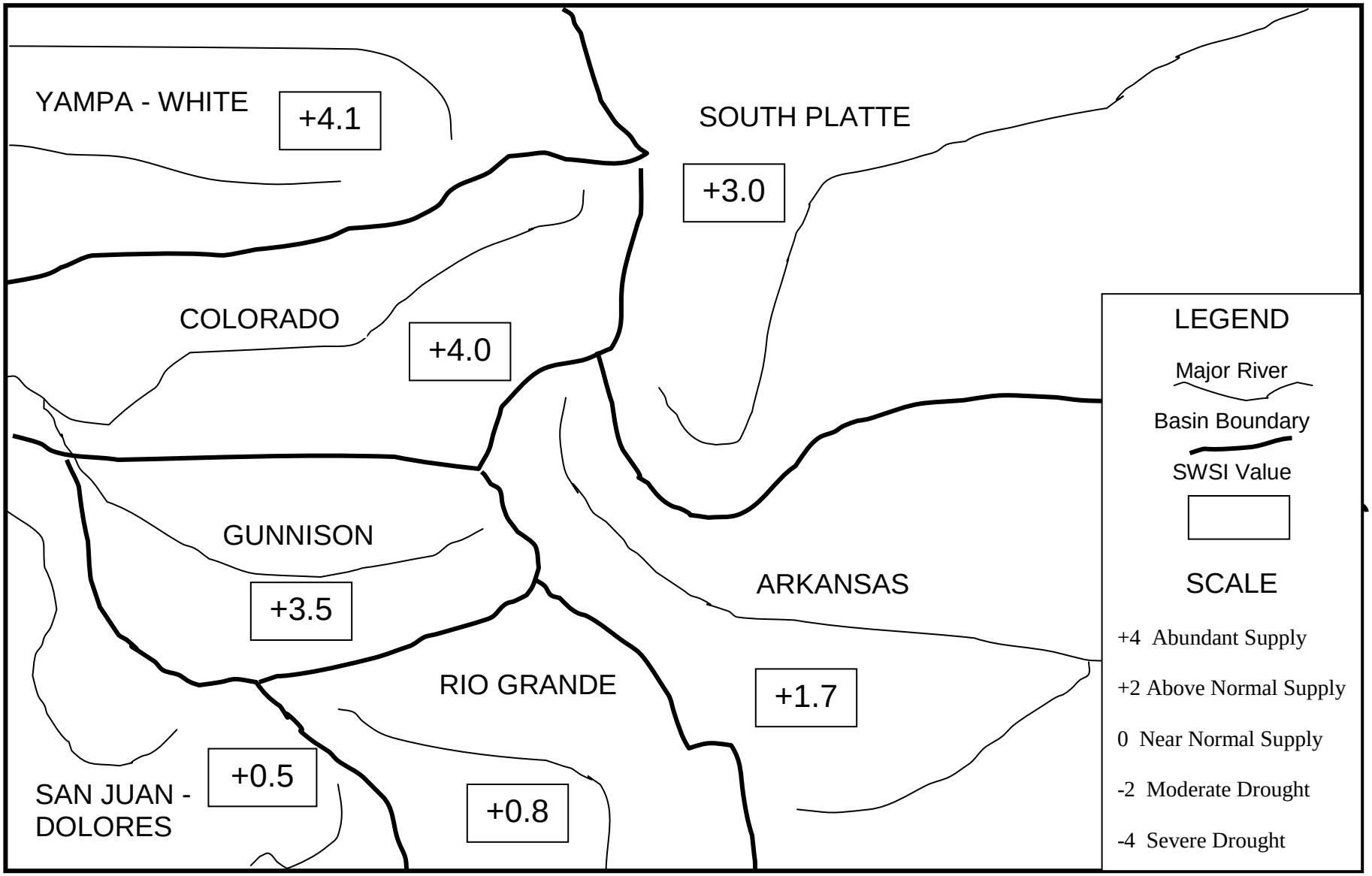
The following SWSI values were computed for each of the seven major basins for May 1, 2011, and reflect the conditions during the month of April.

Basin	May 1, 2011 SWSI Value	Change From Previous Month	Change From Previous Year
South Platte	+3.0	0.0	+1.2
Arkansas	+1.7	+0.7	+3.2
Rio Grande	+0.8	+0.9	- 0.7
Gunnison	+3.5	+1.0	+4.3
Colorado	+4.0	+0.7	+5.5
Yampa/White	+4.1	+1.0	+6.5
San Juan/Dolores	+0.5	+1.0	+1.3

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



May 1, 2011

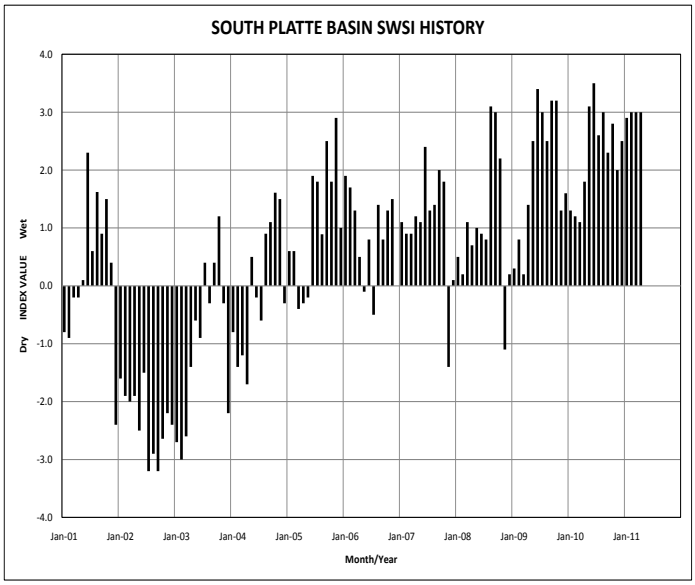
Basinwide Conditions Assessment

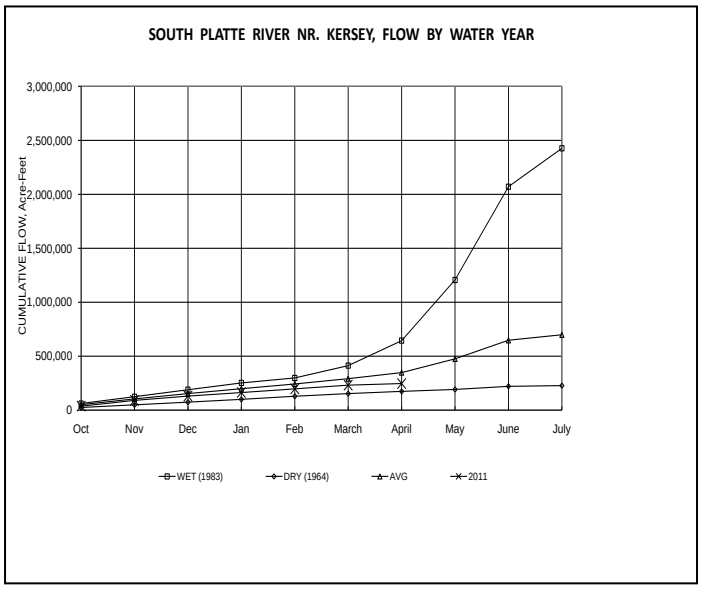
The SWSI value for the month was +3.0. The Natural Resources Conservation Service reports that May 1 snowpack is 149% of normal. Cumulative storage for the six reservoirs graphed on this page was 103% of normal as of the end of April. Cumulative storage in the major plains reservoirs (Julesberg, North Sterling, and Prewitt) is at 99% of capacity. Cumulative storage in the major upper-basin reservoirs (Cheesman, Eleven Mile, Spinney, and Antero) is at 91% of capacity. Flow at the gaging station South Platte River near Kersey was 270 cfs, as compared to the long-term average of 855 cfs. Flow at the Colorado/Nebraska state line was 157 cfs, as compared to the long-term average of 524 cfs.

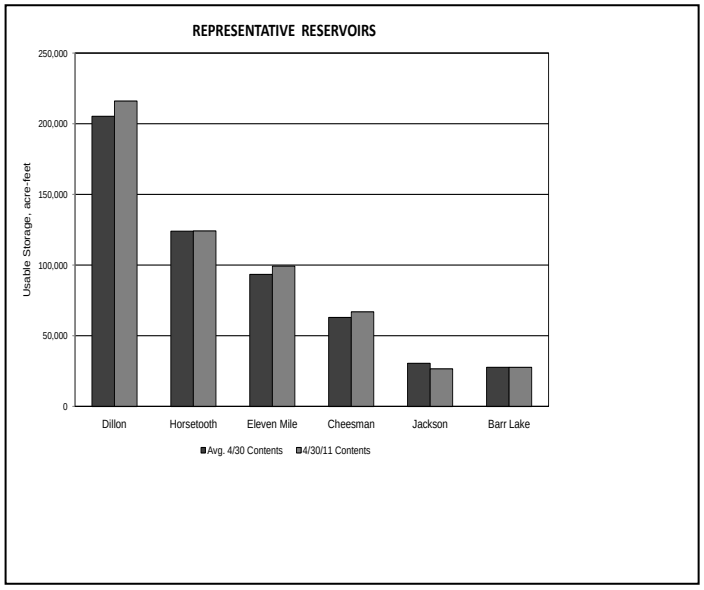
Outlook

The dual personality of the South Platte basin continued to be evident in April. Warm, dry conditions forced a call for the entire mainstem above District 64 for the all of April while the snow pack in the mountains continued to grow even higher above average. The flow at the key mainstem index gage at Kersey declined sharply to just 32% of average for the month while the snowpack climbed to 156% of average. This large snowpack has raised flooding concerns once it finally starts to melt. For example, the current snowpack in the Cache la Poudre basin is similar to the 1983 snowpack which had a peak average daily flow of 5,970 cfs while the 2010 peak average daily flow of just 3,940 cfs caused noticeable low land flooding and property damage. Of course a slow steady melt will cause much less flooding than a rapid melt. Reservoir storage remains good with the end of April readings at 98% of average for the basin as a whole.

The May outlook is for a high probability of continued dry conditions but equal chances of warm or cool temperatures for the South Platte basin.







Basinwide Conditions Assessment

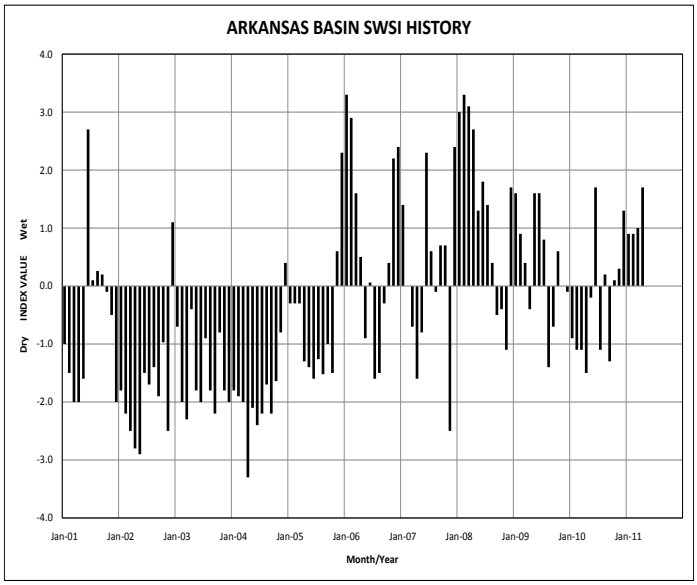
The SWSI value for the month was +1.7. The Natural Resources Conservation Service reports that May 1 snowpack is 112% of normal. Flow at the gaging station Arkansas River near Portland was 229 cfs, as compared to the long-term average of 437 cfs. Storage in Turquoise, Twin Lakes, Pueblo, and John Martin reservoirs totaled 96% of normal as of the end of April.

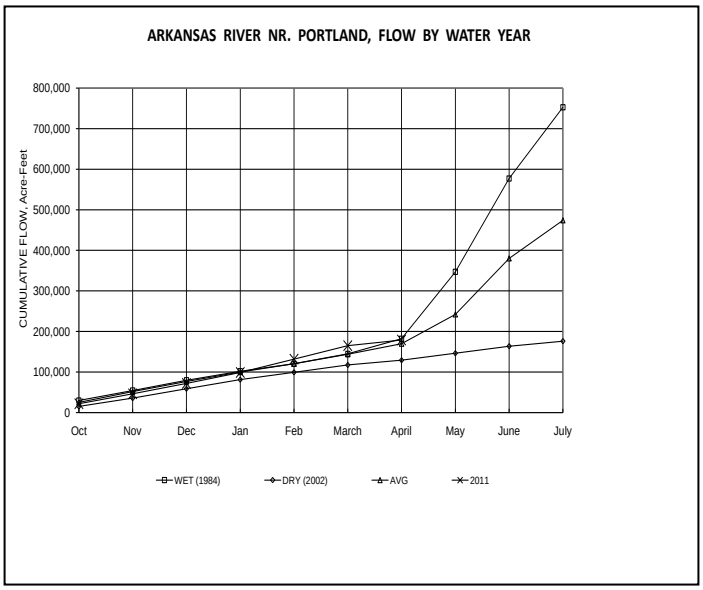
Outlook

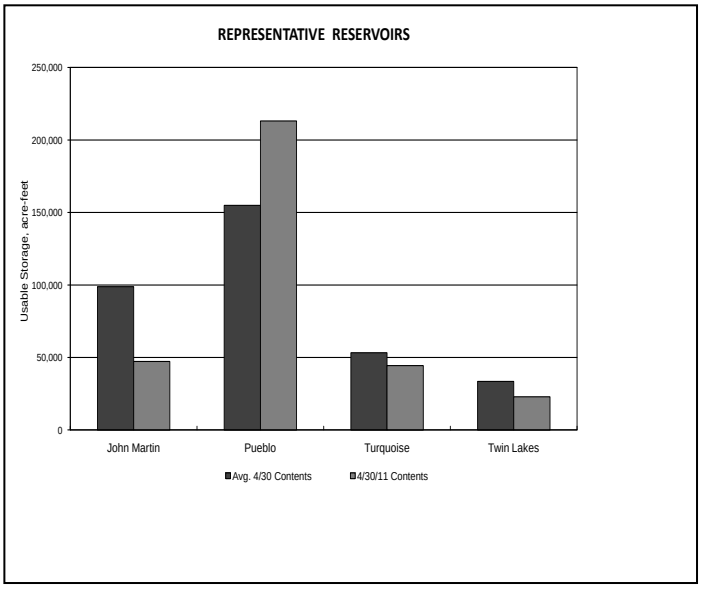
Water District 67 ditches below John Martin Reservoir called for water on April 4, 2011; consequently the distribution of conservation storage into accounts per the 1980 Operating Agreement for John Martin Reservoir began on April 4, 2011 at 10:00 hours. Total storage from November 1, 2011 through April 30, 2011 distributed into accounts in John Martin Reservoir was approximately a net of 23,675 acre-feet. This storage volume was considerably smaller than 2010 when the conservation storage total transferred in April was 63,165 acre-feet.

Administrative/Management Concerns

A slow runoff and low native flows have caused ditches below Pueblo Reservoir and below John Martin Reservoir to expend a considerable amount of reservoir stored water to provide early irrigation. High well pumping occurred in March and it is anticipated that high well pumping in April also took place to help meet the surface water shortage.







Basinwide Conditions Assessment

The SWSI value for the month was +0.8. The Natural Resources Conservation Service reports that May 1 snowpack is 82% of normal. Storage in Platoro, Rio Grande, and Santa Maria reservoirs totaled 97% of normal as of the end of April.

Flow at the gaging station Rio Grande near Del Norte averaged 624 cfs (90% of normal). The Conejos River near Mogote had a mean flow of 194 cfs (60% of normal). Flow to the state line was only 21% of normal as upstream diversions for irrigation needs continued.

Alamosa received precipitation totaling 0.13 inches during April, 0.41 inches below normal. Temperatures in the San Luis Valley were above normal for the second month in a row.

Outlook

NRCS forecasts are now predicting runoff to be only 77% of average on the Rio Grande near Del Norte and 80% for the Conejos near Mogote. Other drainages of particular concern are the Alamosa River (76%), Saguache Creek (79%), and the eastern side of the basin where runoff from Sangre de Cristo Range Creeks will be extremely poor at less than 40% of normal.

Based on these forecasts, water users in the basin who are reliant on stream flow for irrigation and stock watering needs should expect extremely limited availability.

Administrative/Management Concerns

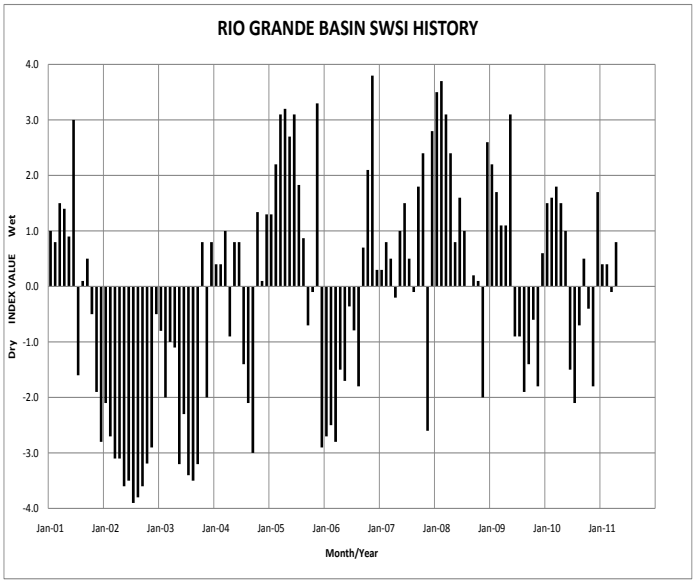
The lack of low and mid-elevation snowpack in the upper Rio Grande basin was clearly evident in the runoff totals for April. All streams within the basin were below normal volume during the month. These snowpack conditions will result in a late start to the runoff, a shortened period of high water, and peak runoff levels well below average.

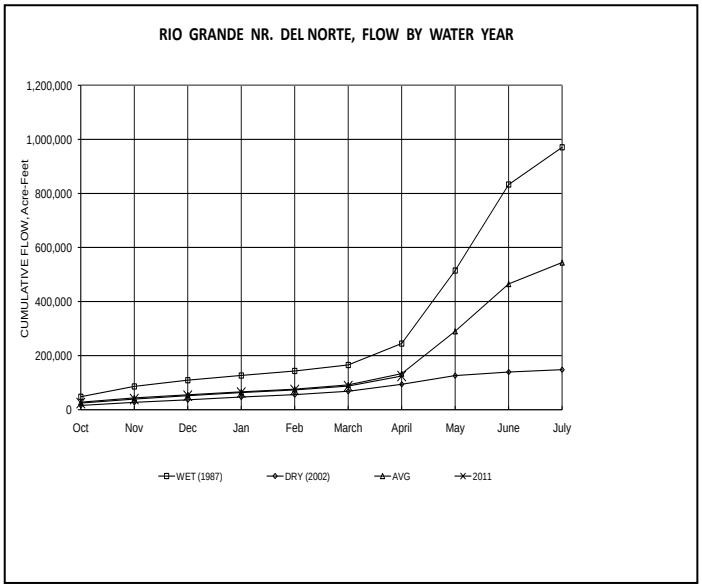
Water rights were curtailed slightly during April on the Rio Grande and the Conejos for Rio Grande Compact delivery requirements. It appears that only very low curtailment will be necessary on these drainages for Compact delivery requirements this year.

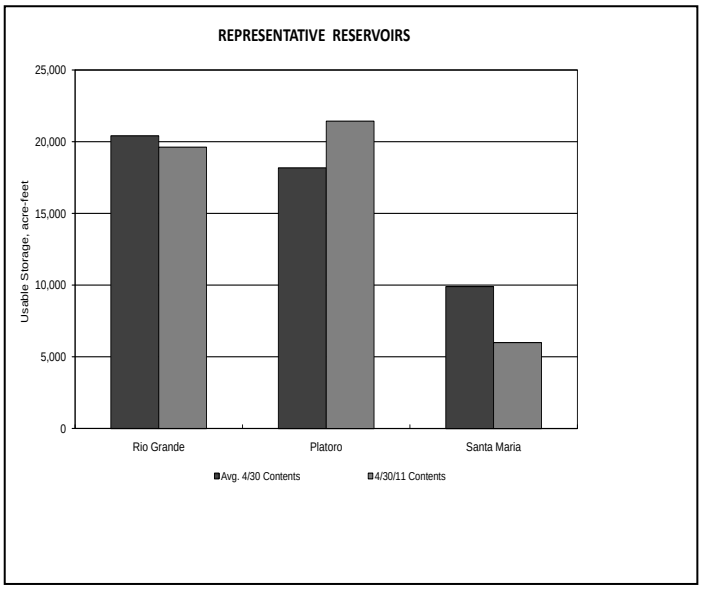
With only the more senior water rights able to divert throughout the summer, massive pumping from the valley's aquifers will be necessary to meet demand. Reservoir storage in the basin is generally poor; with not nearly enough water in storage to offset drought conditions.

Public Use Impacts

The expected poor stream flow will adversely affect the farming, ranching, and recreational industries in the basin. Lack of precipitation during the winter and spring has rendered the rangeland in poor condition. Government officials may have to restrict grazing in most areas of the upper Rio Grande basin.

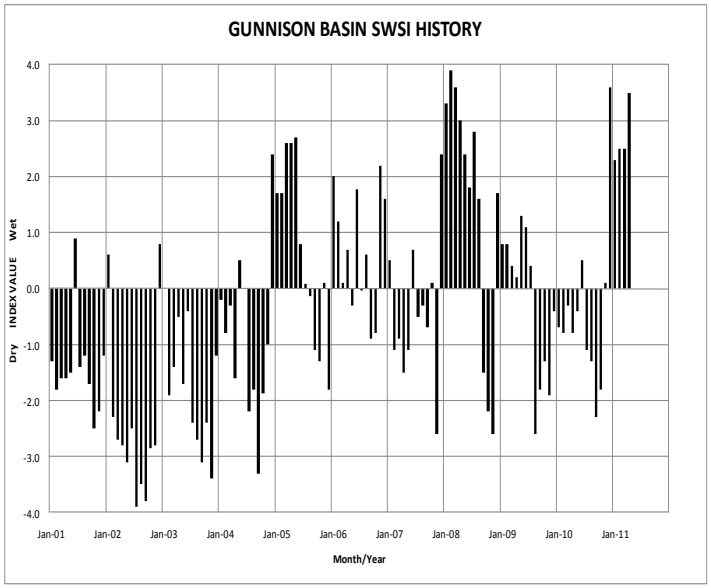






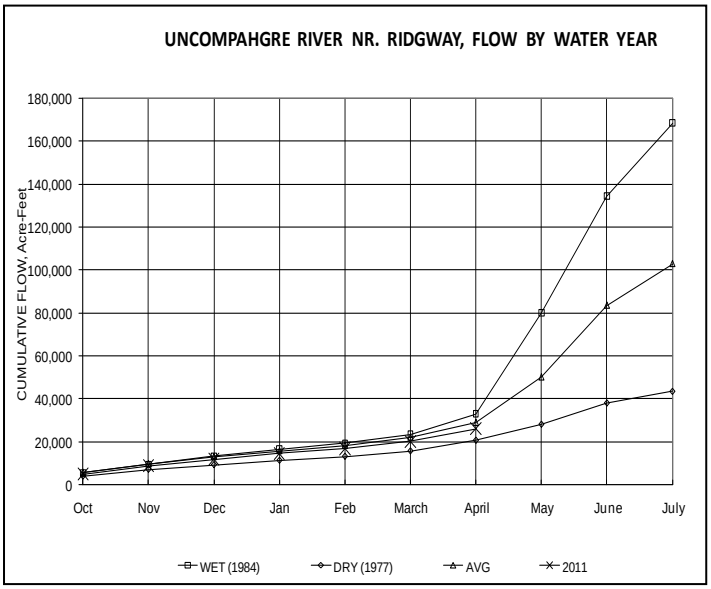
Basinwide Conditions Assessment

The SWSI value for the month was +3.5. The Natural Resources Conservation Service reports that May 1 snowpack is 139% of normal. Flow at the gaging station Uncompahgre River near Ridgeway was 99.8 cfs, as compared to the long-term average of 115 cfs. Storage in Taylor Park, Crawford, and Fruitland reservoirs totaled 118% of normal as of the end of April. April precipitation in the Gunnison basin was well above normal at 150% of average. As a result, we have passed the typical end to the snow accumulation season (April 18th) and on May 1st have excellent snowpack conditions at 120% of the seasonal total and 140% of the average for the date. Northern areas such as the Grand Mesa, Crested Butte, McClure Pass, and Taylor Park sit at over 130% of seasonal while the southern areas such as Lake City and above Ridgway Reservoir are around 110% of seasonal.



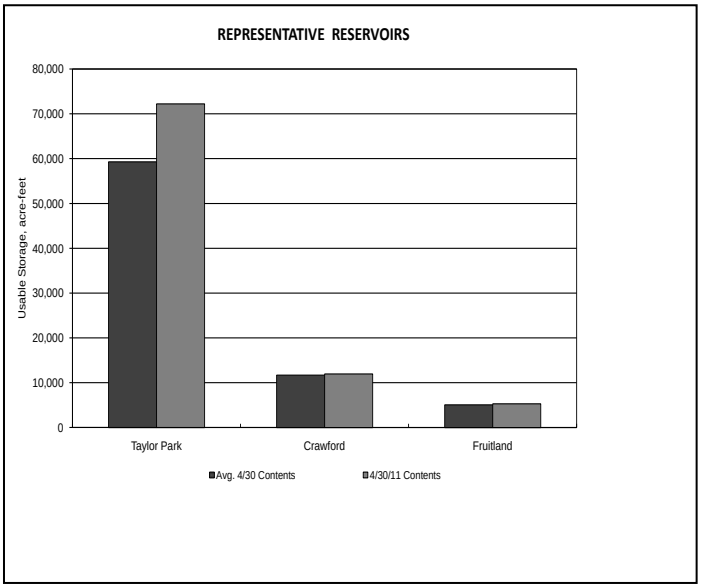
Outlook

April to July runoff predictions are above average in all areas of the Gunnison basin with 135 to 140% predicted for streams in the north such as the Taylor River, East Creek, North Fork Gunnison River and Surface Creek, while runoff predictions for areas in the south, such as Ridgway, Tomichi Creek and the Lake Fork Gunnison River, are around 107% of average. Runoff predictions for the San Miguel River, are not dire, but are less rosy than the Gunnison with a May 1st prediction of 92%. The National Climate Center predicts slightly greater than equal chances that the Gunnison basin will experience higher than average temperatures, and equal chances of higher or lower than average precipitation during the 90 day outlook period.



Administrative/Management Concerns

So far runoff has been delayed this season due to unseasonably cool (-3 degrees from average) and unsettled weather basin wide. During late April in areas such as Kannah Creek, only the first and second priority rights were satisfied because of the frozen conditions in the high country. The runoff delay increases the chance that temperatures could increase dramatically for a long period of time and cause large peak flows and minor flooding on some streams. As of May 1st we still have only experienced a few minor dust-on-snow events. If that trend continues it will help reduce the chances for the snowpack to melt as rapidly. Additional snow in April increased the forecast April to July inflow into Blue Mesa by 17% (800,000 AF to 940,000 AF). The peak one day release from Crystal Dam could be above 8,000 cfs in order to achieve a peak in the Black Canyon of 6,800 cfs as decreed in the Black Canyon Federal Reserve water right. Due to predicted heavy runoff on the North Fork Gunnison River the USBR will attempt to time the releases from Crystal to prevent flooding in the Delta area. Other reservoirs, such as Ridgway are attempting to avoid spilling this year by releasing additional water, but if the snowmelt occurs quickly a spill may be unavoidable.



Public Use Impacts

Some fishing guides that take clients down the Gunnison Gorge below Crystal Dam are concerned that the one-day peak and associated flow ramp up period in the Black Canyon will affect trips planned during the stone fly hatch in early June. The USBR has not announced a target date for the one-day peak yet, however, because of delayed runoff.

Basinwide Conditions Assessment

The SWSI value for the month was +4.0. The Natural Resources Conservation Service reports that May 1 snowpack is 157% of normal. Flow at the gaging station Colorado River near Dotsero was 2645 cfs, as compared to the long-term average of 1771 cfs. Storage in Green Mountain, Ruedi, and Williams Fork reservoirs totaled 119% of normal as of the end of April.

Outlook

Basin wide river flows should continue significantly above average in May with run-off and reservoir release increases to open storage capacity for anticipated high runoff this season. Unsettled conditions throughout April limited early runoff pushing snowpack snow water equivalents to near record highs. The NOAA Forecast Center has predicted a 50 percent chance that Roaring Fork River flow will exceed 7,400 cfs – 1250 cfs above average.

Administrative/Management Concerns

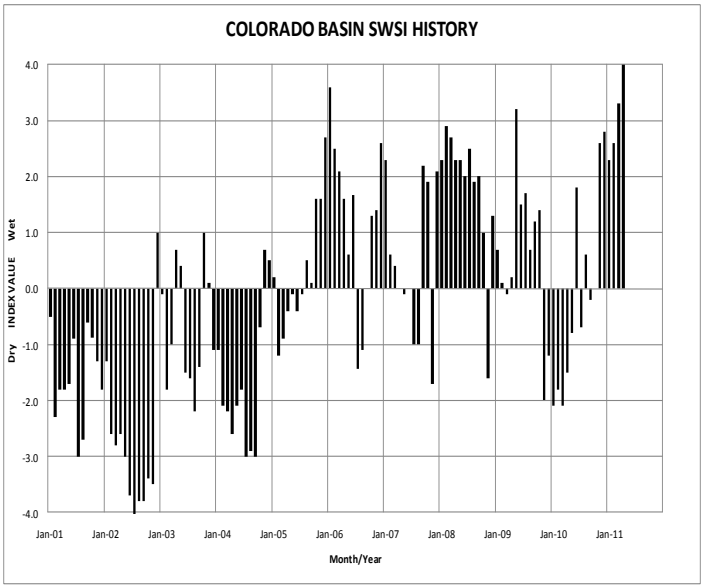
Lake Granby reservoir is expecting 25% higher runoff inflows than in previous years, and is expected to spill. Additionally, Adams Tunnel will likely be closed at or near peak runoff to allow East Slope reservoirs to capture native runoff. Releases have been increased from 200 to approx. 450 cfs in early May. Colorado Big-Thompson operators anticipate 97,000 acre-feet of runoff into Willow Creek this year resulting from a record 203% of average snowpack in the Willow Creek Basin. Accordingly, Willow Creek Reservoir has increased releases to over 500 cfs; however, releases will be capped at 1100 cfs to maintain streams downstream of the reservoir below flood flow. Neither the Windy Gap Pipeline nor the Willow Creek Pump Canal will be operated this year. Jones Pass, within the Moffat System, had tied the record for snow as of May 1st. Denver Water plans to reserve a certain amount of space in Gross Reservoir for peaks on the Fraser River. Repairs to the outlet works of Williams Fork Reservoir should be completed by mid-May enabling release rate increases from the current 70-80 cfs. Wolford Mountain Reservoir recently began releasing 400 cfs however will not likely increase this rate due to erosion concerns. Green Mountain Reservoir releases have been increased by an additional 700 cfs in late April and early May. Ruedi Reservoir releases have also been increased by approximately 110 cfs in late April.

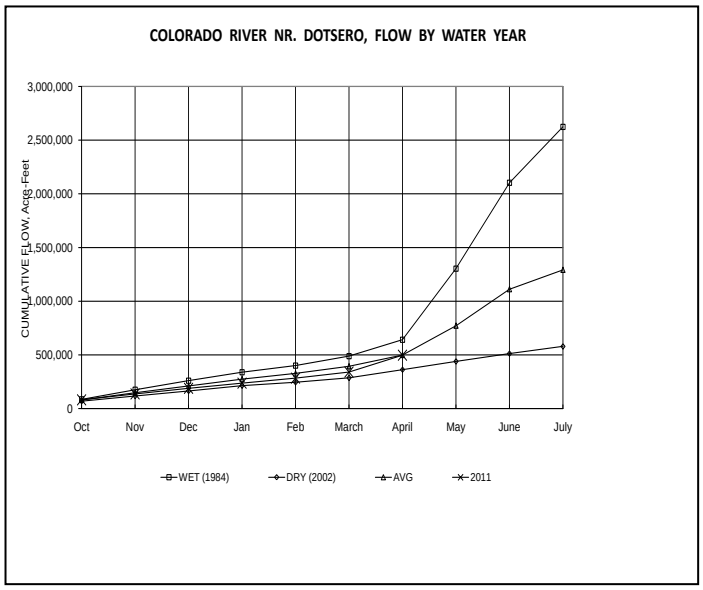
Public Use Impacts

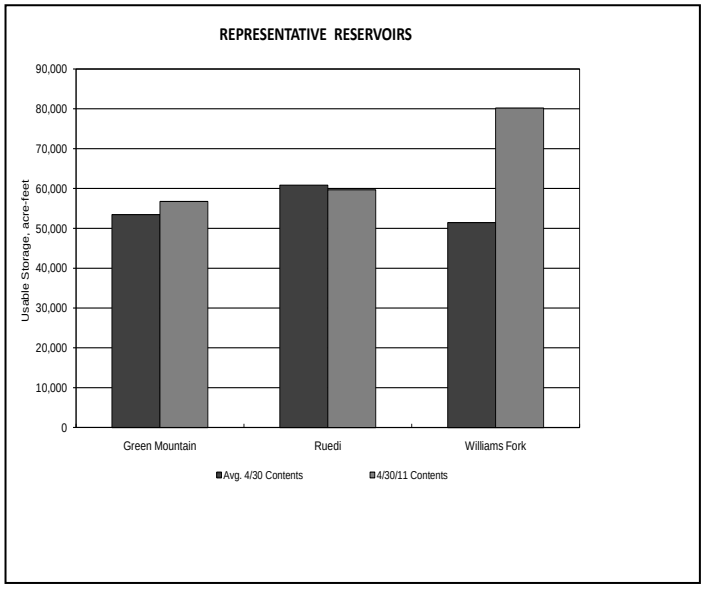
The situation as it currently stands, presents a high probability for record Colorado River flows. The potential for localized flooding is high, but obviously depends on the rate and magnitude of temperature increases as spring progresses.

High runoff forecasts have rafters and kayakers anticipating a very good season.

It was an excellent ski season this year with snowfall far exceeding averages and/or breaking records as of April 21stat most resorts in division 5. Breckenridge far surpassed its 10-year average of 347 inches with 507 inches, as did Copper Mountain with nearly 100 inches more than its 10-year average of 281 inches. Keystone also far exceeded its 10-year average of 208 inches with 331 inches. Arapahoe Basin ended up only slightly above its 10-year average of 350 inches with 367 inches.

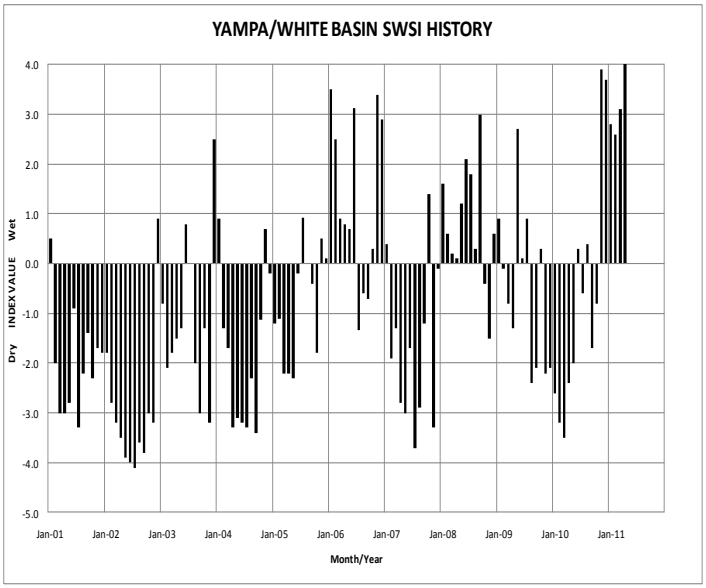


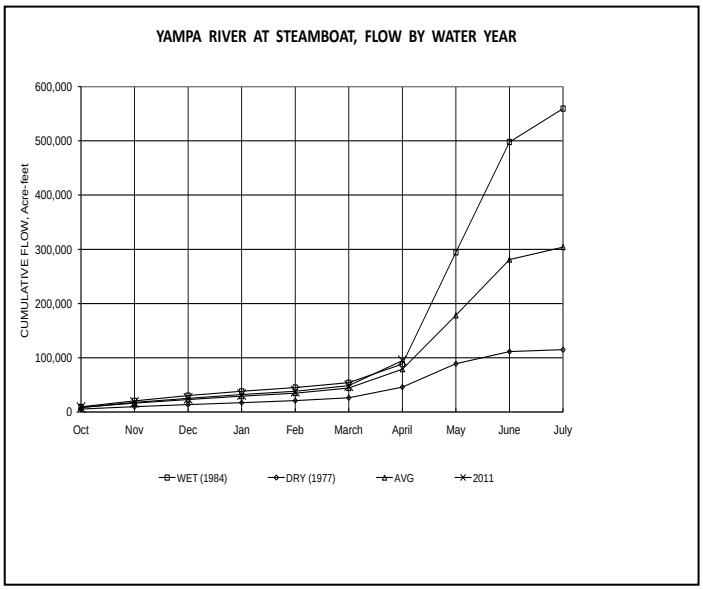




Basinwide Conditions Assessment

The SWSI value for the month was +4.1. Flow at the gaging station Yampa River at Steamboat was 777 cfs, as compared to the long-term average of 583 cfs. April precipitation was well above the monthly 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 approximately 188% 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 April is 140%. The SWE for the water year to date on April 30th was 164% of average for the North Platte River basin and 163% of average for the Yampa and White River basins. The highest snow depth and snow water equivalent ever recorded in the state of Colorado was measured in early May at a SNOTEL site just northeast of Steamboat Springs. As of May 1st, NRCS predicts well above average spring and summer streamflows in the Yampa, White, and North Platte River basins. The latest runoff forecasts from the NRCS for the May through July period are 220% of average for the North Platte River near Northgate, 202% of average for the Yampa River near Maybell, 226% of average for the Little Snake River near Lily, and 154% of average for the White River near Meeker. Local and State officials are preparing for potential flooding conditions given the high runoff forecast for the North Platte, Yampa, and White River basins. All of the Division 6 stream gages were opened during April. Steamboat Lake and Pearl Lake will become operational once there is open water near the gaging equipment. Currently both lakes remain frozen with several inches of ice and also substantial snow cover.





Outlook

As of April 30th Fish Creek Reservoir was storing 2,779 AF, 66.7% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Water stored in Yamcolo Reservoir increased during April to 9,329 AF. That volume represents 97% of Yamcolo Reservoir's capacity. On April 30th Elkhead Creek Reservoir was storing 22,371 AF. Elkhead storage volume increased from the end of March and represents 90% of capacity. Elkhead is currently releasing with all gates 100% open. The reservoir is expected to spill in early May. At the end of April, Stagecoach Reservoir was storing approximately 27,800 AF which is 76% of the capacity of 36,460 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. However, water is rarely released for those purposes.

Public Use Impacts

Steamboat Ski Resort closed for the season on April 10th. Snowfall for the ski season totaled 435 inches as measured at mid-mountain. As of May 1st the entire mountain remained covered by snow with the exception of the lower base area. Stagecoach Reservoir became ice free on May 3rd. Shore fishing and tailwater fishing is reported as good. Steamboat Lake remains completely covered by snow and ice with most park roads unplowed. However the inlets are ice free and offering good fishing opportunities.

Basinwide Conditions Assessment

The SWSI value for the month was +0.5. The Natural Resources Conservation Service reports that May 1 snowpack is 95% of normal. Flow at the Animas River at Durango averaged 663 cfs (79% of average). The flow at the Dolores River at Dolores averaged 534 cfs (71% of average). The La Plata River at Hesperus averaged 64 cfs (64% of average).

Precipitation in Durango was 1.12 inches for the month, 81% of the 30-year average of 1.38 inches. Precipitation to date in Durango, for the water year, is 8.54 inches, 75% of the 30-year average of 11.40 inches. The average high and low temperatures for the month of March in Durango were 64^{o} and 28^{o}. In comparison, the 30-year average high and low for the month is 62^{o} and 31^{o}.

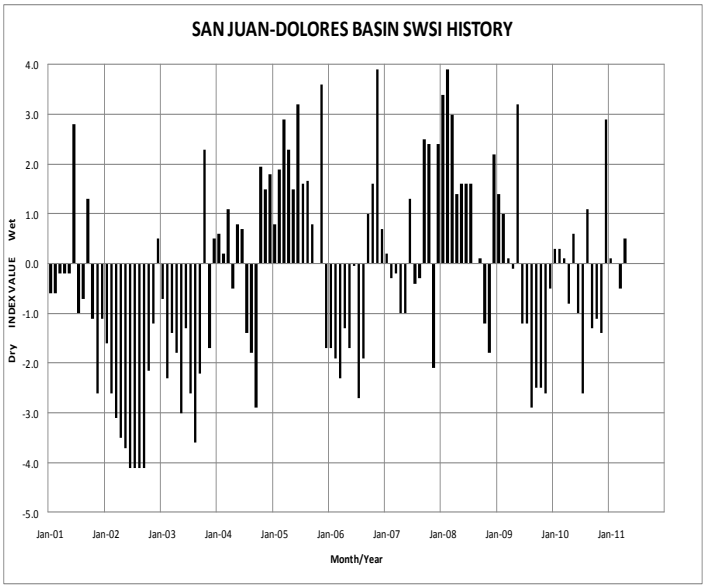
At the end of the month Vallecito Reservoir contained 94,680 acre-feet compared to its average content of 63,705 acre-feet (149% of average). McPhee Reservoir was up to 317,819 acre-feet compared to its average content of 298,098 (107% of average), while Lemon Reservoir was up to 18,750 acre-feet as compared to its average content of 22,454 acre-feet (84% of average).

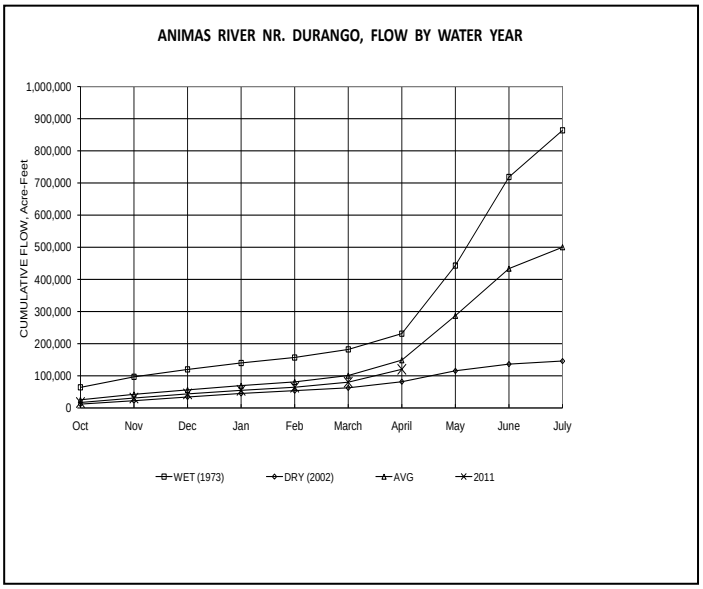
Outlook

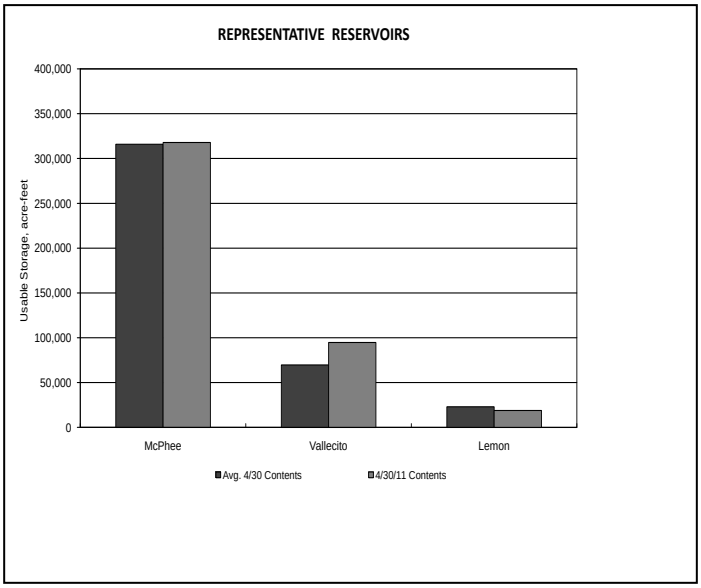
Precipitation (1.12-inches) was near average for April in Durango. There are 60 years out of 117 years of record where there was more precipitation than this year. On April 30th the NRCS SNOTEL sites estimated 97% snow-water equivalent within the basin which is slightly higher than last month 91% of average.

Administrative/Management Concerns

Lower than normal temperatures kept base flow in the rivers below average within the basin. The LaPlata River compact call started on April 7, 2011.







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