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
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May 1999

Significant precipitation across the entire state during the second half of April greatly improved the outlook for the spring/summer runoff. On April 1 the only basin with a positive SWSI value was the South Platte basin, and a tight water year was expected. The only basin with a May 1 SWSI value below zero is the Yampa/White basin. It now appears that this year's water supply will be near normal.

At the end of April, the Natural Resources Conservation Service reported that the statewide snowpack averaged 91% of normal. The increase from 65% of normal at the end of March over one month is unusually large, and a great relief to water users, especially the agricultural community. End of April reservoir storage is also good, at a statewide average of approximately 125% of normal.

Runoff typically begins in May, with high flows continuing through June. The exact timing of the peak flows, and how long high flows will extend into summer, depend on weather conditions. Higher temperatures and rain falling on the snowpack would both increase the rate of snow melt. Precipitation would also add to the river flows.

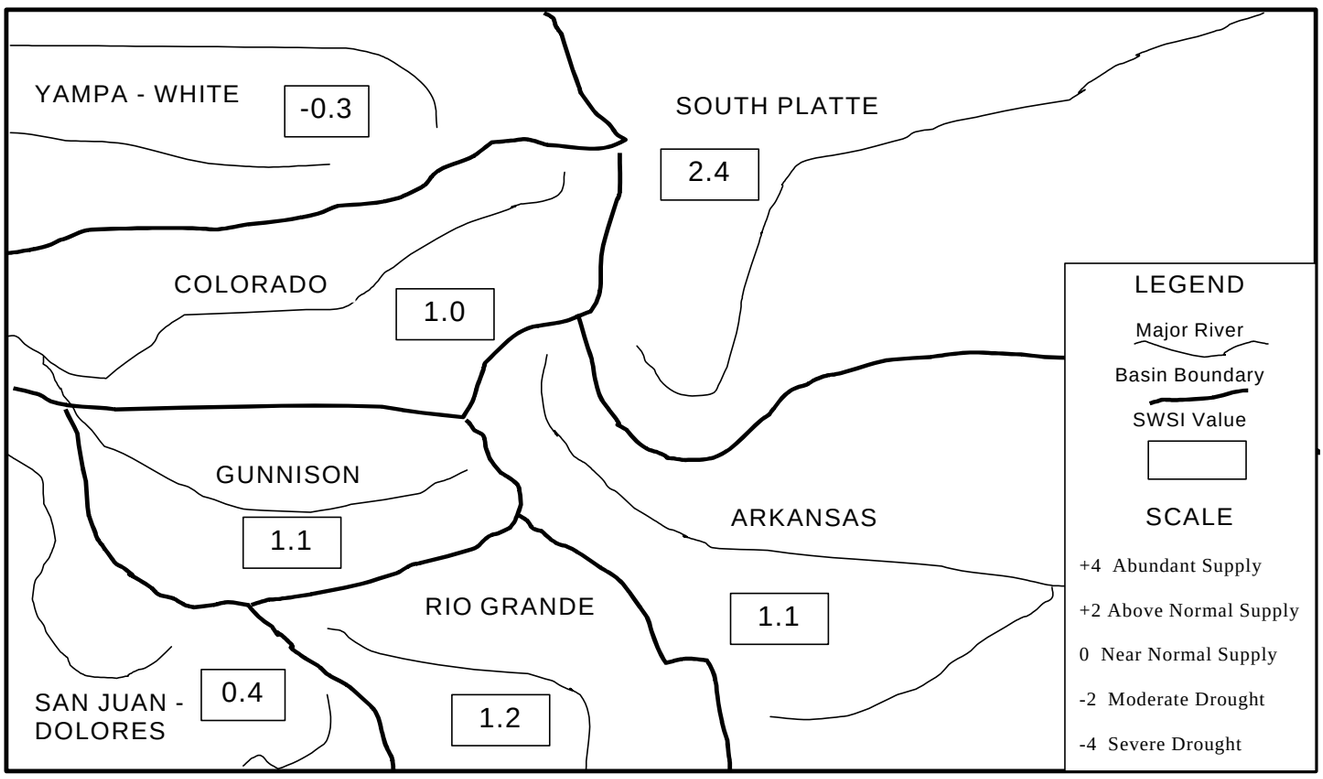
The Surface Water Supply Index (SWSI) developed by this office and the U.S.D.A. Natural Resources Conservation Service is used as an indicator of mountain based water supply conditions in the major river basins of the state. It is based on snowpack, reservoir storage, and precipitation for the winter period (November through April). 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 following SWSI values were computed for each of the seven major basins for May 1, 1999, and reflect the conditions during the month of April.

Basin	May 1, 1999 SWSI Value	Change From Previous Month	Change From Previous Year
South Platte	2.4	+2.0	+0.2
Arkansas	1.1	+2.2	+1.0
Rio Grande	1.2	+2.8	-0.5
Gunnison	1.1	+2.3	-0.9
Colorado	1.0	+1.7	+0.9
Yampa/White	-0.3	+2.4	+1.3
San Juan/Dolores	0.4	+2.0	+0.3

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, 1999

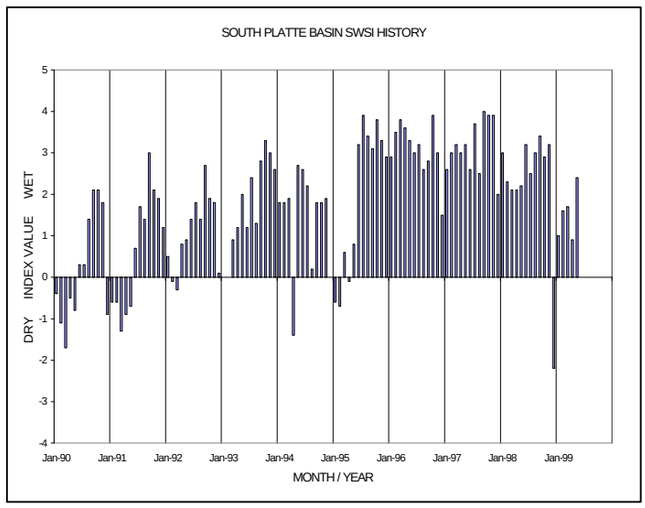
Basinwide Conditions Assessment

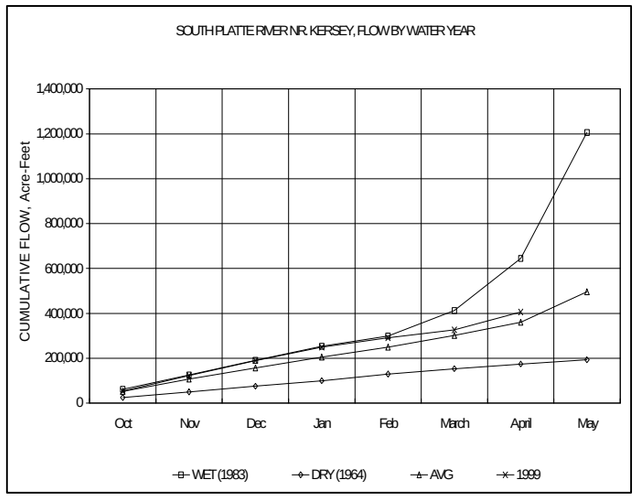
The SWSI value of 2.4 indicates that for April the basin water supplies were above normal. Reservoir storage, the major component in this basin in computing the SWSI value, was 98% of normal as of the end of April. Storage in the major plains reservoirs: Julesburg, North Sterling, and Prewitt, increased by 6,970 acre-feet during April and is at 98% of capacity. Storage in the major upper-basin reservoirs: Cheesman, Eleven Mile, Spinney, and Antero, increased by 10,851 acre-feet and is at 86% of capacity. The Natural Resources Conservation Service reports that May 1 snowpack is 114% of normal. Flow at the gaging station South Platte River near Kersey was 1,326 cfs, as compared to the long-term average of 1,079 cfs. Flow at the Colorado/Nebraska state line averaged 279 cfs.

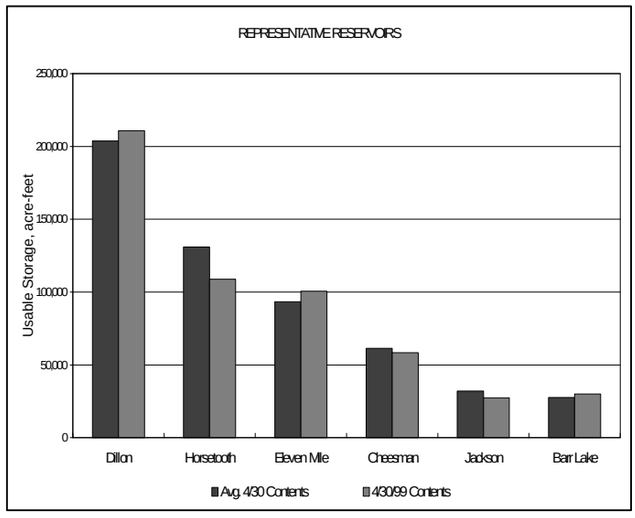
April turned out to be a very transitional month for the water supply outlook in the South Platte basin. The first half of April continued very dry with snowpack falling well below average throughout the basin. Low snowpack and the dry conditions created concern that this year would be a below average water year and that users who normally have a supply would have to be curtailed. Beginning the last week of April, there were major storms that provided large amounts of rainfall on the plains and significant snowfall in the mountains. The precipitation continued for several days, leaving above average snowpack levels throughout the basin, and raising stream flow to flood stage in the South Platte down stream of its confluence with the Big Thompson River. The South Platte crested at over 22,500 cfs at the Kersey gage. Flooding also occurred along parts of the Poudre and the Big Thompson rivers. The flooding damaged parts of Greeley, Fort Collins, and Loveland, flooding low level farm structures and ground adjacent to the rivers.

Outlook

The precipitation toward the end of April increased both snowpack and bank storage along all rivers. This bank storage will help to maintain flows this summer. The snowpack, riverbank storage, and existing reservoir storage has removed significant concern that there will be shortages caused by well below-average stream flows in the basin







Basinwide Conditions Assessment

The SWSI value of 1.1 indicates that for April the basin water supplies were near normal. The Natural Resources Conservation Service reports that May 1 snowpack is 98% of normal. Flow at the gaging station Arkansas River near Portland was 475 cfs, as compared to the long-term average of 439 cfs. Storage in Turquoise, Twin Lakes, Pueblo, and John Martin reservoirs totaled 185% of normal as of the end of April.

A large area wide rain and snow storm dropped up to eight inches of precipitation in areas of the basin over a four day period at the end of April. The ensuing runoff filled the conservation storage capacity in both John Martin and Pueblo Reservoirs. The conservation capacity of Trinidad Reservoir is also filling and currently is half full, and it is projected to completely fill later during the season.

Outlook

The filling of reservoirs, combined with the 30% increase in snowpack as a percent of average during April, have upgraded the water supply situation to above average in the Arkansas Basin.

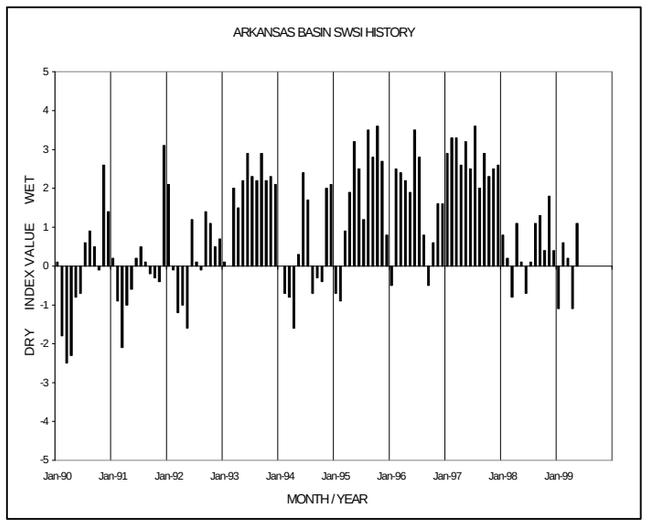
Administrative/Management Concerns

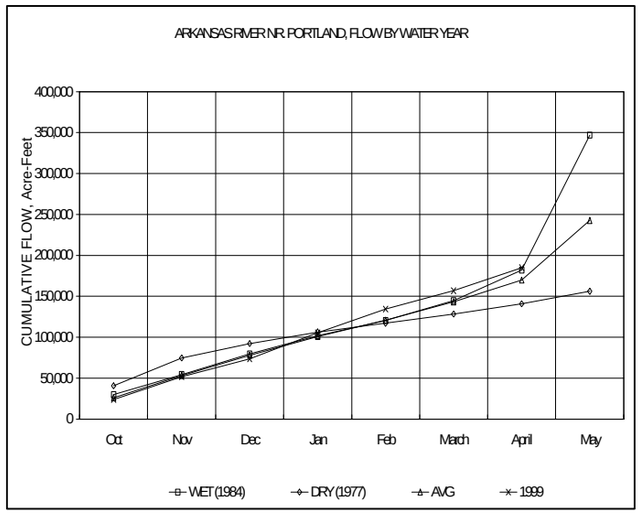
The river call on the main stem of the Arkansas should remain at the relatively junior date through the upcoming runoff and into July. This should allow for more than adequate water supplies for water users not on the smaller tributary streams.

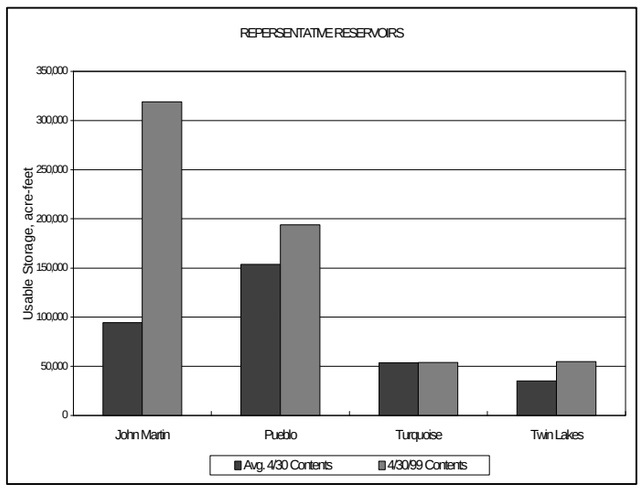
Public Use Impacts

The recent storm caused upwards of $40,000,000 of damage to public and private property. The Fountain Creek basin experienced damages to the cities of Manitou Springs and Colorado Springs, loss of farmland and bridges, and the destruction of all but one diversion structure on the lower portion of the creek. Although the Arkansas mainstem was detained in Pueblo Reservoir, Fountain Creek and other tributary waters caused flooding in the Avondale, Rocky Ford, and LaJunta areas. A dike protecting North LaJunta failed and 280 homes were inundated with up to eight feet of water. Several of the larger canal diversion works, and the canals themselves, were damaged. Fortunately, no known deaths occurred.

Close contact between public safety officials, the Corps of Engineers, and the Bureau of Reclamation was maintained. The Corps of Engineers continues to closely monitor the flood pool operations at John Martin Reservoir, as close to half of the flood pool in the reservoir has been filled.



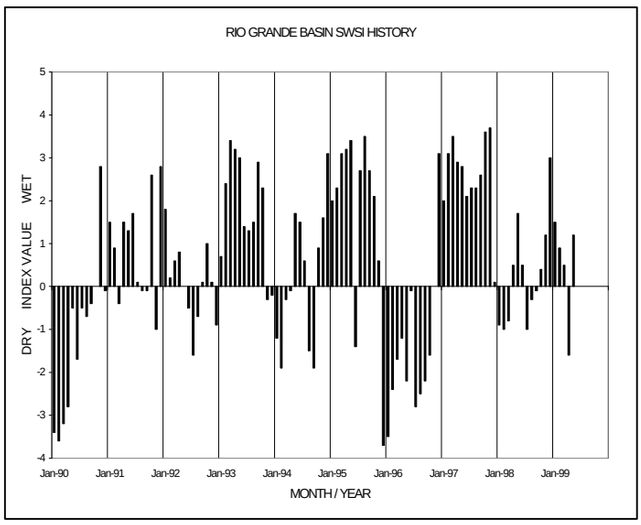




Basinwide Conditions Assessment

The SWSI value of 1.2 indicates that for April the basin water supplies were near normal. The Natural Resources Conservation Service reports that May 1 snowpack is 87% of normal. Flow at the gaging station Rio Grande near Del Norte was 704 cfs, as compared to the long-term average of 665 cfs. The Conejos River near Mogote had a mean flow of 189 cfs (59% of normal). Flow to the state line was only 22% of normal as upstream diversions for irrigation needs continued. Storage in Platoro, Rio Grande, and Santa Maria reservoirs totaled 110% of normal as of the end of April.

Alamosa received well above average precipitation, totaling 1.15 inches during April, 0.66 inches above normal. Temperatures ranged from 3° to 70° during a very windy month that had a maximum wind speed of 75 mph. This wind exceeded any peak wind velocity in Alamosa in the past 30 years, and slowed vehicular traffic to a crawl as "brow out" conditions existed.

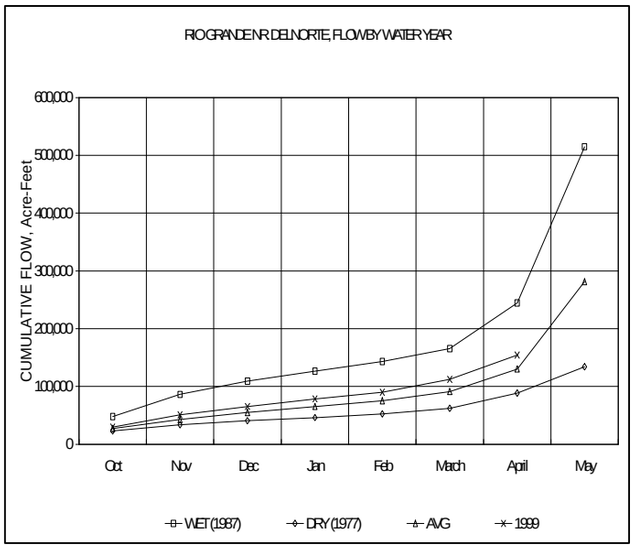


Outlook

NRCS forecasts are now predicting runoff to be 109% of average on the Rio Grande near Del Norte, and 100% for the Conejos near Mogote. This is a major increase from last month when the runoff predictions were 74% for the Rio Grande and 67% for the Conejos. The past 30 days of cool temperatures and generous amounts of snowfall created one of the most amazing turn arounds in many years. Water administrators were planning for mild drought just weeks ago.

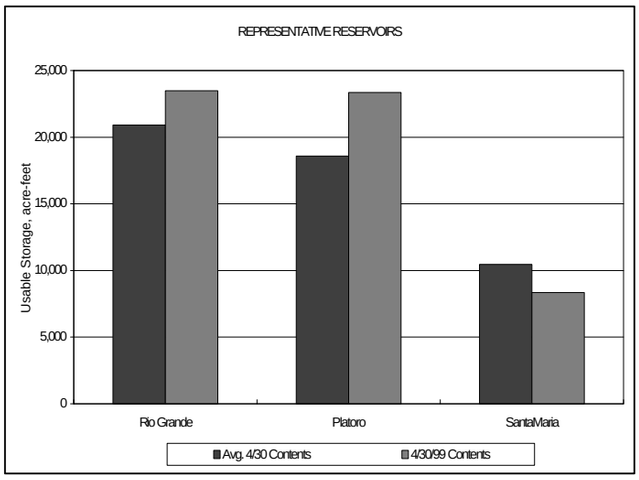
Several examples of the huge increase in NRCS projected runoff include:

	April 1 Forecast	May 1 Forecast
Saguache Creek	59%	100%
La Jara Creek	66%	105%
Trinchera Creek	53%	83%
Costilla Creek	46%	86%



Administrative/Management Concerns

Water rights were not being curtailed on the Rio Grande or Conejos River during April. However, the increase in the forecasted runoff has forced administrators to impose diversion curtailments on both rivers beginning in May in order to meet Colorado's water delivery obligation to the state line.

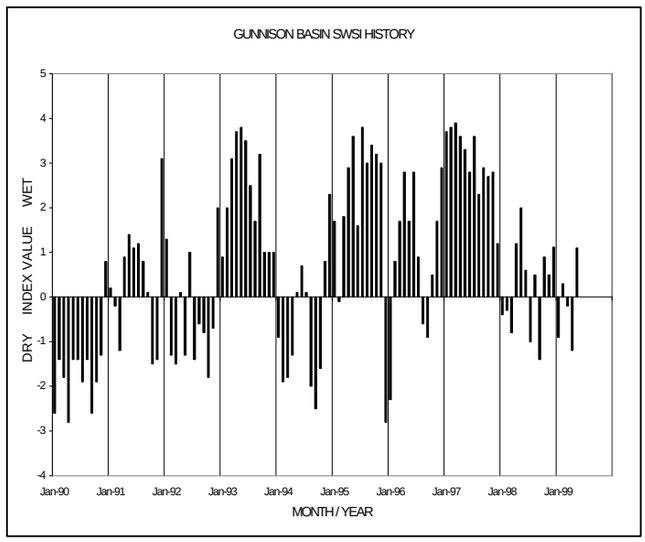


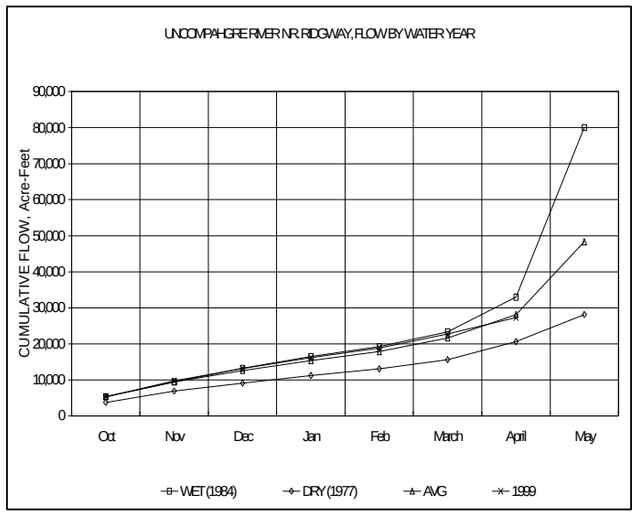
Public Use Impacts

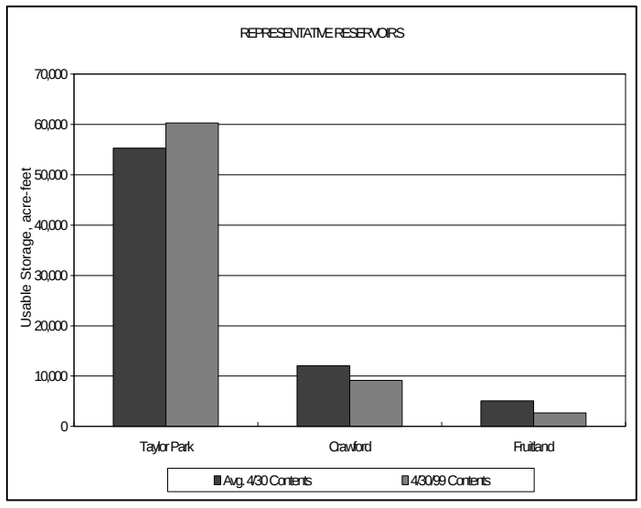
Mild weather conditions between the first and last weekends of April allowed many farmers to begin working in the fields. Cool temperatures kept stream flow at pre-runoff levels.

Basinwide Conditions Assessment

The SWSI value of 1.1 indicates that for April the basin water supplies were near normal. The Natural Resources Conservation Service reports that May 1 snowpack is 88% of normal. Flow at the gaging station Uncompahgre River near Ridgway was 77 cfs, as compared to the long-term average of 109 cfs. Storage in Taylor Park, Crawford, and Fruitland reservoirs totaled 100% of normal as of the end of April.







Basinwide Conditions Assessment

The SWSI value of 1.0 indicates that for April the basin water supplies were near normal. The Natural Resources Conservation Service reports that May 1 snowpack is 91% of normal. Flow at the gaging station Colorado River near Dotsero was 1,299 cfs, as compared to the long-term average of 1,818 cfs. Storage in Green Mountain, Ruedi, and Williams Fork reservoirs totaled 129% of normal as of the end of April.

Outlook

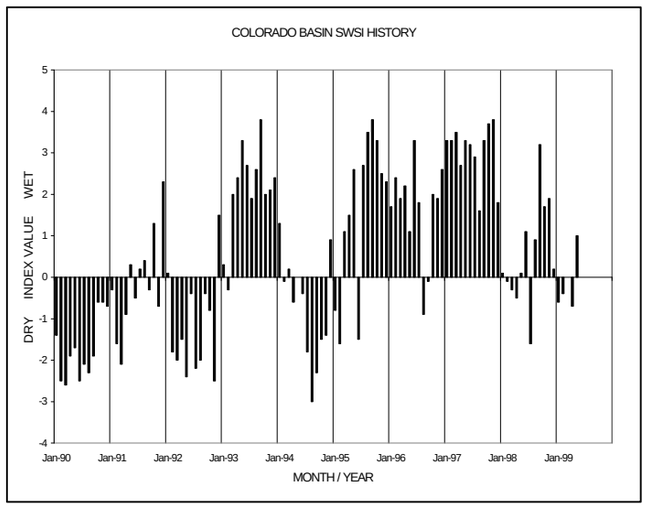
The numerous snow storms at higher elevations in late April and early May greatly improved the basin wide snow water equivalent from mid-April's 78% of average value to the 91% May 1st value.

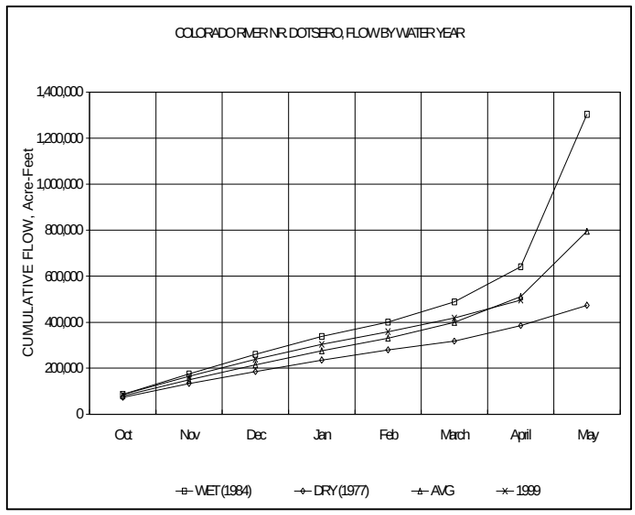
Administrative/Management Concerns

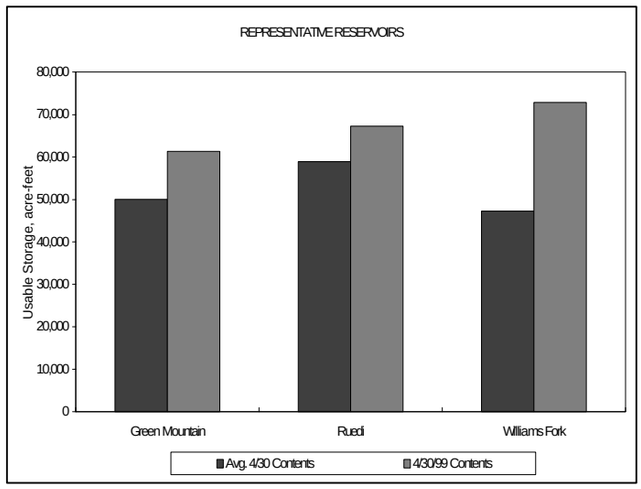
Continuous rains at the lower elevations took the calls off both the Colorado mainstem and side tributaries, easing administration to urban and rural irrigators.

Public Use Impacts

Fishing has been highlighted prior to this year's runoff. The caddis fly hatch had a brief visit on the Colorado River below Glenwood Springs before the snow storms moved in.







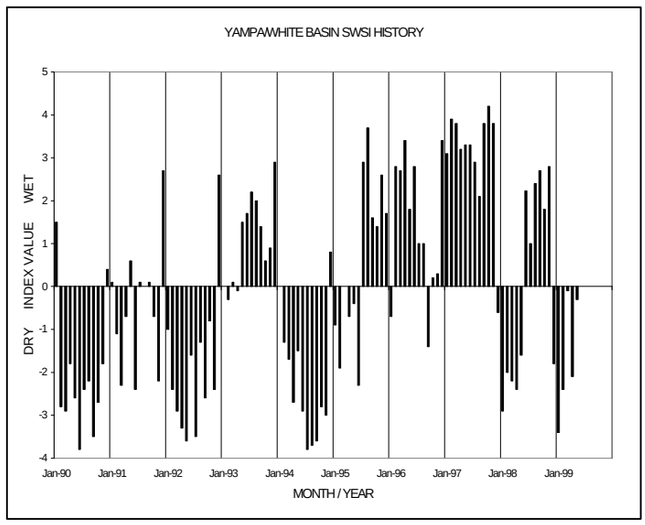
Basinwide Conditions Assessment

The SWSI value of –0.3 indicates that for April the basin water supplies were near normal. The Natural Resources Conservation Service reports that May 1 snowpack is 92% of normal. Flow at the gaging station Yampa River at Steamboat was 476 cfs, as compared to the long-term average of 598 cfs.

April was an extremely wet month throughout the Yampa River basin. The Steamboat Springs weather observer reports a total of 2.33 inches of precipitation for the month, which is 107% of average. In Hayden, April precipitation 2.8 inches, or 189% of average. Temperatures for April were below normal for this time of year.

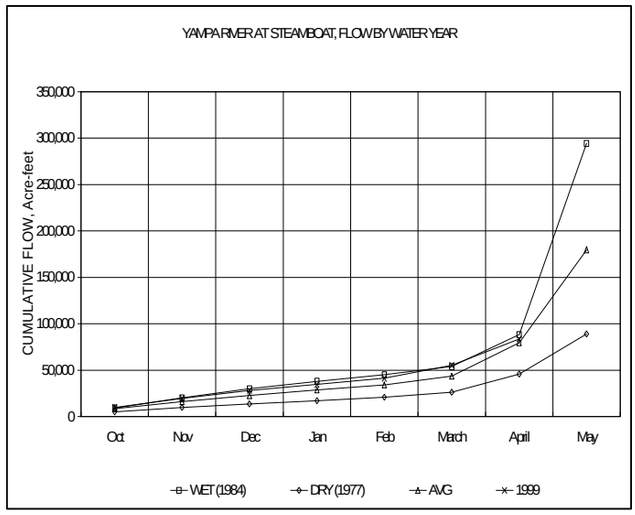
Above average snowfall in April coupled with below average temperatures resulted in a noticeable increase in snowpack basin wide. Along with the snow fall at higher elevations, rain added much needed moisture to the soil at lower elevations.

Reservoirs throughout the basin are at or near full storage.



Outlook

Stream flows are expected to be near average for this time of year. Snow melt has decreased due to the cooler temperatures, resulting in lower stream flows. As temperature moderated, stream flows should return to normal levels.



Administrative/Management Concerns

Cool temperatures have delayed the normal start of irrigation in several parts of the basin. As warmer temperatures return, there may be early season administration on some stream systems until the snowmelt exceeds the demand for water.

Public Use Impacts

Most streams and rivers are open at the lower elevation. Stream flows have fluctuated greatly throughout April, depending on weather conditions. Many of the reservoirs at higher elevations are still ice covered.

Basinwide Conditions Assessment

The SWSI value of 0.4 indicates that for April the basin water supplies were near normal. The Natural Resources Conservation Service reports that May 1 snowpack is 74% of normal. Flow at the gaging station Animas River near Durango was 647 cfs, as compared to the long-term average of 786 cfs. Storage in McPhee, Vallecito, and Lemon reservoirs totaled 110% of normal as of the end of April.

The month of April brought dramatic change to the water supply conditions in southwestern Colorado. The snowpack was augmented by significant precipitation during the first week of the month. Temperatures remained cool. High winds were common. Beginning April 21 there was a string of 8 out of 10 days where Durango received measurable precipitation, culminating with 0.84 inches on the 30th. Durango received its fourth wettest snow in 105 years, and had a record snow total for April of 20.4 inches, containing 3.92 inches of water.

The effect was to raise the snowpack and bring fresh snow to areas that were previously dry. The Mancos and La Plata snow courses measured about the same as the beginning of April. Since they are at a lower elevation this indicates a new supply of additional runoff in May.

River flow began to increase, but cool temperatures moderated the flow. River flows varied but were generally well below normal. The Dolores River at Dolores reached 1,140 cfs on the 29th.

Carryover storage in the reservoirs remained high. Lemon Reservoir was only exception, but it managed to gain to over half full by the end of April

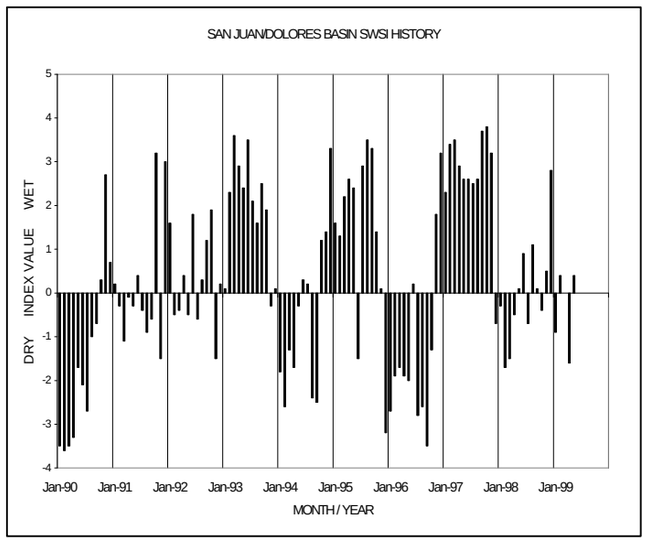
Soil moisture across the basin was very high, and grass hay began a promising season.

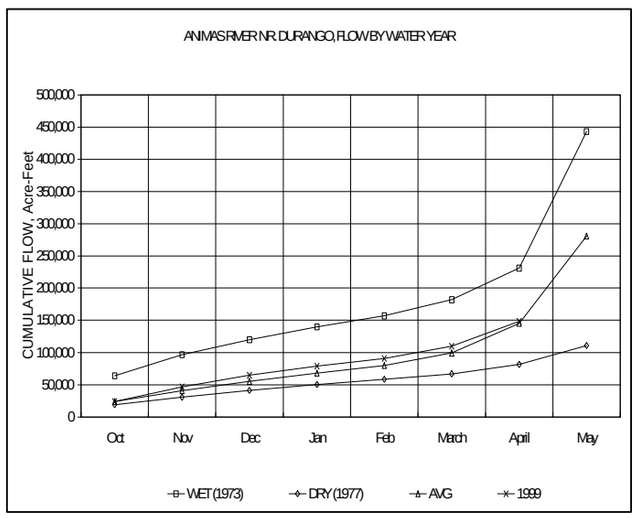
Outlook

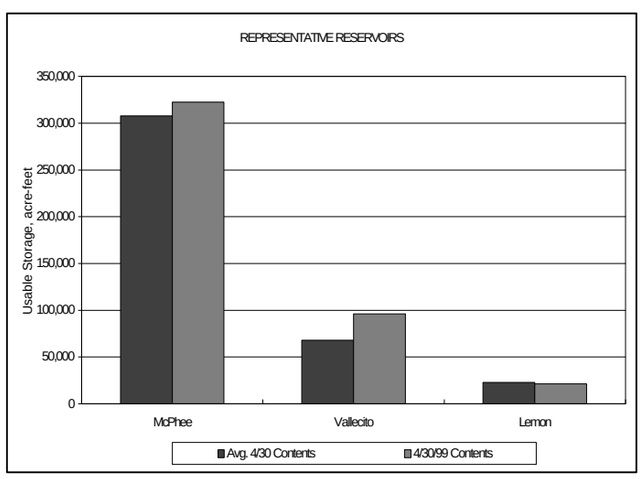
It appears that earlier predictions that reservoirs would not fill this year will be revised.

Administrative/Management Concerns

The La Plata Compact was administered to meet the New Mexico demands. Reservoir releases had not been adjusted because irrigators were waiting to allow reservoirs to maximize their fills.







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