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Agriculture

**Natural  
Resources  
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Service**

# Colorado Basin Outlook Report MARCH 1, 2003



# Basin Outlook Reports and Federal - State - Private Cooperative Snow Surveys

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## *How forecasts are made*

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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# COLORADO WATER SUPPLY OUTLOOK REPORT MARCH 1, 2003

## Summary

February's weather patterns brought a welcome relief to the series of dry months that have gripped the state since last fall. A steady series of storms brought significant snowfall to all areas of the state during the month, improving snowpack percentages in all basins. While the improved snowpack percentages are encouraging, the state continues to face water shortages for the remainder of this year. Reservoir storage continues to track well below average as a reminder of last year's drought conditions. Runoff forecasts, while improved from a month ago, remain below average across most of the state. The below average runoff expected in 2003 will not substantially improve reservoir storage volumes this year.

## Snowpack

February brought a welcome return to winter to Colorado. Snowfall was above average across the state during the month, especially during the last week of the month, with a series of storms, which added nearly an inch of water content to the snowpack in each storm. By the end of the month, the statewide snowpack had increased to 83% of average, which is a sizable increase from last month's 71% of average. Also, by month's end all basins were reporting more snowpack water equivalent than at anytime last year. In comparison to last year, the current snowpack is 148% of last year's March 1 snowpack. The basins reporting the largest improvement during the month include the South Platte and Arkansas basins, which increased by 16% and 15% of average, respectively. For the first time since December, there are basins reporting snowpack percentages in excess of 90% of average. Those basins, with the highest snowpack percentages, include the Colorado River Basin at 93% of average, and the Yampa and White basins, at 90% of average. Although the snowpack improved by 7% of average in the Rio Grande Basin, it remains the lowest in the state at 73% of average. While February's improvements were certainly welcome, the state will need to receive an even wetter March in order to reach an average snowpack by April 1. Snowfall would need to approach 150% of average during the month. Statistically, the state has only a 22% chance of receiving this amount or greater snowfall. With these odds, it's advisable for the state's water users to prepare for another year of below normal water supplies.

## Precipitation

Precipitation measured at Colorado's SNOTEL sites was above average for February. Statewide, precipitation was 121% of average, breaking a three-month streak of below average precipitation for the state. Monthly totals were above average in all of the state's major basins. Those basins reporting the highest percentages for the month include the Arkansas, at 139% of average, and the South Platte, at 130% of average. In the remaining basins, totals for the month range from 115% to 117% of average. With a return to above average precipitation, the state's water year totals finally saw improvements. While all consistently below average, all basins range from 82% to 89% of average for the five months in the 2003 water year. Statewide, water year precipitation totals improved from 78% of average on February 1, to 87% of average on March 1.

## Reservoir Storage

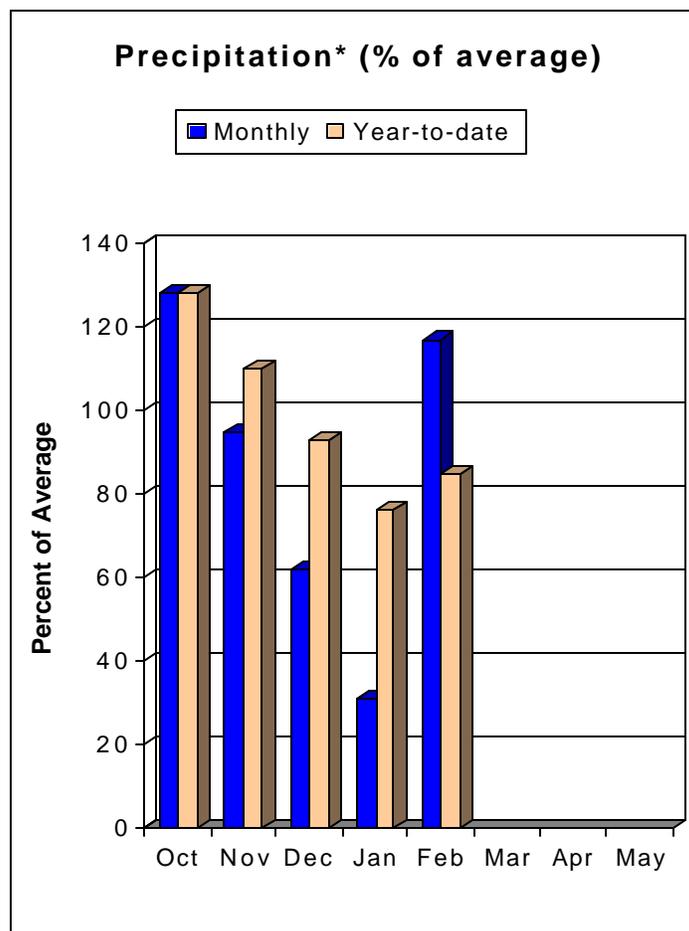
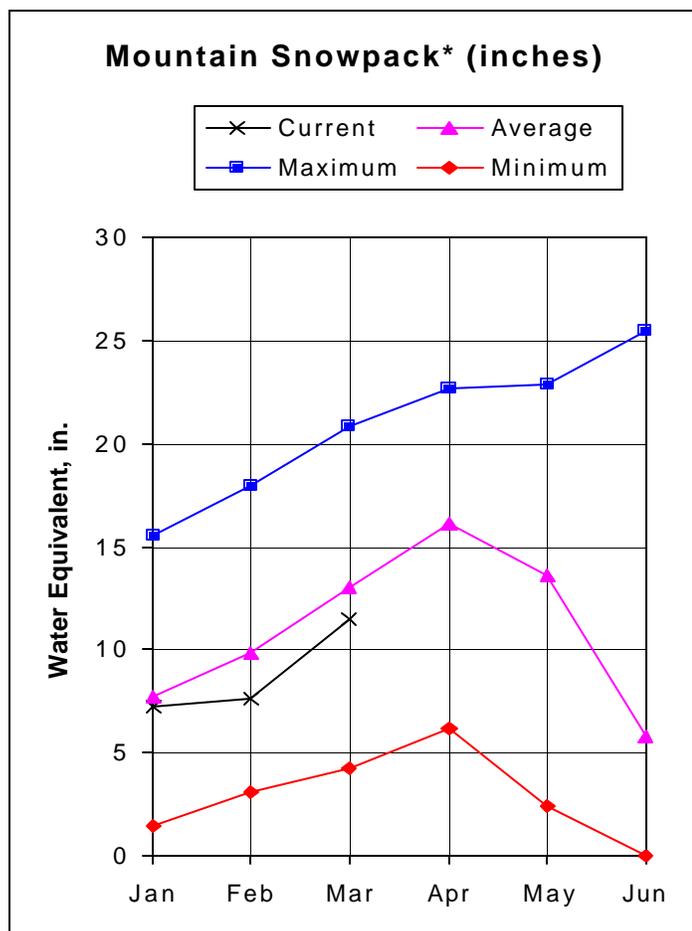
Reservoir storage saw little improvement during February. Storage volumes continue to track well below average in all basins this month, with little to no significant increases in storage. Storage volumes are the lowest, as a percent of average, in the Colorado Basin. These volumes are only 36% of average and are 42% of last year's storage. In terms of volume, this basin is also reporting the greatest deficit of any of the state's basins, with 476,000 acre-feet below the average mark for this time of year. The basin with the best storage, as a percent of average is the Yampa, with 92% of average storage. However, with only two reservoirs, with a total capacity of 42,000 acre-feet, this basin's high storage figures are relatively insignificant in comparison to the remainder of the state. Statewide, reservoir storage is now 54% of average and is only 61% of last year's storage on this date. The state's current storage is 1.57 million acre-feet below average.

## Streamflow

Even with the additional snowfall during February, Colorado can continue to expect below normal water supplies and runoff this spring and summer. The latest runoff forecasts call for below average volumes at all forecast points. The state's best case scenario is in the headwaters of the Colorado River, where forecasts range from 80% to 86% of average. Forecasted runoff, as a percent of average, tends to decrease towards southern Colorado, where many forecasts remain around 60% of average. All of these forecasts assume near average weather patterns for the remainder of the forecast period. Should the state receive below or above average precipitation in the coming months, these forecasts will be adjusted downward or upward accordingly. Given these well below average forecasts for most of the state, water users should anticipate shortages throughout the remainder of the year. While improvements to these forecasts can occur yet this spring, reaching even an average runoff remains highly unlikely this year.

# GUNNISON RIVER BASIN

## as of March 1, 2003



\*Based on selected stations

Snowfall in the Gunnison Basin during February has helped to improve the snowpack measurements from 74% of average on February 1, to 85% of average on March 1. Although this improvement is a far cry from the amount needed to significantly reduce the impacts of the recent water supply shortages, it does greatly improve the chances that the snow measurements could reach near average amounts before the meltout begins. The entire basin has benefited from the February snows, making the measurements unusually uniform, only ranging from 85% to 86% of average throughout the basin. Precipitation during February was 117% of average, which is the first time since October the monthly amount was above average. The water year total is now 85% of average. Reservoirs in the basin remain very low at the end of February at only 74% of average. There is only 67% of the amount there was last year at this time. Streamflow forecasts have improved from last month, but remain well below average at all of the forecast points. They range from only 63% of average on the Uncompahgre River at Colona, to 77% of average on the North Fork Gunnison near Somerset.

GUNNISON RIVER BASIN  
Streamflow Forecasts - March 1, 2003

Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>					30-Yr Avg. (1000AF)	
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)		10% (1000AF)
Taylor River blw Taylor Park Resv	APR-JUL	43	63	77	75	91	111	103
Slate River nr Crested Butte	APR-JUL	44	56	65	73	74	86	89
East River at Almont	APR-JUL	90	123	145	76	167	202	192
Gunnison River nr Gunnison	APR-JUL	152	220	270	69	320	390	390
Tomichi Creek at Sargents	APR-JUL	6.8	16.0	22	69	28	37	32
Cochetopa Creek blw Rock Creek	APR-JUL	2.7	7.7	11.0	64	14.3	19.3	17.3
Tomichi Creek at Gunnison	APR-JUL	23	40	55	68	72	101	81
Lake Fork at Gateview	APR-JUL	34	65	86	68	107	138	126
Blue Mesa Reservoir Inflow	APR-JUL	245	410	520	72	630	795	720
Paonia Reservoir Inflow	MAR-JUN	41	60	74	74	90	116	100
	APR-JUL	36	58	76	75	97	132	102
N.F. Gunnison River nr Somerset	APR-JUL	149	198	235	77	275	341	305
Surface Creek nr Cedaredge	APR-JUL	8.0	10.2	12.0	70	14.1	18.0	17.1
Ridgway Reservoir Inflow	APR-JUL	49	62	72	71	84	106	102
Uncompahgre River at Colona	APR-JUL	50	71	87	63	105	135	139
Gunnison River nr Grand Junction	APR-JUL	495	825	1050	67	1280	1610	1560

GUNNISON RIVER BASIN Reservoir Storage (1000 AF) - End of February					GUNNISON RIVER BASIN Watershed Snowpack Analysis - March 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
BLUE MESA	830.0	295.3	522.4	446.5	UPPER GUNNISON BASIN	11	148	85
CRAWFORD	14.3	4.6	3.7	9.2	SURFACE CREEK BASIN	2	161	85
FRUITGROWERS	4.3	1.9	1.9	3.7	UNCOMPAGRE BASIN	4	138	86
FRUITLAND	9.2	0.7	1.3	2.1	TOTAL GUNNISON RIVER BASI	15	145	85
MORROW POINT	121.0	111.0	111.4	113.4				
PAONIA	18.0	5.9	3.0	4.9				
RIDGWAY	83.2	62.4	67.3	60.5				
TAYLOR PARK	106.0	39.7	63.3	65.5				

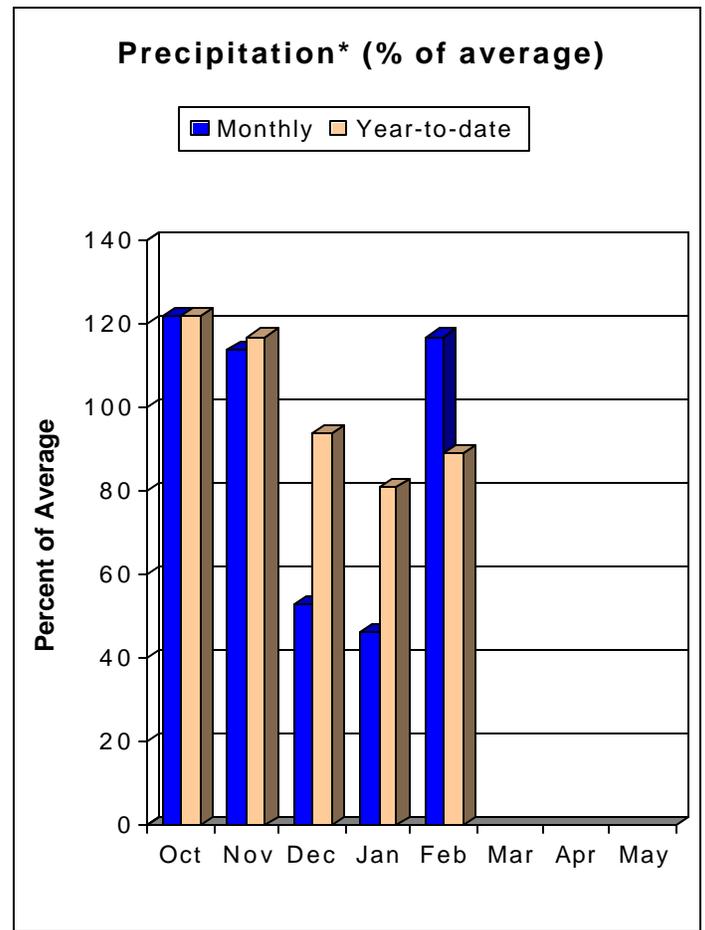
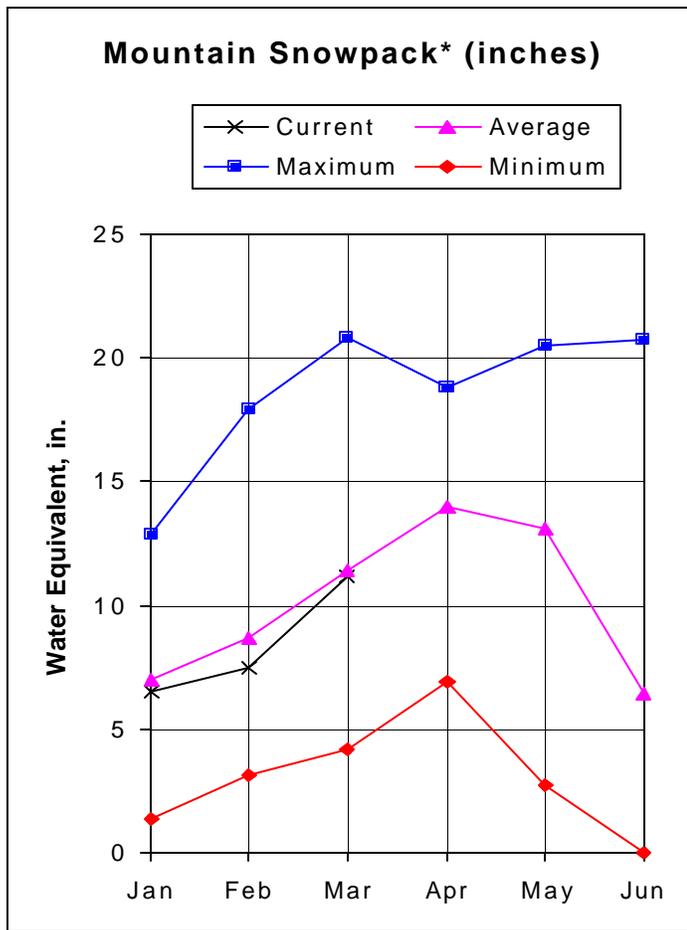
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

# UPPER COLORADO RIVER BASIN

## as of March 1, 2003



\*Based on selected stations

The Colorado Basin received enough additional snowfall during February to boost the measurements from 82% of average on February 1, to 93% of average on March 1. At this point, water users can be cautiously hopeful, that if there is as much accumulation during March as there was in February, there will be above average measurements by April 1. The measurements are variable throughout the basin, ranging from 85% of average in the Plateau Creek Watershed, to 107% of average in the Willow Creek Watershed. There was 117% of average precipitation during February, which was the first month with an above average monthly measurement since November. The water year total is now 89% of average. Reservoirs in the basin remain very low for this time of year at only 36% of average storage for the end of February. All of the stream forecasts have improved from last month, but they are still much below average. Forecasts range from 78% of average on the Roaring Fork at Glenwood Springs, to 86% of average at the inflow to Green Mountain Reservoir.

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UPPER COLORADO RIVER BASIN  
Streamflow Forecasts - March 1, 2003

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Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>					30-Yr Avg. (1000AF)	
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)		10% (1000AF)
Lake Granby Inflow	APR-JUL	132	159	180	80	204	245	225
Willow Creek Reservoir Inflow	APR-JUL	27	35	42	82	49	61	51
Williams Fork Reservoir inflow	APR-JUL	60	72	80	84	89	103	95
Dillon Reservoir Inflow	APR-JUL	86	118	140	84	162	194	167
Green Mountain Reservoir inflow	APR-JUL	189	219	240	86	262	297	280
Muddy Creek blw Wolford Mtn. Resv.	APR-JUL	26	38	48	80	61	88	60
Eagle River blw Gypsum	APR-JUL	187	235	275	82	322	405	335
Colorado River nr Dotsero	APR-JUL	685	990	1200	83	1410	1720	1440
Ruedi Reservoir Inflow	APR-JUL	79	99	115	82	134	168	141
Roaring Fork at Glenwood Springs	APR-JUL	375	475	550	78	630	759	710
Colorado River nr Cameo	APR-JUL	1100	1590	1930	80	2270	2760	2420

UPPER COLORADO RIVER BASIN Reservoir Storage (1000 AF) - End of February					UPPER COLORADO RIVER BASIN Watershed Snowpack Analysis - March 1, 2003				
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of		
		This Year	Last Year	Avg			Last Yr	Average	
DILLON	250.8	126.0	201.0	216.8	BLUE RIVER BASIN	8	132	96	
LAKE GRANBY	465.6	23.6	192.2	281.1	UPPER COLORADO RIVER BASIN	34	137	95	
GREEN MOUNTAIN	139.0	30.9	66.8	70.0	MUDDY CREEK BASIN	4	137	90	
HOMESTAKE	43.0	17.0	28.4	26.6	PLATEAU CREEK BASIN	2	161	85	
RUEDI	102.0	46.3	63.7	68.0	ROARING FORK BASIN	7	129	86	
VEGA	32.0	4.4	9.6	12.2	WILLIAMS FORK BASIN	4	130	97	
WILLIAMS FORK	96.8	7.7	55.2	57.3	WILLOW CREEK BASIN	4	165	107	
WILLOW CREEK	9.0	7.1	8.3	6.7	TOTAL COLORADO RIVER BASIN	43	137	93	

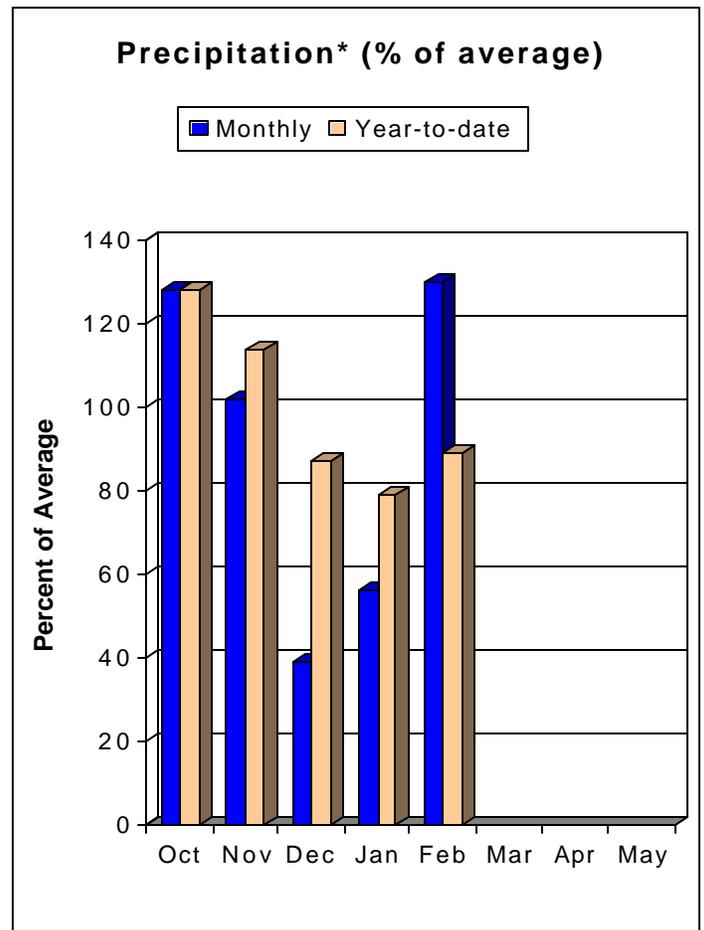
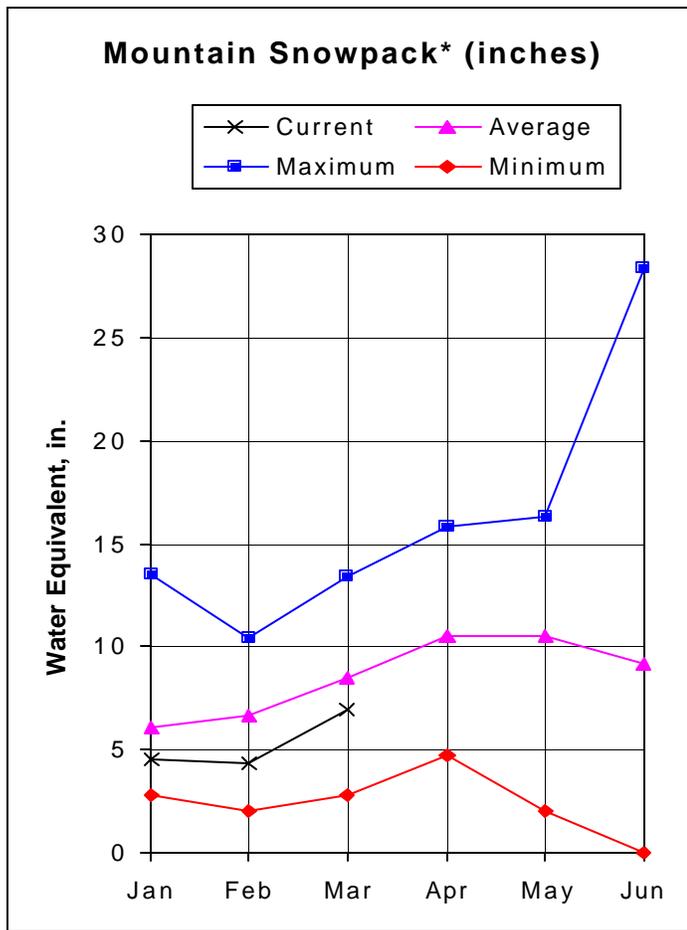
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- 1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- 2) - The value is natural volume - actual volume may be affected by upstream water management.

# SOUTH PLATTE RIVER BASIN

## as of March 1, 2003



\*Based on selected stations

The snowpack measurement in the South Platte Basin has taken a remarkable rebound after dropping to only 63% of average on February 1, the measurements have increased to 79% of average on March 1. If the accumulation during March is as plentiful as during February, snowpack measurements could be near 90% of average by April 1. Measurements are highly variable throughout the basin, ranging from only 70% of average in the Saint Vrain Watershed, to 96% of average in the Clear Creek Watershed. Precipitation during February was the highest monthly measurement this water year, at 130% of average. The water year total is now 89% of average. Reservoirs in the basin remain extremely low for this time of year, at only 54% of average storage. There is only 66% of the amount of storage there was last year at this time. Unfortunately, despite the additional snow during February, the forecasted runoff has not changed significantly from last months'. Forecasts range from only 35% of average at the inflow to Antero Reservoir, to 76% of average on Boulder Creek near Orodell.

SOUTH PLATTE RIVER BASIN  
Streamflow Forecasts - March 1, 2003

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		<<----- Drier ----->>		----- Wetter ----->				
		Chance Of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
Antero Reservoir inflow	APR-JUL	2.4	3.5	4.5	35	5.8	8.3	13.0
Spinney Mountain Reservoir inflow	APR-JUL	15.2	20	25	63	31	41	40
Elevenmile Canyon Reservoir inflow	APR-JUL	9.9	18.3	24	59	30	38	41
Cheesman Lake inflow	APR-JUL	38	47	55	62	64	80	89
South Platte River at South Platte	APR-SEP	75	122	155	67	188	233	230
Bear Creek at Morrison	APR-SEP	10.5	17.3	22	71	27	34	31
Clear Creek at Golden	APR-SEP	48	73	90	67	107	132	134
St. Vrain Creek at Lyons	APR-SEP	33	48	58	69	68	83	84
Boulder Creek nr Orodell	APR-SEP	25	34	40	76	46	55	53
South Boulder Creek nr Eldorado Spri	APR-SEP	13.0	25	34	74	43	55	46
Big Thompson River at mouth nr Drake	APR-SEP	57	74	85	73	96	113	117
Cache La Poudre at Canyon Mouth	APR-SEP	106	159	195	71	230	285	275

SOUTH PLATTE RIVER BASIN  
Reservoir Storage (1000 AF) - End of February

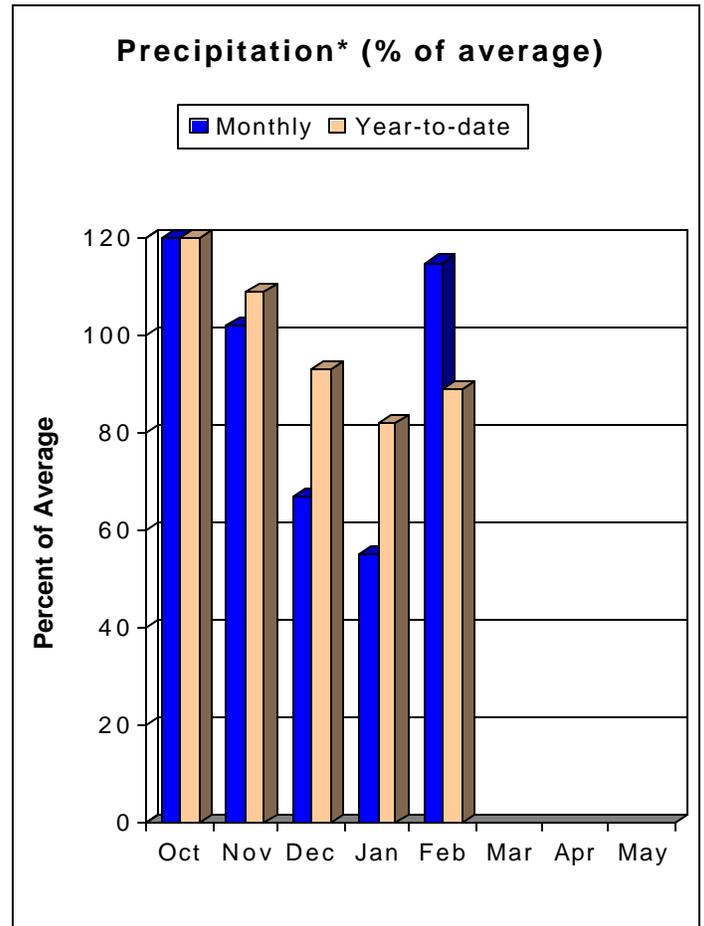
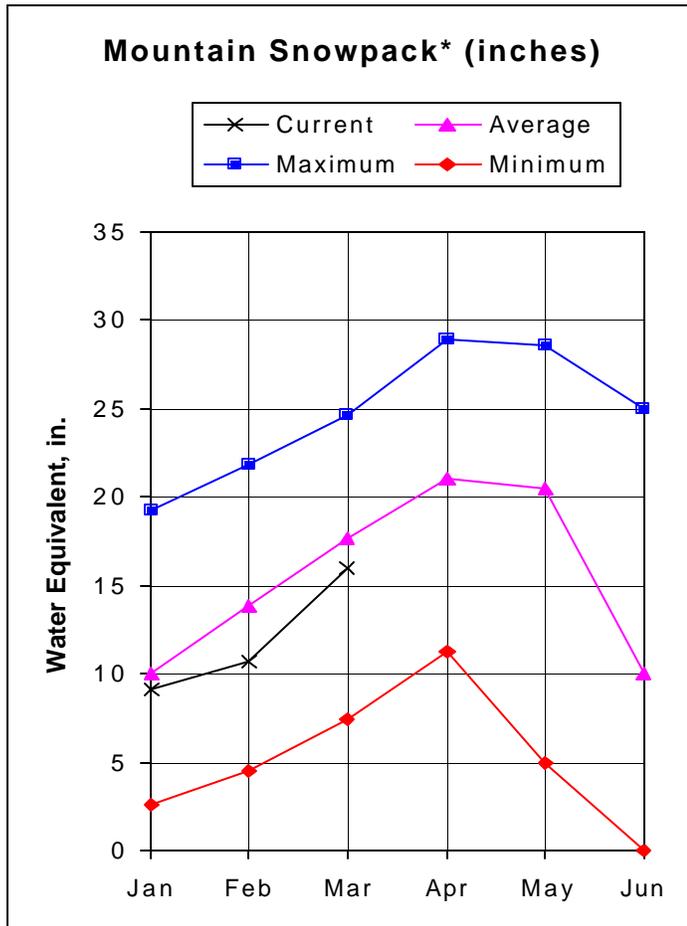
SOUTH PLATTE RIVER BASIN  
Watershed Snowpack Analysis - March 1, 2003

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ANTERO	20.0	0.0	20.0	16.3	BIG THOMPSON BASIN	6	143	81
BARR LAKE	32.0	13.8	25.0	26.0	BOULDER CREEK BASIN	5	165	82
BLACK HOLLOW	8.0	2.1	2.8	3.9	CACHE LA POUFRE BASIN	8	132	80
BOYD LAKE	49.0	6.0	20.4	32.4	CLEAR CREEK BASIN	4	158	96
CACHE LA POUFRE	10.0	2.6	3.6	7.8	SAINT VRAIN BASIN	4	133	70
CARTER	108.9	101.2	93.5	93.4	UPPER SOUTH PLATTE BASIN	15	173	74
CHAMBERS LAKE	9.0	2.0	3.8	3.1	TOTAL SOUTH PLATTE BASIN	41	151	79
CHEESMAN	79.0	46.2	58.0	59.0				
COBB LAKE	34.0	2.5	6.8	13.9				
ELEVEN MILE	97.8	44.5	99.4	95.8				
EMPIRE	38.0	24.0	30.1	25.6				
FOSSIL CREEK	12.0	6.0	8.6	7.4				
GROSS	41.8	15.9	22.9	25.3				
HALLIGAN	6.4	2.8	4.7	4.8				
HORSECREEK	16.0	1.1	12.5	12.5				
HORSETOOTH	149.7	20.4	19.3	109.2				
JACKSON	35.0	23.5	20.5	27.3				
JULESBURG	28.0	16.9	14.6	18.9				
LAKE LOVELAND	14.0	8.1	10.2	8.8				
LONE TREE	9.0	6.6	8.4	6.7				
MARIANO	6.0	0.5	2.3	4.3				
MARSHALL	10.0	3.5	4.8	5.4				
MARSTON	13.0	13.4	9.0	12.9				
MILTON	24.0	3.0	19.3	17.1				
POINT OF ROCKS	70.0	25.0	52.8	65.4				
PREWITT	33.0	5.1	20.2	21.0				
RIVERSIDE	63.1	30.6	47.1	48.9				
SPINNEY MOUNTAIN	48.7	13.2	22.1	32.2				
STANDLEY	42.0	20.7	32.1	33.6				
TERRY LAKE	8.0	1.4	5.1	5.3				
UNION	13.0	6.0	9.5	11.0				
WINDSOR	19.0	0.4	5.5	11.5				

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table. The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

# YAMPA, WHITE, NORTH PLATTE AND LARAMIE RIVER BASINS as of March 1, 2003



\*Based on selected stations

Once again these basins managed to receive some of the largest monthly snowfall amounts in the state. The additional snowfall has improved the overall snowpack measurements in all of the basins, which now range from 66% of average in the Laramie Basin, to 93% of average in the Yampa Basin. If as much new snowfall occurs during March as did during February, the snowpack in many of these basins could reach above average amounts by April 1. There is about 37% more snow this year compared to last year at this time. Precipitation measurements during February were 115% of average, and were the first monthly accumulations to be above average since November. The water year total is now 89% of average. Reservoirs in the basin have 92% of their average storage for this time of year. There is only 89% of last year's storage amount. Streamflow forecasts have all improved from last month, but are well below average for most of the sites. They range from 66% of average on the White River near Meeker, to 88% of average on the Yampa River at Steamboat Springs.

YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS  
Streamflow Forecasts - March 1, 2003

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
North Platte River nr Northgate	APR-SEP	44	113	160	59	205	275	270
Laramie River nr Woods	APR-SEP	35	56	70	52	97	136	135
Yampa R abv Stagecoach Res	APR-JUL	14.4	21	25	86	29	36	29
Yampa River at Steamboat Springs	APR-JUL	161	210	245	88	280	330	280
Elk River nr Milner	APR-JUL	159	211	250	77	293	361	325
Elkhead Creek nr Elkhead	APR-JUL	12.6	19.0	25	64	33	50	39
ELKHEAD CREEK blw Maynard Gulch	APR-JUL	13.3	30	42	71	54	71	59
Fortification Ck nr Fortification	MAR-JUN	1.50	3.30	5.20	69	7.10	9.00	7.50
Yampa River nr Maybell	APR-JUL	470	660	790	80	920	1110	990
Little Snake River nr Slater	APR-JUL	72	98	118	74	140	175	159
LITTLE SNAKE R nr Dixon	APR-JUL	133	200	245	74	290	355	330
LITTLE SNAKE R nr Lily	APR-JUL	149	220	265	73	310	380	365
White River nr Meeker	APR-JUL	129	163	190	66	222	279	290

YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS  
Reservoir Storage (1000 AF) - End of February

YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS  
Watershed Snowpack Analysis - March 1, 2003

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
STAGECOACH	33.3	24.4	27.0	24.0	LARAMIE RIVER BASIN	3	123	66
YAMCOLO	9.1	3.8	4.6	6.5	NORTH PLATTE RIVER BASIN	9	138	87
					TOTAL NORTH PLATTE BASIN	11	135	84
					ELK RIVER BASIN	2	130	86
					YAMPA RIVER BASIN	11	144	93
					WHITE RIVER BASIN	4	157	84
					TOTAL YAMPA AND WHITE RIV	14	139	90
LITTLE SNAKE RIVER BASIN	8	128	88					

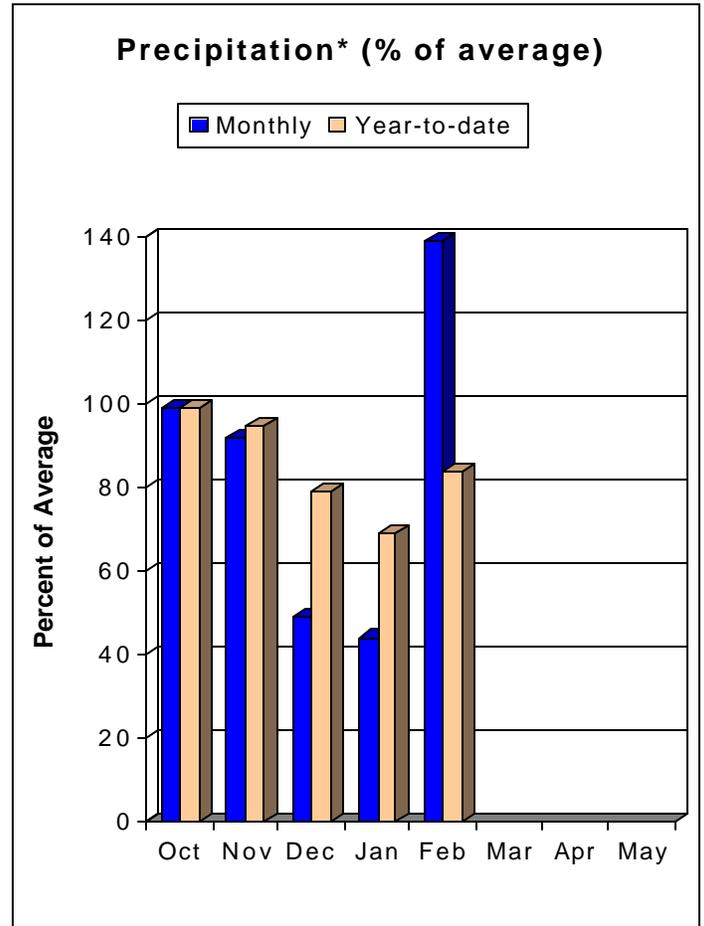
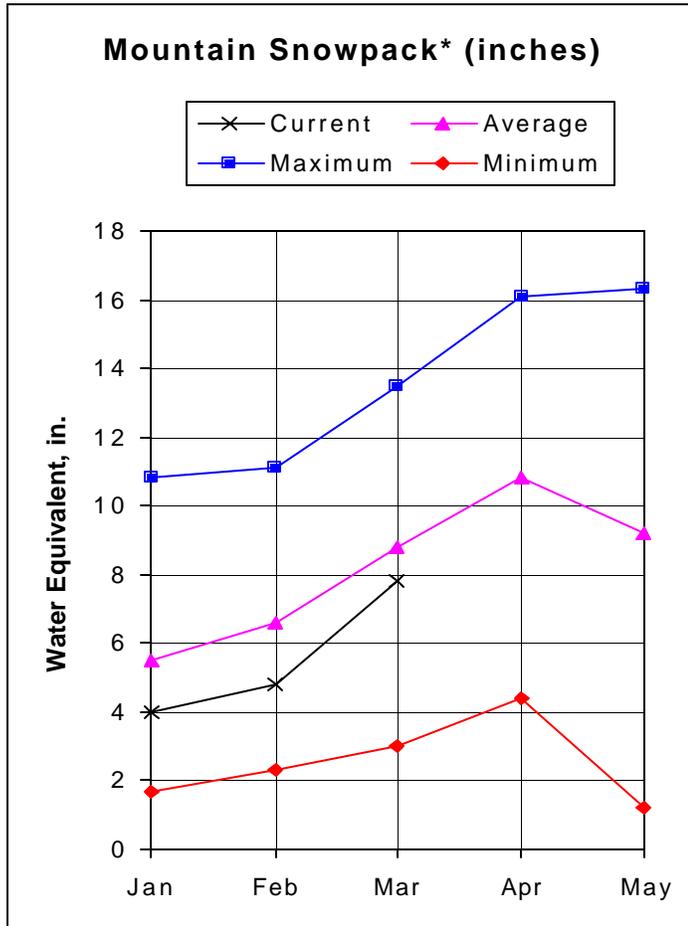
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

# ARKANSAS RIVER BASIN

## as of March 1, 2003



\*Based on selected stations

The Arkansas Basin received enough new snowfall during February to boost the snowpack measurements from 68% of average last month, to 83% of average on March 1. If the same amount of snow falls during March as did in February the snow measurements would be about average by April 1. The measurements are variable throughout the basin ranging from only 76% of average in the Cucharas and Huerfano watersheds, to 93% of average in the Purgatoire Watershed. Precipitation measurements for the month of February were 139% of average, and were the first monthly accumulations to be above average this water year. The water year total is now 84% of average. Reservoirs in the basin have only 46% of their average storage amount for the end of February. There is only 59% of the storage there was last year at the end of February. Streamflow forecasts are much higher than last month, but remain much below average at all of the forecasted points. They range from only 64% of average on Grape Creek near Westcliffe, to 81% of average on the Arkansas River at Salida.

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ARKANSAS RIVER BASIN  
Streamflow Forecasts - March 1, 2003

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Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Chalk Creek nr Nathrop	APR-SEP	3.6	13.0	20	74	27	36	27
Arkansas River at Salida	APR-SEP	145	210	250	81	290	355	310
Grape Creek nr Westcliffe	APR-SEP	1.8	4.2	12.5	64	21	33	19.6
Pueblo Reservoir Inflow	APR-SEP	169	255	315	73	375	460	430
Huerfano River nr Redwing	APR-SEP	2.1	8.0	12.0	77	16.0	22	15.5
Cucharas River nr La Veta	APR-SEP	2.2	3.8	8.5	65	13.2	20	13.0
Trinidad Lake Inflow	APR-SEP	7.5	19.0	34	77	49	71	44

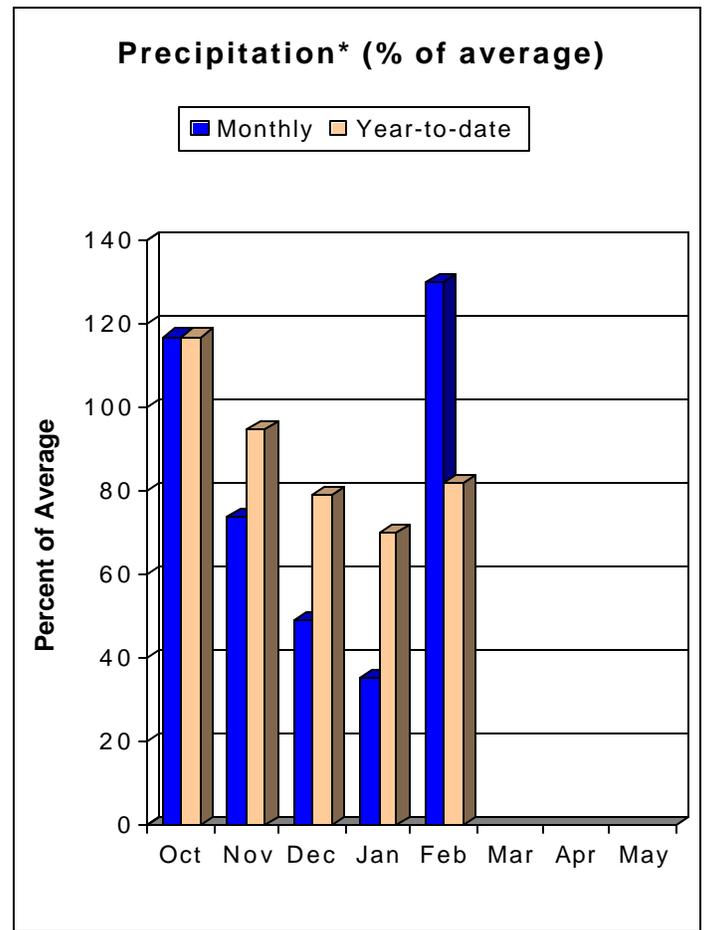
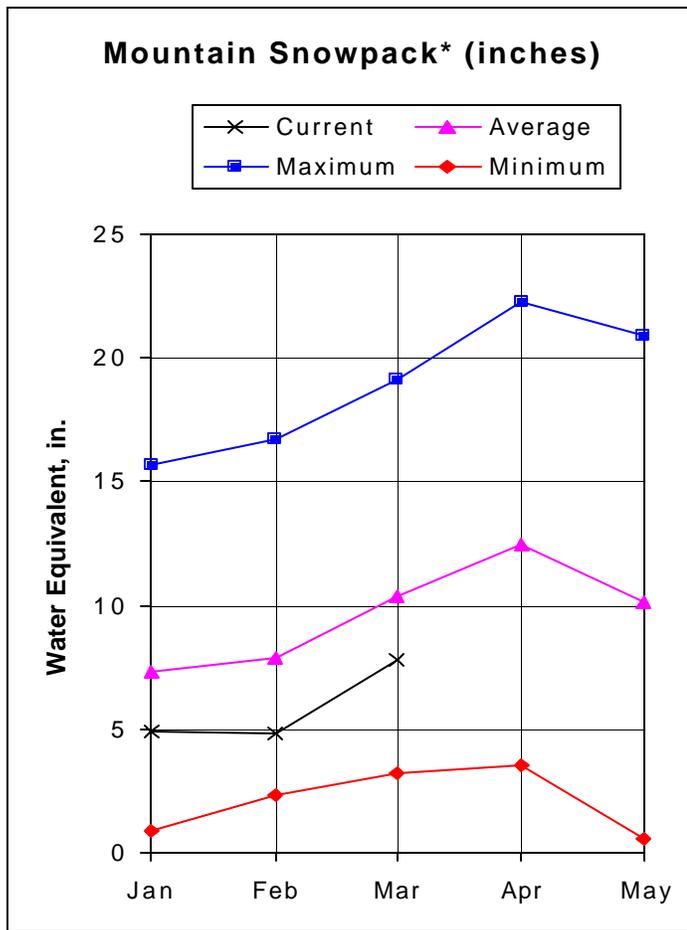
ARKANSAS RIVER BASIN Reservoir Storage (1000 AF) - End of February					ARKANSAS RIVER BASIN Watershed Snowpack Analysis - March 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ADOBE	70.0	0.0	27.1	36.0	UPPER ARKANSAS BASIN	3	126	85
CLEAR CREEK	11.0	6.9	6.3	6.8	CUCHARAS & HUERFANO RIVER	4	128	76
GREAT PLAINS	150.0	3.8	23.8	38.9	PURGATOIRE RIVER BASIN	2	137	93
HOLBROOK	7.0	2.3	5.8	4.8	TOTAL ARKANSAS RIVER BASIN	8	135	84
HORSE CREEK	28.0	0.0	0.0	12.7				
JOHN MARTIN	335.7	37.7	86.5	132.2				
LAKE HENRY	8.0	4.4	6.7	5.6				
MEREDITH	42.0	15.3	26.1	18.1				
PUEBLO	236.7	106.8	139.3	168.7				
TRINIDAD	72.3	16.3	17.6	26.2				
TURQUOISE	126.6	37.8	62.8	77.3				
TWIN LAKES	86.0	31.0	43.5	44.0				

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

# UPPER RIO GRANDE RIVER BASIN as of March 1, 2003



\*Based on selected stations

Snowpack measurements in the Rio Grande Basin are at 73% of average on March 1, which is much more encouraging than a month ago when they were only 60% of average. Even with the additional snow amounts, the basin has a long way to go to for significant relief in the recent water supply shortage. If as much new snow falls during March as did in February, the snowpack measurements would only reach about 86% of average by April 1. Measurements range from only 56% of average in the Alamosa Creek Watershed, to 101% of average in the Culebra and Trinchera Creek watersheds. Precipitation was 130% of average during February, which is the first above average monthly measurement since October. The water year total is now 82% of average. Reservoirs in the basin contain only 61% of their average storage amount for this time of year, which is only 81% of the storage amount there was last year at this time. Streamflow forecasts remain well below average at most of the forecast points. Forecasts range from only 58% of average on La Jara Creek near Capulin, to 96% of average on Costilla Creek near Costilla.

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UPPER RIO GRANDE BASIN  
Streamflow Forecasts - March 1, 2003

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Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>					30-Yr Avg. (1000AF)	
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)		10% (1000AF)
Rio Grande at Thirty Mile Bridge	APR-SEP	58	72	83	61	96	120	136
Rio Grande Reservoir Inflow	APR-JUL	51	62	72	61	83	103	118
Rio Grande at Wagon Wheel Gap	APR-SEP	75	153	205	59	255	335	345
South Fork Rio Grande at South Fork	APR-SEP	39	65	83	63	101	127	132
Rio Grande nr Del Norte	APR-SEP	92	225	315	59	405	540	531
Saguache Creek nr Saguache	APR-SEP	2.6	12.7	19.5	59	27	37	33
Alamosa Creek abv Terrace Reservoir	APR-SEP	16.0	31	41	59	51	66	70
La Jara Creek nr Capulin	MAR-JUL	1.70	2.80	5.00	58	7.20	10.50	8.70
Trinchera Water Supply	APR-SEP	11.2	18.3	29	73	40	55	40
Platoro Reservoir Inflow	APR-JUL	23	34	41	64	48	59	64
	APR-SEP	22	34	42	59	50	62	71
Conejos River nr Mogote	APR-SEP	59	102	131	66	160	204	200
San Antonio River at Ortiz	APR-SEP	3.6	7.0	10.0	61	13.5	19.7	16.4
Los Pinos River nr Ortiz	APR-SEP	18.6	37	50	68	63	81	74
Culebra Creek at San Luis	APR-SEP	7.9	13.0	20	87	27	37	23
Costilla Reservoir inflow	MAR-JUL	5.5	8.2	10.0	94	11.8	14.5	10.6
Costilla Creek nr Costilla	MAR-JUL	14.1	21	25	96	29	38	26

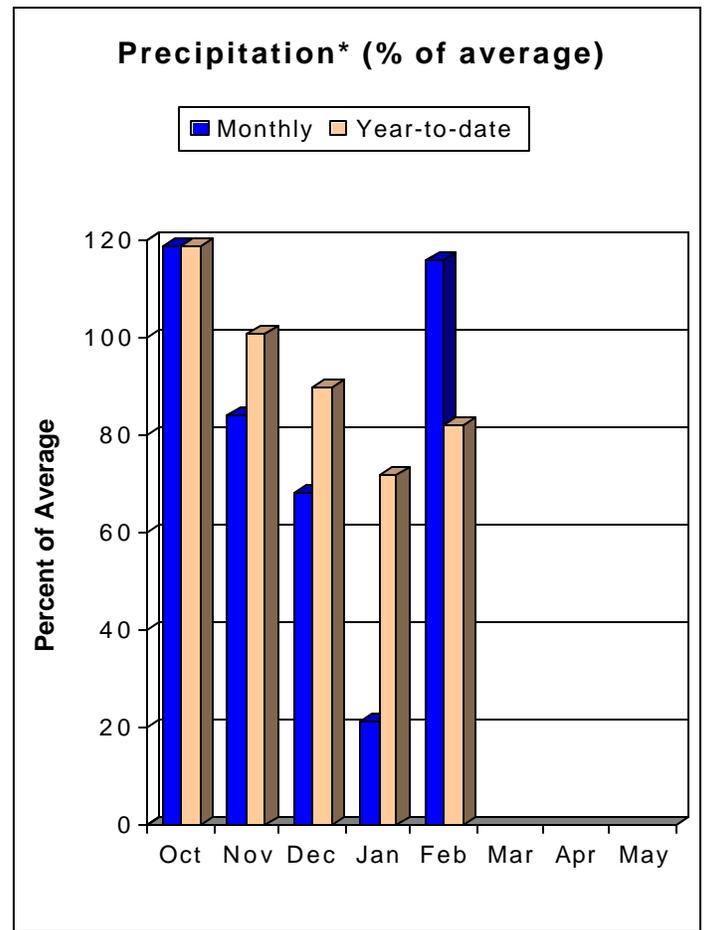
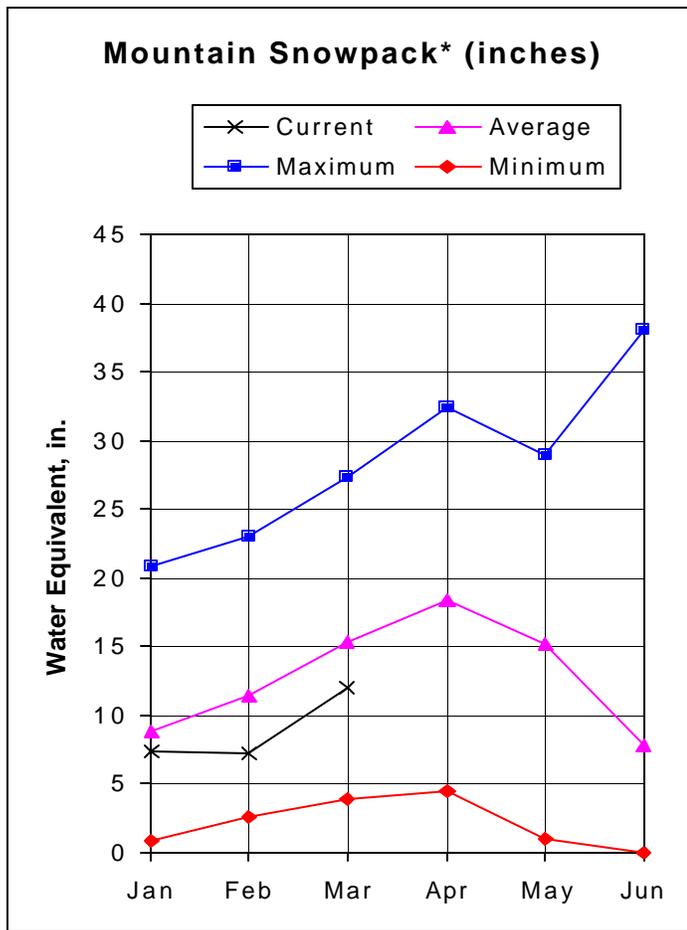
UPPER RIO GRANDE BASIN Reservoir Storage (1000 AF) - End of February					UPPER RIO GRANDE BASIN Watershed Snowpack Analysis - March 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CONTINENTAL	15.0	3.1	3.3	5.3	ALAMOSA CREEK BASIN	2	125	56
PLATORO	53.7	7.8	16.8	24.3	CONEJOS & RIO SAN ANTONIO	4	182	77
RIO GRANDE	51.0	18.1	11.8	17.6	CULEBRA & TRINCHERA CREEK	5	162	101
SANCHEZ	103.0	11.8	23.6	24.1	UPPER RIO GRANDE BASIN	12	173	61
SANTA MARIA	45.0	11.0	7.5	10.6	TOTAL UPPER RIO GRANDE BA	23	170	73
TERRACE	13.1	2.2	3.5	6.7				

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

# SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS as of March 1, 2003



\*Based on selected stations

Snowpack measurements for these basins are 77% of average on March 1, which is 14% of average higher than on February 1. Snowfall during the later part of February has provided a desperately needed boost to the snowpack numbers in all of these basins, but they still need much more snow to see significantly noticeable relief in the recent water shortages. If as much snow falls in March as did in February, the snowpack measurements would remain about 10% below average on April 1. The measurements range from 71% of average in the San Juan Basin, to 86% of average in the San Miguel Basin. Precipitation during February was 116% of average, which is the first above average monthly measurement since October. The water year total is only 82% of average. Reservoirs in these basins have only 57% of their average storage amount for this time of year, which is only 72% of last year's storage. All of the streamflow forecasts have increased from last months', but are still well below average. They range from only 59% of average on the Navajo River at Oso Diversion, to 75% of average on the Mancos near Mancos.

SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS  
Streamflow Forecasts - March 1, 2003

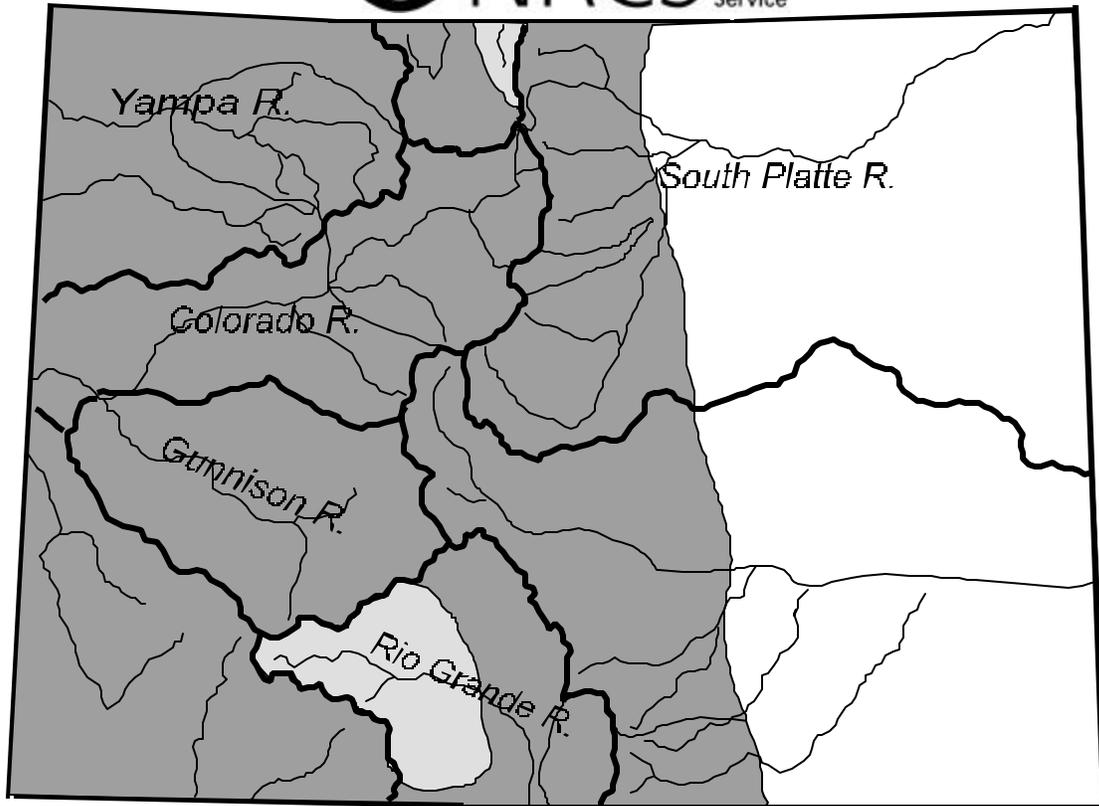
Forecast Point	Forecast Period	Future Conditions				Wetter		30-Yr Avg. (1000AF)
		Chance Of Exceeding *				30% (1000AF)	10% (1000AF)	
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)			
Dolores River at Dolores	APR-JUL	95	152	190	72	230	285	265
McPhee Reservoir inflow	APR-JUL	115	180	225	70	270	335	320
San Miguel River nr Placerville	APR-JUL	47	75	95	72	115	143	132
Gurley Reservoir Inlet	APR-JUL	5.2	9.0	11.5	70	14.0	18.0	16.5
	APRIL			1.50	90			1.66
	MAY			7.00	79			8.83
	JUNE			2.50	54			4.67
	JULY			0.50	38			1.32
Cone Reservoir Inlet	APR-JUL	0.46	1.61	2.50	71	3.40	4.70	3.53
	APRIL			0.42	91			0.46
	MAY			1.32	81			1.64
	JUNE			0.60	58			1.04
	JULY			0.16	42			0.38
Lilylands Reservoir Inlet	APR-JUL	0.87	1.51	1.95	68	2.38	3.08	2.86
	APRIL			0.27	68			0.40
	MAY			1.10	83			1.32
	JUNE			0.48	55			0.87
	JULY			0.10	37			0.27
Rio Blanco at Blanco Diversion	APR-JUL	10.0	24	34	64	44	58	53
Navajo River at Oso Diversion	APR-JUL	11.0	29	41	59	53	71	69
San Juan River nr Carracus	APR-JUL	126	202	265	65	336	456	405
Piedra River nr Arboles	APR-JUL	52	105	140	61	175	227	230
Vallecito Reservoir Inflow	APR-JUL	57	97	125	61	153	191	205
Navajo Reservoir Inflow	APR-JUL	145	340	470	59	600	800	800
Animas River at Durango	APR-JUL	133	220	280	64	340	425	440
Lemon Reservoir Inflow	APR-JUL	13.4	27	37	64	47	61	58
La Plata River at Hesperus	APR-JUL	7.4	13.7	17.9	72	22	28	25
Mancos River nr Mancos	APR-JUL	7.0	21	30	75	39	53	40
	APRIL			5.70	98			5.80
	MAY			15.3	96			15.9
	JUNE			8.0	58			13.7
	JULY			2.00	44			4.60

SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS Reservoir Storage (1000 AF) - End of February	SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS Watershed Snowpack Analysis - March 1, 2003
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Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
GROUNDHOG	21.7	3.8	11.1	12.0	ANIMAS RIVER BASIN	9	168	73
JACKSON GULCH	10.0	2.6	2.3	4.6	DOLORES RIVER BASIN	7	161	83
LEMON	40.0	6.0	12.9	20.4	SAN MIGUEL RIVER BASIN	5	162	86
MCPHEE	381.2	162.9	206.3	276.3	SAN JUAN RIVER BASIN	3	241	71
NARRAGUINNEP	19.0	8.5	18.0	13.5	TOTAL SAN MIGUEL, DOLORES	23	173	77
VALLECITO	126.0	37.6	56.9	60.8	AN JUAN RIVER BASINS			

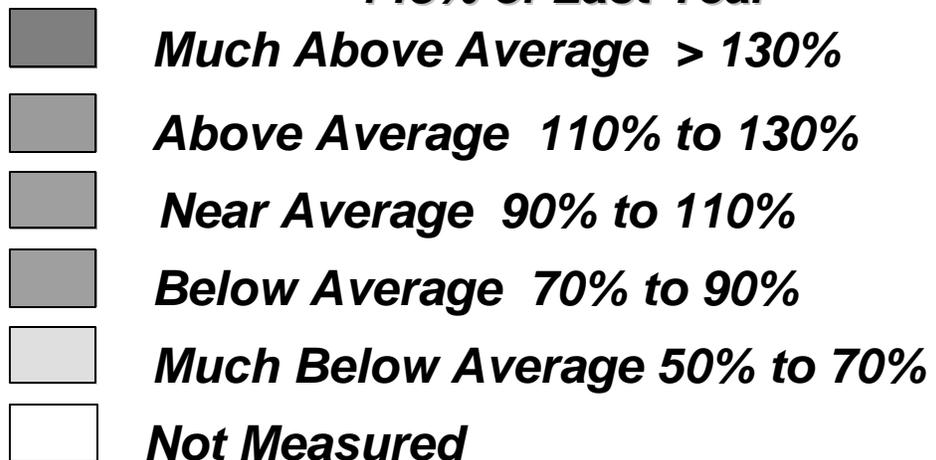
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**Snowpack  
March 1, 2003**

**Statewide: 83% of Average  
148% of Last Year**





655 Parfet Street, Room E200C  
Lakewood, CO 80215-5517

In addition to the basin outlook reports, water supply forecast information for the Western United States is available from the Natural Resources Conservation Service and the National Weather Service monthly, January through May. The information may be obtained from the National Resources Conservation Service web page at <http://www.wcc.nrcs.usda.gov/water/quantity/westwide.html>.

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*Issued by*

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**Colorado**  
**Basin Outlook Report**  
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