

# Colorado Basin Outlook Report March 1, 2013



**This month's photo is of the Mesa Lakes snow course marker. It was taken on 2/28/2013, when surveyors measured 14" of SWE on the course, which is 92 percent of median. Photo courtesy of Lenny Lang, Soil Conservationist in Grand Junction, CO.**

**REMINDER:**

We are soliciting field work photos from our snow surveyors this year. Each month we will pick one to grace the cover of this report! The photographer will be given proper credit of course. Please include information on where, when and of who/what the photo was taken.

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

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*For more water supply and resource management information, contact:*

**Mage Hultstrand**  
**Assistant Data Collection Office Supervisor**  
**USDA, Natural Resources Conservation Service**  
**Denver Federal Center, Bldg 56, Rm 2604**  
**PO Box 25426**  
**Denver, CO 80225-0426**  
**Phone (720) 544-2855**

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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. 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, 2013

#### Summary

Colorado experienced a dry month during February, with extremely dry conditions in the Gunnison River basin and the southwestern portion of the Colorado River basin. In most basins, snowpack percentages have remained relatively constant from last month's; there were increases in the South Platte and Arkansas River basins due to storms along the Front Range in the last half of February. The Arkansas and South Platte increased 8 and 9 percent respectively but even with the increase the South Platte remains at a dismal 63 percent of median. As expected, seasonal runoff forecasts have decreased from those issued a month ago. The state can expect below average runoff this spring and summer across all of the major basins. Reservoir storage percentages across the state continue to decline. Storage in the South Platte and Yampa and White basins are at 82 and 106 percent of average respectively and are the only basins at or near average.

#### Snowpack

February made relatively little difference in the mountain snowpack's. Due to cold temperatures and some welcome storm systems the state was able to generally maintain its snowpack during the month of February. The statewide snowpack posted a slight increase from 71 percent of median on February 1 to 73 percent of median on March 1. Snow storms that developed along the Front Range in the last three weeks of February boosted the snowpack in the South Platte basin from 54 percent to 63 percent of median; unfortunately this increase won't do much to improve water supply conditions. The same storms increased the snowpack in the Arkansas basin from 63 percent to 71 percent of median but again this won't have much of an impact on future water supplies. The bright spot in the State is the southwest which was at 83 percent of median as of March 1; however this will not be enough to have a big impact on available water this season. Because of the increases along the Front Range this month, Colorado's statewide snowpack increased by 2 percentage points to 73 percent of median for the March 1 readings.

#### Precipitation

Monthly precipitation during the 2013 water year has been somewhat of a rollercoaster with some extremely dry months followed by wet months and a return to dry conditions this past month. The ups and downs from month to month have been dramatic, for example November recorded precipitation at 41 percent of average followed by December at 111 percent of average. Unfortunately total year to date precipitation for October through December was well below average resulting in a statewide total of just 68 percent of average. January's total came in at just 82 percent of average followed by a February which saw totals at 74 percent of average. Total cumulative precipitation received in the state was at only 71 percent of average by the end of January and 72 percent by the end of February. Again the precipitation received along the Front Range in late February accounts for the 1 percent change from January to February.

## Reservoir Storage

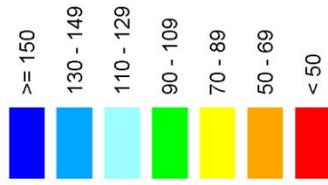
As is typical during mid-winter, reservoir storage changed only slightly during January and February. Storage volumes are below average in all basins. The lowest, in terms of percent of average, is in the Rio Grande basin which now stands at 53 percent of average, this low is followed closely by the Arkansas basin which is at 55 percent of average. The Rio Grande and Arkansas basins are storing significantly less water than last year at this time, at 78 percent and 62 percent of last year's storage, respectively. The highest storage volumes in Colorado are in the Yampa and White basins at 106 percent of average; the South Platte basin is a distant second at 82 percent of average. With statewide storage now at 71 percent of average and the forecasted inflows to the reservoirs also below average, both the early and late summer water supplies will be negatively impacted for most water users across the state.

## Streamflow

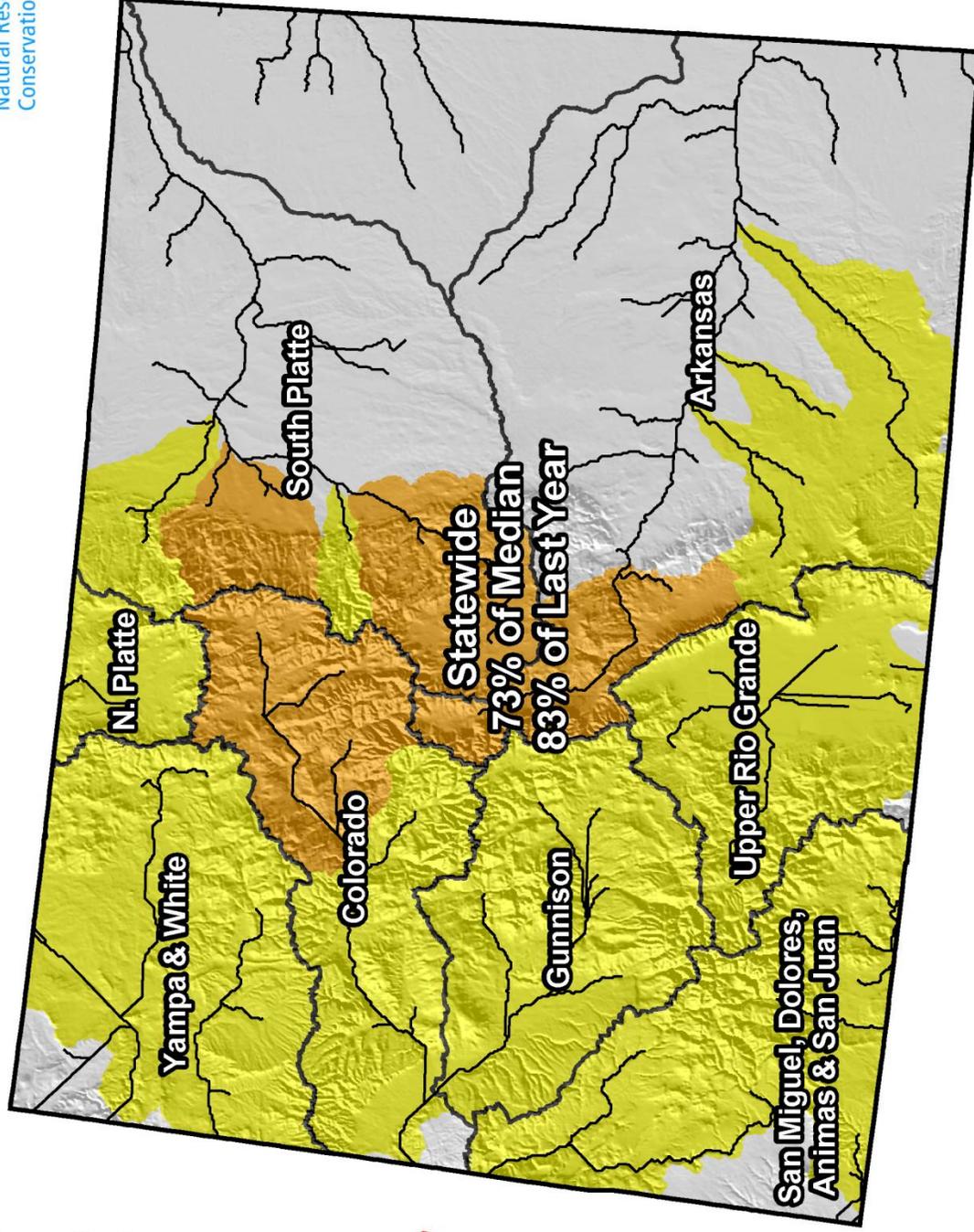
As one would expect after such a dry month, streamflow forecasts have significantly decreased across Colorado. The lowest forecasts continue to be for those streams in the South Platte basin which are at about 60 percent of average. Flows on all rivers are now expected to be consistently well below average for the 2013 runoff season. All basins will need a significant turnaround in weather patterns in March in order to see improvements in this year's water supply outlook.

# Colorado Snowpack Map

## Percent of Median

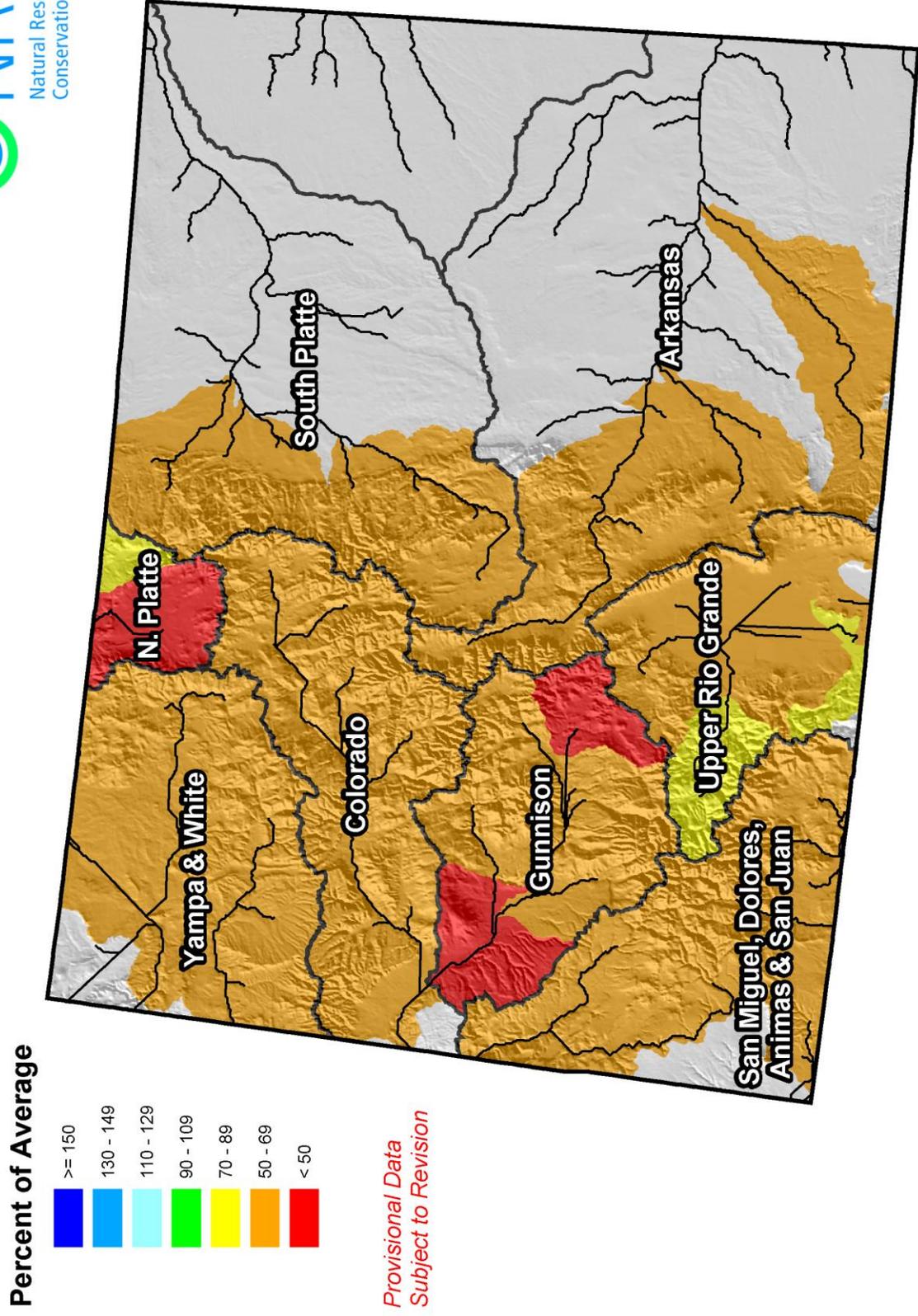


*Provisional Data  
Subject to Revision*



Current as of March 1, 2013

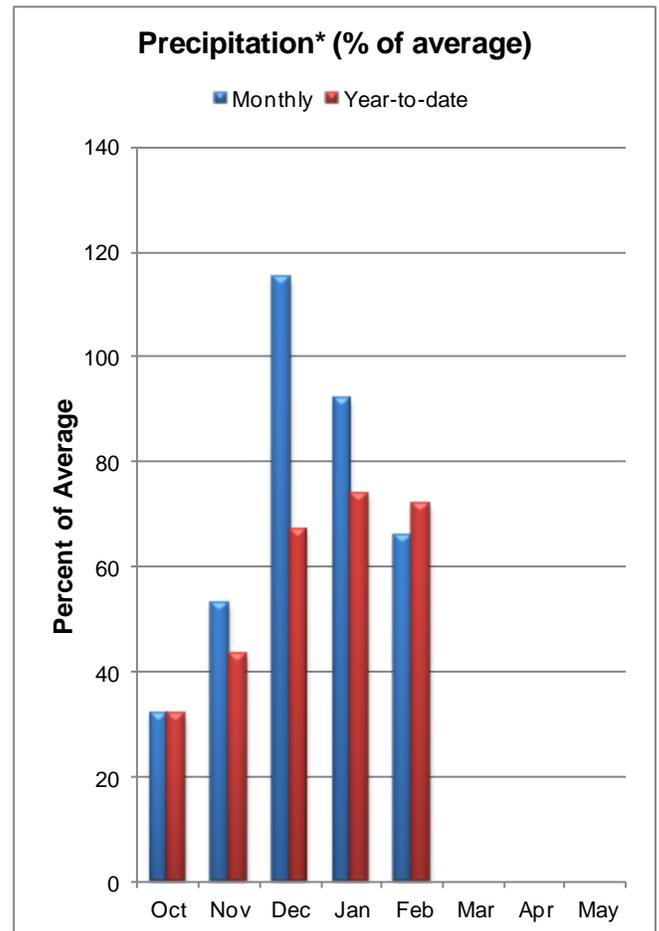
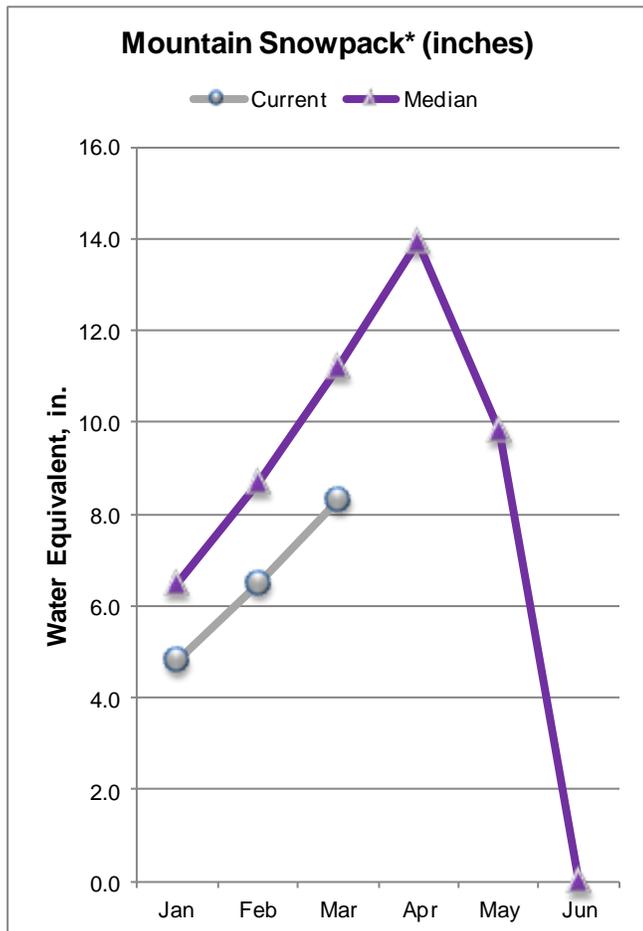
# Colorado Streamflow Forecast Map



Current as of March 1, 2013

# GUNNISON RIVER BASIN

## as of March 1, 2013



\*Based on selected stations

Snow accumulation in the Gunnison River basin during February was below normal. In fact December is the only month so far this season that has received above normal accumulation. The snowfall received in the basin during February was enough to maintain the snowpack but was not enough to boost the total snowpack percentage. March 1 snowpack was at 74 percent of the median compared to 75 percent recorded on February 1. Total mountain precipitation recorded within the basin during February was just 66 percent of average. As of March 1 cumulative precipitation for the water year has declined slightly to 72 percent of average and 79 percent of last year's total at this same time.

Reservoir storage in the Gunnison basin at the end of February was at 77 percent of average, and 45 percent of capacity. There was no data available this month for Ridgway Reservoir and so it is not included in this month's report. The March 1 streamflow forecasts reflect the below normal precipitation and snowpack conditions in the basin. Current forecasts have declined from those issued last month for nearly all forecast points. March 1 forecasts for the East River at Almont and the Gunnison River near Gunnison both dropped 11 percentage points from those issued February 1. Across the basin, forecasts range from just 42 percent of average for Tomichi Creek at Gunnison to 68 percent of average for Lake Fork at Gateview.

GUNNISON RIVER BASIN  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		=====		>>===== Wetter =====>>		
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Taylor Park Reservoir Inflow (2)	APR-JUL	35	46	55	56	64	80	99
Slate R nr Crested Butte	APR-JUL	35	43	50	60	57	68	83
East R at Almont	APR-JUL	63	80	92	51	105	126	182
Gunnison R nr Gunnison (2)	APR-JUL	110	150	180	49	213	267	370
Tomichi Ck at Sargents	APR-JUL	6.7	11.7	16.0	53	21	29	30
Cochetopa Ck bl Rock Ck nr Parlin	APR-JUL	2.4	5.6	8.5	57	12.0	18.4	15.0
Tomichi Ck at Gunnison	APR-JUL	6.6	18.9	31	42	46	74	74
Lake Fk at Gateview	APR-JUL	52	69	83	68	98	122	123
Blue Mesa Reservoir Inflow (2)	APR-JUL	204	278	335	50	397	499	675
Paonia Reservoir Inflow (2)	MAR-JUN	25	37	47	49	58	76	96
	APR-JUL	24	37	48	50	60	81	97
NF Gunnison R nr Somerset (2)	APR-JUL	98	128	150	52	174	213	290
Surface Ck at Cedaredge	APR-JUL	6.4	8.2	9.6	57	11.1	13.4	16.8
Ridgway Reservoir Inflow (2)	APR-JUL	41	56	68	67	81	101	101
Uncompahgre R at Colona (2)	APR-JUL	40	64	83	61	105	142	137
Gunnison R nr Grand Junction (2)	APR-JUL	392	564	700	47	850	1097	1480

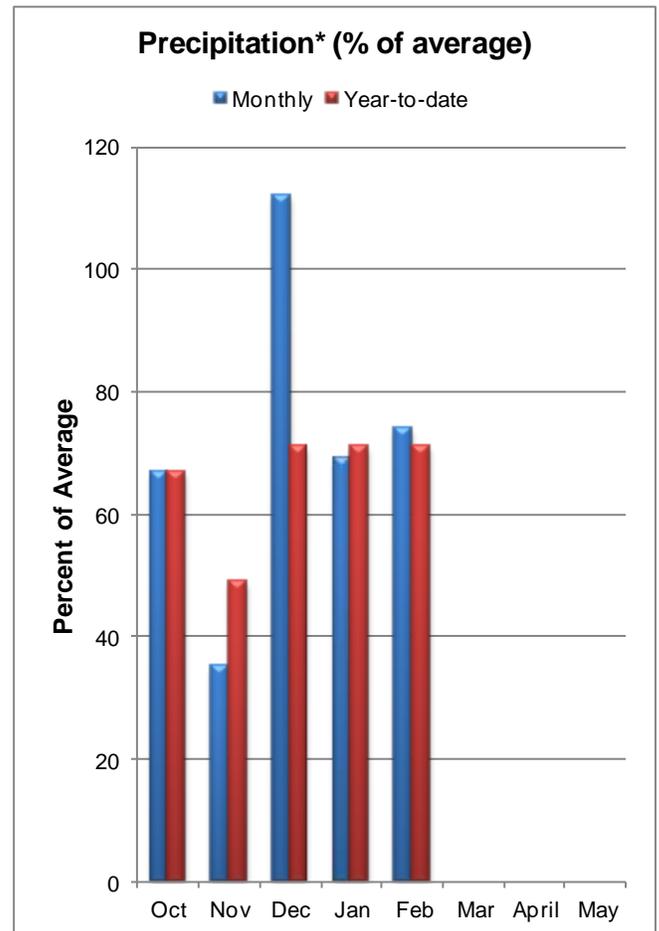
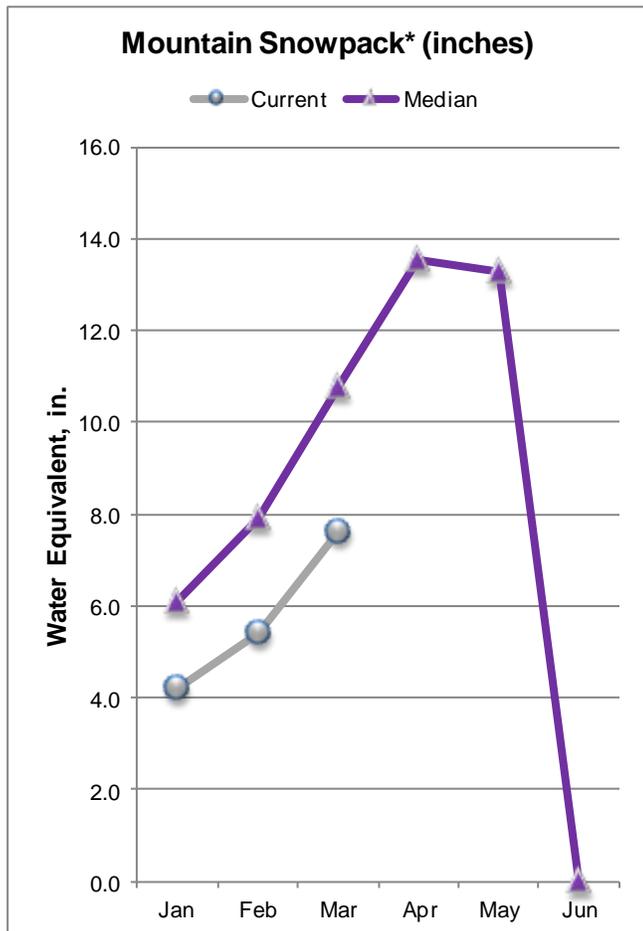
GUNNISON RIVER BASIN Reservoir Storage (1000 AF) - End of February					GUNNISON RIVER BASIN Watershed Snowpack Analysis - March 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
BLUE MESA	830.0	329.0	532.8	446.5	UPPER GUNNISON BASIN	15	84	70
CRAWFORD	14.0	1.6	6.4	9.2	SURFACE CREEK BASIN	3	93	81
FRUITGROWERS	3.6	1.9	3.6	3.7	UNCOMPAHGRE BASIN	4	95	89
FRUITLAND	9.2	1.1	2.2	2.1	TOTAL GUNNISON RIVER BASI	19	87	74
MORROW POINT	121.0	104.9	113.2	113.4				
PAONIA	15.4	1.3	0.4	4.9				
RIDGWAY	83.0	0.0	68.2	60.5				
TAYLOR PARK	106.0	56.5	65.5	65.5				

\* 90%, 70%, 50%, 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 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (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.
- (3) - Median value used in place of average.

# UPPER COLORADO RIVER BASIN as of March 1, 2013



\*Based on selected stations

February brought a welcome change of weather patterns to the Colorado River basin with fairly consistent snowfall throughout the month. Even with consistent storms, total accumulation for the month fell short of normal conditions for this time of year. Snowpack accumulation for February was just 63 percent of median. The total snowpack percentage as of March 1 was 70 percent of the median which is 86 percent of last year's snowpack at this time of year. The sub basins continue to be quite variable ranging from 63 percent of median in the Blue River basin to 81 percent of median in the Plateau Creek drainage. Mountain precipitation received in the basin in February was 74 percent of average. Year to date precipitation is at just 71 percent of average for the third consecutive month.

As of March 1 the total volume of water stored in the reservoirs of the Colorado River basin was 489,000 acre-feet compared to the 857,000 acre-feet stored at this time last year. Reservoir storage is at 66 percent of average in the basin. For the second consecutive month, seasonal streamflow forecasts have declined across the Colorado River basin. For most forecast points current forecasts are 5 to 7 percentage points lower than those issued last month. March 1 forecasts range from 56 percent of average for both the Roaring Fork at Glenwood Spring and the Colorado River near Cameo to 68 percent of average for the Inflows to Lake Granby and Willow Creek Reservoir.

UPPER COLORADO RIVER BASIN  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		===== Wetter =====>>				
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Lake Granby Inflow (2)	APR-JUL	99	128	150	68	174	211	220
Willow Ck Reservoir Inflow (2)	APR-JUL	16.8	25	32	68	40	52	47
Williams Fk bl Williams Fk Reservoir	APR-JUL	41	55	65	67	77	95	97
Blue R bl Dillon (2)	APR-JUL	69	90	107	66	125	154	163
Blue R bl Green Mountain Reservoir (	APR-JUL	115	153	182	66	213	264	275
Muddy Ck bl Wolford Mtn Reservoir nr	APR-JUL	19.0	27	33	61	40	51	54
Eagle R bl Gypsum (2)	APR-JUL	133	177	210	63	246	304	335
Colorado R nr Dotsero (2)	APR-JUL	523	719	870	62	1035	1305	1400
Ruedi Reservoir Inflow (2)	APR-JUL	52	68	80	58	93	114	139
Roaring Fk at Glenwood Springs (2)	APR-JUL	266	334	385	56	439	525	690
Colorado R nr Cameo (2)	APR-JUL	885	1133	1320	56	1521	1842	2350

UPPER COLORADO RIVER BASIN Reservoir Storage (1000 AF) - End of February					UPPER COLORADO RIVER BASIN Watershed Snowpack Analysis - March 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
DILLON	254.0	166.9	244.0	216.8	BLUE RIVER BASIN	9	76	63
LAKE GRANBY	465.6	149.0	358.0	281.1	UPPER COLORADO RIVER BASI	31	85	67
GREEN MOUNTAIN	146.8	53.8	75.7	70.0	MUDDY CREEK BASIN	3	83	80
HOMESTAKE	43.0	0.3	0.6	26.6	PLATEAU CREEK BASIN	3	93	81
RUEDI	102.0	62.0	73.0	68.0	ROARING FORK BASIN	7	87	71
VEGA	32.9	7.8	17.5	12.2	WILLIAMS FORK BASIN	3	91	70
WILLIAMS FORK	97.0	42.1	80.6	57.3	WILLOW CREEK BASIN	4	85	77
WILLOW CREEK	9.1	6.8	7.6	6.7	TOTAL COLORADO RIVER BASI	41	86	69

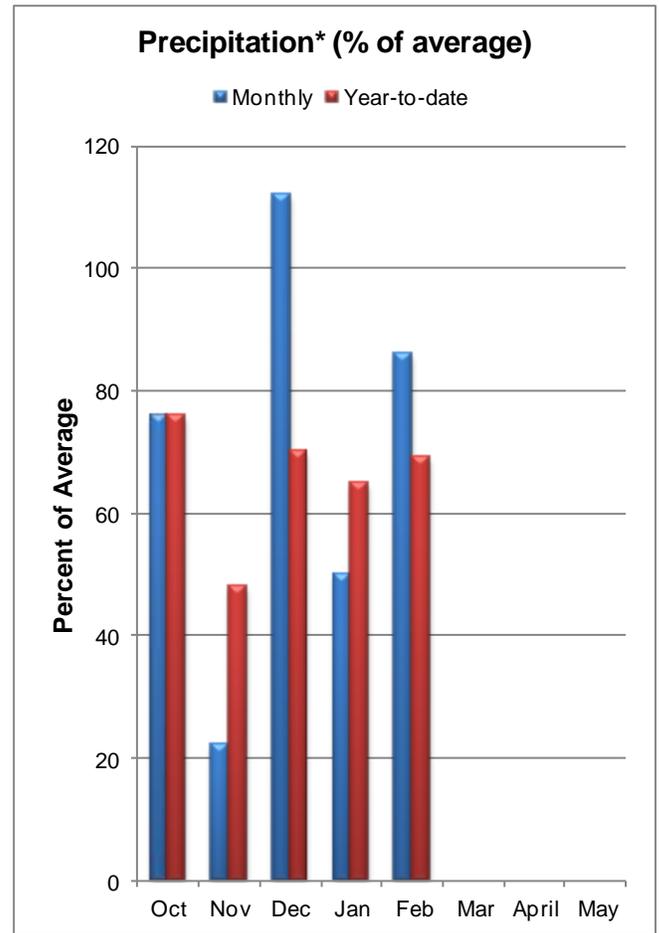
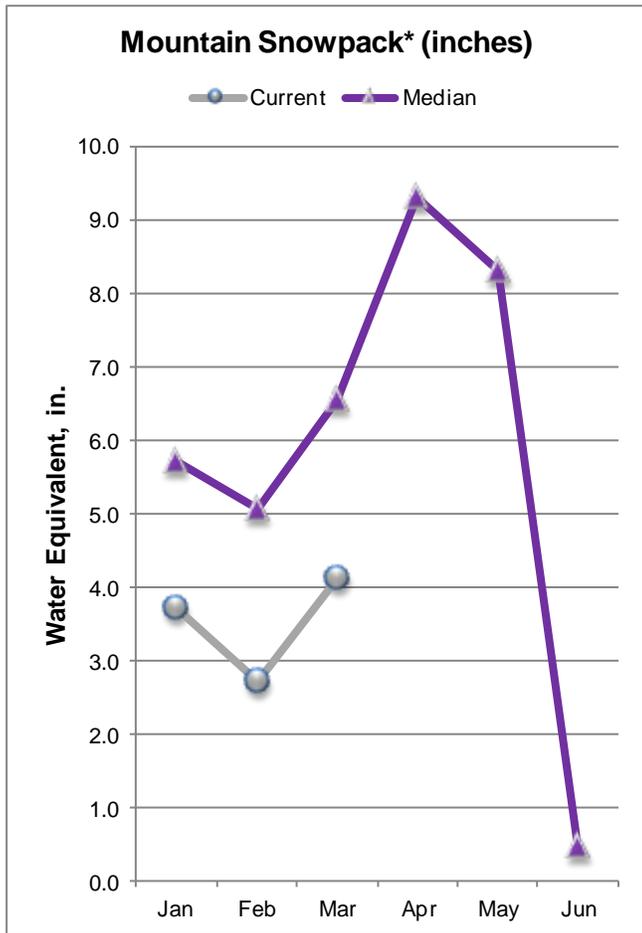
\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (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.
- (3) - Median value used in place of average.

# SOUTH PLATTE RIVER BASIN

## as of March 1, 2013



\*Based on selected stations

The South Platte basin received enough snow accumulation during February to boost the basin's snowpack from only 54 percent of median last month, to 63 percent of median as of March 1. This leaves the snowpack at just 62 percent of where it was last year at this time. Most of the watersheds in the basin received enough snow to improve their measurements slightly over last month. Measurements range from 53 percent of normal in the Big Thompson watershed, to 71 percent of normal in the Cache la Poudre and Clear Creek watersheds. Mountain precipitation received during February was 86 percent of average in the basin; however this only marginally helped the water year total which is now at 69 percent of average.

The combined reservoir storage for the South Platte was at 82 percent of average on March 1, which is just 78 percent of last year's storage at this time. Storage volumes will likely decrease rapidly during the summer if snowpack and precipitation conditions don't improve significantly during the next month. The recent April to July streamflow forecasts actually improved slightly from those issued last month but all forecasts in the basin remain well below average at this time. Current forecasts are highly variable ranging from only 48 percent of average at the Inflow to Antero Reservoir, to 68 percent of average for Clear Creek at Golden.

SOUTH PLATTE RIVER BASIN  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Future Conditions		Wetter		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Antero Reservoir Inflow (2)	APR-JUL	3.6	5.3	6.9	48	9.0	13.4	14.5
	APR-SEP	4.2	6.3	8.4	47	11.2	17.0	17.8
Spinney Mountain Res Inflow (2)	APR-JUL	14.7	22	28	58	36	53	48
	APR-SEP	17.0	26	34	56	45	68	61
Elevenmile Canyon Res Inflow (2)	APR-JUL	14.1	21	28	56	37	55	50
	APR-SEP	16.5	26	35	55	47	74	64
Cheesman Lake Inflow (2)	APR-JUL	26	41	55	55	74	116	100
	APR-SEP	32	51	69	55	94	148	126
South Platte R at South Platte (2)	APR-JUL	44	68	93	52	126	199	180
	APR-SEP	55	87	119	53	163	260	225
Bear Ck ab Evergreen	APR-JUL	4.5	7.4	10.4	63	14.6	24	16.4
	APR-SEP	6.4	10.3	14.2	68	19.6	32	21
Bear Ck at Morrison	APR-JUL	4.6	8.4	12.5	57	18.7	34	22
	APR-SEP	6.5	11.5	17.0	61	25	44	28
Clear Ck at Golden	APR-JUL	40	58	71	68	84	102	105
	APR-SEP	45	70	87	68	104	129	128
St. Vrain Ck at Lyons (2)	APR-JUL	31	44	52	59	60	73	88
	APR-SEP	37	52	62	60	72	87	103
Boulder Ck nr Orodell (2)	APR-JUL	23	30	34	63	38	45	54
	APR-SEP	25	34	39	62	44	53	63
S Boulder Ck nr Eldorado Springs(2)	APR-JUL	41	46	49	62	52	57	79
	APR-SEP	48	55	59	65	63	70	91
Big Thompson R at Canyon Mouth (2)	APR-JUL	23	37	46	51	55	69	90
	APR-SEP	31	48	59	55	70	87	107
Cache La Poudre at Canyon Mouth (2)	APR-JUL	67	114	146	65	178	225	225
	APR-SEP	73	126	162	65	198	250	250

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

SOUTH PLATTE RIVER BASIN  
Watershed Snowpack Analysis - March 1, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
ANTERO	19.9	15.1	15.9	16.3	BIG THOMPSON BASIN	7	58	53
BARR LAKE	30.1	15.1	28.4	26.0	BOULDER CREEK BASIN	5	57	64
BLACK HOLLOW	6.5	2.4	3.8	3.9	CACHE LA POUFRE BASIN	9	67	71
BOYD LAKE	48.4	15.7	40.5	32.4	CLEAR CREEK BASIN	3	78	71
BUTTON ROCK/RALPH PRICE	16.2	13.5	13.1	12.4	SAINT VRAIN BASIN	3	46	54
CACHE LA POUFRE	10.1	4.3	9.9	7.8	UPPER SOUTH PLATTE BASIN	11	67	63
CARTER	108.9	82.1	57.0	93.4	TOTAL SOUTH PLATTE BASIN	38	62	63
CHAMBERS LAKE	8.8	1.2	5.9	3.1				
CHEESMAN	79.0	44.7	69.0	59.0				
COBB LAKE	22.3	11.8	19.4	13.9				
ELEVEN MILE	98.0	99.2	99.3	95.8				
EMPIRE	36.5	24.3	36.0	25.6				
FOSSIL CREEK	11.1	10.3	9.2	7.4				
GROSS	41.8	26.9	27.2	25.3				
HALLIGAN	6.4	4.6	5.7	4.8				
HORSECREEK	14.7	0.5	11.6	12.5				
HORSETOOTH	149.7	85.9	133.2	109.2				
JACKSON	26.1	22.6	24.7	27.3				
JULESBURG	20.5	15.6	17.3	18.9				
LAKE LOVELAND	10.3	3.2	9.2	8.8				
LONE TREE	8.7	6.2	6.7	6.7				
MARIANO	5.4	2.4	3.2	4.3				
MARSHALL	10.0	5.9	7.6	5.4				
MARSTON	13.0	11.1	5.3	12.9				
MILTON	23.5	17.1	20.6	17.1				
POINT OF ROCKS	70.6	54.5	65.2	65.4				
PREWITT	28.2	5.8	22.3	21.0				
RIVERSIDE	55.8	46.1	47.1	48.9				
SPINNEY MOUNTAIN	49.0	22.5	45.7	32.2				
STANDLEY	42.0	28.4	36.5	33.6				
TERRY LAKE	8.0	4.8	5.6	5.3				
UNION	13.0	5.6	12.3	11.0				
WINDSOR	15.2	9.6	11.6	11.5				

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

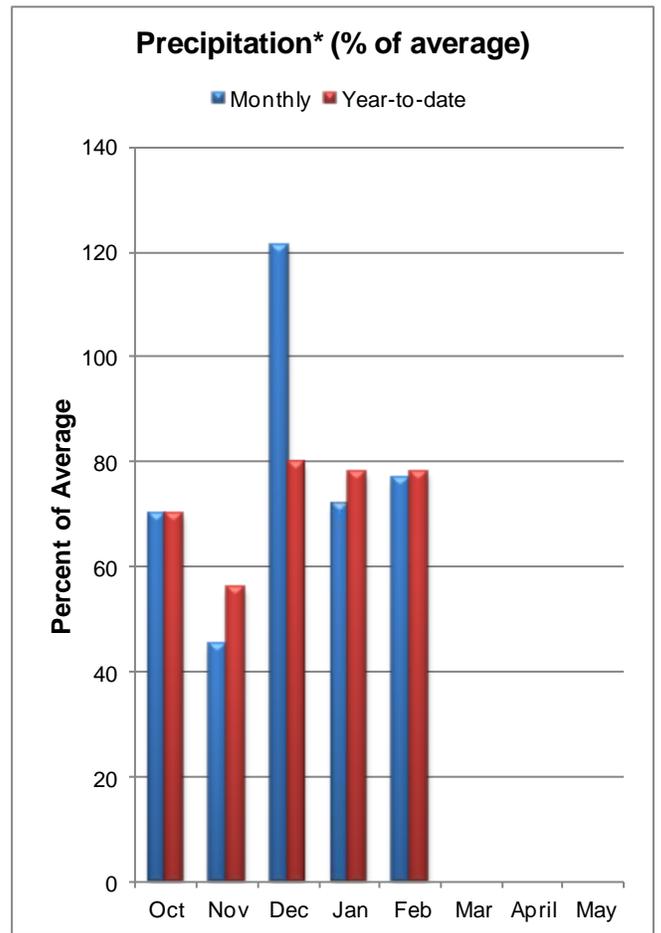
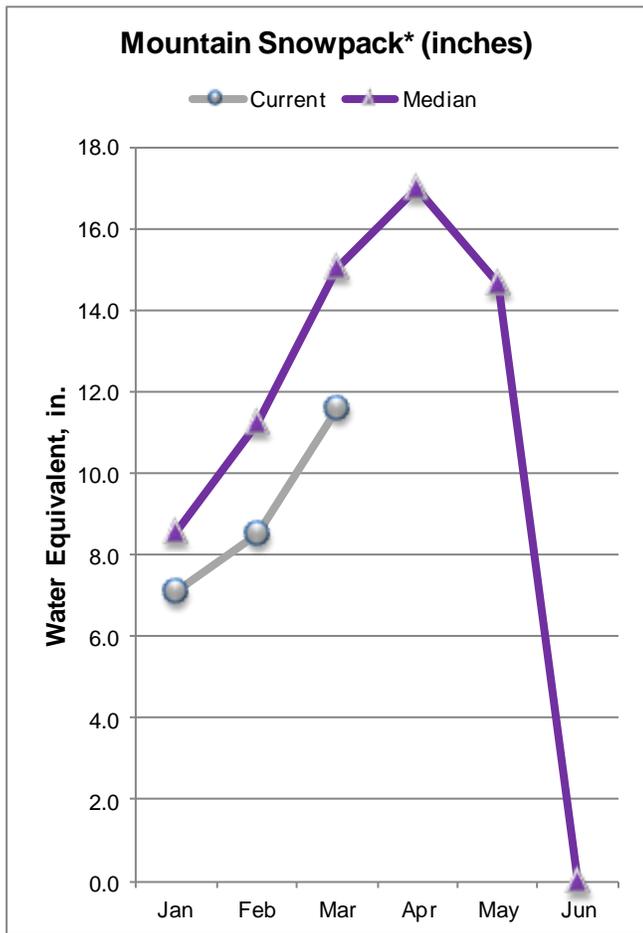
The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

(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.

(3) - Median value used in place of average.

# YAMPA, WHITE, NORTH PLATTE AND LARAMIE RIVER BASINS as of March 1, 2013



\*Based on selected stations

Snowfall received in the Yampa, White, North Platte, and Laramie River basins during February was not enough to boost the overall snowpack percentage. It did however allow the basins to maintain their snowpack; the March 1 basin wide snowpack was at 77 percent of median compared to 76 percent of median measured on February 1. February precipitation measured at the SNOTEL sites in these basins was 77 percent of average. Year to date precipitation totals remained constant compared to last month. As of March 1 total precipitation totals for these basins was at 78 percent of average. These basins are reporting the highest year to date precipitation in the state.

The two reservoirs in these basins continue to maintain above average storage for this time of year. They are storing 32,000 acre feet stored as of the end of February which is to 106 percent of the average storage for this time of year. Across these basins current streamflow forecasts have declined yet again from those issued last month. The March 1 forecast for the North Platte River near Northgate dropped 12 percentage points from the February 1 forecast. April to July streamflow volumes are now expected to range from 38 percent of average for the North Platte River near Northgate to 70 percent of average for the Laramie River near Woods Landing. Elsewhere in the basins, the Yampa River at Steamboat Springs is expected to flow at 63 percent of average.

YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<==== Drier =====		===== 50% (1000AF) (% AVG.)		===== Wetter =====>>		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)	
North Platte R nr Northgate	APR-JUL APR-SEP	25 30	41 45	86 95	38 38	131 145	197 220	225 250
Laramie R nr Woods	APR-JUL APR-SEP	45 49	66 72	80 88	70 70	94 104	115 127	115 126
Yampa R ab Stagecoach Reservoir (2)	APR-JUL	5.7	9.7	13.0	57	16.8	23	23
Yampa R at Steamboat Springs (2)	APR-JUL	108	139	163	63	188	229	260
Elk R nr Milner	APR-JUL	137	184	220	69	259	323	320
Elkhead Ck ab Long Gulch	APR-JUL	16.5	29	39	53	51	71	73
Yampa R nr Maybell (2)	APR-JUL	290	430	540	58	663	867	935
Little Snake R nr Slater (2)	APR-JUL	55	74	89	57	105	131	156
Little Snake R nr Savery (2)	APR-JUL	79	132	175	51	224	308	345
Little Snake R nr Lily (2)	APR-JUL	72	129	177	51	233	329	345
White R nr Meeker	APR-JUL	104	142	170	61	201	251	280

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, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
STAGECOACH	36.4	28.9	31.2	24.0	LARAMIE RIVER BASIN	3	71	77
YAMCOLO	8.7	3.4	6.6	6.5	NORTH PLATTE RIVER BASIN	7	90	75
					TOTAL NORTH PLATTE BASIN	9	87	76
					ELK RIVER BASIN	1	85	71
					YAMPA RIVER BASIN	11	94	78
					WHITE RIVER BASIN	6	98	75
					TOTAL YAMPA AND WHITE RIV	16	95	76
					LITTLE SNAKE RIVER BASIN	8	88	78
TOTAL YAMPA, WHITE AND NO	30	91	78					

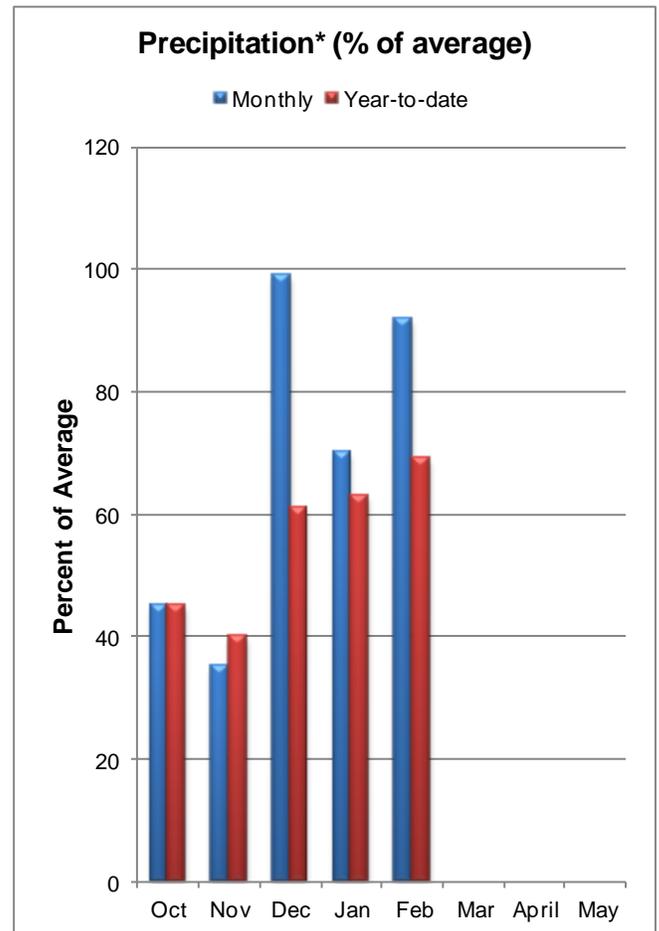
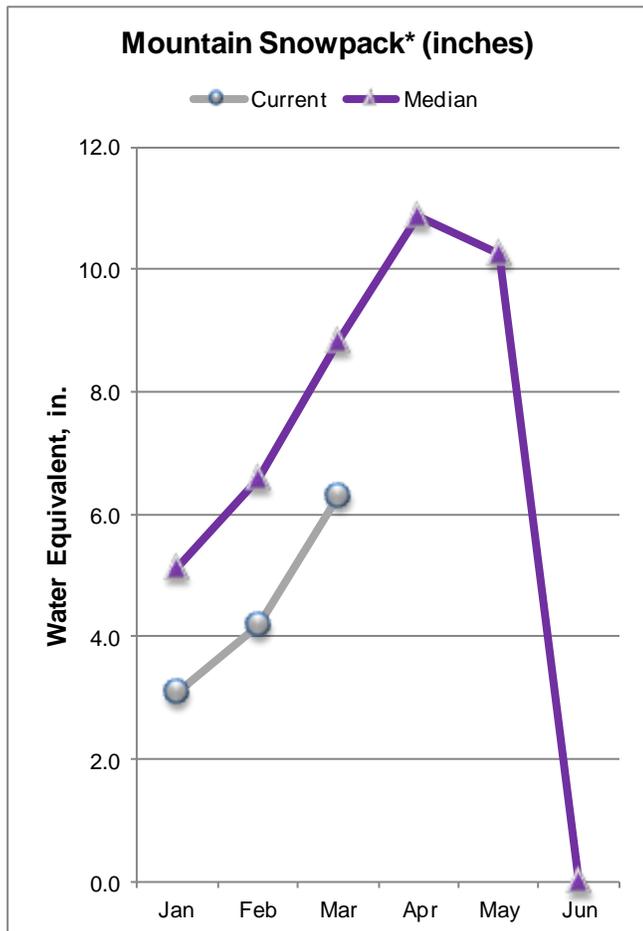
\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (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.
- (3) - Median value used in place of average.

# ARKANSAS RIVER BASIN

## as of March 1, 2013



\*Based on selected stations

Although the Arkansas River basin received enough additional snow accumulation to gradually improve the snowpack totals over the last month, the amount of snow in the basin remains well below average, at only 71 percent of median. There is less snow accumulated in the basin than there was last year at this time, current measurements are only 79 percent of last years. Snowpack percentages are variable throughout the basin, current reports show only 69 percent of median in the Upper Arkansas watershed, 76 percent of median in the Cucharas and Huerfano River watersheds and 85 percent of median in the Purgatoire watershed. Mountain precipitation during February amounted to 92 percent of average, but this did not help the water year total much. Year to date precipitation in the basin is now only 69 percent of average. The combined reservoir storage in the basin remains at 55 percent of average, which is 62 percent of the March 1, 2012 storage. Volumes can be expected to decline this summer if snowpack and precipitation conditions do not improve over the next month. While most forecasts in this basin improved from last month's predictions, all forecasts remain well below average at this time. The largest improvement from last month was in the forecast for Grape Creek near Westcliffe which jumped 11 percentage points. Current April to July forecasts range from only 50 percent of average on the Cucharas River near La Veta, to 65 percent of average on the Huerfano River near Redwing.

ARKANSAS RIVER BASIN  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		===== Wetter =====>>				
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding *		30% (1000AF)	10% (1000AF)	
		(1000AF)	(% AVG.)					
Chalk Ck nr Nathrop	APR-JUL	5.5	9.2	12.3	59	15.8	22	21
	APR-SEP	7.5	12.1	15.8	61	20	27	26
Arkansas R at Salida (2)	APR-JUL	86	113	134	56	157	193	240
	APR-SEP	104	138	165	56	194	240	295
Grape Ck nr Westcliffe	APR-JUL	1.2	5.3	9.7	61	15.5	26	15.9
	APR-SEP	2.5	7.3	12.0	61	17.9	29	19.6
Arkansas R ab Pueblo (2)	APR-JUL	106	163	210	58	260	350	360
	APR-SEP	139	210	265	58	325	430	455
Huerfano R nr Redwing	APR-JUL	3.5	5.8	7.7	65	9.9	13.5	11.9
	APR-SEP	5.2	8.1	10.4	68	13.0	17.4	15.2
Cucharas R nr La Veta	APR-JUL	1.7	4.0	6.1	50	8.6	13.2	12.2
	APR-SEP	2.5	5.2	7.5	53	10.2	15.1	14.1
Purgatoire R at Trinidad (2)	MAR-JUL	5.7	14.1	22	60	32	49	37
	APR-SEP	7.8	18.4	28	60	40	61	47

ARKANSAS RIVER BASIN Reservoir Storage (1000 AF) - End of February					ARKANSAS RIVER BASIN Watershed Snowpack Analysis - March 1, 2013				
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of		
		This Year	Last Year	Avg			Last Yr	Median	
ADOBE	62.0	6.8	36.7	36.0	UPPER ARKANSAS BASIN	10	79	69	
CLEAR CREEK	11.4	7.1	7.6	6.8	CUCHARAS & HUERFANO RIVER	3	77	82	
CUCHARAS RESERVOIR	40.0	0.1	0.1	4.7	PURGATOIRE RIVER BASIN	2	82	85	
GREAT PLAINS	150.0	0.0	0.0	38.9	TOTAL ARKANSAS RIVER BASIN	14	78	72	
HOLBROOK	7.0	4.1	2.2	4.8					
HORSE CREEK	27.0	0.0	0.0	12.7					
JOHN MARTIN	616.0	29.0	39.1	132.2					
LAKE HENRY	8.0	5.0	7.8	5.6					
MEREDITH	42.0	28.5	38.9	18.1					
PUEBLO	354.0	168.7	239.7	168.7					
TRINIDAD	167.0	12.8	16.0	26.2					
TURQUOISE	127.0	31.7	78.0	77.3					
TWIN LAKES	86.0	24.5	47.6	44.0					

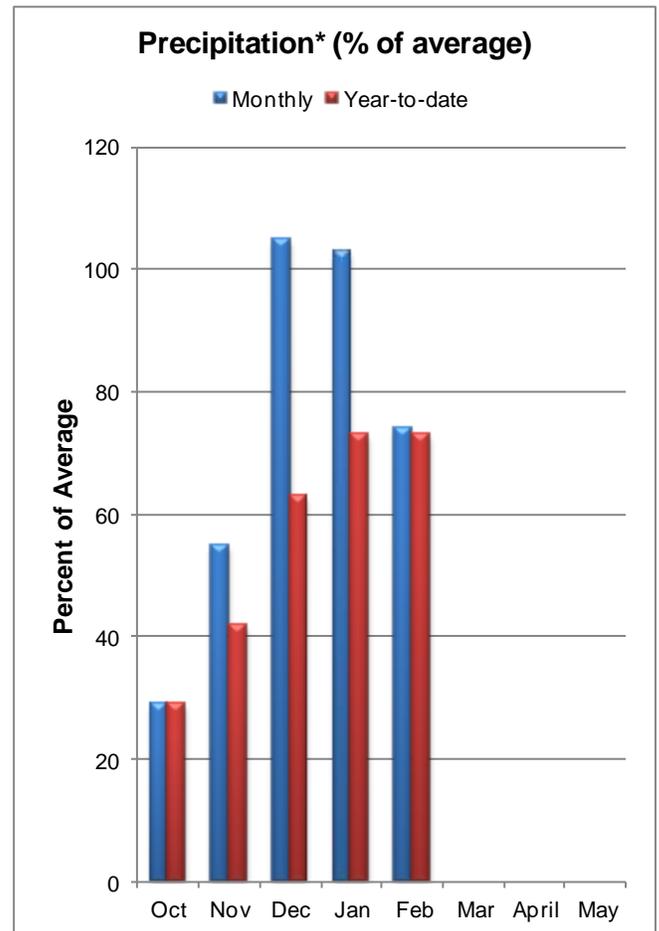
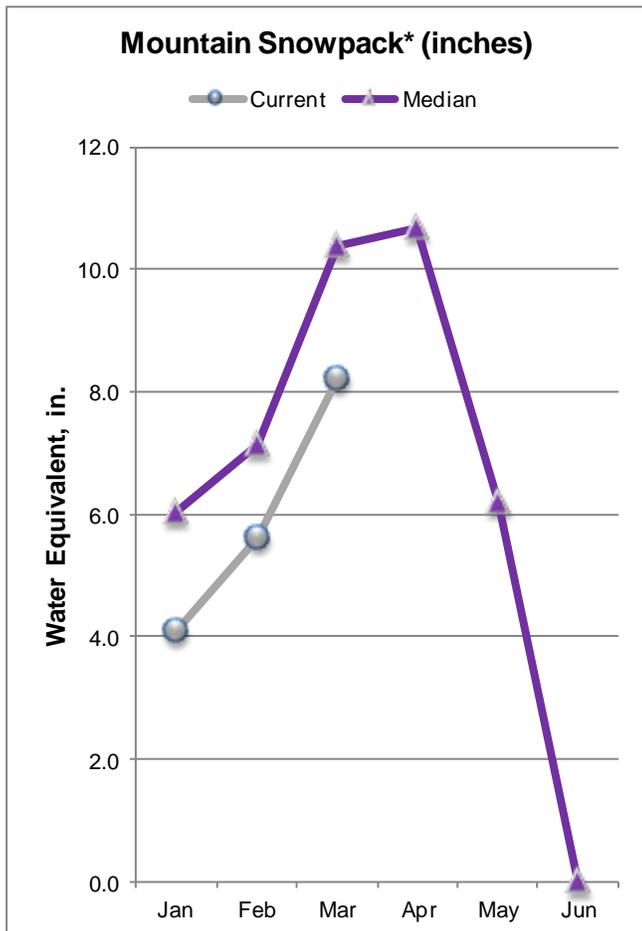
\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (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.
- (3) - Median value used in place of average.

# UPPER RIO GRANDE RIVER BASIN

## as of March 1, 2013



\*Based on selected stations

Snowpack measurements in the Upper Rio Grande basin saw a nominal increase from 78 percent of median last month, to 79 percent of median on March 1. The current snowpack is just 91 percent of last year's measurement for this same date. While the amount of snow for the greater basin has increased slightly, the sub basins showed more variability. The Conejos, Rio San Antonio, and Alamosa Creek sub basins all had overall declines in their snowpack percentages. On the flip side, the Upper Rio Grande, Culebra and Trinchera sub basins saw modest increases of 1 percent and 7 percent respectively. All the watersheds in this basin have snowpack's that are well below normal. Unlike January, the precipitation received during February was below average. Precipitation totals for February were only 74 percent of the normal monthly amount. Water year to date precipitation was reported at 73 percent of average for the second consecutive month.

Reservoirs in the basin are storing volumes that are only 53 percent of average, and only 78 percent of last year's storage. The recent streamflow forecasts issued for the April to September period are below 75 percent of average for all forecast points in the basin. They range from 74 percent of average for the Inflow to Platoro Reservoir and the Rio Grande near Thirty Mile Bridge to only 33 percent of average for Sangre de Cristo Creek.

UPPER RIO GRANDE BASIN  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		===== Wetter =====>>				
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Rio Grande at Thirty Mile Bridge (2)	APR-SEP	60	80	95	74	111	138	129
Rio Grande at Thirty Mile Bridge (2)	APR-JUL	54	71	83	74	96	118	113
Rio Grande at Wagon Wheel Gap (2)	APR-SEP	147	200	245	72	290	370	340
SF Rio Grande at South Fork (2)	APR-SEP	56	75	89	70	104	130	127
Rio Grande nr Del Norte (2)	APR-SEP	210	295	360	70	430	550	515
Saguache Ck nr Saguache (2)	APR-SEP	10.2	16.7	22	69	28	38	32
Alamosa Ck ab Terrace Reservoir	APR-SEP	30	40	48	71	57	70	68
La Jara Ck nr Capulin	MAR-JUL	2.9	4.6	6.0	67	7.6	10.2	8.9
Trinchera Ck ab Turners Ranch	APR-SEP	3.8	5.0	6.0	48	7.0	8.8	12.6
Sangre de Cristo Ck (2)	APR-SEP	1.3	3.4	5.3	33	7.7	11.9	16.3
Ute Ck nr Fort Garland	APR-SEP	2.9	4.8	6.4	50	8.2	11.3	12.8
Platoro Reservoir Inflow (2)	APR-JUL	29	36	42	75	48	58	56
	APR-SEP	31	39	46	74	53	64	62
Conejos R nr Mogote (2)	APR-SEP	88	116	138	71	162	200	194
San Antonio R at Ortiz	APR-SEP	2.9	5.2	7.2	46	9.5	13.4	15.6
Los Pinos R nr Ortiz	APR-SEP	26	37	45	62	54	69	73
Culebra Ck at San Luis (2)	APR-SEP	3.6	7.0	9.9	43	13.3	19.2	23
Costilla Reservoir Inflow (2)	MAR-JUL	4.1	6.0	7.6	69	9.3	12.2	11.1
Costilla Ck nr Costilla (2)	MAR-JUL	7.1	12.1	16.3	63	21	29	26

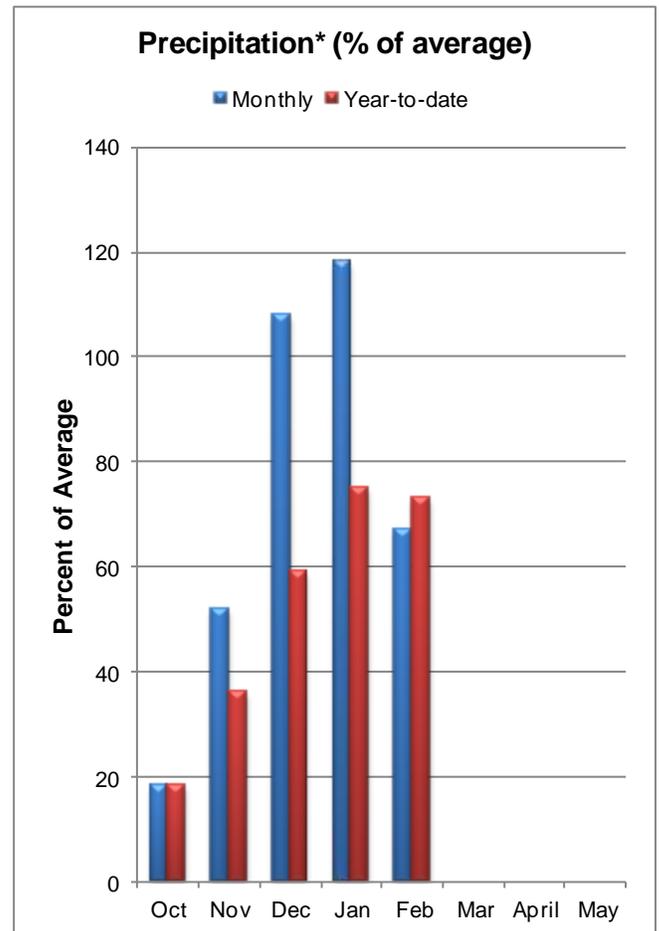
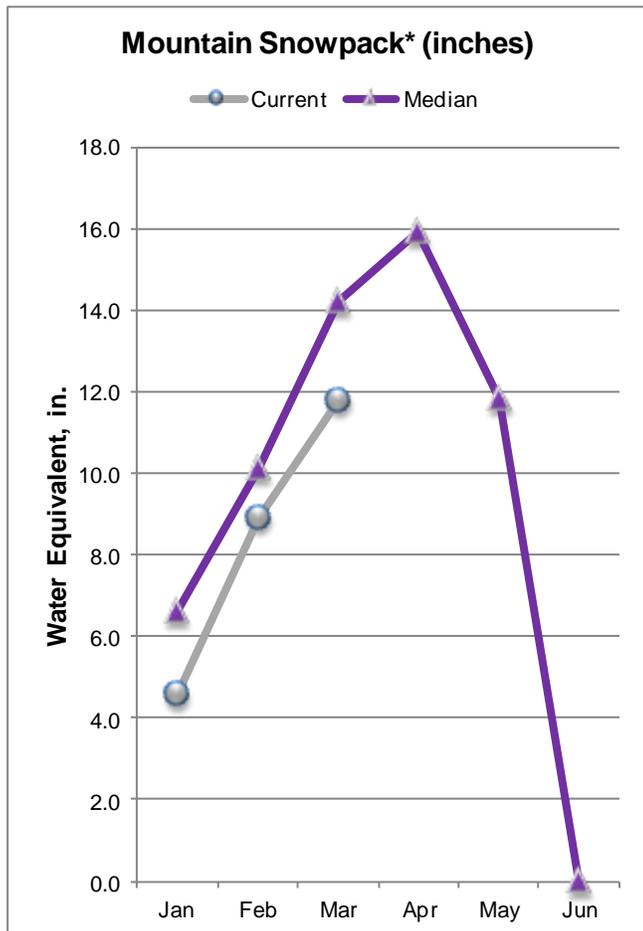
UPPER RIO GRANDE BASIN Reservoir Storage (1000 AF) - End of February					UPPER RIO GRANDE BASIN Watershed Snowpack Analysis - March 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
CONTINENTAL	27.0	7.8	4.6	5.3	ALAMOSA CREEK BASIN	1	89	63
PLATORO	60.0	8.8	15.4	24.3	CONEJOS & RIO SAN ANTONIO	4	97	73
RIO GRANDE	51.0	13.0	18.5	17.6	CULEBRA & TRINCHERA CREEK	4	96	82
SANCHEZ	103.0	6.7	8.5	24.1	UPPER RIO GRANDE BASIN	11	88	79
SANTA MARIA	45.0	7.5	8.2	10.6	TOTAL UPPER RIO GRANDE BA	19	91	78
TERRACE	18.0	3.5	5.6	6.7				

\* 90%, 70%, 50%, 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 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
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- (3) - Median value used in place of average.

# SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS as of March 1, 2013



\*Based on selected stations

Snow accumulation for the San Miguel, Dolores, Animas, and San Juan basins came in below normal, at just 79 percent of the median, for the month of February. This is somewhat disappointing coming on the heels of above normal accumulation in both December and January. As a result the total snowpack percentage for these basins declined 5 percentage points from last month, with a report of 83 percent of median as of March 1. Even with the decline this remains the highest snowpack percentage reported across the state. Precipitation recorded at the SNOTEL sites in these basins during February was only 67 percent of average. The year to date total decreased slightly from last month to 73 percent of average reported on March 1.

The total volume of water stored in the reservoirs in these basins increased slightly from last month's reports. At the end of February the reservoirs were storing 258,000 acre-feet of water which is 67 percent of average storage for this time of year and 64 percent of what was stored last year at this time. This month's below normal precipitation and snow accumulation are directly reflected in this month's forecasts. Forecasts across the basin have declined significantly from those issued last month. April to July streamflow volumes are now expected to range from 58 percent of average for the Inflow to McPhee Reservoir to 73 percent of average for the Inflow to Vallecito Reservoir.

SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS  
Streamflow Forecasts - March 1, 2013

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		=====		>>===== Wetter =====>>		
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Dolores R at Dolores	APR-JUL	95	129	155	63	183	229	245
McPhee Reservoir Inflow (2)	APR-JUL	96	138	170	58	206	265	295
San Miguel R nr Placerville	APR-JUL	50	70	85	66	102	129	128
Gurley Reservoir Inlet	APR-JUL	7.0	9.2	11.0	67	13.0	16.3	16.4
Cone Reservoir Inlet	APR-JUL	0.4	1.1	2.0	67	3.2	5.7	3.0
Lillylands Reservoir Inlet	APR-JUL	0.7	1.0	1.3	65	1.6	2.1	1.9
Rio Blanco at Blanco Diversion (2)	APR-JUL	22	32	39	72	47	60	54
Navajo R at Oso Diversion (2)	APR-JUL	27	38	47	72	57	72	65
San Juan R nr Carracas (2)	APR-JUL	141	205	255	67	310	400	380
Piedra R nr Arboles	APR-JUL	82	112	135	64	160	200	210
Vallecito Reservoir Inflow (2)	APR-JUL	96	122	141	73	161	194	194
Navajo Reservoir Inflow (2)	APR-JUL	275	380	465	63	555	705	735
Animas R at Durango	APR-JUL	171	225	265	64	310	380	415
Lemon Reservoir Inflow (2)	APR-JUL	24	32	38	69	44	55	55
La Plata R at Hesperus	APR-JUL	9.3	12.5	15.0	65	17.7	22	23
Mancos R nr Mancos (2)	APR-JUL	10.2	15.3	19.4	63	24	31	31

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, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
GROUNDHOG	22.0	5.7	4.8	12.0	ANIMAS RIVER BASIN	8	82	78
JACKSON GULCH	10.0	1.4	3.7	4.6	DOLORES RIVER BASIN	6	94	84
LEMON	40.0	8.2	14.3	20.4	SAN MIGUEL RIVER BASIN	5	89	82
MCPHEE	381.0	188.9	287.7	276.3	SAN JUAN RIVER BASIN	4	96	88
NARRAGUINNEP	19.0	7.6	16.4	13.5	TOTAL SAN MIGUEL, DOLORES	22	89	83
VALLECITO	126.0	46.0	76.6	60.8	AN JUAN RIVER BASINS			

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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Denver Federal Center, Bldg 56, Rm 2604  
PO Box 25426  
Denver, CO 80225-0426

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 Natural Resources Conservation Service web page at <http://www.wcc.nrcs.usda.gov/wsf/westwide.html>

*Issued by*

**Jason Weller**  
**Acting Chief**  
**Natural Resources Conservation Service**  
**U.S. Department of Agriculture**

*Released by*

**Phyllis Ann Philipps**  
**State Conservationist**  
**Natural Resources Conservation Service**  
**Lakewood, Colorado**

**Colorado**  
**Basin Outlook Report**  
Natural Resources Conservation Service  
Lakewood, CO