

**USDA** United States  
Department of  
Agriculture

**Natural  
Resources  
Conservation  
Service**

# Arizona

## Basin Outlook Report

### April 1, 2005



# 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 and streamflow values 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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# ARIZONA

## Water Supply Outlook Report as of April 1, 2005

A full range of Snow Survey and Water Supply Forecasting products is available on the Arizona NRCS Home Page

### Arizona Snow Survey Program

<http://www.az.nrcs.usda.gov/snow/index.html>

### Helpful Internet Sites

#### Defending Against Drought – NRCS

<http://www.nrcs.usda.gov/feature/highlights/drought.html>

- Ideas on water, land, and crop management for you to consider while creating your drought plan.

#### Arizona Agri-Weekly

<http://www.nass.usda.gov/az/cur-agwk.pdf>

- Provides an overview of Arizona's crop, livestock, range and pasture conditions as reported by local staffs of the USDA's Agricultural Statistic Service and the University of Arizona.

## SUMMARY

Snowpack levels remain above average for April 1. Total cumulative precipitation since October 1 is well above average at all SNOTEL sites. Runoff volume for March was near median to well above median for streams covered in this report. Where reservoir storage is available, water supplies are looking very good for the spring and summer growing season.

## SNOWPACK

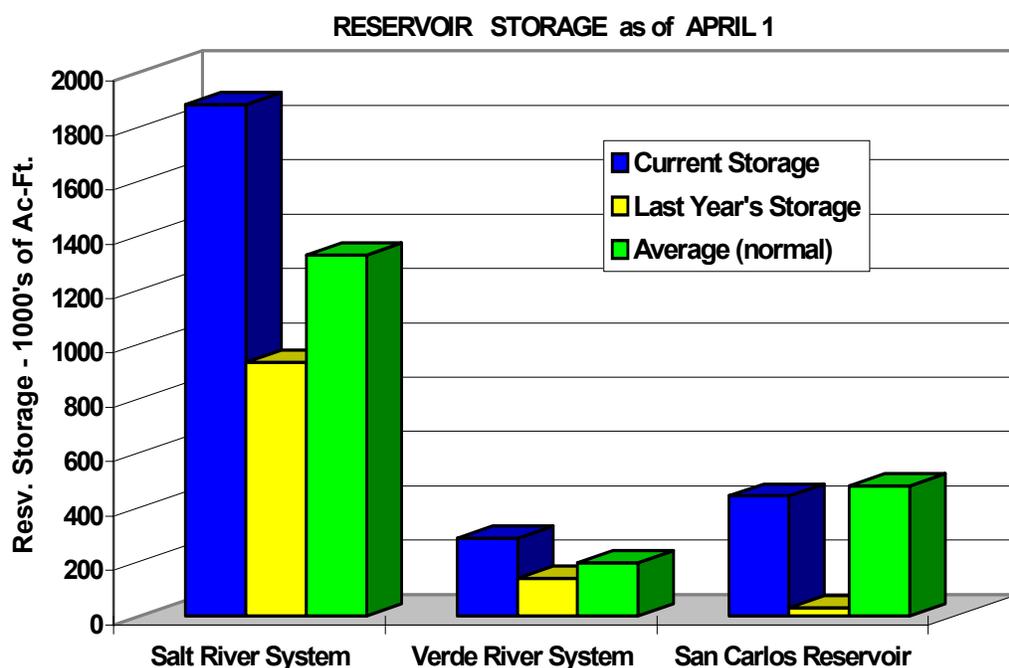
Watershed	Percent (%) of 30-Yr. Average Snowpack Levels as of April 1
Salt River Basin	138%
Verde River Basin	139%
Little Colorado River Basin	126%
San Francisco-Upper Gila River Basin	166%
<b>Other Points of Interest</b>	
Chuska Mountains	203%
Central Mogollon Rim	114%
Grand Canyon	147%
San Francisco Peaks	189%
<b>Statewide Snowpack</b>	<b>161%</b>

## PRECIPITATION

Mountain data from NRCS SNOTEL sites indicate that total precipitation for the month of March varied from near average to below average from one river basin to the next. Total cumulative precipitation for the water year, however, is well above average for all basins covered in this report.

Please refer to the basin bar graphs found in the report for more information regarding seasonal precipitation amounts.

## RESERVOIR

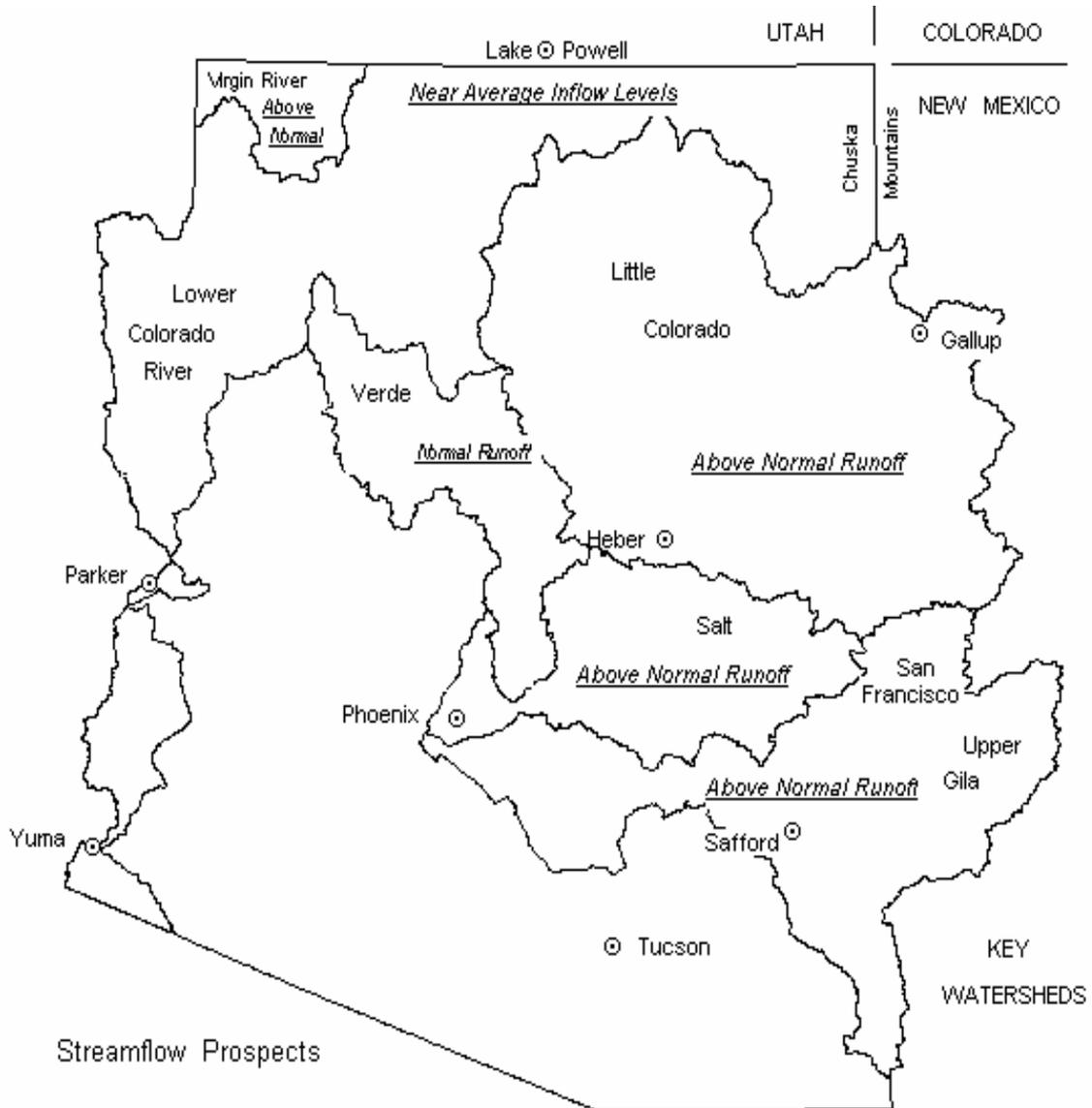


Key storage volumes displayed in thousands of acre-feet (1000 x ):

RESERVOIR	CURRENT STORAGE	LAST YEAR STORAGE	30-YEAR AVERAGE
Lyman Lake	6.4	4.2	17.2
Show Low Lake	5.1	3.5	4.1
Lake Pleasant	768.7	698.4	----
Lake Havasu	551.0	536.2	562.3
Lake Mohave	1688.9	1677.2	1680.4
Lake Mead	16220.0	15255.0	21999.0
Lake Powell	8015.0	10180.0	18326.0
Salt River System	1879.7	932.8	1327.4
Verde River System	285.2	137.8	195.7
San Carlos Reservoir	440.4	30.1	476.9

# STREAMFLOW

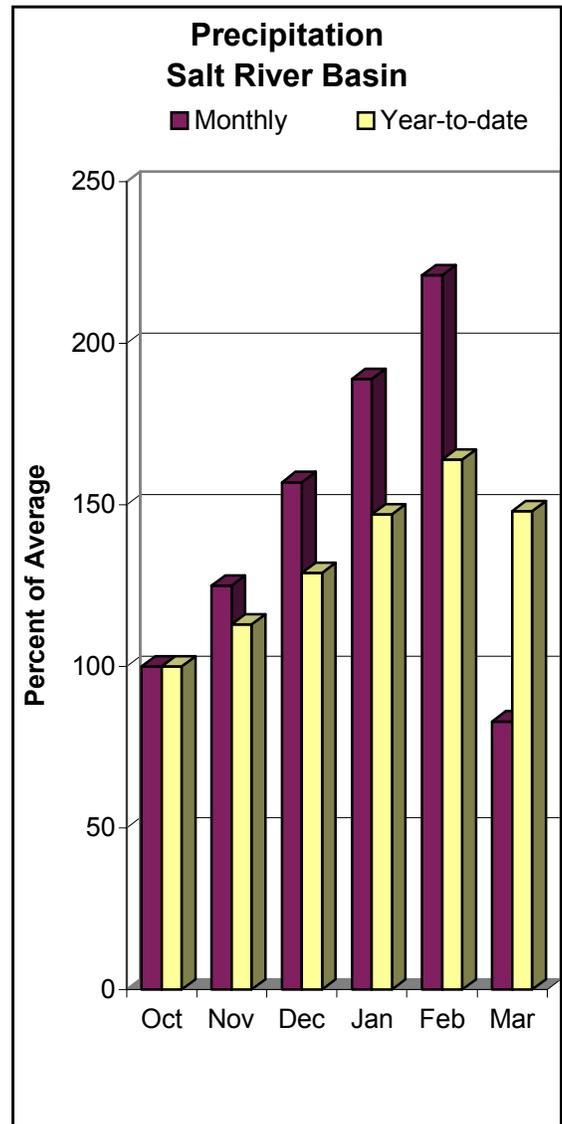
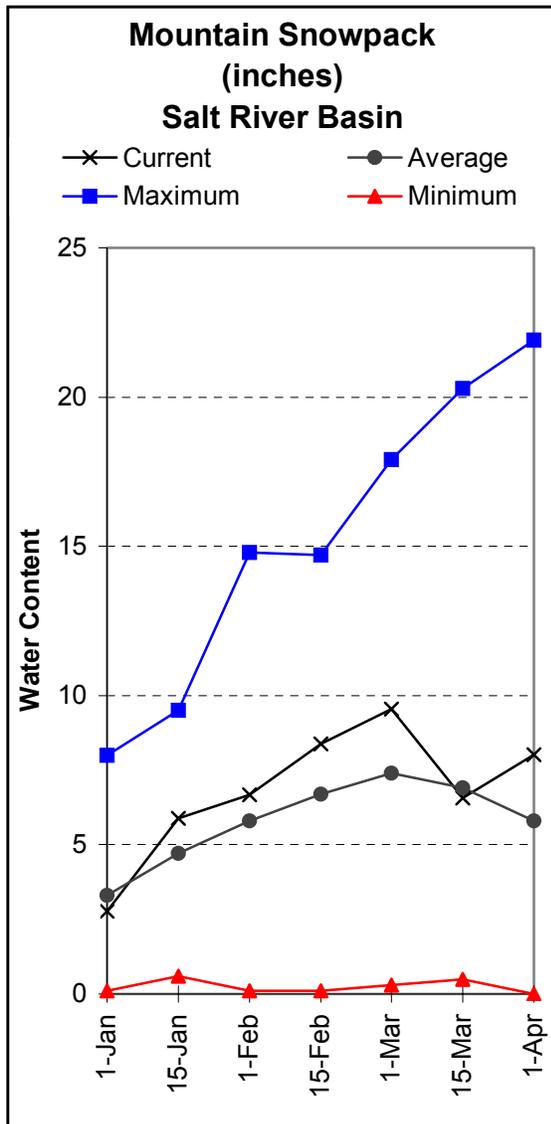
Near median or well above median streamflow levels are forecast for streams covered in this report. Please refer to the streamflow forecast tables found in the report for more information regarding seasonal water supplies.



## SALT RIVER BASIN as of April 1, 2005

Near median or above median streamflow levels are forecast for the basin. For the Salt River, near Roosevelt, the forecast calls for 122 % of median streamflow levels through MAY, while at Tonto Creek, the forecast calls for 95 % of median streamflow levels through MAY.

Additionally, snow survey measurements show basin snowpack levels to be 138 % of the 30-year average, while combined reservoir storage in the Salt River system was recorded at 1,879,672 acre-feet for April 1.



SALT RIVER BASIN  
Streamflow Forecasts - April 1, 2005

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Med (1000AF)
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (1000AF) (% MED.)	30% (1000AF)	10% (1000AF)		
Salt River nr Roosevelt							
APR-MAY	92	137	175	122	255	350	143
APRIL	93	112	125	136	138	157	92
Tonto Creek ab Gun Creek nr Roosevelt							
APR-MAY	4.00	6.30	8.00	95	10.11	12.90	8.40
APRIL	3.20	4.90	6.00	98	7.10	8.80	6.10

\* 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 and median are 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.

SALT RIVER BASIN  
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** Usable Storage *****		
		This Year	Last Year	Average
SALT RIVER RES SYSTEM	2025.8	1879.7	932.8	1327.4

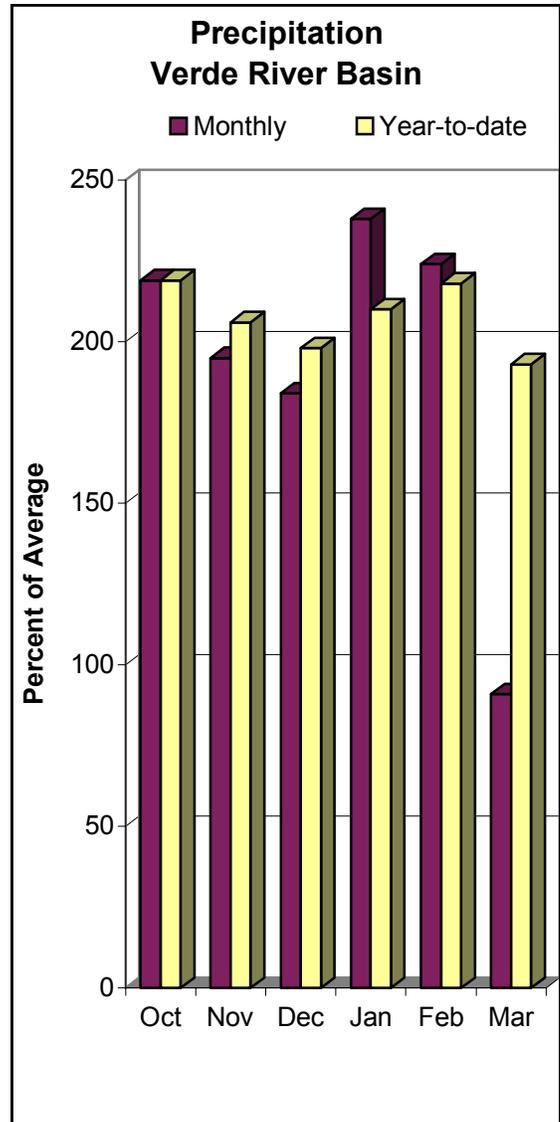
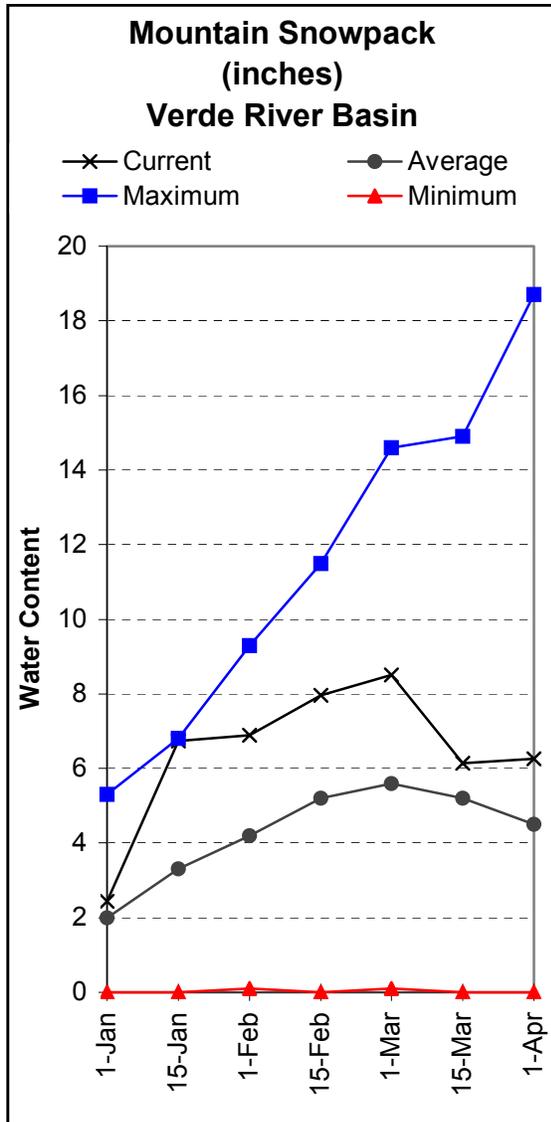
SALT RIVER BASIN  
Watershed Snowpack Analysis - April 1, 2005

Watershed	Number of Data Sites	This Year as Percent of	
		Last Year	Average
SALT RIVER BASIN	8	1037	138

## VERDE RIVER BASIN as of April 1, 2005

Near median streamflow levels are forecast for the basin. For the Verde River, above Horseshoe Dam, the forecast calls for 102 % of median streamflow levels through MAY.

Additionally, snow survey measurements show basin snowpack levels to be 139 % of the 30-year average, while combined reservoir storage in the Verde River system was recorded at 285,190 acre-feet for April 1..



VERDE RIVER BASIN  
Streamflow Forecasts - April 1, 2005

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Med (1000AF)
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (1000AF) (% MED.)	30% (1000AF)	10% (1000AF)		
Verde River abv Horseshoe Dam							
APR-MAY	20	33	45	102	59	85	44
APRIL	21	29	35	103	41	49	34

\* 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 and median are 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.

VERDE RIVER BASIN  
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** This Year	***** Usable Storage Last Year	***** Average
VERDE RIVER RES SYSTEM	287.4	285.2	137.8	195.7

VERDE RIVER BASIN  
Watershed Snowpack Analysis - April 1, 2005

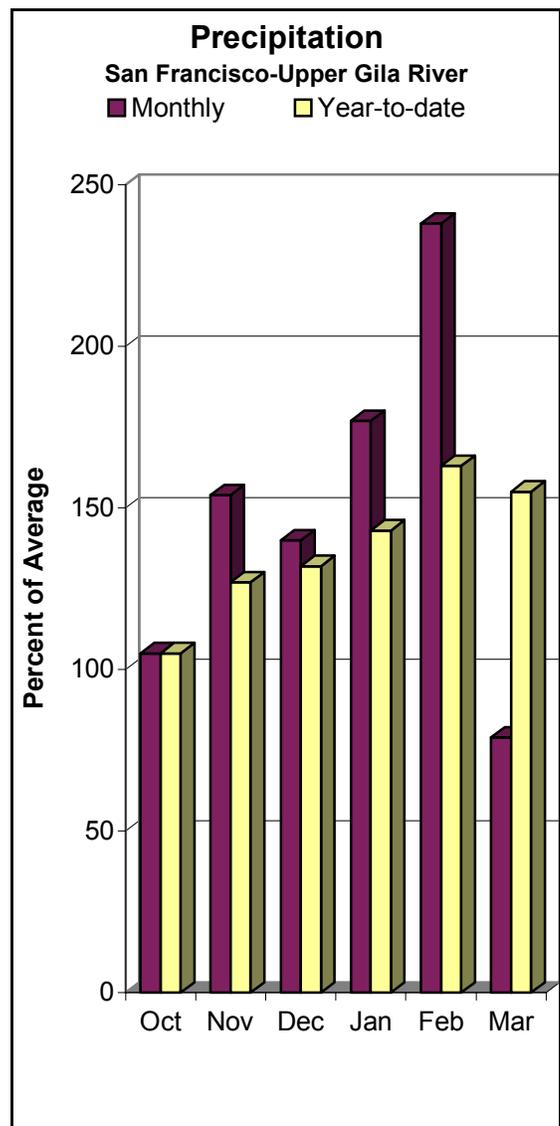
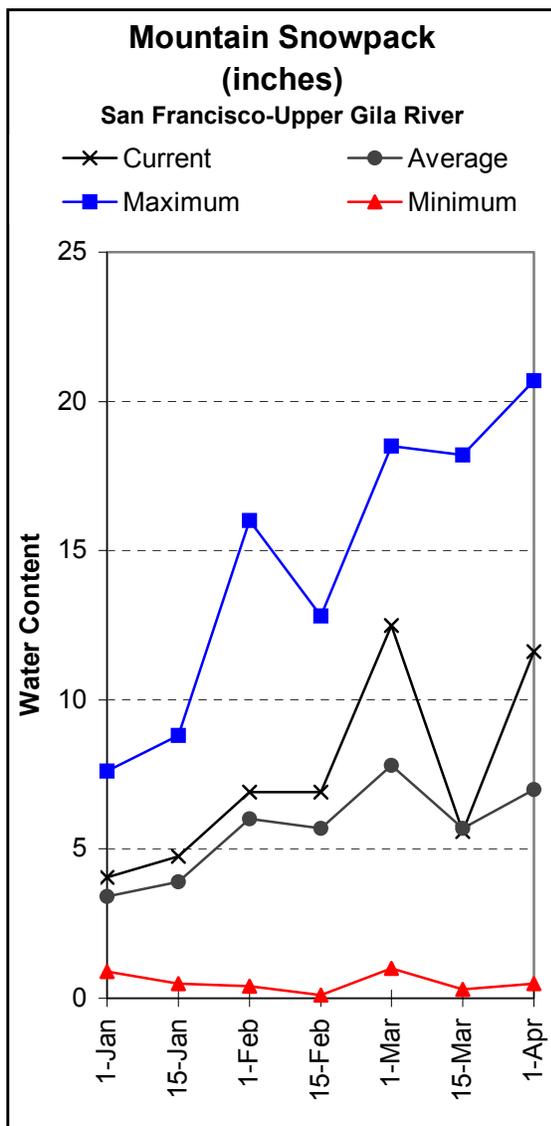
Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
VERDE RIVER BASIN	10	924	139
SAN FRANCISCO PEAKS	3	504	189

## SAN FRANCISCO-UPPER GILA RIVER BASIN as of April 1, 2005

Well above median streamflow levels are forecast for the basin. For the San Francisco River, at Clifton, the forecast calls for 146 % of median streamflow levels through MAY, while in the Gila River, near Solomon, the forecast calls for 119 % of median streamflow levels through MAY.

At San Carlos Reservoir, inflow into the lake is forecast at 227 % of median through MAY.

At San Carlos, reservoir storage has increased to 440,400 acre-feet, while snow survey measurements show basin snowpack levels to be 166 % of the 30-year average for April 1.



SAN FRANCISCO - UPPER GILA RIVER BASIN  
Streamflow Forecasts - April 1, 2005

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Med (1000AF)
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (1000AF)	(% MED.)	30% (1000AF)	10% (1000AF)	
Gila River at Gila APR-MAY	18.0	24	30	173	43	55	17.3
Gila River nr Virden APR-MAY	19.9	28	35	146	46	56	24
San Francisco River at Glenwood APR-MAY	6.00	10.00	14.00	180	19.99	25.99	7.80
San Francisco River at Clifton APR-MAY	14.1	21	27	146	37	47	18.5
Gila River nr Solomon APR-MAY	25	37	50	119	68	86	42
	APRIL		35	121			29
San Carlos Reservoir inflow APR-MAY	8.9	22	35	227	47	60	15.4

\* 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 and median are 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 FRANCISCO - UPPER GILA RIVER BASIN  
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** Usable Storage *****		
		This Year	Last Year	Average
SAN CARLOS	875.0	440.4	30.1	476.9
PAINTED ROCK DAM		NO REPORT		

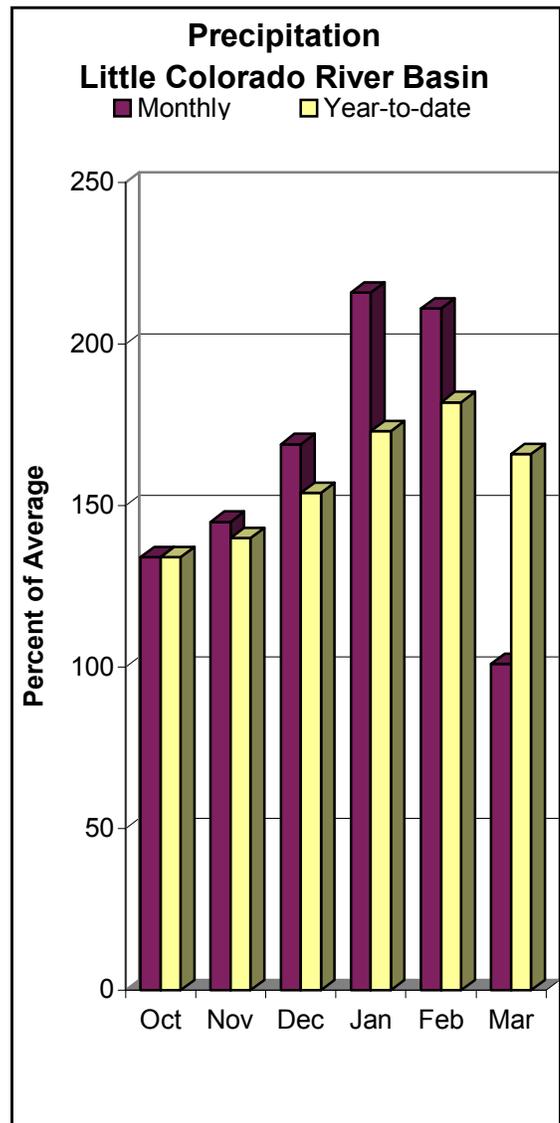
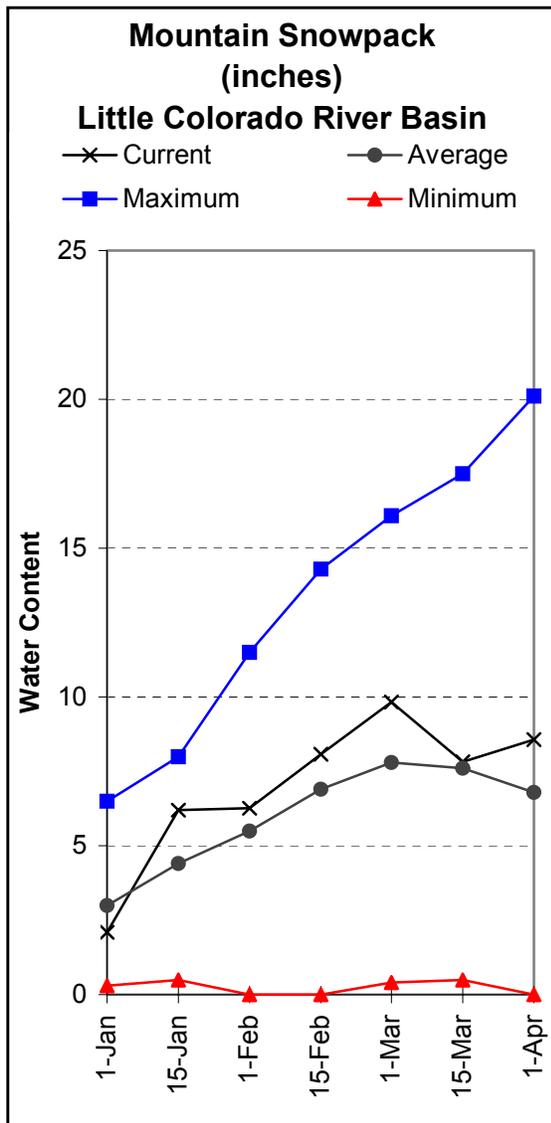
SAN FRANCISCO - UPPER GILA RIVER BASIN  
Watershed Snowpack Analysis - April 1, 2005

Watershed	Number of Data Sites	This Year as Percent of	
		Last Year	Average
SAN FRANCISCO - UPPER GILA R	11	476	166

## LITTLE COLORADO RIVER BASIN as of April 1, 2005

Much above median streamflow levels are forecast for the basin. For the Little Colorado River, above Lyman Lake, the forecast calls for 256 % of median streamflow levels through JUNE, while at Woodruff, the forecast calls for 262 % of median streamflow levels through MAY.

Additionally, snow remaining along the southern headwaters of the Little Colorado River and along the central Mogollon Rim was measured at 126 % and 114 % of the 30-year average, respectively.



LITTLE COLORADO RIVER BASIN  
Streamflow Forecasts - April 1, 2005

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Med (1000AF)
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (1000AF) (% MED.)	30% (1000AF)	10% (1000AF)		
Little Colorado River abv Lyman Lake							
APR-JUN	5.50	8.60	11.00	256	14.00	19.99	4.30
Rio Nutria nr Ramah							
APR-MAY	0.10	0.30	0.50	96	1.00	1.50	0.52
Ramah Reservoir inflow							
APR-MAY	0.08	0.14	0.20	69	0.70	1.20	0.29
Zuni River abv Black Rock Reservoir							
APR-MAY	0.01	0.22	0.44	69	1.07	1.70	0.64
Little Colorado River at Woodruff							
APR-MAY	1.08	1.61	2.20	262	3.00	3.90	0.84
Blue Ridge Reservoir inflow							
APR-MAY	3.00	4.50	6.00	122	8.00	10.00	4.90
Lake Mary inflow							
APR-MAY	0.74	1.26	1.78	122	2.30	2.80	1.46

\* 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 and median are 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.

LITTLE COLORADO RIVER BASIN  
Reservoir Storage (1000AF) End of March

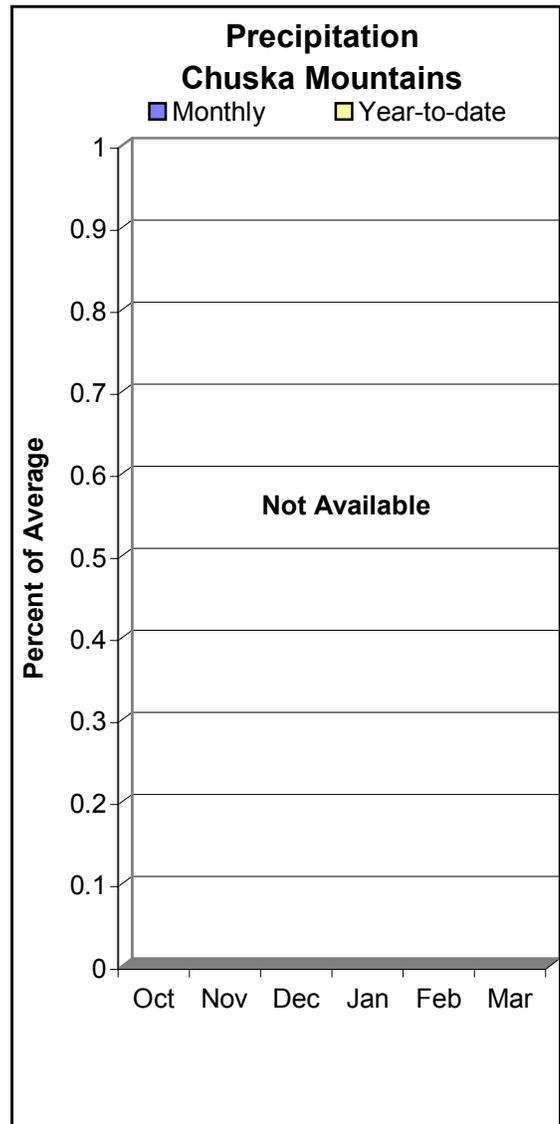
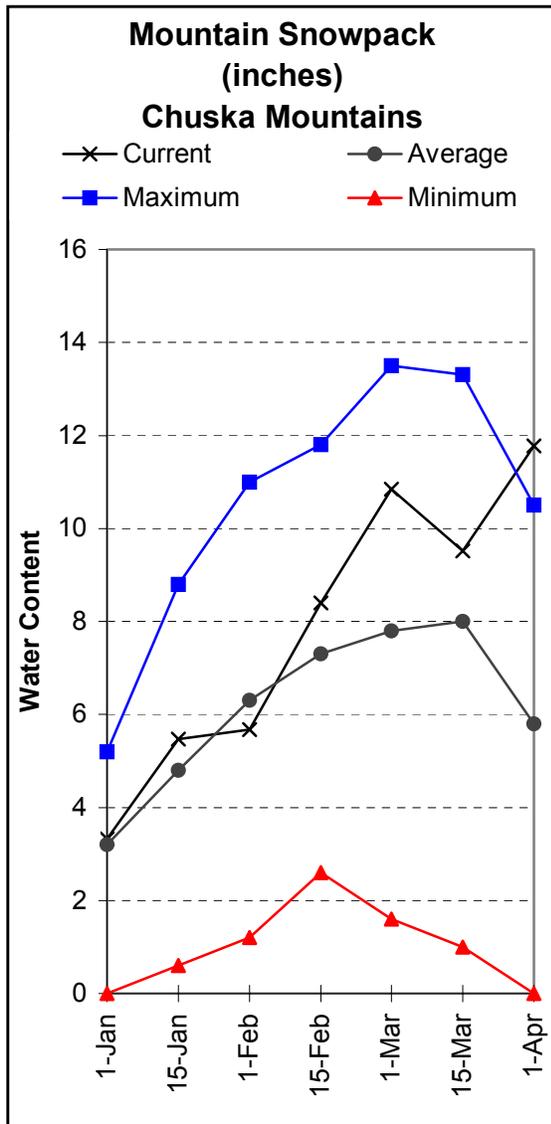
Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
LYMAN RESERVOIR	30.0	6.4	4.2	17.2
SHOW LOW LAKE	5.1	5.1	3.5	4.1

LITTLE COLORADO RIVER BASIN  
Watershed Snowpack Analysis - April 1, 2005

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
LITTLE COLORADO - SOUTHERN H	9	1921	126
CENTRAL MOGOLLON RIM	4	4662	114

## CHUSKA MOUNTAINS as of April 1, 2005

In the Chuska Mountains of northeastern Arizona, snow survey measurements conducted by staff of the Navajo Tribe show snowpack levels to be 203 % of average for April 1, while well above average streamflow levels are forecast for Captain Tom Wash, Wheatfields Creek, and Bowl Canyon Creek through springtime.



CHUSKA MOUNTAINS  
Streamflow Forecasts - April 1, 2005

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Avg (1000AF)
	Chance of Exceeding *						
	90% (1000AF)	70% (1000AF)	50% (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
<b>Captain Tom Wash nr Two Gray Hills</b>							
MAR-MAY	1.10	3.40	4.90	173	6.40	8.70	2.83
<b>Wheatfields Creek nr Wheatfields</b>							
MAR-MAY	1.80	4.10	5.70	197	7.30	9.60	2.90
<b>Bowl Canyon Creek abv Assayi Lake</b>							
MAR-MAY	0.56	1.36	1.90	190	2.40	3.20	1.00

\* 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 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.

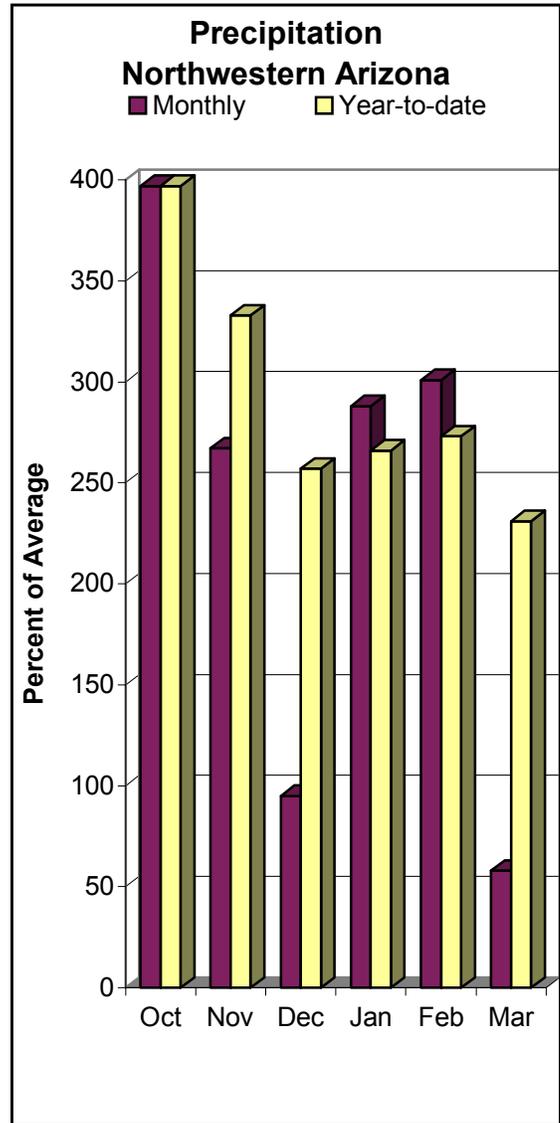
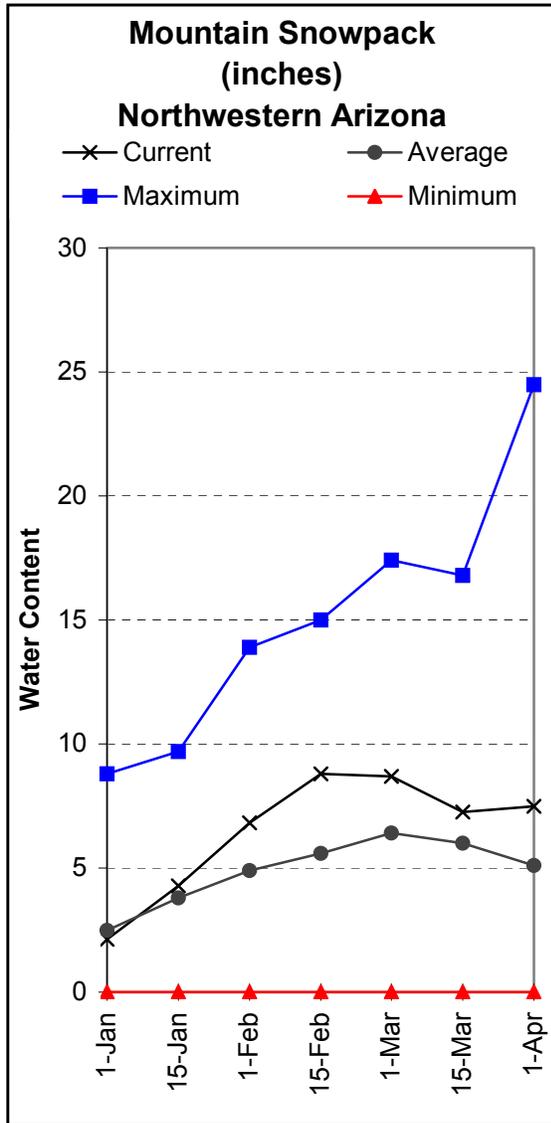
CHUSKA MOUNTAINS  
Watershed Snowpack Analysis - April 1, 2005

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
CHUSKA MOUNTAINS	7	2388	203
DEFIANCE PLATEAU	2	0	89

## NORTHWESTERN ARIZONA as of April 1, 2005

On the Colorado River, inflow into Lake Powell is forecast at 107 % of the 30-year average APRIL-JULY, while in the Virgin River at Littlefield, the forecast calls for 351 % of average streamflow levels APRIL-JULY.

At the Grand Canyon, snow survey measurements conducted by staff of the National Park Service show snowpack levels to be 147 % of the 30-year average for April 1.



NORTHWESTERN ARIZONA  
Streamflow Forecasts - April 1, 2005

Forecast Pt	<=== Drier === Future Conditions === Wetter ===>						30 Yr Avg
	Chance of Exceeding *						
Forecast Period	90% (1000AF)	70% (1000AF)	50% (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)	(1000AF)	(1000AF)
Virgin River at Littlefield							
APR-JUL	180	230	260	351	295	355	74
Lake Powell inflow							
APR-JUL	5990	7480	8500	107	9520	11010	7930

\* 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 1971-2000 base period.

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- (2) - The value is natural volume - actual volume may be affected by upstream water management.

NORTHWESTERN ARIZONA  
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** Usable Storage *****		
		This Year	Last Year	Average
LAKE HAVASU	619.0	551.0	536.2	562.3
LAKE MOHAVE	1810.0	1688.9	1677.2	1680.4
LAKE MEAD	26159.0	16220.0	15255.0	21999.0
LAKE POWELL	24322.0	8015.0	10180.0	18326.0

NORTHWESTERN ARIZONA  
Watershed Snowpack Analysis - April 1, 2005

Watershed	Number of Data Sites	This Year as Percent of	
		Last Year	Average
GRAND CANYON	2	0	147

S N O W   S U R V E Y   D A T A

APRIL 1, 2005

SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
ARBABS FOREST (AK)	7680	4/01	0	.0	0.0	.3
BAKER BUTTE SNOTEL	7330	4/01	8	3.0	0.0	4.5
BAKER BUTTE #2	7700	4/01	45	18.0	0.8	13.9
BALDY SNOTEL	9220	4/01	30	9.9	0.0	6.9
BEAVER HEAD	8000	3/31	0	.0	0.0	1.3
BEAVER HEAD SNOTEL	7990	4/01	8	3.4	0.0	1.5
BEAVER SPRING	9220	4/01	42	14.7	0.0	8.1
BRIGHT ANGEL	8400	3/31	42	15.7	0.0	9.9
BUCK SPRING	7400	3/31	0	.0	0.0	.7
CHALENDER	7100	4/01	0	.0	0.0	1.6
CHEESE SPRINGS	8600	3/31	20	7.1	0.0	3.8
CORONADO TRL SNOTEL	8400	4/01	0	.0	0.3	.7
CORONADO TRAIL	8350	3/31	0	.0	0.0	1.2
FLUTED ROCK	7800	4/01	2	.8	0.0	.6
FORT APACHE	9160	3/31	35	11.0	2.6	7.2
FORT VALLEY	7350	3/31	2	0.9	0.0	1.0
FRY SNOTEL	7220	4/01	13	6.6	0.1	3.2
GRAND CANYON	7500	3/31	0	.0	0.0	.8
HANNAGAN MDWS SNOTEL	9020	4/01	44	18.5	1.1	10.8
HAPPY JACK	7630	4/02	1	0.4	0.0	3.0
HAPPY JACK SNOTEL	7630	4/01	20	9.1	0.0	2.8
HEBER SNOTEL	7640	4/01	0	.0	0.0	2.9
LAKE MARY	6930	4/01	0	.0	0.0	.5
MAVERICK FORK SNOTEL	9200	4/01	35	14.8	0.6	9.0
MORMON MTN SNOTEL	7500	4/01	18	8.8	1.9	5.0
MORMON MT. SUMMIT #2	8470	4/04	52	22.3	5.0	15.1
NEWMAN PARK	6750	3/30	0	.0	0.0	.9
NUTRIOSO	8500	3/31	0	.0	0.0	.7
PROMONTORY SNOTEL	7900	4/01	39	16.3	0.0	11.4
SNOW BOWL #1 ALT.	10260	4/02	50	17.6	3.0	14.1
SNOW BOWL #2	11000	4/02	107	39.6	6.8	22.5
SNOWSLIDE CYN SNOTEL	9750	4/01	101	39.0	9.3	14.4
TSAILE CANYON #1	8160	4/01	20	8.8	0.0	3.4
TSAILE CANYON #3	8920	4/01	36	14.3	0.0	7.0
WHITE HORSE SNOTEL	7180	4/01	0	.0	0.0	3.0
WILDCAT SNOTEL	7850	4/01	0	.0	0.0	2.0
WILLIAMS SKI RUN	7720	4/01	36	14.0	0.0	9.5
WORKMAN CREEK SNOTEL	6900	4/01	-	.0	0.0	2.7

*Issued by*

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