



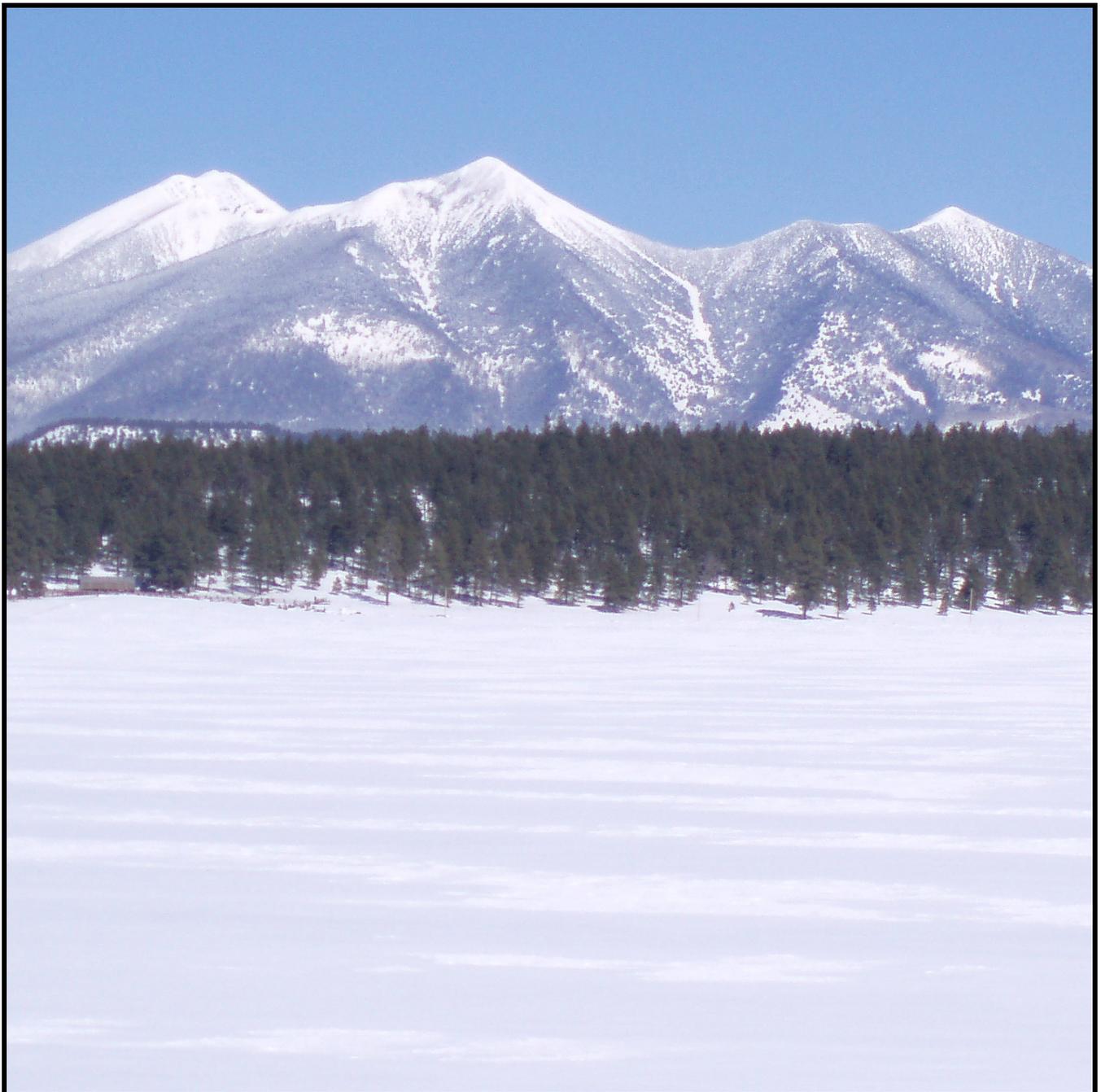
United States
Department of
Agriculture

Natural
Resources
Conservation
Service

Arizona

Basin Outlook Report

March 15, 2009



Issued by

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Basin Outlook Reports And Federal – State – Private Cooperative Snow Surveys

How forecasts are made

Most of the annual streamflow in Arizona 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 Snow Telemetry (SNOTEL) sites, along with precipitation and streamflow values, are used in statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service (NRCS) the National Weather Service, and the Salt River Project.

Forecasts of any kind are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertainty 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 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 are concerned about having an adequate water supply, they may want to base their decisions on the 90% or 70% exceedance probability forecasts. On the other hand, if users anticipate receiving too much water, or are concerned about the threat of flooding, they may want to base their decisions on the 30% or 10% exceedance probability forecasts. Regardless of the forecast value users choose, they should be prepared to deal with either more or less water.



For more water supply and resource management information, contact:

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ARIZONA Water Supply Outlook Report as of March 15, 2009

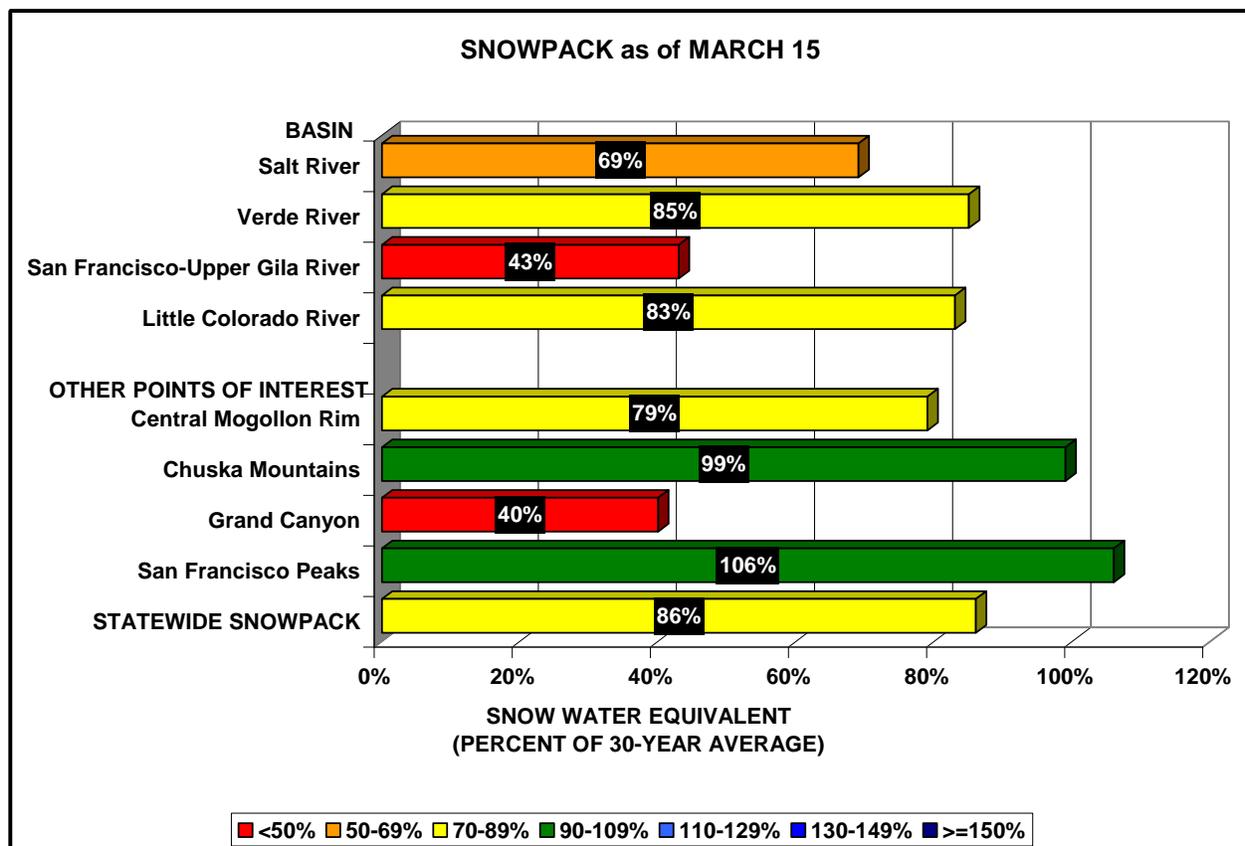
Useful Websites

- ◆ A full range of Snow Survey and Water Supply Forecasting products is available at:
<http://www.az.nrcs.usda.gov/snow>
- ◆ Information on current crop, livestock, range and pasture conditions in Arizona is available at:
http://www.nass.usda.gov/Statistics_by_State/Arizona/Publications
- ◆ Information on current hydrometeorological conditions in Arizona is available at:
<http://www.wrh.noaa.gov/psr/hydrology>

SUMMARY

As of March 15, basin snowpack levels range from well below normal at 43 percent of average in the San Francisco-Upper Gila River Basin to below normal at 85 percent of average in the Verde River Basin. The statewide snowpack is also below normal at 86 percent of average. The aerial extent of the snowpack is now limited to the uppermost reaches of the basins and several sites have no snow remaining. With continuing above average temperatures and below average precipitation during the first half of March, the snowpack is rapidly melting out. The forecast generally calls for well below normal streamflow levels for the spring runoff period. The Salt and Verde River reservoirs stand at 97 percent of capacity.

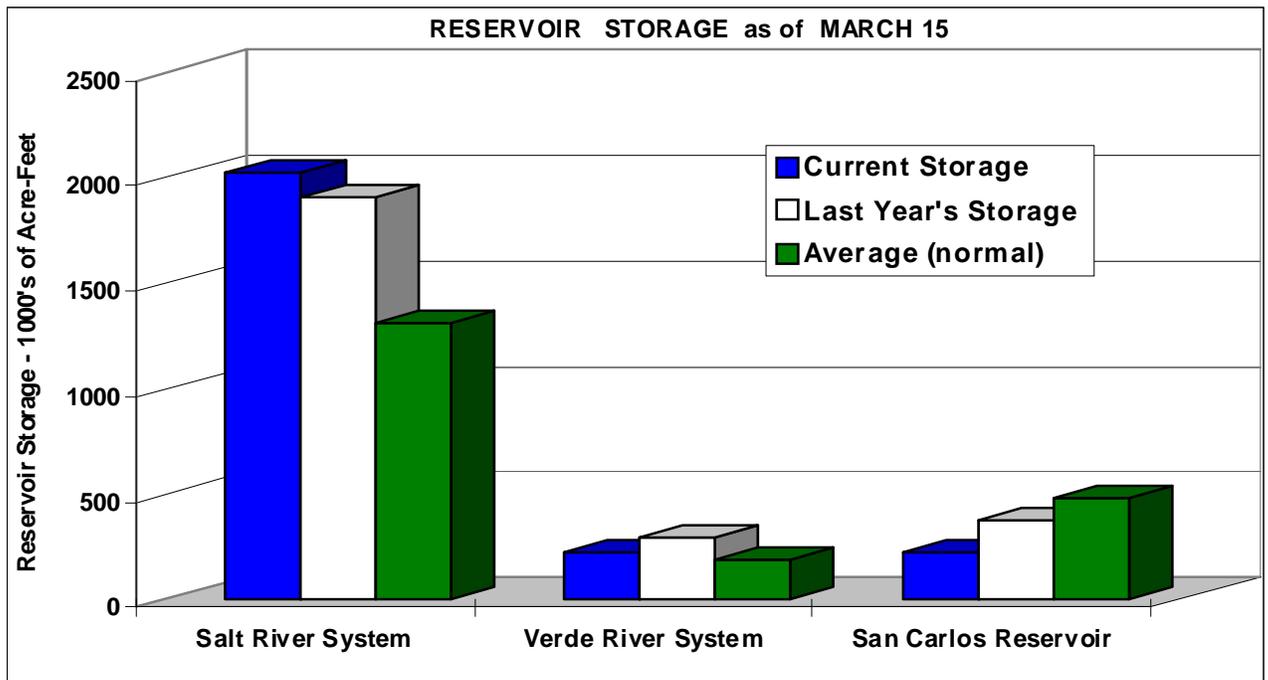
SNOWPACK



PRECIPITATION

Mountain data from NRCS SNOTEL sites show that cumulative precipitation since October 1 remains average in all basins, except for the San Francisco – Upper Gila River Basin, which remains below average for the water year. Please refer to the precipitation bar graphs found in this report for more information on precipitation levels in the basins.

RESERVOIR STORAGE



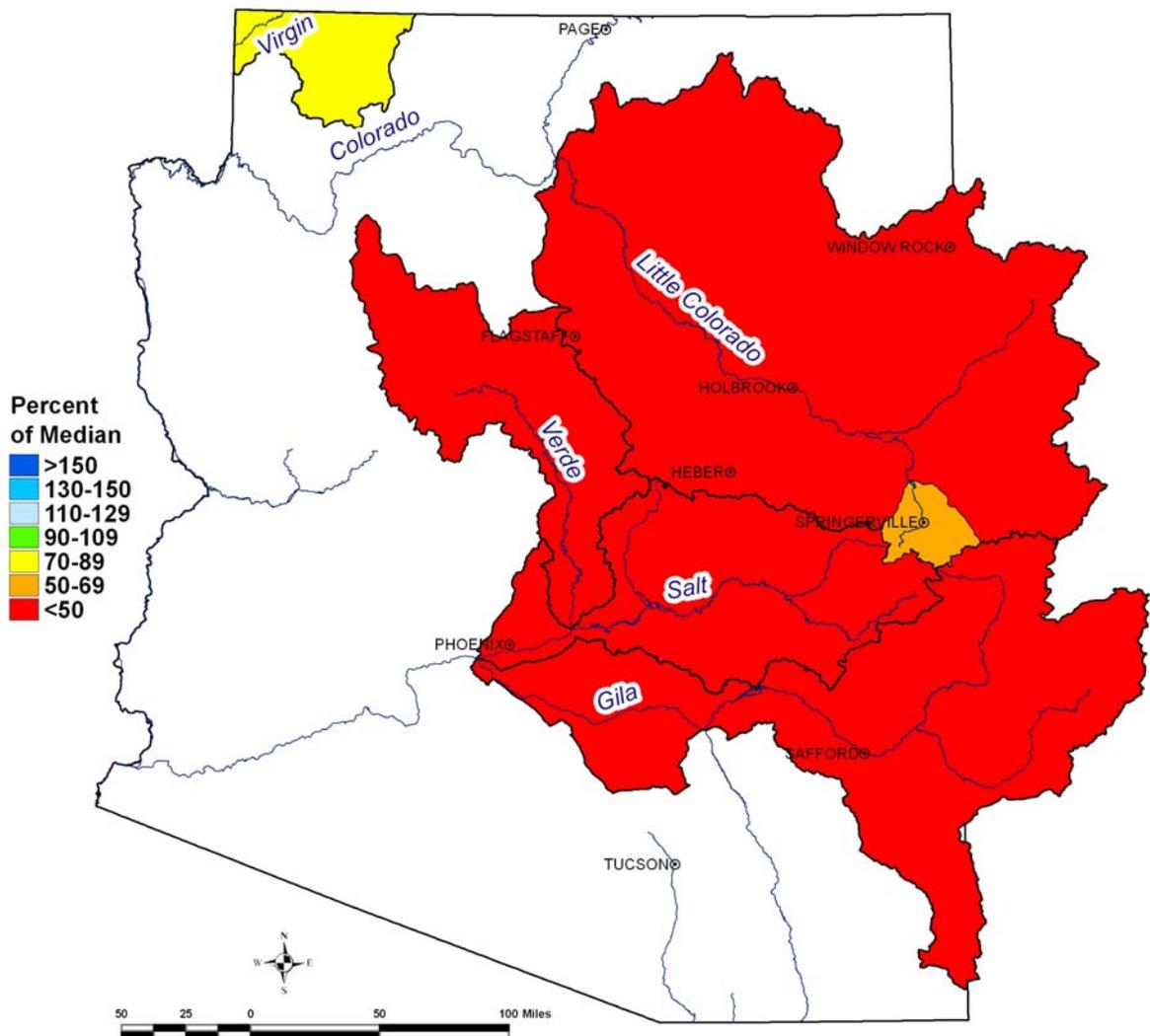
Key storage volumes displayed in thousands of acre-feet (x1000):

<u>Reservoir</u>	<u>Current Storage</u>	<u>Last Year Storage</u>	<u>30-Year Average</u>
Salt River System	2020.2	1903.3	1306.3
Verde River System	221.3	284.6	187.9
San Carlos Reservoir	218.7	370.8	476.9
Lyman Lake	16.0	10.8	16.2
Lake Pleasant	730.6	739.2	----
Lake Havasu	558.2	553.4	552.6
Lake Mohave	1630.9	1651.7	1694.0
Lake Mead	12428.0	13105.0	22090.0
Lake Powell	12864.0	10694.0	18366.0

STREAMFLOW

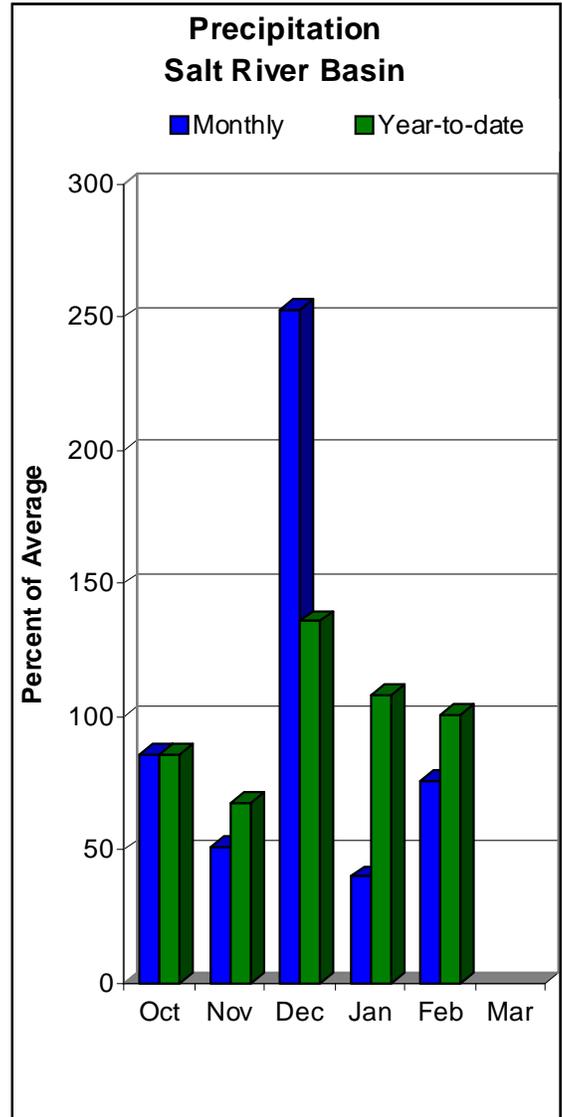
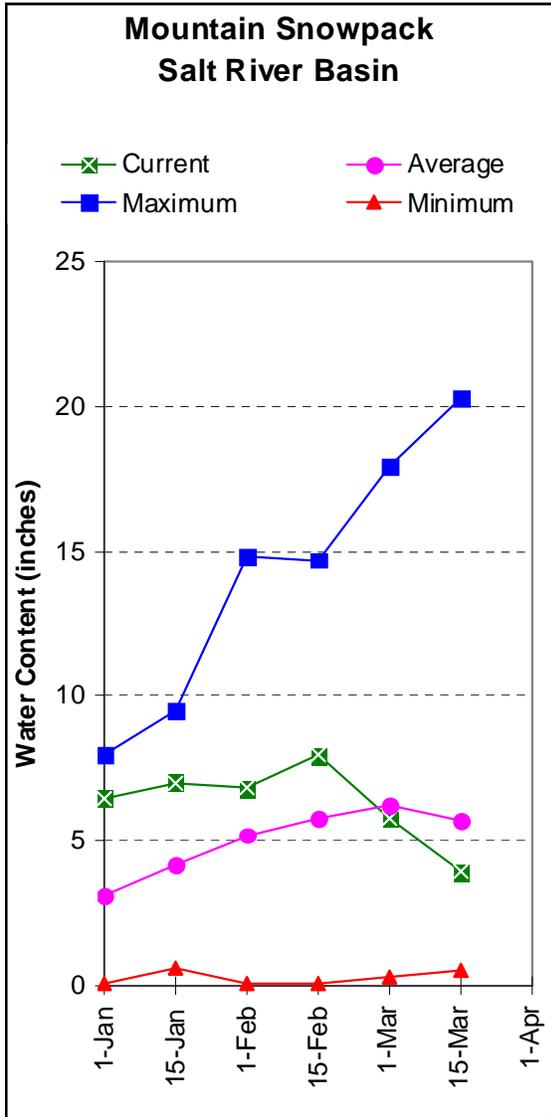
As of March 15, the forecast generally calls for well below normal streamflow levels for the spring runoff period, ranging from 64% of average in the Little Colorado River above Lyman Lake to 29% of average in the Gila River near Solomon. The streamflow forecasts continue to decline primarily due to below normal precipitation during the first half of March and a poor outlook for precipitation during the coming months. Please refer to the basin forecast tables found in this report for more information regarding water supply forecasts.

Arizona Spring Streamflow Forecasts as of March 15, 2009



SALT RIVER BASIN as of March 15, 2009

Well below median streamflow levels are forecast for the basin. In the Salt River, near Roosevelt, the forecast calls for 38% of median streamflow through May, while at Tonto Creek, the forecast calls for 30% of median streamflow through May. Snow survey measurements show the Salt snowpack to be at 69% of average.



SALT RIVER BASIN
Streamflow Forecasts - March 15, 2009

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							
M15-MAY	46	68	86	38	107	144	225
MARCH			85	65			131
Tonto Creek ab Gun Creek nr Roosevelt							
M15-MAY	2.0	2.5	5.0	30	8.7	17.0	16.6
MARCH			2.0	12			16.9

* 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.

SALT RIVER BASIN
Reservoir Storage (1000AF) Mid-March

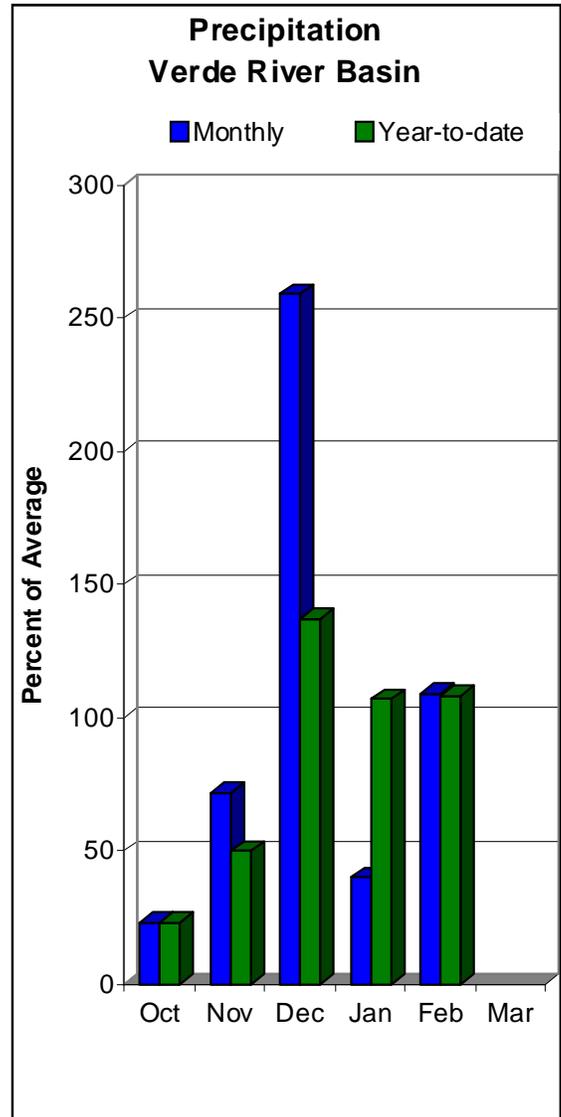
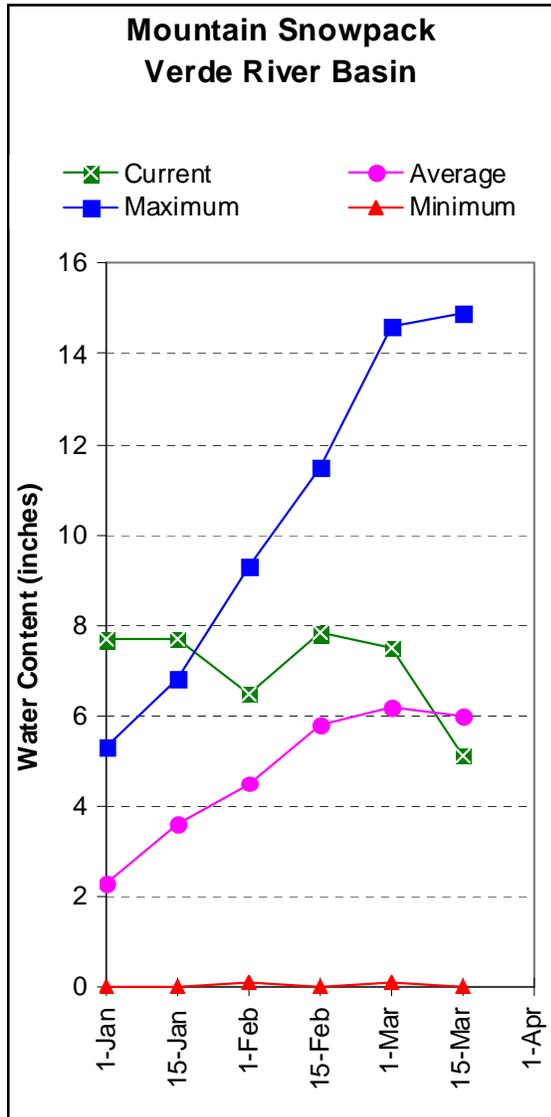
Reservoir	Usable	***** Usable Storage *****		
	Capacity	This Year	Last Year	Average
SALT RIVER RES SYSTEM	2025.8	2017.3	1903.3	1306.3

SALT RIVER BASIN
Watershed Snowpack Analysis - March 15, 2009

Watershed	Number of	This Year as Percent of	
	Data Sites	Last Year	Average
SALT RIVER BASIN	8	60	69

VERDE RIVER BASIN as of March 15, 2009

Well below median streamflow levels are forecast for the basin. In the Verde River, at Horseshoe Dam, the forecast calls for 28% of median streamflow through May. Snow survey measurements show the Verde snowpack to be at 85% of average.



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VERDE RIVER BASIN
Streamflow Forecasts - March 15, 2009

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Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Med (1000AF)
	Chance of Exceeding *						
	90%	70%	50%	30%	10%		
	(1000AF)	(1000AF)	(1000AF) (% MED.)	(1000AF)	(1000AF)	(1000AF)	
=====							
Verde River abv Horseshoe Dam							
M15-MAY	8.0	18.0	28	28	42	69	100
MARCH			32	64			50

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* 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.

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VERDE RIVER BASIN
Reservoir Storage (1000AF) Mid-March

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Reservoir	Usable Capacity	***** Usable Storage *****		
		This Year	Last Year	Average
VERDE RIVER RES SYSTEM	287.4	206.5	284.6	187.9

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VERDE RIVER BASIN
Watershed Snowpack Analysis - March 15, 2009

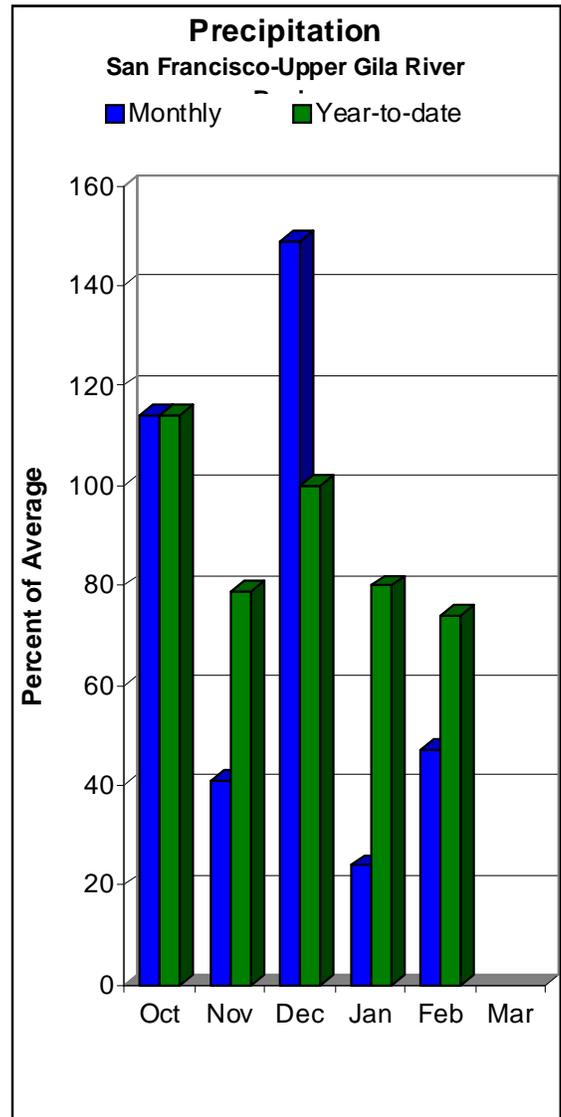
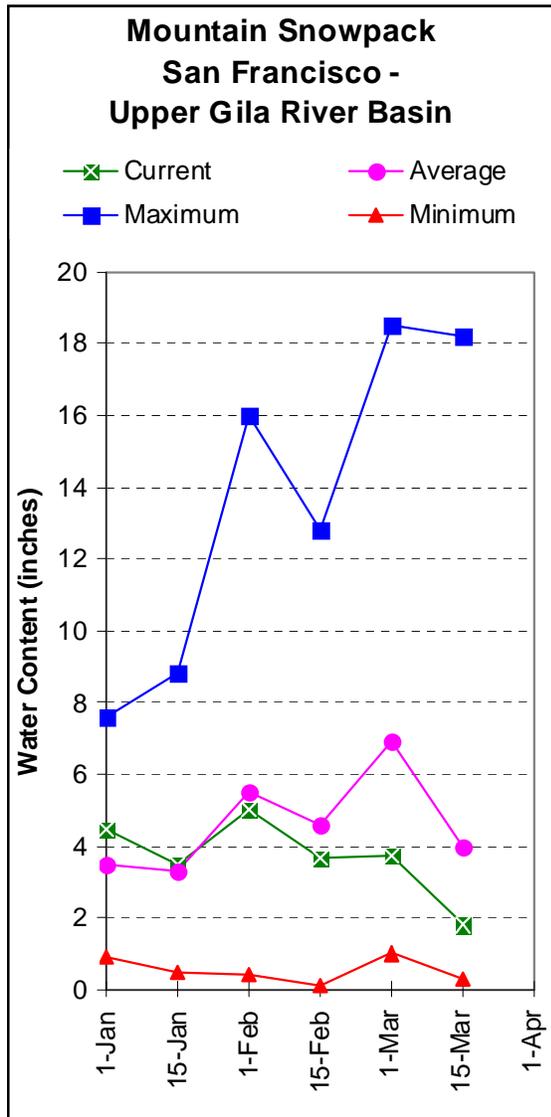
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Watershed	Number of Data Sites	This Year as Percent of	
		Last Year	Average
VERDE RIVER BASIN	10	62	85
SAN FRANCISCO PEAKS	3	72	106

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SAN FRANCISCO-UPPER GILA RIVER BASIN as of March 15, 2009

Well below median streamflow levels are forecast for the basin. In the San Francisco River, at Clifton, the forecast calls for 40% of median streamflow levels through May, while in the Gila River, near Solomon, the forecast calls for 29% of median streamflow levels through May. At San Carlos Reservoir, inflow to the lake is forecast at 27% of median through May. Snow survey measurements show the snowpack for this basin to be at 43% of average.



SAN FRANCISCO - UPPER GILA RIVER BASIN
Streamflow Forecasts - March 15, 2009

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>						30 Yr Med (1000AF)
	Chance of Exceeding * 90% 70% 50% 30% 10% (1000AF) (1000AF) (1000AF) (% MED.) (1000AF) (1000AF)						
Gila River at Gila							
M15-MAY	7.0	7.9	10.0	40	12.5	16.8	25
Gila River nr Virden							
M15-MAY	5.5	7.0	9.0	28	20	36	32
San Francisco River at Glenwood							
M15-MAY	3.0	3.5	5.0	41	6.9	10.5	12.3
San Francisco River at Clifton							
M15-MAY	7.0	9.0	12.0	40	24	41	30
Gila River nr Solomon							
M15-MAY	13.0	16.0	21	29	49	91	73
MARCH			13.0	25			53
San Carlos Reservoir Inflow							
M15-MAY	1.0	3.0	13.0	27	31	56	48

* 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.

SAN FRANCISCO - UPPER GILA RIVER BASIN
Reservoir Storage (1000AF) Mid-March

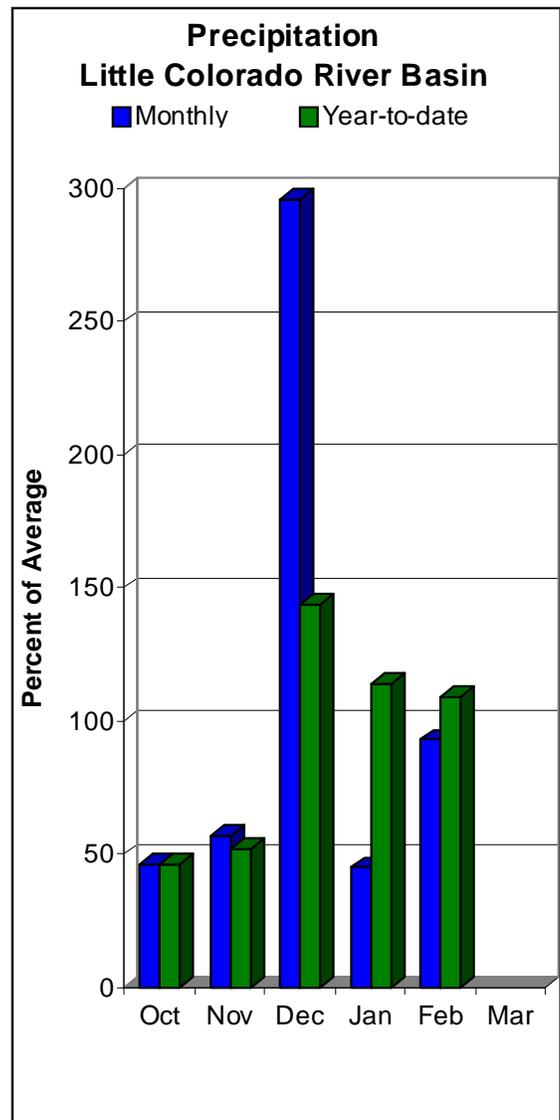
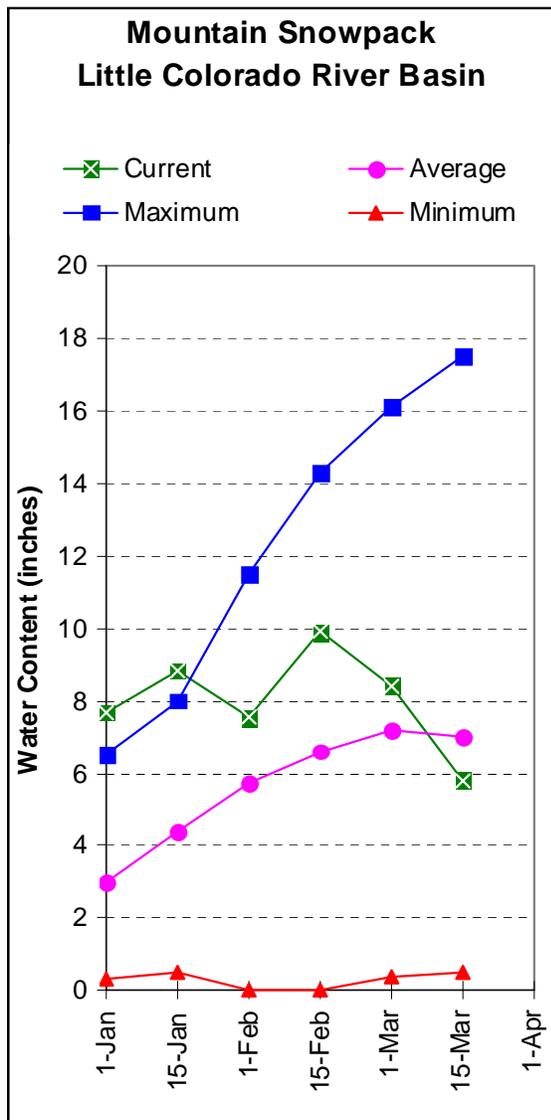
Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
SAN CARLOS	875.0	231.4	----	476.9
PAINTED ROCK DAM		NO REPORT		

SAN FRANCISCO - UPPER GILA RIVER BASIN
Watershed Snowpack Analysis - March 15, 2009

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SAN FRANCISCO - UPPER GILA R	9	47	43

LITTLE COLORADO RIVER BASIN as of March 15, 2009

Well below median streamflow levels are forecast for the basin. In the Little Colorado River, at Lyman Lake, the forecast calls for 64% of median streamflow through June, while at Woodruff, the forecast calls for 41% of median streamflow through May. Snowpacks along the southern headwaters of the Little Colorado River, and along the central Mogollon Rim, were measured at 83% and 79% of average, respectively.



LITTLE COLORADO RIVER BASIN
Streamflow Forecasts - March 15, 2009

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							
MAR-JUN	1.38	2.70	4.00	64	5.60	8.80	6.30
Little Colorado River at Woodruff							
MAR-MAY	0.00	0.20	0.90	41	1.96	3.50	2.20
Blue Ridge Reservoir Inflow							
MAR-MAY	4.0	6.2	8.0	63	10.0	13.3	12.8
Lake Mary Inflow							
MAR-MAY	1.02	1.84	2.60	63	3.50	5.30	4.10

* 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.

LITTLE COLORADO RIVER BASIN
Reservoir Storage (1000AF) Mid-March

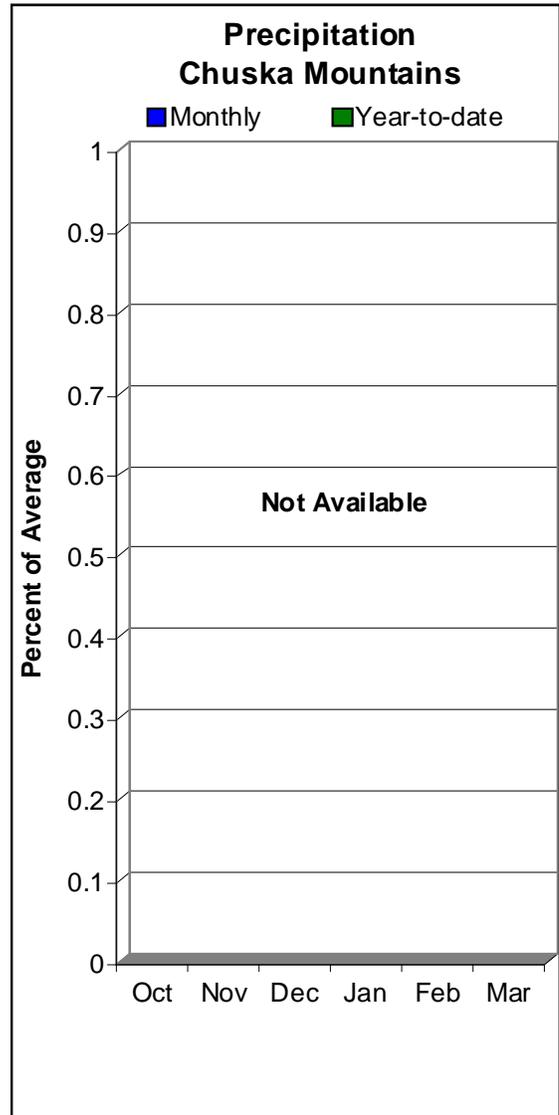
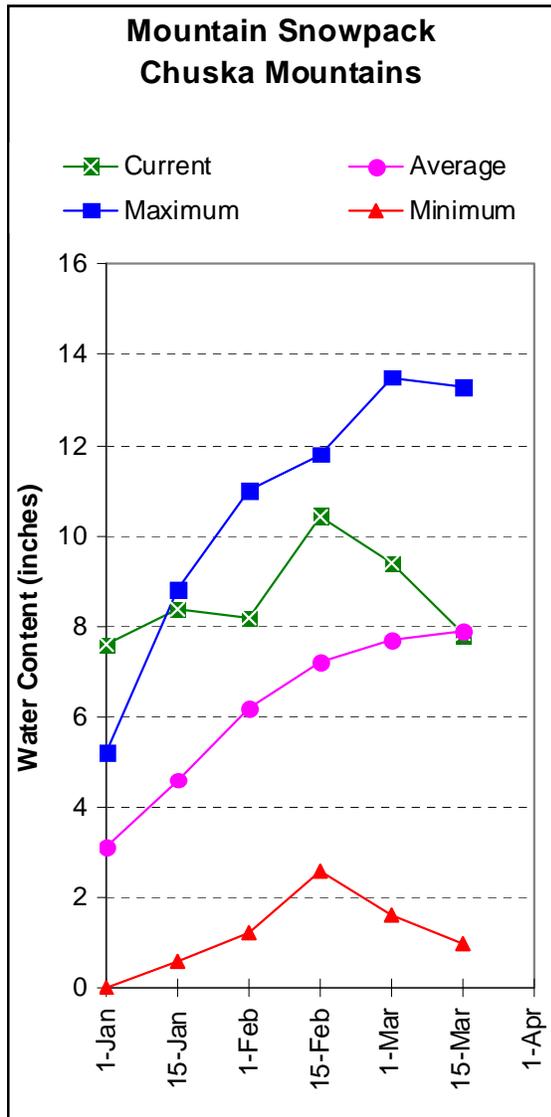
Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
LYMAN RESERVOIR	30.0	14.6	10.8	16.2
SHOW LOW LAKE		NO REPORT		

LITTLE COLORADO RIVER BASIN
Watershed Snowpack Analysis - March 15, 2009

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
LITTLE COLORADO - SOUTHERN H	9	79	83
CENTRAL MOGOLLON RIM	4	81	79

CHUSKA MOUNTAINS as of March 15, 2009

Snow survey measurements conducted by staff of the Navajo Water Management Branch show the Chuska snowpack to be at 99% of average. Average to below average runoff is forecast for Captain Tom Wash, Wheatfields Creek, and Bowl Canyon Creek, while well below average runoff is forecast for Kinlichee Creek.



CHUSKA MOUNTAINS
Streamflow Forecasts - March 15, 2009

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)		
Captain Tom Wash nr Two Gray Hills							
MAR-MAY	0.46	1.49	2.70	95	4.40	8.10	2.83
Wheatfields Creek nr Wheatfields							
MAR-MAY	1.99	2.50	2.40	83	3.30	4.10	2.90
Bowl Canyon Creek abv Asaayi Lake							
MAR-MAY	0.48	0.71	0.90	90	1.12	1.51	1.00
Kinlichee Creek							
MAR-MAY	0.05	0.14	0.25	15	0.40	0.70	1.70

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

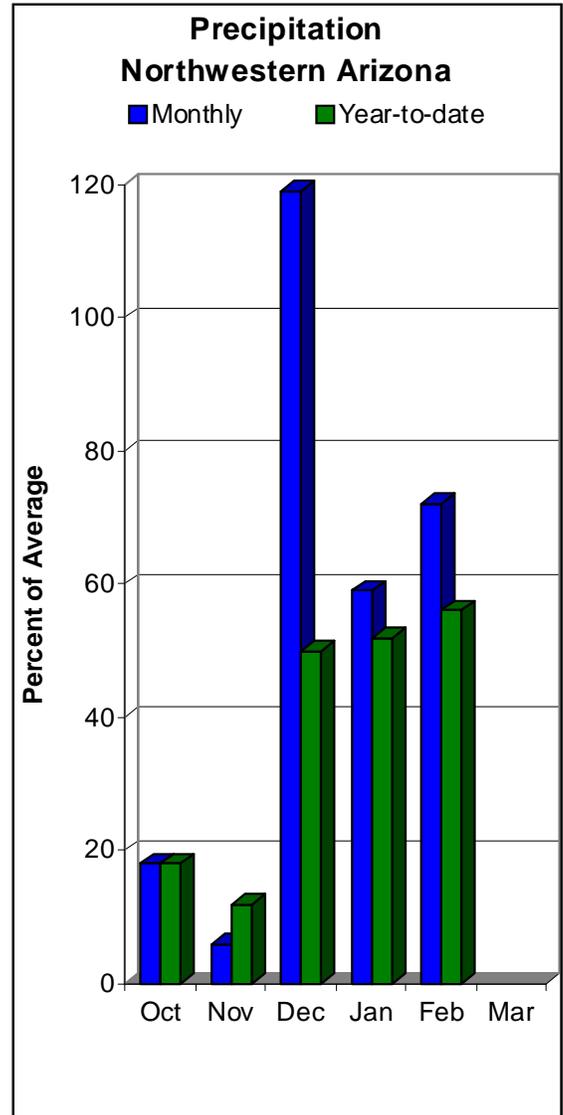
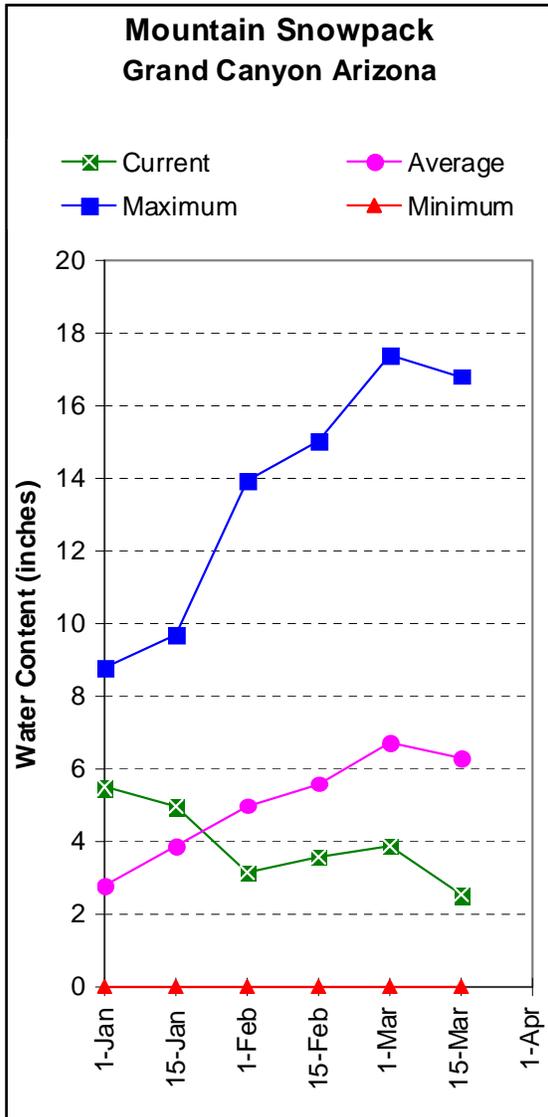
The average is computed for the 1971-2000 base period.

CHUSKA MOUNTAINS
Watershed Snowpack Analysis - March 15, 2009

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
CHUSKA MOUNTAINS	6	65	99
DEFIANCE PLATEAU	2	7	17

NORTHWESTERN ARIZONA as of March 15, 2009

On the Colorado River, inflow to Lake Powell is forecast at 88% of the 30-year average for the forecast period April-July. At the Grand Canyon, measurements conducted by park rangers show the snowpack to be at 40% of average.



NORTHWESTERN ARIZONA
Streamflow Forecasts - March 15, 2009

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===>					30 Yr Avg (1000AF)
	Chance of Exceeding *					
	90%	70%	50%	30%	10%	
	(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)	(1000AF)
Lake Powell Inflow (2)						
APR-JUL	4040	5800	7000	88	8200	9960
						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.

- (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.

NORTHWESTERN ARIZONA
Reservoir Storage (1000AF) Mid-March

Reservoir	Usable Capacity	***** Usable Storage *****		
		This Year	Last Year	Average
LAKE HAVASU	619.0	541.8	553.4	552.6
LAKE MOHAVE	1810.0	1675.2	1651.7	1694.0
LAKE MEAD	26159.0	12533.0	13105.0	22090.0
LAKE POWELL	24322.0	12934.0	10694.0	18366.0

NORTHWESTERN ARIZONA
Watershed Snowpack Analysis - March 15, 2009

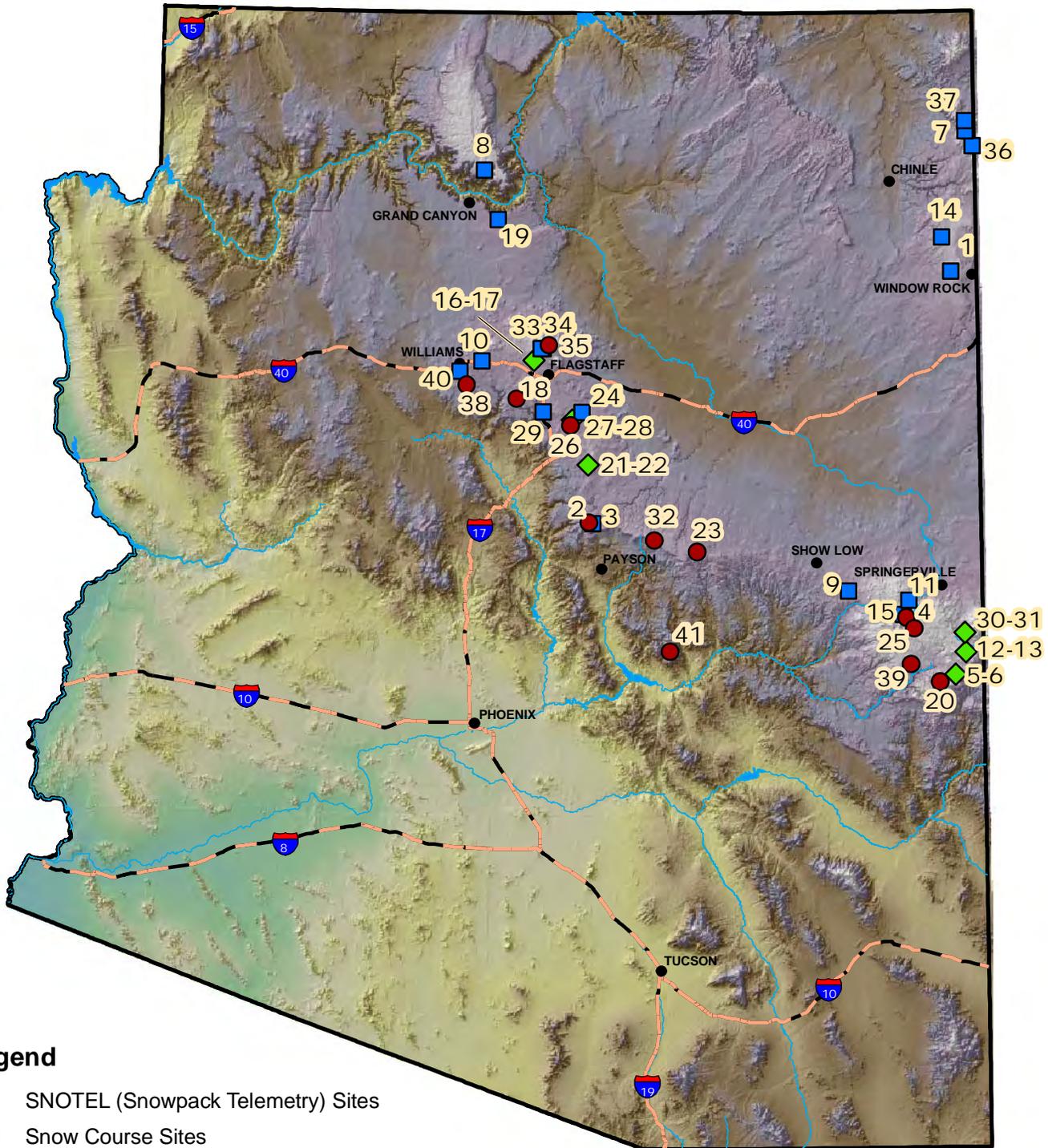
Watershed	Number of Data Sites	This Year as Percent of	
		Last Year	Average
GRAND CANYON	2	0	40

S N O W S U R V E Y D A T A

MARCH 15, 2009

MAP NUM.	SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
1.	ARBABS FOREST (AK)	7680	3/13	0	.0	3.0	1.3
2.	BAKER BUTTE SNOTEL	7330	3/15	7	3.5	5.5	5.6
3.	BAKER BUTTE #2	7700	3/12	30	12.1	14.1	13.7
4.	BALDY SNOTEL	9220	3/15	19	8.2	10.3	8.1
5.	BEAVER HEAD	8000	3/12	0	.0	2.5	2.1
6.	BEAVER HEAD SNOTEL	7990	3/15	2	.6	5.5	2.6
7.	BEAVER SPRING	9220	3/12	0	.0	13.8	9.9
8.	BRIGHT ANGEL	8400	3/13	12	5.0	-	11.3
9.	BUCK SPRING	7400	3/13	0	.0	.0	3.1
10.	CHALENDER	7100	3/11	1	.3	3.7	2.8
11.	CHEESE SPRINGS	8600	3/11	15	5.6	6.6	5.8
12.	CORONADO TRL SNOTEL	8400	3/15	-	.0	1.4	2.2
13.	CORONADO TRAIL	8400	3/12	0	.0	1.5	2.3
14.	FLUTED ROCK	7800	3/12	1	.7	6.6	2.8
15.	FORT APACHE	9160	3/11	27	9.3	10.6	8.1
16.	FORT VALLEY	7350	3/10	1	.5	3.3	1.9
17.	FORT VALLEY SNOTEL	7350	3/15	0	.0	-	-
18.	FRY SNOTEL	7220	3/15	15	7.6	10.0	5.5
19.	GRAND CANYON	7500	3/11	0	.0	2.4	1.3
20.	HANNAGAN MDWS SNOTEL	9020	no report			16.6	12.3
21.	HAPPY JACK	7630	3/09	2	.9	8.0	4.4
22.	HAPPY JACK SNOTEL	7630	3/15	13	6.4	11.3	6.3
23.	HEBER SNOTEL	7640	3/15	0	.0	2.5	4.1
24.	LAKE MARY	6970	3/10	1	.5	2.9	1.4
25.	MAVERICK FORK SNOTEL	9200	3/15	29	12.3	14.9	9.5
26.	MORMON MTN SNOTEL	7500	3/15	11	5.4	11.2	6.4
27.	MORMON MT. SUMMIT #2	8470	3/12	35	13.9	19.3	15.3
28.	MORMON MTN SUMMIT SN	8500	3/15	35	14.3	-	-
29.	NEWMAN PARK	6750	3/10	1	.3	2.8	1.2
30.	NUTRIOSO	8500	3/12	0	.0	-	1.2
31.	NUTRIOSO SNOTEL	8500	3/15	1	.2	-	-
32.	PROMONTORY SNOTEL	7900	3/15	26	13.3	13.5	12.9
33.	SNOW BOWL #1 ALT.	10260	3/10	37	14.5	23.0	16.1
34.	SNOW BOWL #2	11000	3/10	53	18.4	21.0	20.5
35.	SNOWSLIDE CYN SNTL	9750	3/15	56	20.2	29.9	13.5
36.	TSAILE CANYON #1	8160	3/13	14	5.9	8.5	6.2
37.	TSAILE CANYON #3	8920	3/12	23	9.3	10.9	9.5
38.	WHITE HORSE SNOTEL	7180	3/15	1	.8	3.2	4.6
39.	WILDCAT SNOTEL	7850	3/15	1	.1	2.2	3.7
40.	WILLIAMS SKI RUN	7720	3/11	28	12.0	11.0	9.9
41.	WORKMAN CREEK SNOTEL	6900	3/15	0	.0	1.5	4.2

Arizona Snow Survey Data Sites



Legend

- SNOTEL (Snowpack Telemetry) Sites
- Snow Course Sites
- ◆ SNOTEL and Snow Course Sites

