



Natural
Resources
Conservation
Service

Arizona

Basin Outlook Report

April 1, 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 April 1, 2009

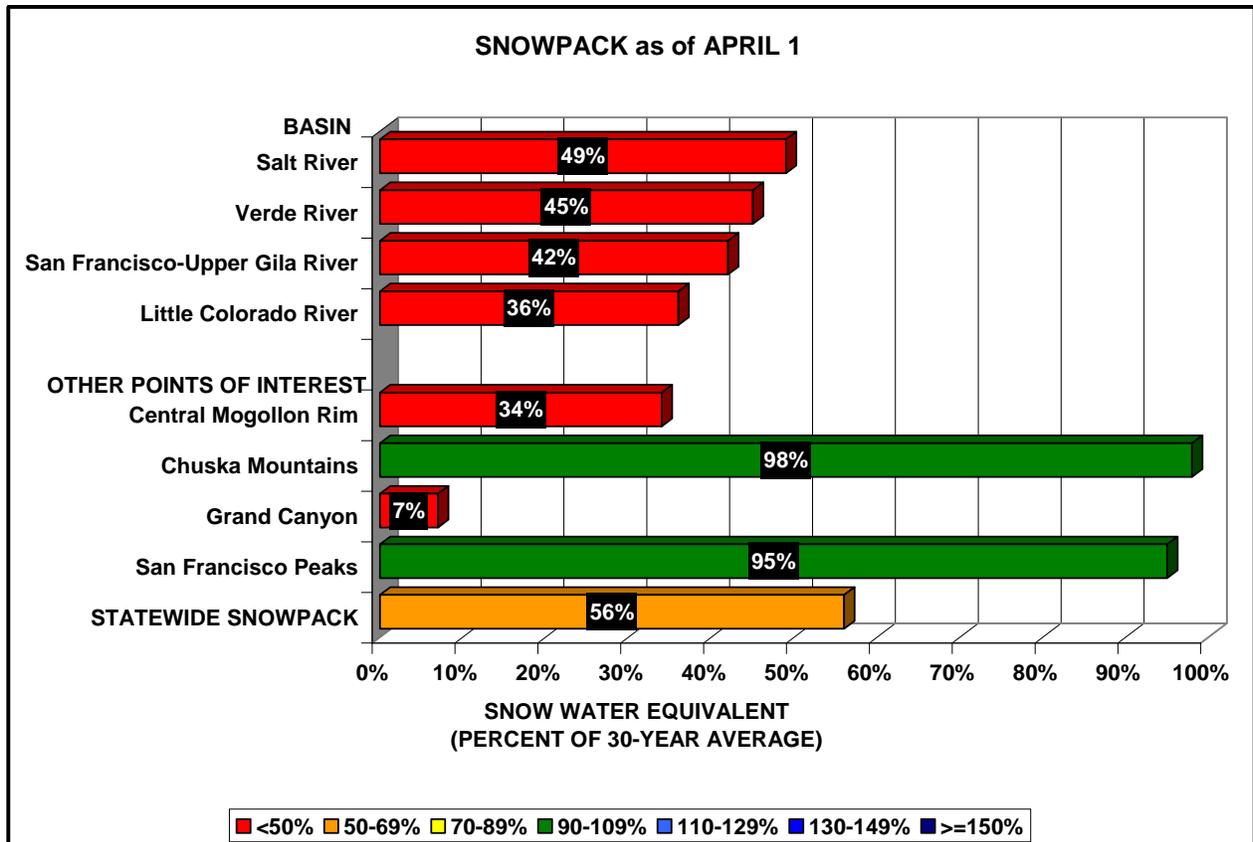
Useful Websites

- ◆ 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 April 1, snowpack levels are well below normal in all basins, ranging from 36 percent of average in the Little Colorado River Basin to 49 percent of average in the Verde River Basin. The statewide snowpack is also well below normal at 56 percent of average. The snowpack is nearly melted out with several sites reporting no snow. March was extremely dry, resulting in cumulative precipitation dropping below average in all basins. The forecast generally calls for well below normal streamflow levels for the remainder of the spring runoff period. The Salt and Verde River reservoirs stand at 97 percent of capacity.

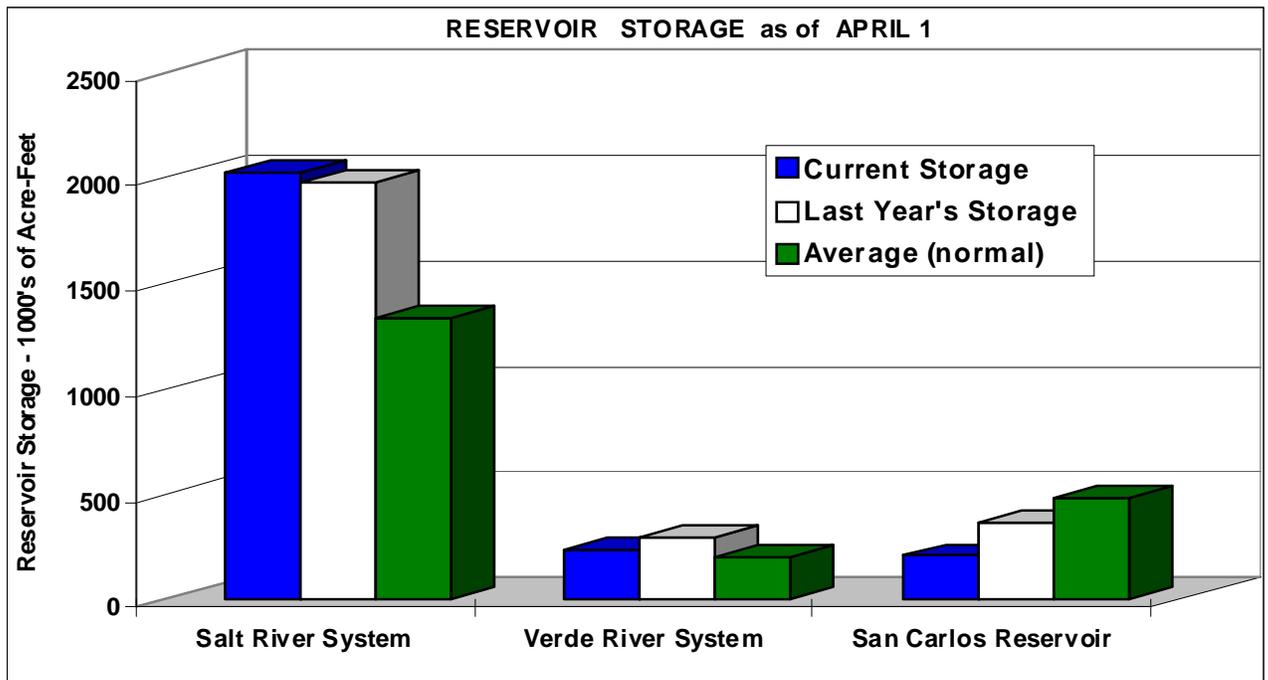
SNOWPACK



PRECIPITATION

Mountain data from NRCS SNOTEL sites show that cumulative precipitation since October 1 is now below average in all basins, as a result of an extremely dry March. Please refer to the precipitation bar graphs found in this report for more information on precipitation levels in the basins.

RESERVOIR STORAGE



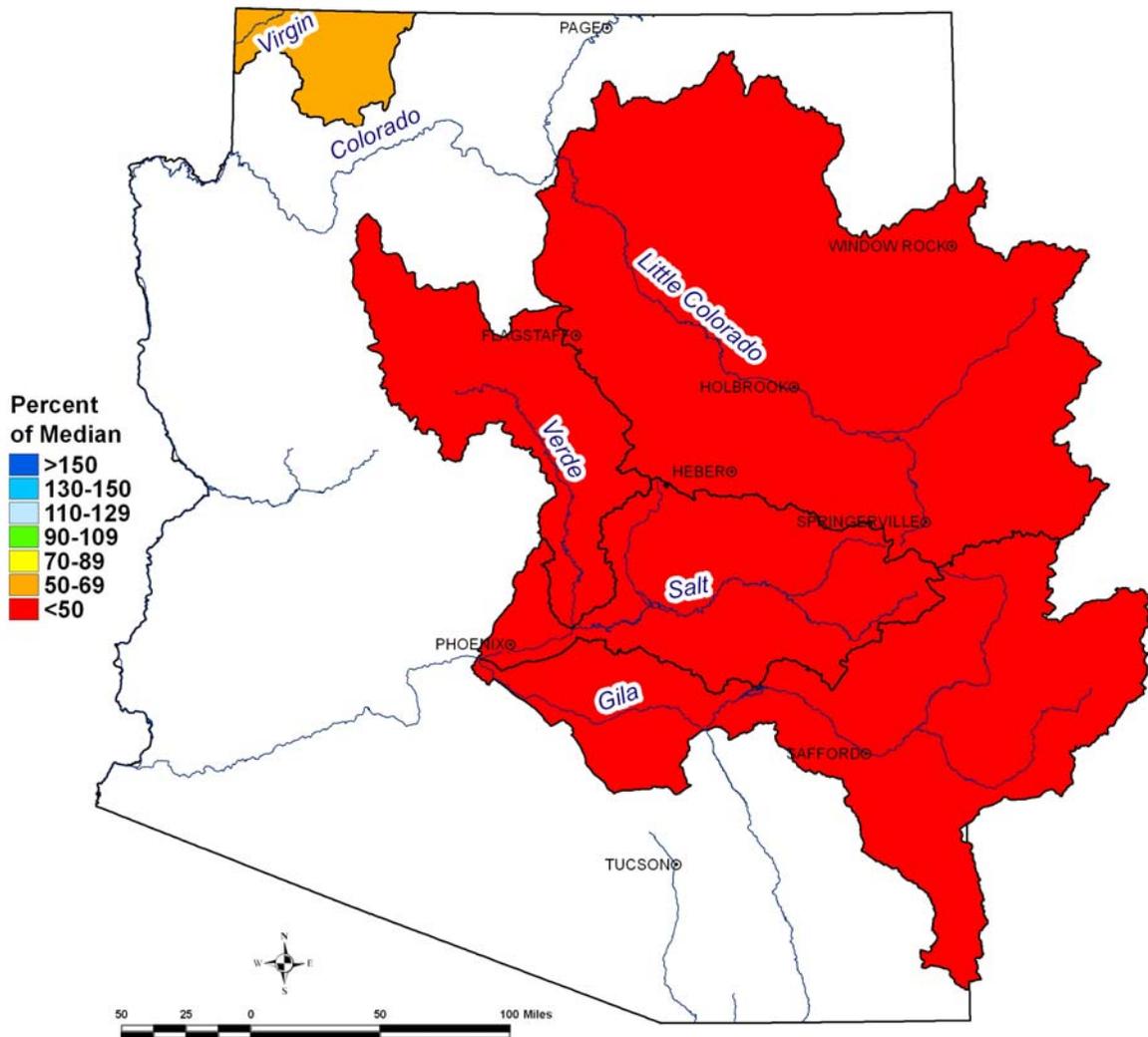
Key storage volumes displayed in thousands of acre-feet (x1000):

<u>Reservoir</u>	<u>Current Storage</u>	<u>Last Year Storage</u>	<u>30-Year Average</u>
Salt River System	2019.9	1972.2	1327.4
Verde River System	226.6	286.6	195.7
San Carlos Reservoir	201.1	361.9	476.9
Lyman Lake	17.1	15.6	17.2
Lake Pleasant	752.3	742.4	----
Lake Havasu	556.5	551.3	562.3
Lake Mohave	1654.7	1617.8	1680.4
Lake Mead	12164.0	12940.0	21999.0
Lake Powell	12774.0	10784.0	18326.0

STREAMFLOW

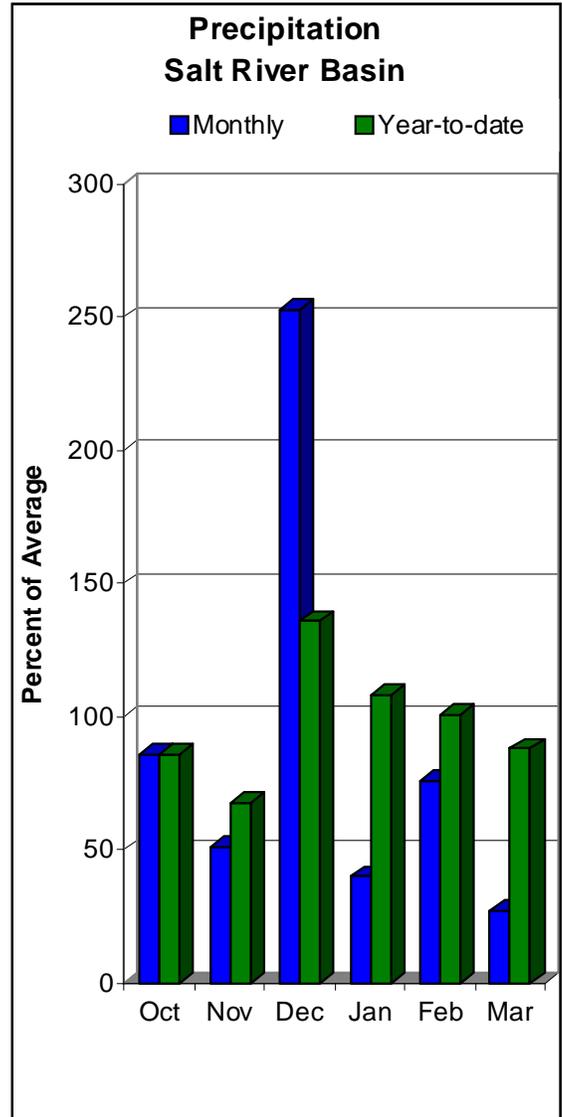
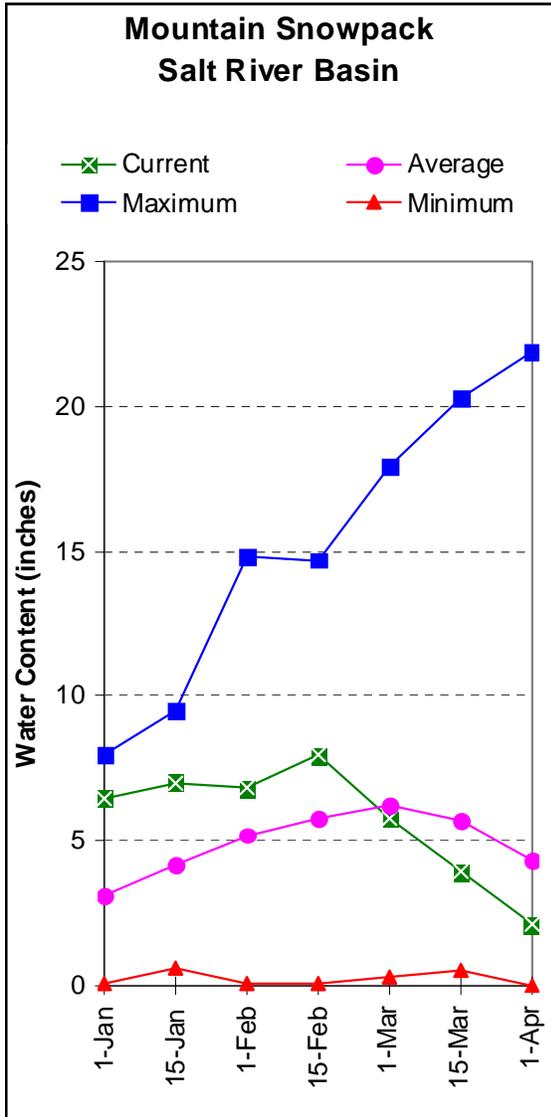
As of April 1, the forecast generally calls for well below normal streamflow levels for the remainder of the spring runoff period, as a result of an extremely dry March and well below normal residual snowpack levels. Please refer to the basin forecast tables found in this report for more information regarding water supply forecasts.

Arizona Spring Streamflow Forecasts as of April 1, 2009



SALT RIVER BASIN as of April 1, 2009

Well below median streamflow levels are forecast for the basin. In the Salt River, near Roosevelt, the forecast calls for 41% of median streamflow through May, while at Tonto Creek, the forecast calls for 36% of median streamflow through May. Snow survey measurements show the Salt snowpack to be at 49% of average.



SALT RIVER BASIN as of April 1, 2009

```

=====
                        SALT RIVER BASIN
                        Streamflow Forecasts - April 1, 2009
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast | ===== Chance of Exceeding * ===== |
Period | 90% 70% | 50% | 30% 10% | 30 Yr Med
          | (1000AF) (1000AF) | (1000AF) (% MED.) | (1000AF) (1000AF) | (1000AF)
=====
Salt River nr Roosevelt
APR-MAY 34 47 58 41 70 92 143
APRIL 41 45

Tonto Creek ab Gun Creek nr Roosevelt
APR-MAY 0.95 1.98 3.00 36 4.30 6.91 8.40
APRIL 2.00 33
  
```

* 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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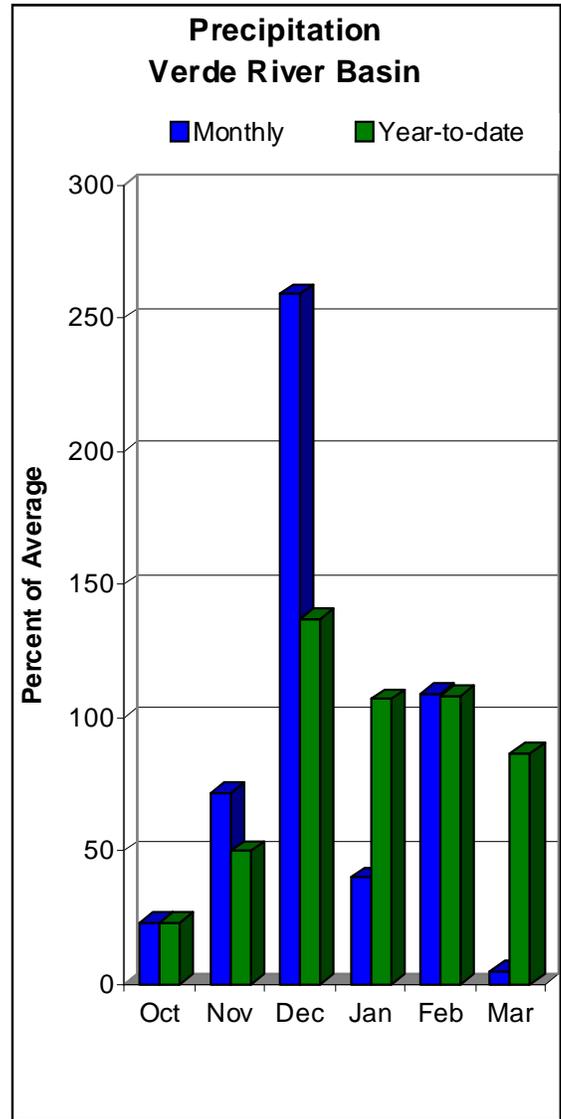
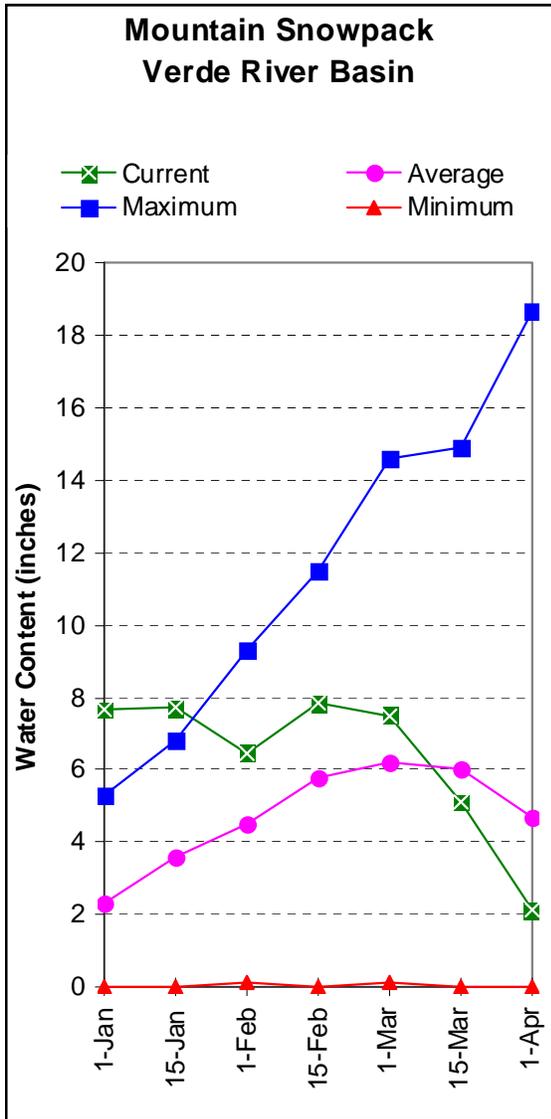
=====
                        SALT RIVER BASIN
                        Reservoir Storage (1000AF) End of March
=====
Reservoir | Usable Capacity | ***** Usable Storage ***** |
          |                  | This Year Last Year Average |
=====
SALT RIVER RES SYSTEM | 2025.8 | 2019.9 1972.3 | 1327.4
  
```

```

=====
                        SALT RIVER BASIN
                        Watershed Snowpack Analysis - April 1, 2009
=====
Watershed | Number of Data Sites | This Year as Percent of Last Year | Average
=====
SALT RIVER BASIN | 8 | 72 | 49
  
```

VERDE RIVER BASIN as of April 1, 2009

Well below median streamflow levels are forecast for the basin. In the Verde River, at Horseshoe Dam, the forecast calls for 41% of median streamflow through May. Snow survey measurements show the Verde snowpack to be at 45% of average.



VERDE RIVER BASIN as of April 1, 2009

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=====
                                VERDE RIVER BASIN
                                Streamflow Forecasts - April 1, 2009
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast | ===== Chance of Exceeding * ===== |
Period | 90% 70% | 50% | 30% 10% | 30 Yr Med
(1000AF) (1000AF) | (1000AF) (% MED.) | (1000AF) (1000AF) | (1000AF)
=====
Verde River abv Horseshoe Dam
APR-MAY 8.8 13.8 18.0 41 23 32 44
APRIL 11.0 32
  
```

* 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.

```

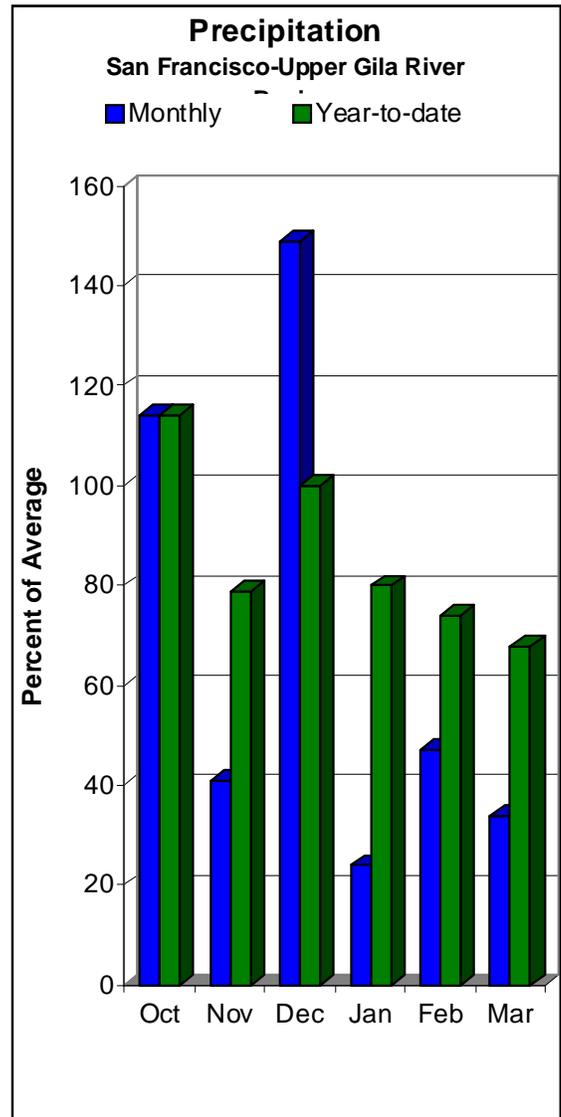
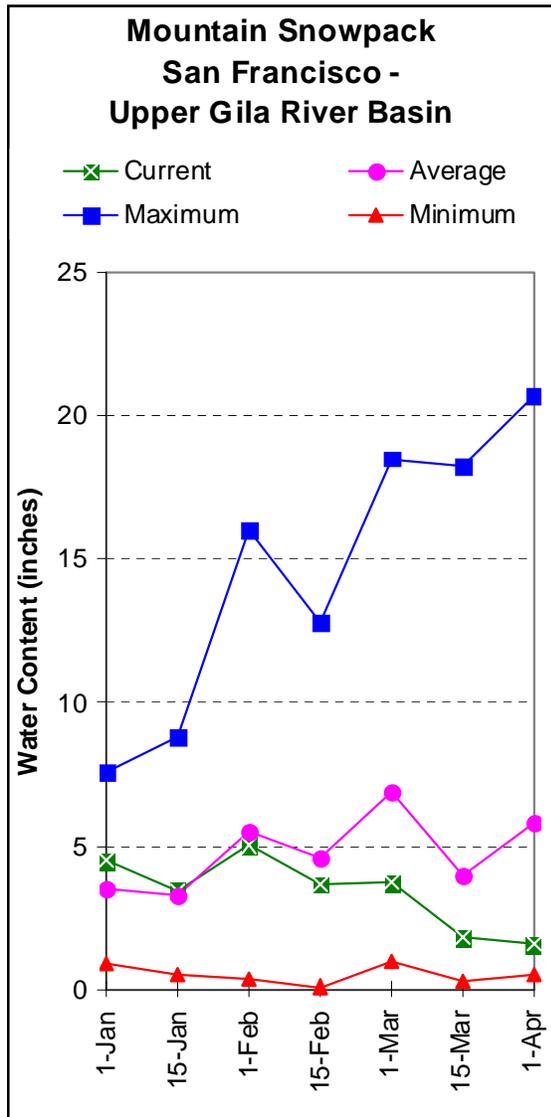
=====
                                VERDE RIVER BASIN
                                Reservoir Storage (1000AF) End of March
=====
Reservoir | Usable Capacity | ***** Usable Storage *****
| | This Year | Last Year | Average
=====
VERDE RIVER RES SYSTEM | 287.4 | 226.6 | 286.6 | 195.7
  
```

```

=====
                                VERDE RIVER BASIN
                                Watershed Snowpack Analysis - April 1, 2009
=====
Watershed | Number of Data Sites | This Year as Percent of Last Year | Average
=====
VERDE RIVER BASIN | 10 | 92 | 45
SAN FRANCISCO PEAKS | 3 | 65 | 95
  
```

SAN FRANCISCO-UPPER GILA RIVER BASIN as of April 1, 2009

Well below median streamflow levels are forecast for the basin. In the San Francisco River, at Clifton, the forecast calls for 43% of median streamflow levels through May, while in the Gila River, near Solomon, the forecast calls for 31% of median streamflow levels through May. At San Carlos Reservoir, inflow to the lake is forecast at 39% of median through May. Snow survey measurements show the snowpack for this basin to be at 42% of average.



SAN FRANCISCO - UPPER GILA RIVER BASIN as of April 1, 2009

```

=====
                        SAN FRANCISCO - UPPER GILA RIVER BASIN
                        Streamflow Forecasts - April 1, 2009
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast | ===== Chance of Exceeding * ===== |
Period | 90% 70% | 50% | 30% 10% | 30 Yr Med
      | (1000AF) (1000AF) | (1000AF) (% MED.) | (1000AF) (1000AF) | (1000AF)
=====
Gila River at Gila
  APR-MAY    3.6   5.4   7.0   41   8.8   12.1   17.3

Gila River nr Virden
  APR-MAY    5.5   6.0   7.0   29  14.6   13.0   24

San Francisco River at Glenwood
  APR-MAY    2.00  2.30  3.00  39   4.30  6.70  7.80

San Francisco River at Clifton
  APR-MAY    6.1   6.5   8.0   43  13.7   22   18.5

Gila River nr Solomon
  APR-MAY    9.0  10.0  13.0  31   29   54   42
  APRIL      7.0   24   29   29

San Carlos Reservoir Inflow
  APR-MAY    4.0   4.5   6.0   39  14.2   26  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.

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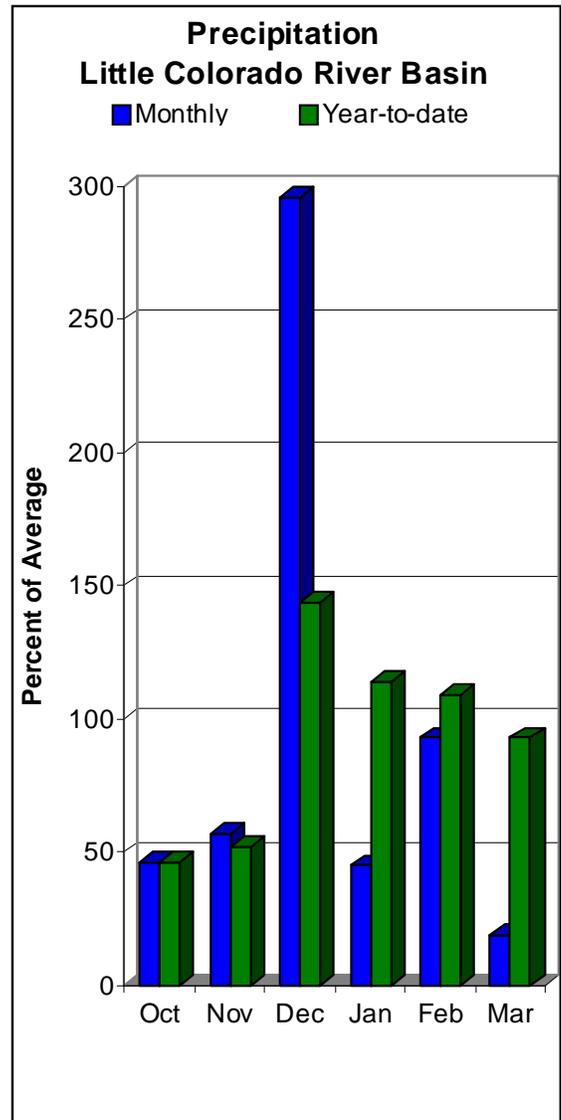
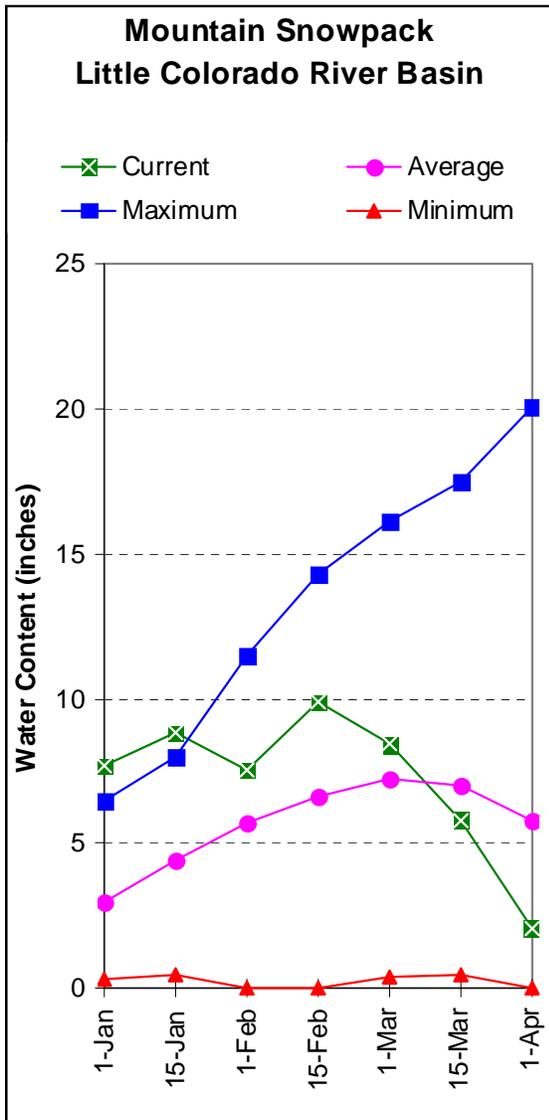
=====
                        SAN FRANCISCO - UPPER GILA RIVER BASIN
                        Reservoir Storage (1000AF) End of March
=====
Reservoir | Usable Capacity | ***** Usable Storage *****
          |                 | This Year  Last Year  Average
=====
SAN CARLOS | 875.0 | 201.1  361.9  476.9
PAINTED ROCK DAM | NO REPORT
    
```

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=====
                        SAN FRANCISCO - UPPER GILA RIVER BASIN
                        Watershed Snowpack Analysis - April 1, 2009
=====
Watershed | Number of Data Sites | This Year as Percent of Last Year | Average
=====
SAN FRANCISCO - UPPER GILA R | 11 | 44 | 42
    
```

LITTLE COLORADO RIVER BASIN as of April 1, 2009

Well below median streamflow levels are forecast for the basin. In the Little Colorado River, at Lyman Lake, the forecast calls for 47% of median streamflow through June, while at Woodruff, the forecast calls for 24% of median streamflow through May. Snowpacks along the southern headwaters of the Little Colorado River, and along the central Mogollon Rim, were measured at 36% and 34% of average, respectively.



LITTLE COLORADO RIVER BASIN as of April 1, 2009

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=====
                        LITTLE COLORADO RIVER BASIN
                        Streamflow Forecasts - April 1, 2009
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast | ===== Chance of Exceeding * ===== |
Period | 90% 70% | 50% | 30% 10% | 30 Yr Med
      | (1000AF) (1000AF) | (1000AF) (% MED.) | (1000AF) (1000AF) | (1000AF)
=====
Little Colorado River abv Lyman Lake
  APR-JUN 1.00 1.28 2.00 47 3.00 4.90 4.30

Rio Nutria nr Ramah
  APR-MAY 0.08 0.10 0.20 39 0.37 0.75 0.52

Ramah Reservoir Inflow
  APR-MAY 0.03 0.05 0.15 52 0.53 1.10 0.29

Zuni River abv Black Rock Reservoir
  APR-MAY 0.03 0.07 0.12 19 0.74 1.60 0.64

Little Colorado River at Woodruff
  APR-MAY 0.05 0.08 0.20 24 0.66 1.30 0.84

Blue Ridge Reservoir Inflow
  APR-MAY 0.20 1.00 2.50 51 4.20 6.20 4.90

Lake Mary Inflow
  APR-MAY 0.48 0.50 0.60 41 0.82 1.20 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.

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=====
                        LITTLE COLORADO RIVER BASIN
                        Reservoir Storage (1000AF) End of March
=====
Reservoir | Usable Capacity | ***** Usable Storage *****
           |                 | This Year  Last Year  Average
=====
LYMAN RESERVOIR | 30.0 | 17.1 | 15.6 | 17.2
SHOW LOW LAKE | | NO REPORT |
=====

```

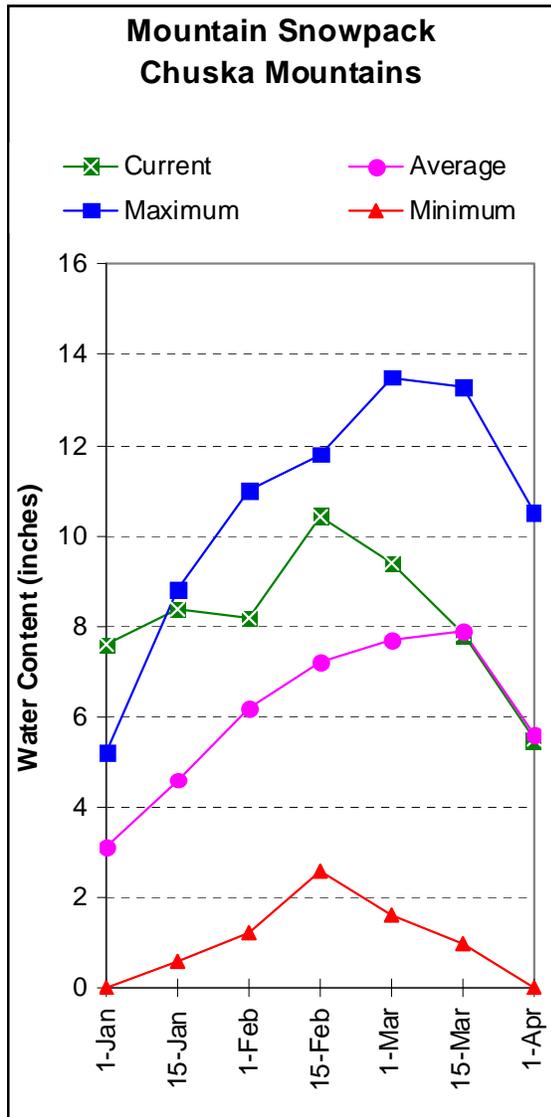
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=====
                        LITTLE COLORADO RIVER BASIN
                        Watershed Snowpack Analysis - April 1, 2009
=====
Watershed | Number of Data Sites | This Year as Percent of Last Year | Average
=====
LITTLE COLORADO - SOUTHERN H | 9 | 77 | 36
CENTRAL MOGOLLON RIM | 4 | 73 | 34
=====

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CHUSKA MOUNTAINS as of April 1, 2009

Snow survey measurements conducted by staff of the Navajo Water Management Branch show the Chuska snowpack to be at 98% of average. 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 as of April 1, 2009

```

=====
                                CHUSKA MOUNTAINS
                                Streamflow Forecasts - April 1, 2009
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast | ===== Chance of Exceeding * ===== |
Period | 90% 70% | 50% | 30% 10% | 30 Yr Avg
          |(1000AF) (1000AF)|(1000AF) (% AVG.)|(1000AF) (1000AF)| (1000AF)
=====
Captain Tom Wash nr Two Gray Hills
MAR-MAY 0.63 1.75 3.00 106 4.70 8.41 2.83

Wheatfields Creek nr Wheatfields
MAR-MAY 2.20 2.70 3.00 103 3.40 3.90 2.90

Bowl Canyon Creek abv Asaayi Lake
MAR-MAY 0.65 0.85 1.00 100 1.17 1.45 1.00

Kinlichee Creek
MAR-MAY 0.24 0.61 1.00 59 1.53 2.60 1.70

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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 is computed for the 1971-2000 base period.

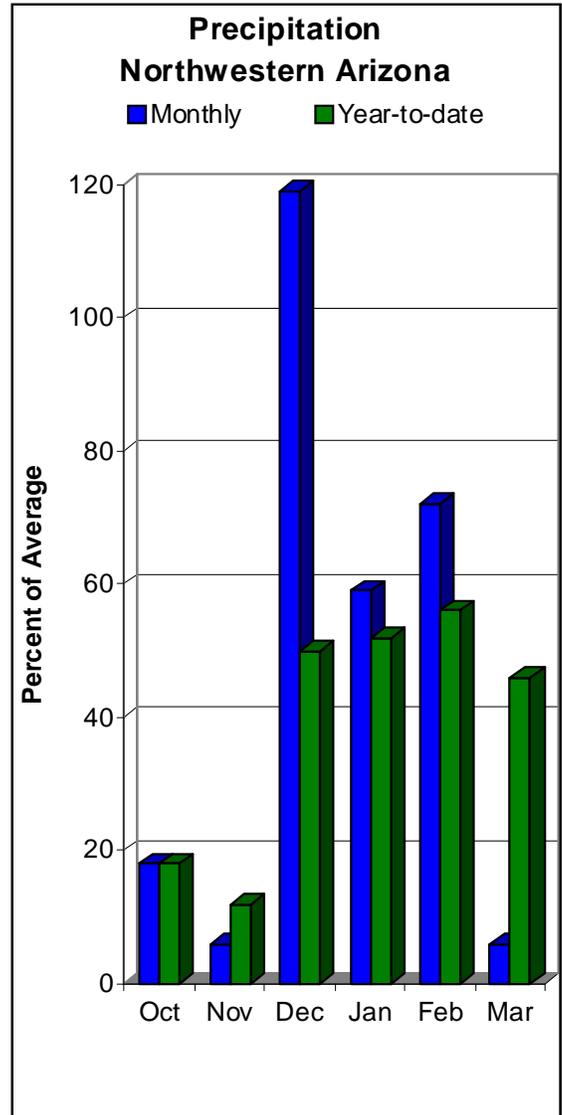
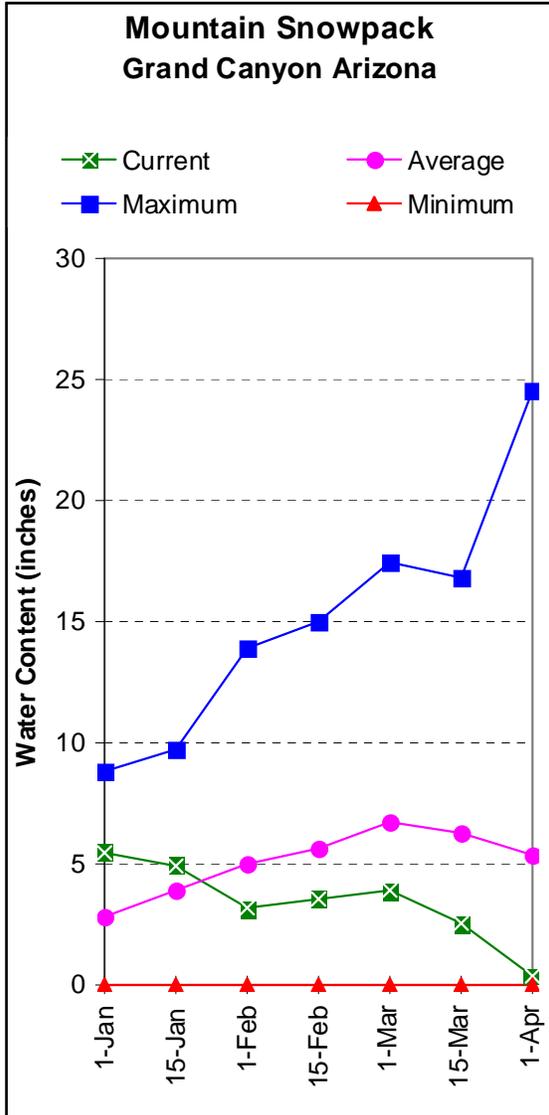
```

=====
                                CHUSKA MOUNTAINS
                                Watershed Snowpack Analysis - April 1, 2009
=====
Watershed | Number of | This Year as Percent of
          | Data Sites | Last Year | Average
=====
CHUSKA MOUNTAINS | 7 | 72 | 98
DEFIANCE PLATEAU | 2 | 0 | 44
=====

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NORTHWESTERN ARIZONA as of April 1, 2009

On the Colorado River, inflow to Lake Powell is forecast at 91% 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 7% of average.



NORTHWESTERN ARIZONA as of April 1, 2009

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=====
                                NORTHWESTERN ARIZONA
                                Streamflow Forecasts - April 1, 2009
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast    | ===== Chance of Exceeding * ===== |
Period      | 90%      70%      | 50%      | 30%      10%      | 30 Yr Avg
              |(1000AF) (1000AF)| (1000AF) (% AVG.)|(1000AF) (1000AF)| (1000AF)
=====
Virgin River at Littlefield
APR-JUL      30      41      50      68      59      74      74

Lake Powell Inflow (2)
APR-JUL      5000     6110     7200     91      8290     9500     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.

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=====
                                NORTHWESTERN ARIZONA
                                Reservoir Storage (1000AF) End of March
=====
Reservoir    Usable Capacity    ***** Usable Storage *****
              |                    | This Year  Last Year  Average
=====
LAKE HAVASU    619.0             556.5     551.3     562.3
LAKE MOHAVE    1810.0            1654.7     1617.8     1680.4
LAKE MEAD      26159.0           12164.0    12940.0    21999.0
LAKE POWELL    24322.0           12774.0    10784.0    18326.0
    
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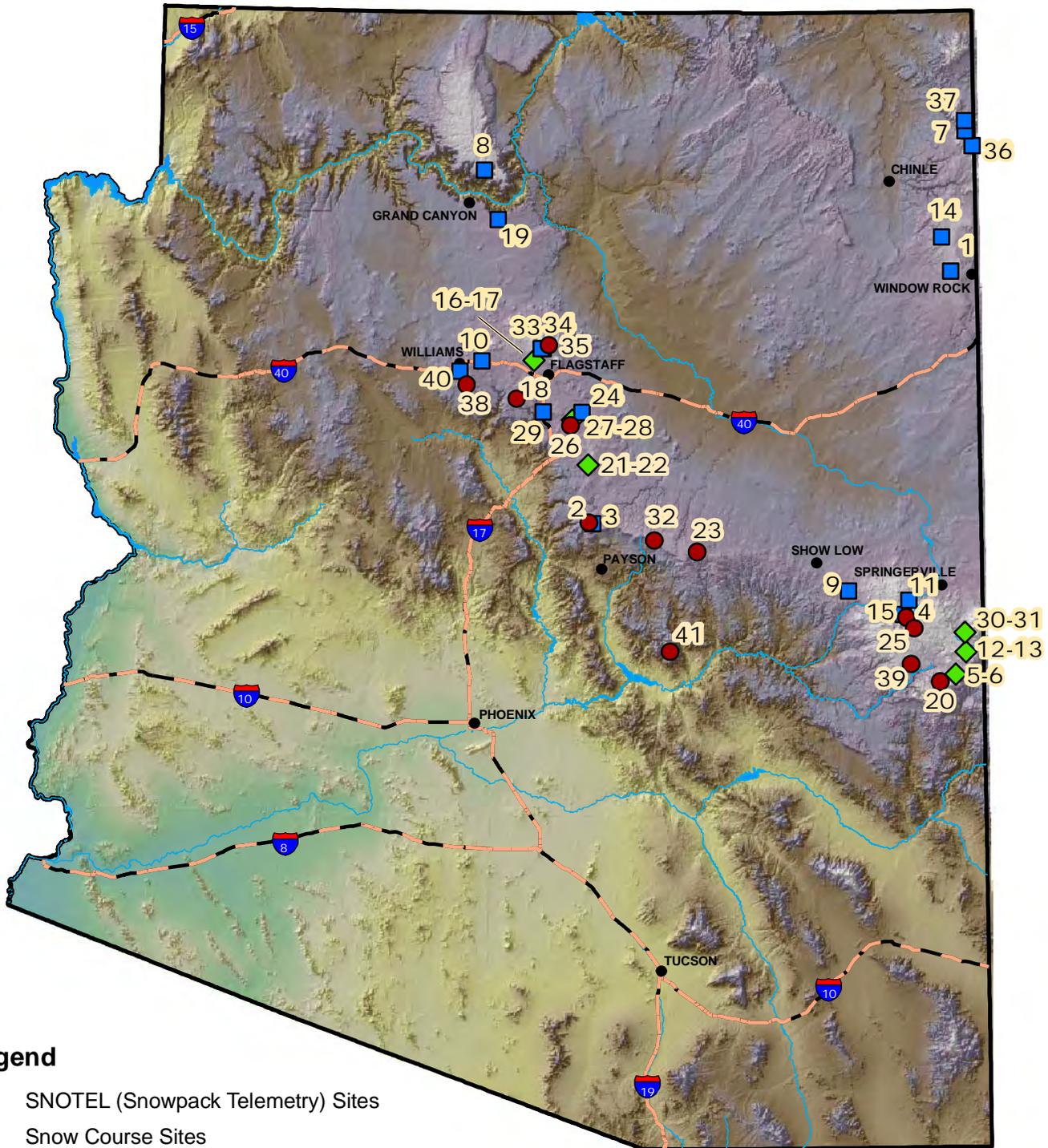
=====
                                NORTHWESTERN ARIZONA
                                Watershed Snowpack Analysis - April 1, 2009
=====
Watershed    Number of Data Sites    This Year as Percent of
              |                    | Last Year  Average
=====
GRAND CANYON    2                    9          7
    
```

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

APRIL 1, 2009

MAP NUM.	SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
1.	ARBABS FOREST (AK)	7680	3/27	1	.1	.0	.3
2.	BAKER BUTTE SNOTEL	7330	4/01	0	.0	.0	4.5
3.	BAKER BUTTE #2	7700	3/30	20	9.0	11.6	13.9
4.	BALDY SNOTEL	9220	4/01	1	.6	1.7	6.9
5.	BEAVER HEAD	8000	3/30	0	.0	-	1.3
6.	BEAVER HEAD SNOTEL	7990	4/01	0	.0	.0	1.5
7.	BEAVER SPRING	9220	4/01	no report		-	8.1
8.	BRIGHT ANGEL	8400	4/02	2	.8	9.2	9.9
9.	BUCK SPRING	7400	3/31	0	.0	.0	.7
10.	CHALENDER	7100	3/31	0	.0	.0	1.6
11.	CHEESE SPRINGS	8600	3/31	3	1.1	1.6	3.8
12.	CORONADO TRL SNOTEL	8400	4/01	0	.0	.0	.7
13.	CORONADO TRAIL	8350	3/30	0	.0	-	1.2
14.	FLUTED ROCK	7800	3/27	2	.3	.0	.6
15.	FORT APACHE	9160	3/31	16	6.2	6.1	7.2
16.	FORT VALLEY	7350	3/30	0	.0	.0	1.0
17.	FORT VALLEY SNOTEL	7350	4/01	0	.0	-	-
18.	FRY SNOTEL	7220	4/01	0	.0	.0	3.2
19.	GRAND CANYON	7500	3/31	0	.0	.0	.8
20.	HANNAGAN MDWS SNOTEL	9020	4/01	-	4.5	9.6	10.8
21.	HAPPY JACK	7630	3/29	0	.0	1.0	3.0
22.	HAPPY JACK SNOTEL	7630	4/01	-	.0	3.9	2.8
23.	HEBER SNOTEL	7640	4/01	0	.0	.0	2.9
24.	LAKE MARY	6930	3/30	0	.0	.0	.5
25.	MAVERICK FORK SNOTEL	9200	4/01	11	6.4	7.9	9.0
26.	MORMON MTN SNOTEL	7500	4/01	0	.0	2.8	5.0
27.	MORMON MT. SUMMIT #2	8470	3/30	23	11.0	16.4	15.7
28.	MORMON MTN SUMMIT SN	8500	4/01	23	11.8	-	-
29.	NEWMAN PARK	6750	3/30	0	.0	.0	.9
30.	NUTRIOSO	8500	3/30	0	.0	-	.7
31.	NUTRIOSO SNOTEL	8500	4/01	0	.0	-	-
32.	PROMONTORY SNOTEL	7900	4/01	4	2.0	3.5	11.4
33.	SNOW BOWL #1 ALT.	10260	3/29	32	12.6	21.0	14.1
34.	SNOW BOWL #2	11000	3/29	44	17.4	26.6	22.5
35.	SNOWSLIDE CYN SNOTEL	9750	4/01	42	18.6	27.4	14.4
36.	TSAILE CANYON #1	8160	3/26	7	1.8	3.9	3.4
37.	TSAILE CANYON #3	8920	3/26	16	6.2	7.5	7.0
38.	WHITE HORSE SNOTEL	7180	4/01	0	.0	.0	3.0
39.	WILDCAT SNOTEL	7850	4/01	0	.0	.0	2.0
40.	WILLIAMS SKI RUN	7720	3/31	22	10.3	.0	9.5
41.	WORKMAN CREEK SNOTEL	6900	4/01	0	.0	.0	2.7

Arizona Snow Survey Data Sites



Legend

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

