



Natural
Resources
Conservation
Service

Arizona

Basin Outlook Report

February 15, 2013



Issued by

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Released 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 Basin Outlook Report as of February 15, 2013

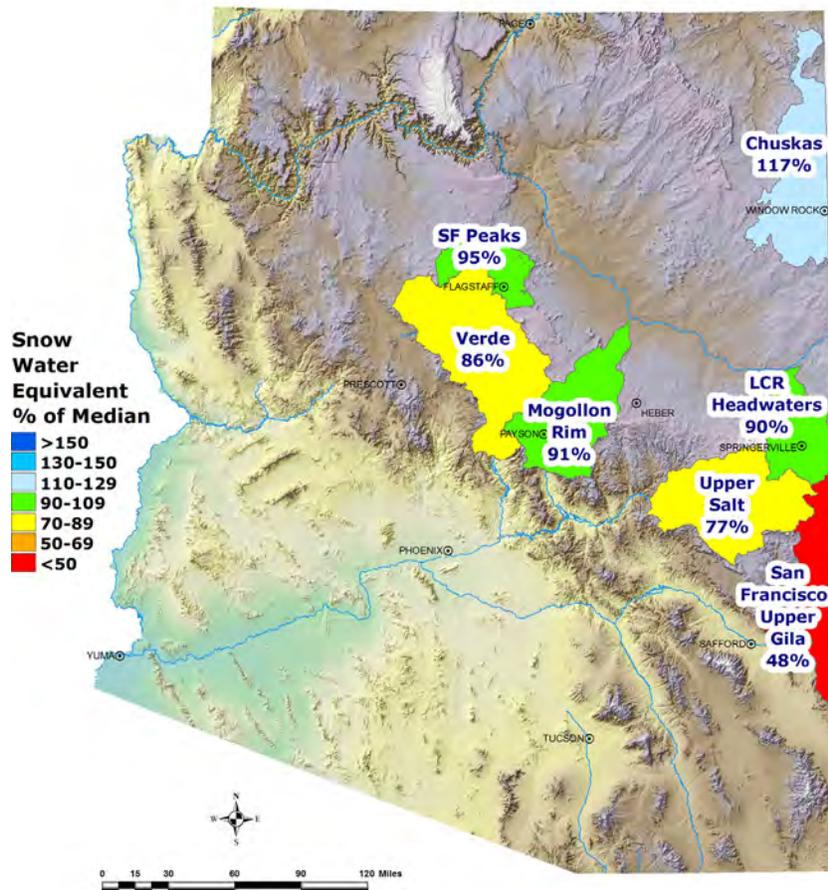
SUMMARY

As of February 15, snowpack levels are well below normal to slightly below normal in the major basins. Precipitation for the first half of February was below normal throughout the basins. The Salt and Verde River reservoir system stands at 56 percent of capacity, while San Carlos Reservoir is at one percent of capacity. The mid-month forecast calls for below normal to well below normal runoff in all major basins for the spring runoff period.

SNOWPACK

Snow water equivalent levels are well below normal to slightly below normal in the major basins, ranging from a low of 48 percent of median in the San Francisco-Upper Gila River Basin to a high of 90 percent of median in the Little Colorado River Basin. The statewide snowpack is slightly below normal at 90 percent of median.

**Arizona
Snow Water Equivalent
as of February 15, 2013**

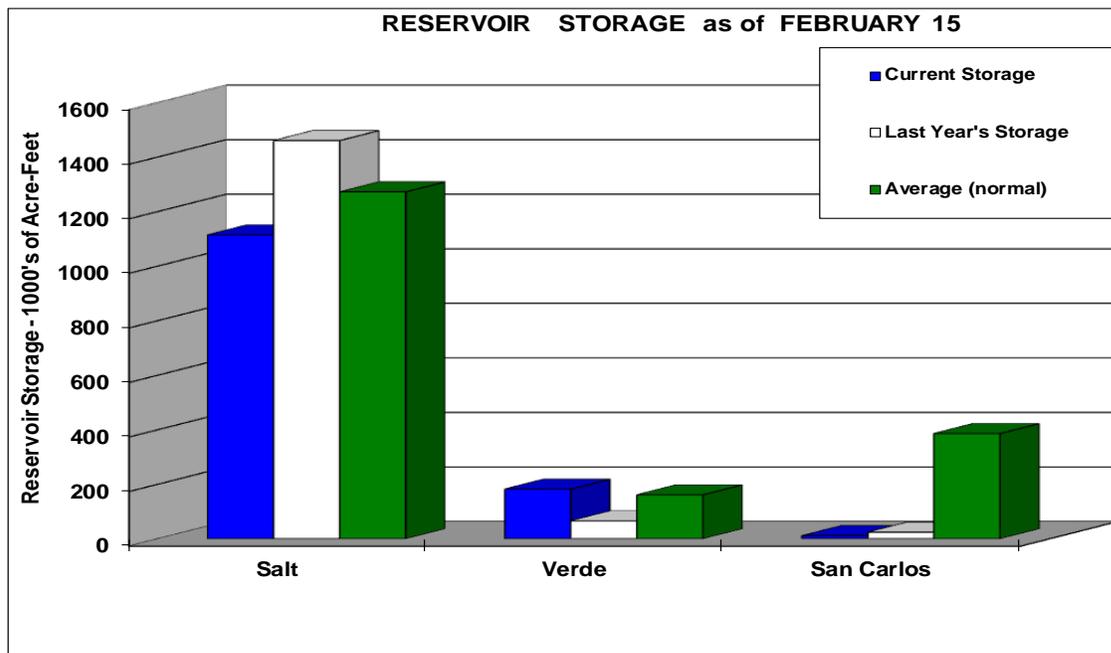


PRECIPITATION

Mountain data from NRCS SNOTEL sites and Cooperator gages show that precipitation for the first half of February was below normal in all major basins. Cumulative precipitation since October 1, however, is about normal in all basins, with the exception of the San Francisco-Upper Gila River Basin, which remains well below normal. Please refer to the precipitation bar graphs found in this report for more information on precipitation levels in the basins.

RESERVOIR STORAGE

As of February 15, the Salt and Verde River reservoir system stands at 56 percent of capacity. San Carlos Reservoir remains well below normal at one percent of capacity.



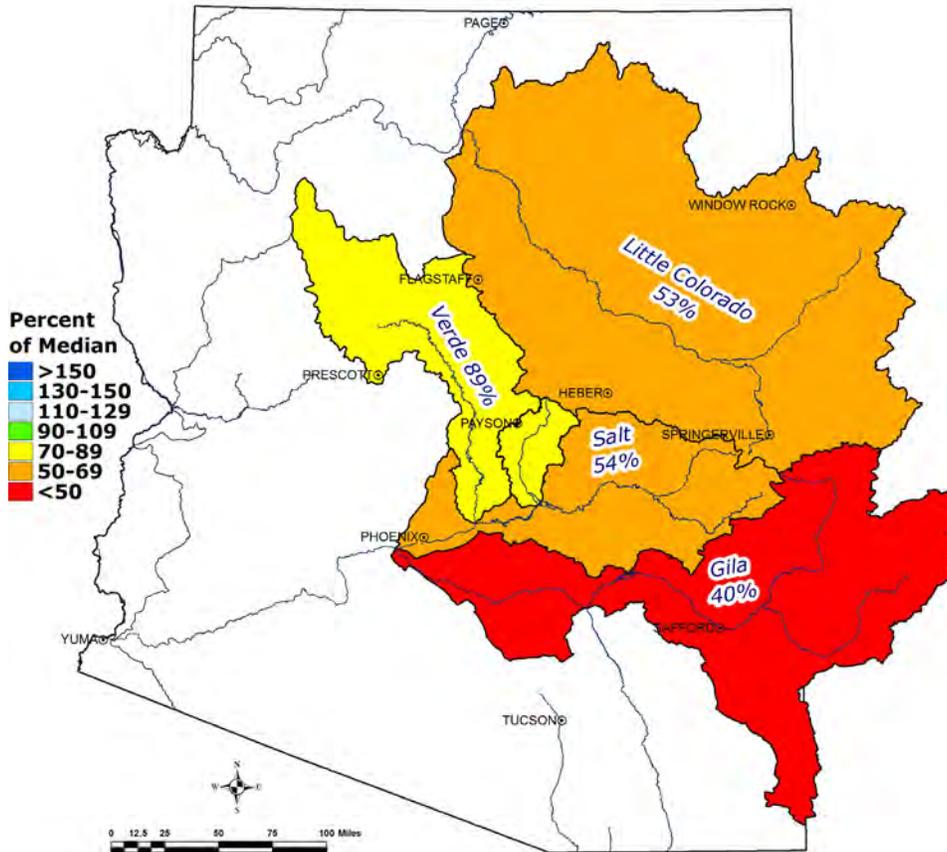
Key storage volumes displayed in thousands of acre-feet (x1000):

<u>Reservoir</u>	<u>Current Storage</u>	<u>Last Year Storage</u>	<u>30-Year Average</u>	<u>Storage Capacity</u>
Salt River System	1113.9	1459.9	1272.0	2025.8
Verde River System	182.1	65.4	160.8	287.4
San Carlos Reservoir	11.2	24.0	385.7	875.0
Lyman Lake	4.5	9.5	12.3	30.0
Lake Havasu	585.2	589.9	558.7	619.0
Lake Mohave	1674.7	1631.8	1685.0	1810.0
Lake Mead	13829.0	14974.0	20526.0	26159.0
Lake Powell	12032.0	15546.0	17170.0	24322.0

STREAMFLOW

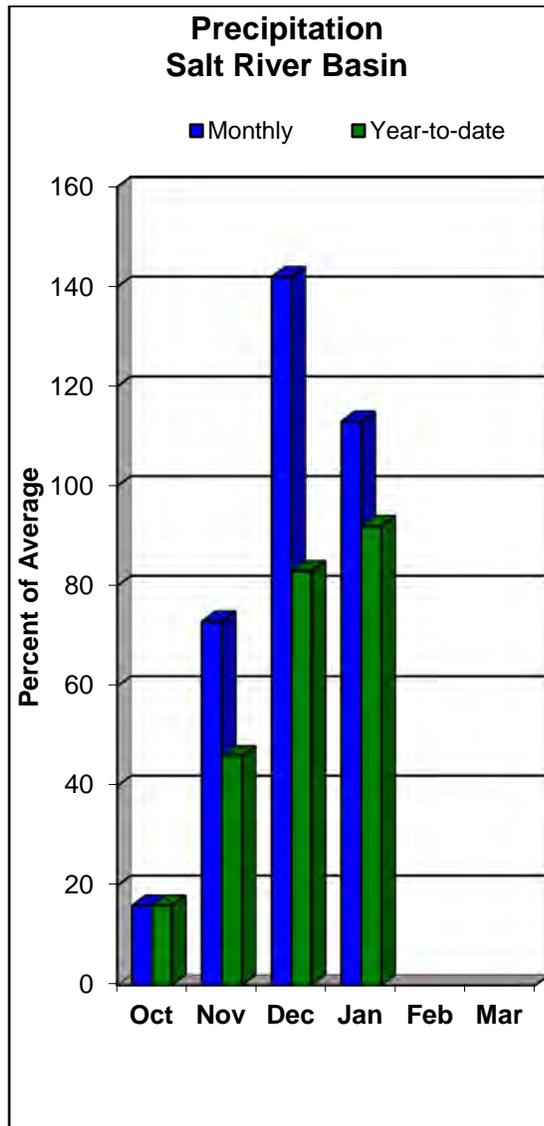
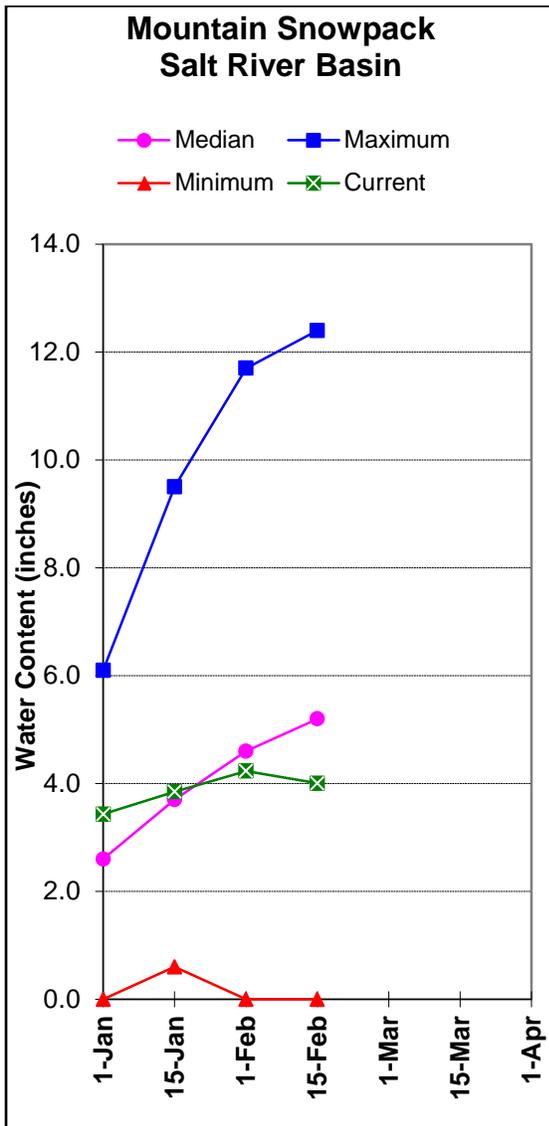
As of February 15, the forecast calls for below normal to well below normal streamflow for the spring runoff period, ranging from 40 percent of median in the Gila River near Solomon to 89 percent of median in the Verde River above Horseshoe Dam. The mid-month streamflow forecasts take into account the below normal precipitation for the first half of the month as well as predictions for mostly dry conditions through the remainder of the spring. Please refer to the basin forecast tables found in this report for more information regarding water supply forecasts.

Arizona Spring Streamflow Forecasts as of February 15, 2013



SALT RIVER BASIN as of February 15, 2013

Below normal to well below normal streamflow levels are forecast for the basin. In the Salt River, near Roosevelt, the forecast calls for 54% of median streamflow through May, while at Tonto Creek, the forecast calls for 85% of median streamflow through May. Snow survey measurements show the Salt snowpack to be at 77% of median.



SALT RIVER BASIN as of February 15, 2013

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=====
                        SALT RIVER BASIN
                    Streamflow Forecasts - February 15, 2013
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
-----|-----|-----|-----|-----|-----|
Forecast | ===== Chance of Exceeding * ===== |
Period | (1000AF) (1000AF) | (1000AF) (% MED.) | (1000AF) (1000AF) | (1000AF)
-----|-----|-----|-----|-----|-----|
Salt R nr Roosevelt (3)
F15-MAY      63      104      140      54      183      260      260
FEBRUARY                28      72
-----|-----|-----|-----|-----|-----|
Tonto Ck ab Gun Ck nr Roosevelt (3)
F15-MAY      7.0      15.0      23      85      33      54      27
FEBRUARY                9.0      87      10.3
=====

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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 1981-2010 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.
- (3) - Median value used in place of average.

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=====
                        SALT RIVER BASIN
                    Reservoir Storage (1000AF) Mid-February
=====
Reservoir | Usable Capacity | ***** Usable Storage ***** |
          |                 | This Year   Last Year   Average |
-----|-----|-----|-----|-----|
SALT RIVER RES SYSTEM | 2025.8 | 1113.9   1459.9   1272.0 |
=====

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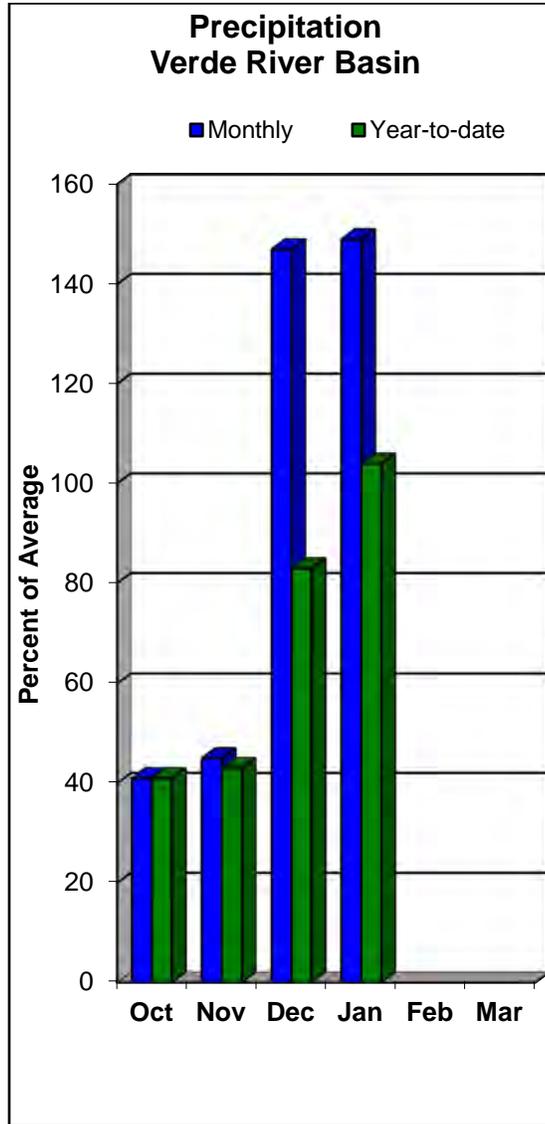
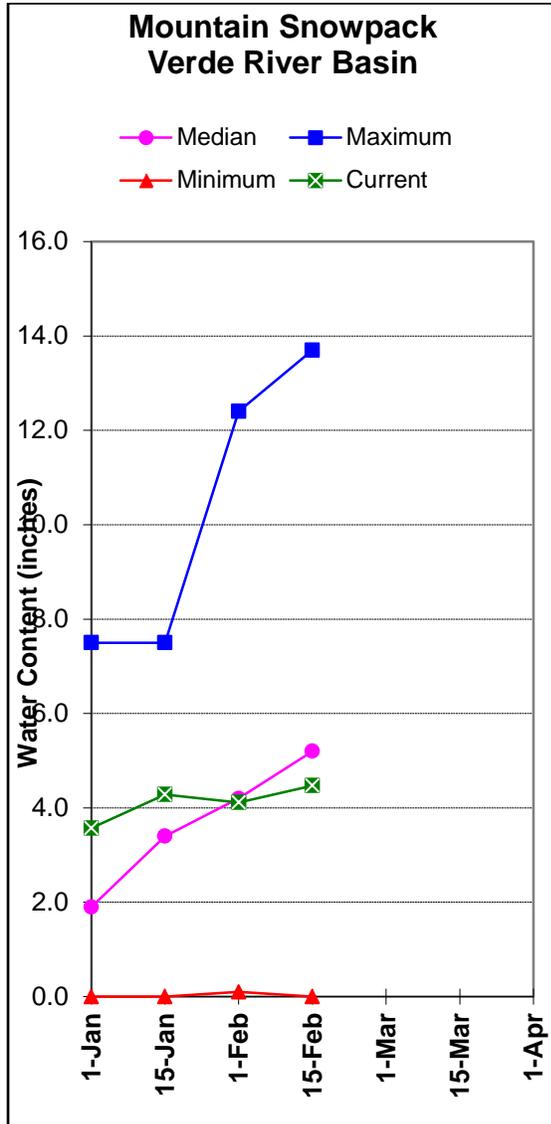
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=====
                        SALT RIVER BASIN
                    Watershed Snowpack Analysis - February 15, 2013
=====
Watershed | Number of Data Sites | This Year as Percent of Last Year | Median |
-----|-----|-----|-----|
SALT RIVER BASIN | 10 | 100 | 77 |
=====

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VERDE RIVER BASIN as of February 15, 2013

Slightly below normal streamflow levels are forecast for the basin. In the Verde River, at Horseshoe Dam, the forecast calls for 89% of median streamflow through May. Snow survey measurements show the Verde snowpack to be at 86% of median.



VERDE RIVER BASIN as of February 15, 2013

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=====
                                VERDE RIVER BASIN
                                Streamflow Forecasts - February 15, 2013
=====
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 R bl Tangle Ck ab Horseshoe Dam (3
F15-MAY      40      76      110      89      152      235      123
FEBRUARY     32      91
=====

```

* 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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- (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.

```

=====
                                VERDE RIVER BASIN
                                Reservoir Storage (1000AF) Mid-February
=====
Reservoir      Usable      ***** Usable Storage *****
                Capacity      This Year      Last Year      Average
=====
VERDE RIVER RES SYSTEM      287.4      182.1      65.4      160.8
=====

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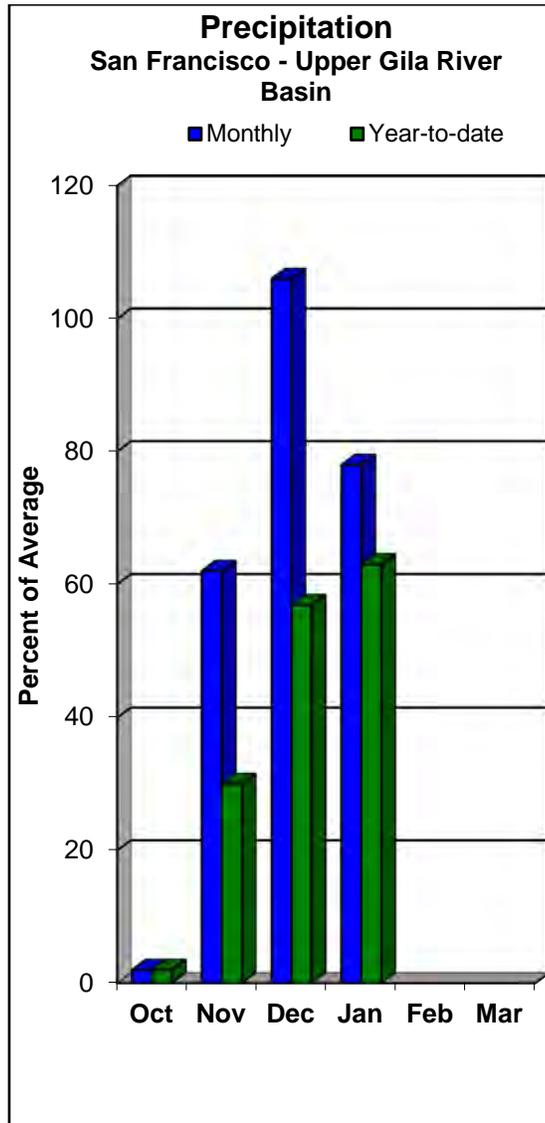
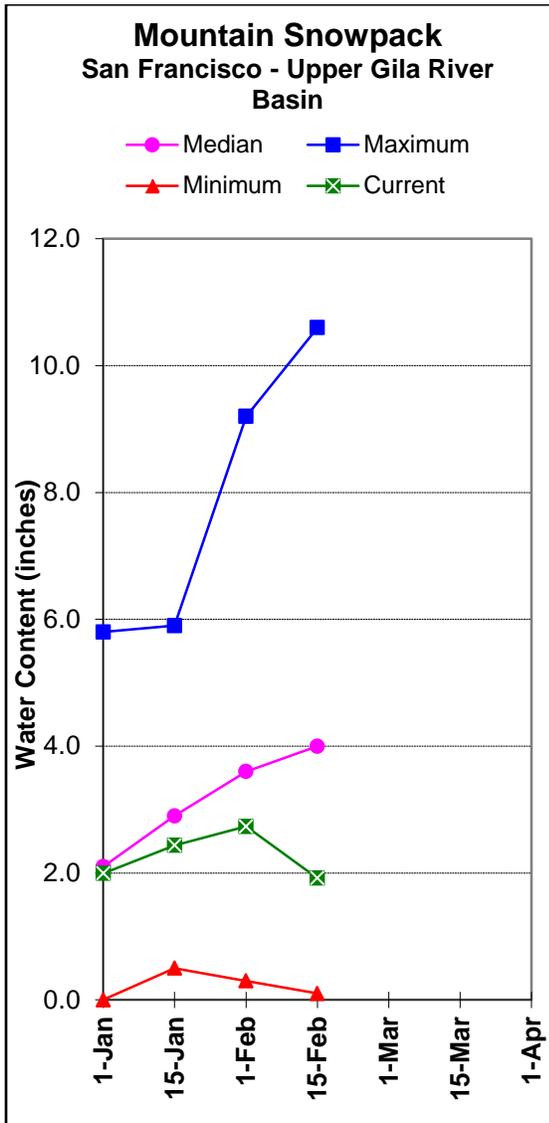
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=====
                                VERDE RIVER BASIN
                                Watershed Snowpack Analysis - February 15, 2013
=====
Watershed      Number of      This Year as Percent of
                Data Sites      Last Year      Median
=====
VERDE RIVER BASIN      10      140      86
SAN FRANCISCO PEAKS      2      158      95
=====

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SAN FRANCISCO-UPPER GILA RIVER BASIN as of February 15, 2013

Well below normal streamflow levels are forecast for the basin. In the San Francisco River, at Clifton, the forecast calls for 50% of median streamflow levels through May. In the Gila River, near Solomon, the forecast calls for 40% of median streamflow levels through May. At San Carlos Reservoir, inflow to the lake is forecast at only 21% of median through May. Snow survey measurements show the snowpack for this basin to be at 48% of median.



SAN FRANCISCO - UPPER GILA RIVER BASIN as of February 15, 2013

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=====
SAN FRANCISCO - UPPER GILA RIVER BASIN
Streamflow Forecasts - February 15, 2013
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast | ===== Chance of Exceeding * ===== |
Period | (1000AF) (1000AF) | (1000AF) (% MED.) | (1000AF) (1000AF) | (1000AF)
=====
Gila R at Gila
F15-MAY 10.0 11.2 15.6 38 21 31 41

Gila R bl Blue Ck nr Virden (3)
F15-MAY 8.0 9.9 17.7 33 28 46 53

San Francisco R at Glenwood (3)
F15-MAY 2.6 5.8 9.0 54 13.2 22 16.8

San Francisco R at Clifton (3)
F15-MAY 8.0 14.5 23 50 33 52 46

Gila R nr Solomon (3)
F15-MAY 16.0 24 41 40 62 102 103
FEBRUARY 7.0 30

San Carlos Reservoir Inflow (2,3)
F15-MAY 0.0 2.8 14.0 21 34 79 67

```

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- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.

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=====
SAN FRANCISCO - UPPER GILA RIVER BASIN
Reservoir Storage (1000AF) Mid-February
=====
Reservoir Usable Capacity ***** Usable Storage ***** Average
SAN CARLOS 875.0 11.2 24.0 385.7

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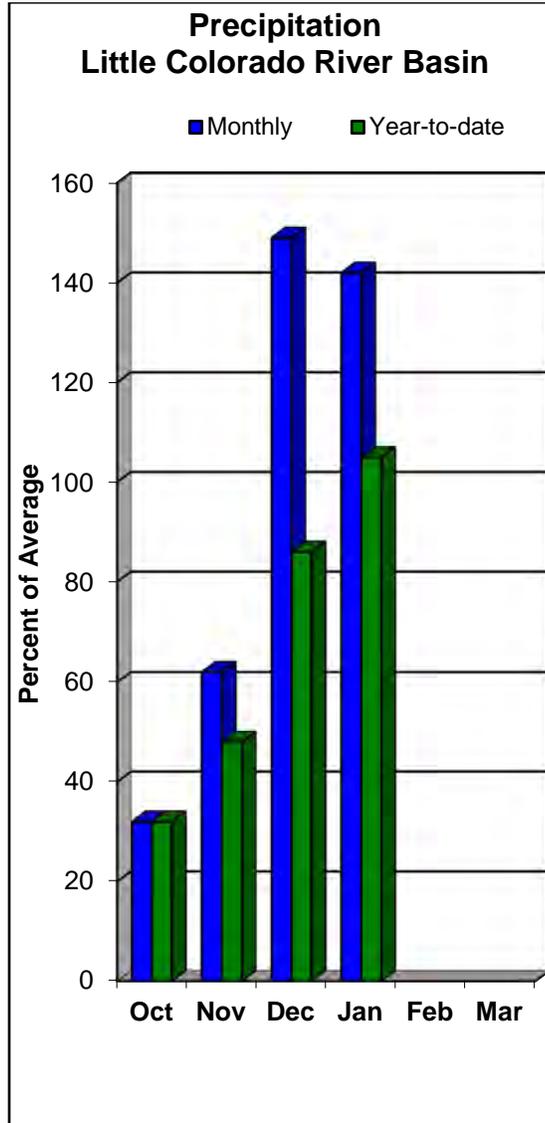
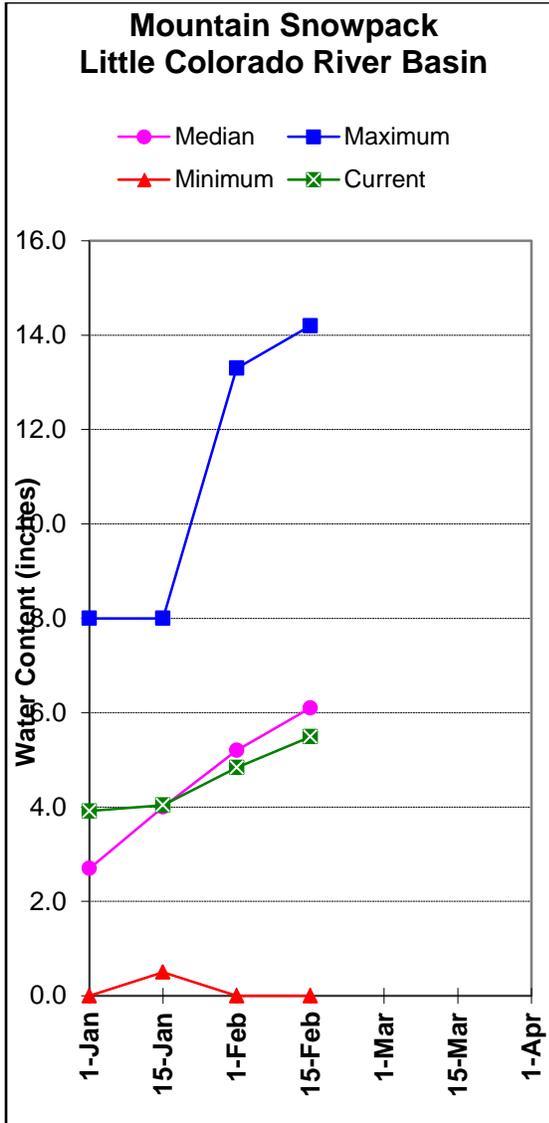
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SAN FRANCISCO - UPPER GILA RIVER BASIN
Watershed Snowpack Analysis - February 15, 2013
=====
Watershed Number of Data Sites This Year as Percent of Last Year Median
SAN FRANCISCO - UPPER GILA R 9 56 48
=====

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LITTLE COLORADO RIVER BASIN as of February 15, 2013

Well below normal streamflow levels are forecast for the basin. In the Little Colorado River, at Lyman Lake, the forecast calls for 53% of median streamflow through June. At Blue Ridge (C.C. Cragin) Reservoir, inflow to the lake is forecast at 49% of median through May. Snowpacks along the southern headwaters of the Little Colorado River, and along the central Mogollon Rim, were measured at 90% and 91% of median, respectively.



LITTLE COLORADO RIVER BASIN as of February 15, 2013

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=====
                        LITTLE COLORADO RIVER BASIN
                        Streamflow Forecasts - February 15, 2013
=====
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 R ab Lyman Lake (3)
FEB-JUN     1.41    2.50    3.50    53     4.70    7.00    6.60

Blue Ridge Reservoir Inflow (3)
FEB-MAY     2.1     5.0     8.0     49     12.0    19.9    16.3

Lake Mary Reservoir Inflow (3)
FEB-MAY     1.17    2.10    3.00    70     4.10    6.20    4.30
=====

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- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.

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=====
                        LITTLE COLORADO RIVER BASIN
                        Reservoir Storage (1000AF) Mid-February
=====
Reservoir    Usable Capacity ***** Usable Storage *****
              This Year   Last Year   Average
=====
LYMAN RESERVOIR                                NO REPORT
=====

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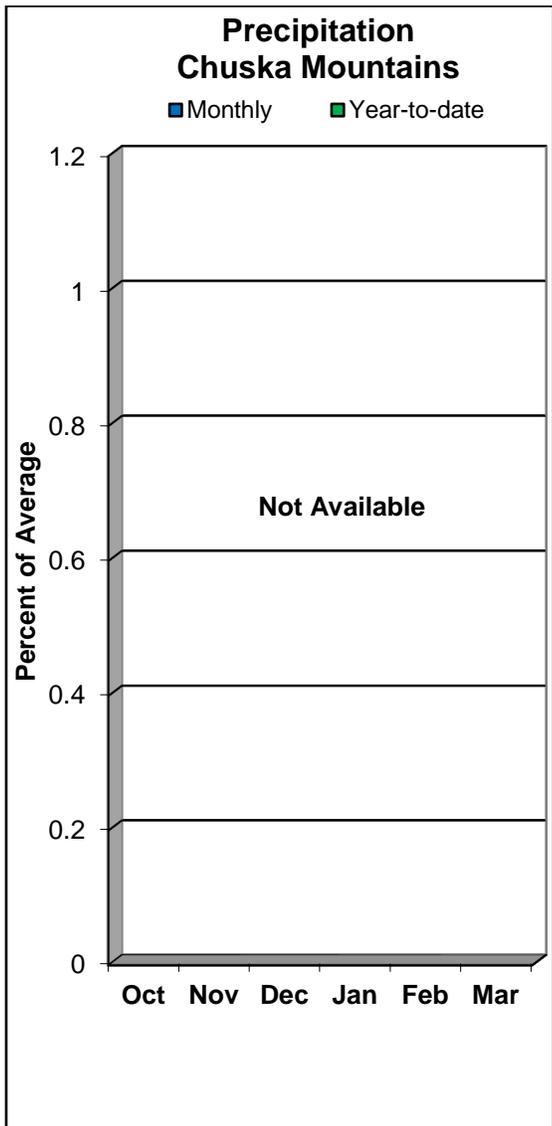
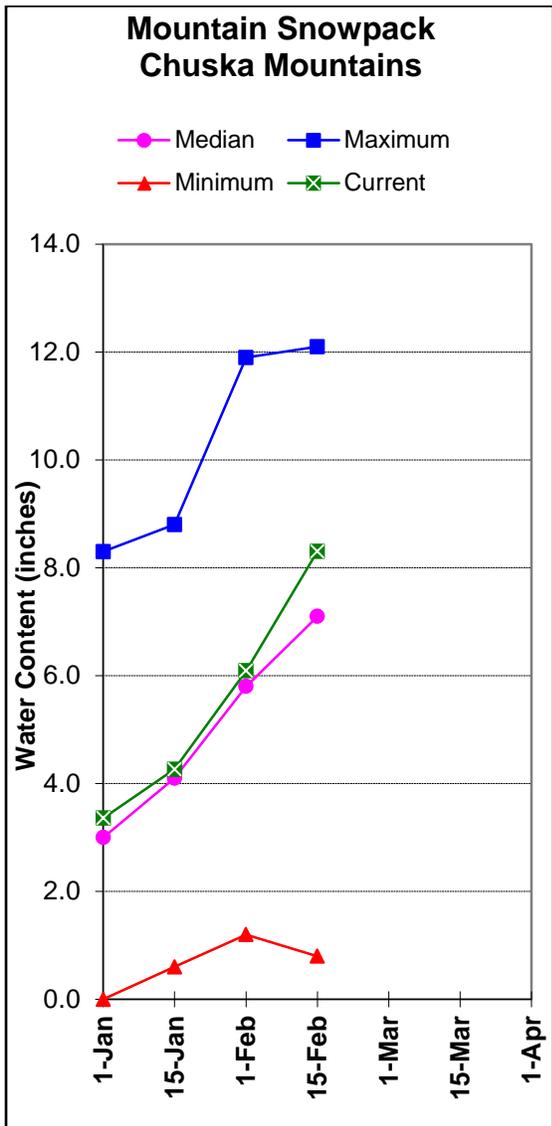
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=====
                        LITTLE COLORADO RIVER BASIN
                        Watershed Snowpack Analysis - February 15, 2013
=====
Watershed    Number of Data Sites    This Year as Percent of
              Last Year    Median
=====
LITTLE COLORADO - SOUTHERN H    10    114    90
CENTRAL MOGOLLON RIM            4    117    91
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CHUSKA MOUNTAINS as of February 15, 2013

Snow survey measurements conducted by staff of the Navajo Water Management Branch show the Chuska snowpack to be at 117% of median. Runoff is forecast to range from below normal at Kinlichee Creek to normal at Captain Tom Wash to above normal at Wheatfields Creek and Bowl Canyon Creek.



CHUSKA MOUNTAINS as of February 15, 2013

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=====
                                CHUSKA MOUNTAINS
                                Streamflow Forecasts - February 15, 2013
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast    | ===== Chance of Exceeding * ===== |
Period      | (1000AF) (1000AF) | (1000AF) (% AVG.) | (1000AF) (1000AF) | (1000AF)
=====
Captain Tom Wash nr Two Gray Hills
MAR-MAY     0.39    1.35    2.50    96    4.20    7.80    2.60

Wheatfields Ck nr Wheatfields
MAR-MAY     1.31    2.20    2.90   138    3.70    5.10    2.10

Bowl Canyon Ck ab Asaayi Lake
MAR-MAY     0.63    1.09    1.48   114    1.92    2.70    1.30

Kinlichee Ck
MAR-MAY     0.12    0.59    1.25    82    2.30    4.60    1.52
=====

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- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.

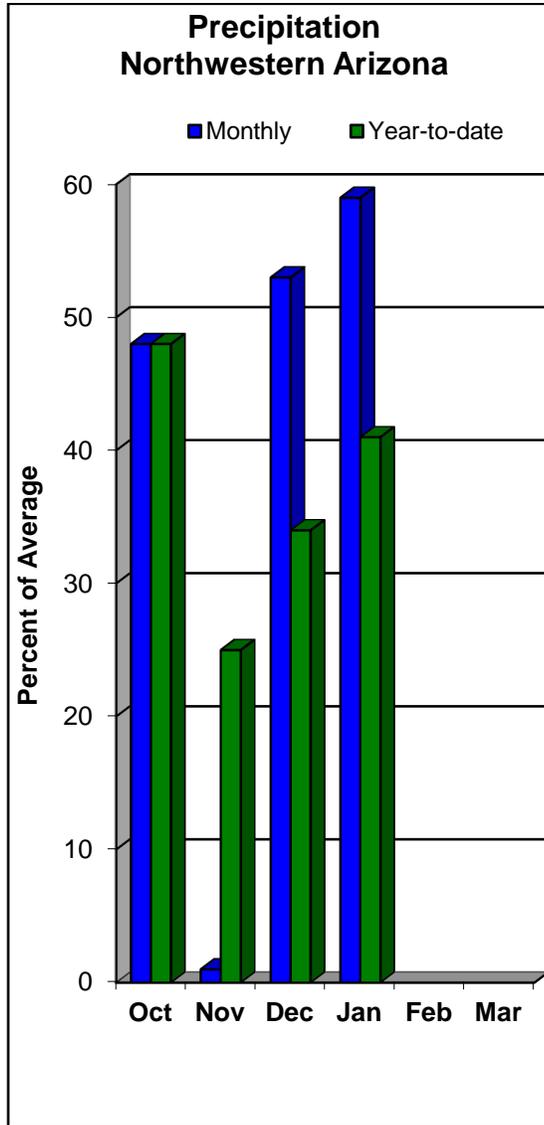
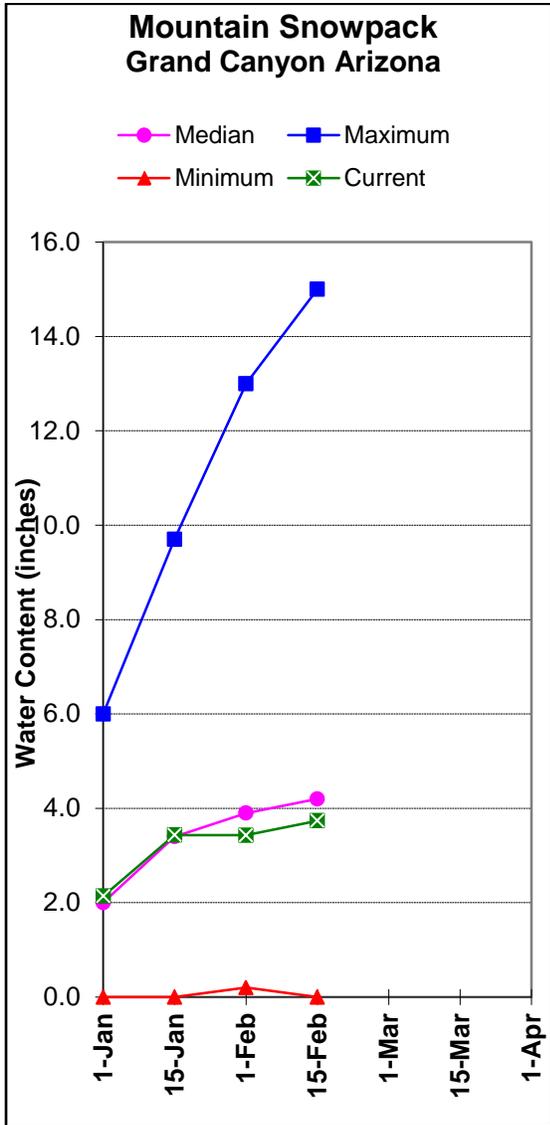
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                                CHUSKA MOUNTAINS
                                Watershed Snowpack Analysis - February 15, 2013
=====
Watershed           Number of           This Year as Percent of
                    Data Sites         Last Year           Median
=====
CHUSKA MOUNTAINS           6                 191                117
DEFIANCE PLATEAU           2                 371                 80
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NORTHWESTERN ARIZONA as of February 15, 2013

On the Colorado River, well below normal inflow to Lake Powell is forecast at 52% 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 89% of median.



NORTHWESTERN ARIZONA as of February 15, 2013

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=====
                                NORTHWESTERN ARIZONA
                                Streamflow Forecasts - February 15, 2013
=====
Forecast Pt | <=== Drier === Future Conditions === Wetter ===> |
Forecast     | ===== Chance of Exceeding * ===== |
Period       | (1000AF) (1000AF) | (1000AF) (% AVG.) | (1000AF) (1000AF) | (1000AF)
=====
Lake Powell Inflow (2)
APR-JUL      1730      2840      3750      52      4790      6540      7160
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- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.

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=====
                                NORTHWESTERN ARIZONA
                                Reservoir Storage (1000AF) Mid-February
=====
Reservoir      Usable Capacity      ***** Usable Storage *****
                This Year      Last Year      Average
=====
LAKE HAVASU      619.0      585.2      592.1      558.7
LAKE MOHAVE      1810.0      1674.7      1629.0      1685.0
LAKE MEAD        26159.0      13829.0      14974.0      20526.0
LAKE POWELL      24322.0      12032.0      15546.0      17170.0
=====

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=====
                                NORTHWESTERN ARIZONA
                                Watershed Snowpack Analysis - February 15, 2013
=====
Watershed      Number of Data Sites      This Year as Percent of Last Year      Median
=====
GRAND CANYON      2      211      89
=====

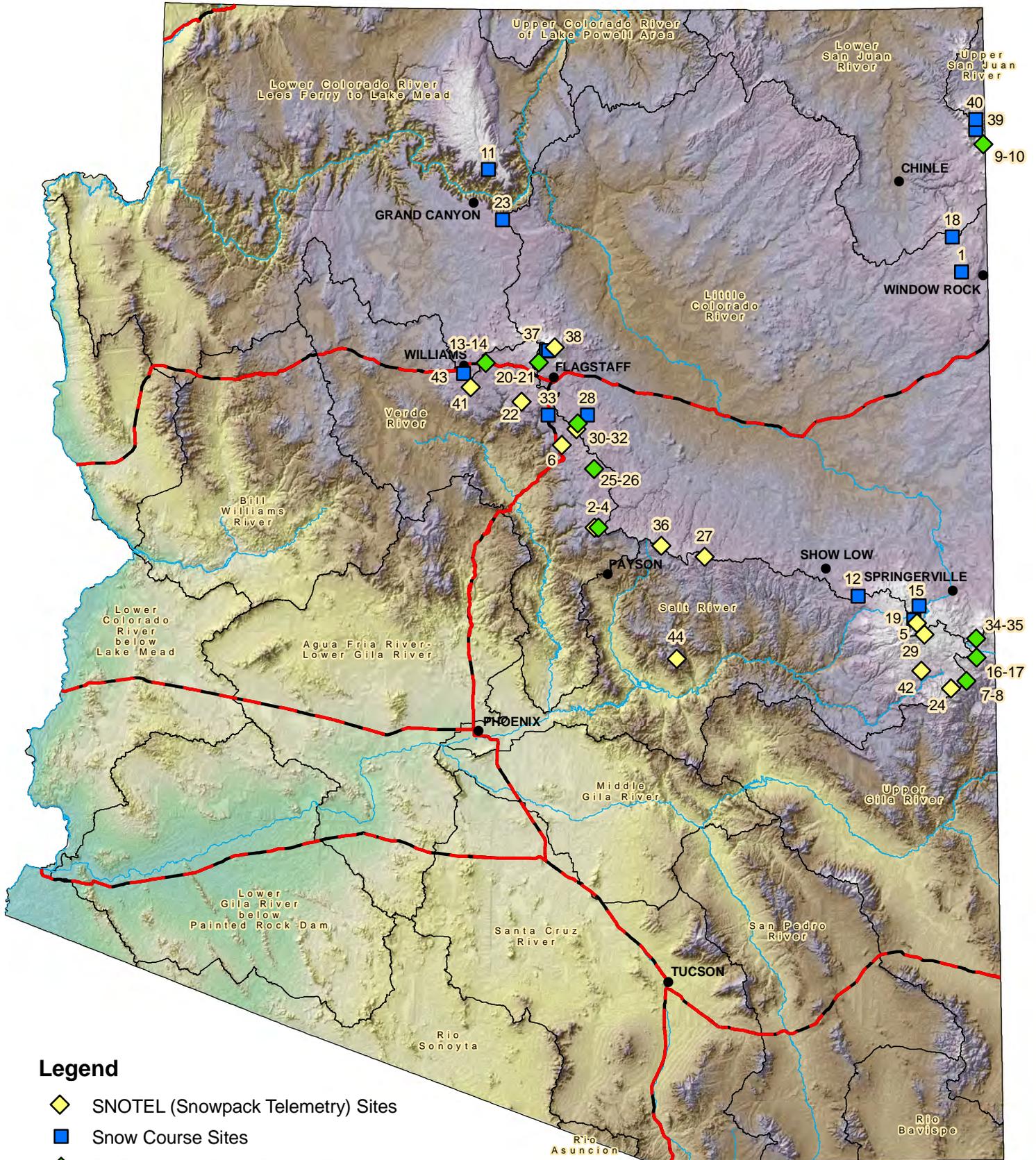
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S N O W S U R V E Y D A T A

FEBRUARY 15, 2013

MAP NUM.	SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	MEDIAN 81-10
1.	ARBABS FOREST (AK)	7680	2/14	7	2.2	.9	2.8
2.	BAKER BUTTE SNOTEL	7330	2/15	12	3.2	2.2	5.2
3.	BAKER BUTTE #2	7700	2/14	26	7.7	7.6	8.3
4.	BAKER BUTTE SMT SNTL	7700	2/15	29	9.3	9.1	-
5.	BALDY SNOTEL	9220	2/15	23	6.4	5.6	7.5
6.	BAR M SNOTEL	6393	2/15	5	1.8	-	-
7.	BEAVER HEAD	8000	2/14	0	.0	1.5	2.6
8.	BEAVER HEAD SNOTEL	7990	2/15	0	.8	1.9	3.6
9.	BEAVER SPRING	9220	2/14	35	9.0	4.8	8.5
10.	BEAVER SPRING SNOTEL	9200	2/15	34	9.4	6.2	-
11.	BRIGHT ANGEL	8400	2/18	22	6.6	3.0	6.6
12.	BUCK SPRING	7400	2/14	5	.8	1.4	2.8
13.	CHALENDER	7100	2/12	8	1.6	.2	2.0
14.	CHALENDER SNOTEL	7100	2/15	9	2.6	1.3	-
15.	CHEESE SPRINGS	8600	2/14	15	4.1	4.9	5.0
16.	CORONADO TRL SNOTEL	8400	2/15	1	.1	.4	2.9
17.	CORONADO TRAIL	8400	2/14	0	.0	.0	2.2
18.	FLUTED ROCK	7800	2/14	11	3.0	.5	3.7
19.	FORT APACHE	9160	2/14	26	7.3	6.1	7.1
20.	FORT VALLEY	7350	2/14	6	1.2	.5	2.2
21.	FORT VALLEY SNOTEL	7350	2/15	0	.8	.4	-
22.	FRY SNOTEL	7220	2/15	14	4.1	5.3	6.3
23.	GRAND CANYON	7500	2/11	6	.8	.5	1.7
24.	HANNAGAN MDWS SNOTEL	9020	2/15	25	8.2	9.2	9.6
25.	HAPPY JACK	7630	2/14	16	4.1	1.2	4.8
26.	HAPPY JACK SNOTEL	7630	2/15	27	6.7	5.0	5.3
27.	HEBER SNOTEL	7640	2/15	12	3.7	2.4	5.1
28.	LAKE MARY	6970	2/14	14	4.4	1.8	2.6
29.	MAVERICK FORK SNOTEL	9200	2/15	23	6.4	6.9	7.9
30.	MORMON MTN SNOTEL	7500	2/15	18	4.9	2.4	4.3
31.	MORMON MT. SUMMIT #2	8470	2/14	29	8.5	5.2	-
32.	MORMON MTN SUMMIT SN	8500	2/15	24	8.0	5.7	-
33.	NEWMAN PARK	6750	2/14	8	1.2	1.1	2.6
34.	NUTRIOSO	8500	2/14	0	.0	.7	1.0
35.	NUTRIOSO SNOTEL	8500	2/15	0	.2	.1	-
36.	PROMONTORY SNOTEL	7900	2/15	30	10.9	8.5	9.5
37.	SNOW BOWL #2	11000	2/14	51	11.8	6.8	14.9
38.	SNOWSLIDE CYN SNTL	9750	2/15	54	14.2	9.7	12.5
39.	TSAILE CANYON #1	8160	2/13	33	9.1	3.1	6.0
40.	TSAILE CANYON #3	8920	2/14	41	11.5	4.5	9.0
41.	WHITE HORSE SNOTEL	7180	2/15	8	2.4	.6	4.5
42.	WILDCAT SNOTEL	7850	2/15	10	3.3	3.9	3.4
43.	WILLIAMS SKI RUN	7720	2/12	31	8.6	4.1	7.5
44.	WORKMAN CREEK SNOTEL	6900	2/15	15	6.6	4.1	5.8

Arizona Snow Survey Data Sites



Legend

-  SNOTEL (Snowpack Telemetry) Sites
-  Snow Course Sites
-  SNOTEL and Snow Course Sites
-  Basin Boundaries

