USDA United States Department of Agriculture

Natural Resources Conservation Service

Arizona Basin Outlook Report February 15, 2005

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

For more water supply and resource management information, contact:

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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.

Issued by

Bruce I. Knight
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

David L. McKay
State Conservationist
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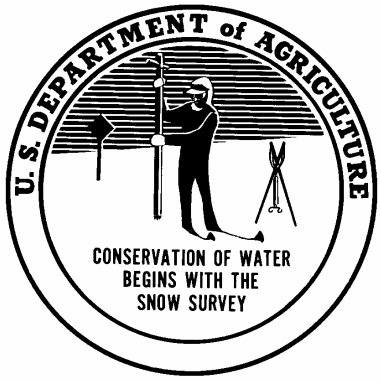

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http://www.az.nrcs.usda.gov/

ARIZONA
Water Supply Outlook Report
as of February 15, 2005

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

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 University of Arizona's College of Agriculture.**

SUMMARY

Impressive precipitation amounts ranging from 2.5 to 9 inches were record at NRCS SNOTEL sites for the first fifteen days of February. As a result, significant increases in stream levels were recorded in the Salt, Verde, and Gila Rivers, while reservoir storage continues to improve on the Salt and Gila Rivers. Additionally, snowpack levels continue well above average for this time of year.

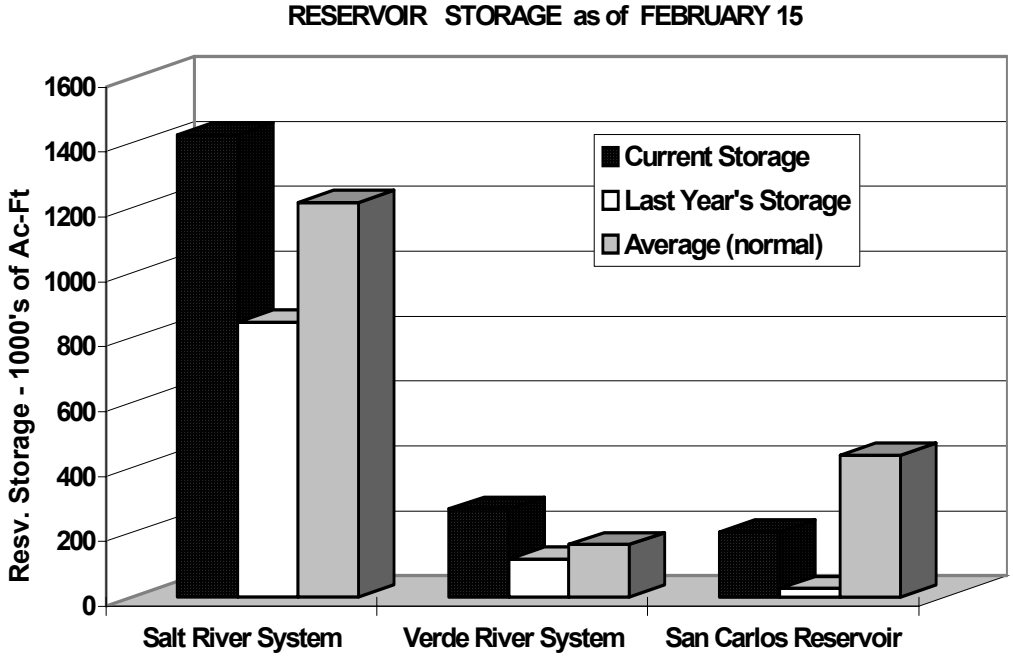
SNOWPACK

Watershed	Percent (%) of 30-Yr. Average Snowpack Levels as of February 15
Salt River Basin	124%
Verde River Basin	153%
Little Colorado River Basin	116%
San Francisco-Upper Gila River Basin	121%
Other Points of Interest	
Chuska Mountains	115%
Central Mogollon Rim	121%
Grand Canyon	185%
San Francisco Peaks	252%
Statewide Snowpack	142%

PRECIPITATION

Significant precipitation at NRCS SNOTEL sites were recorded for the period February 1-15: White Horse Lake SNOTEL site, located near Williams, AZ – 4.3″, Morman Mountain – 3.8″, Baker Butte, located on the Rim – 5.2″, and Workman Creek, located in Gila County – 9.2″. Similar amounts were recorded at stations located in the White Mountains of eastern Arizona. Precipitation totals for the month of February will be illustrated in the next report.

RESERVOIR

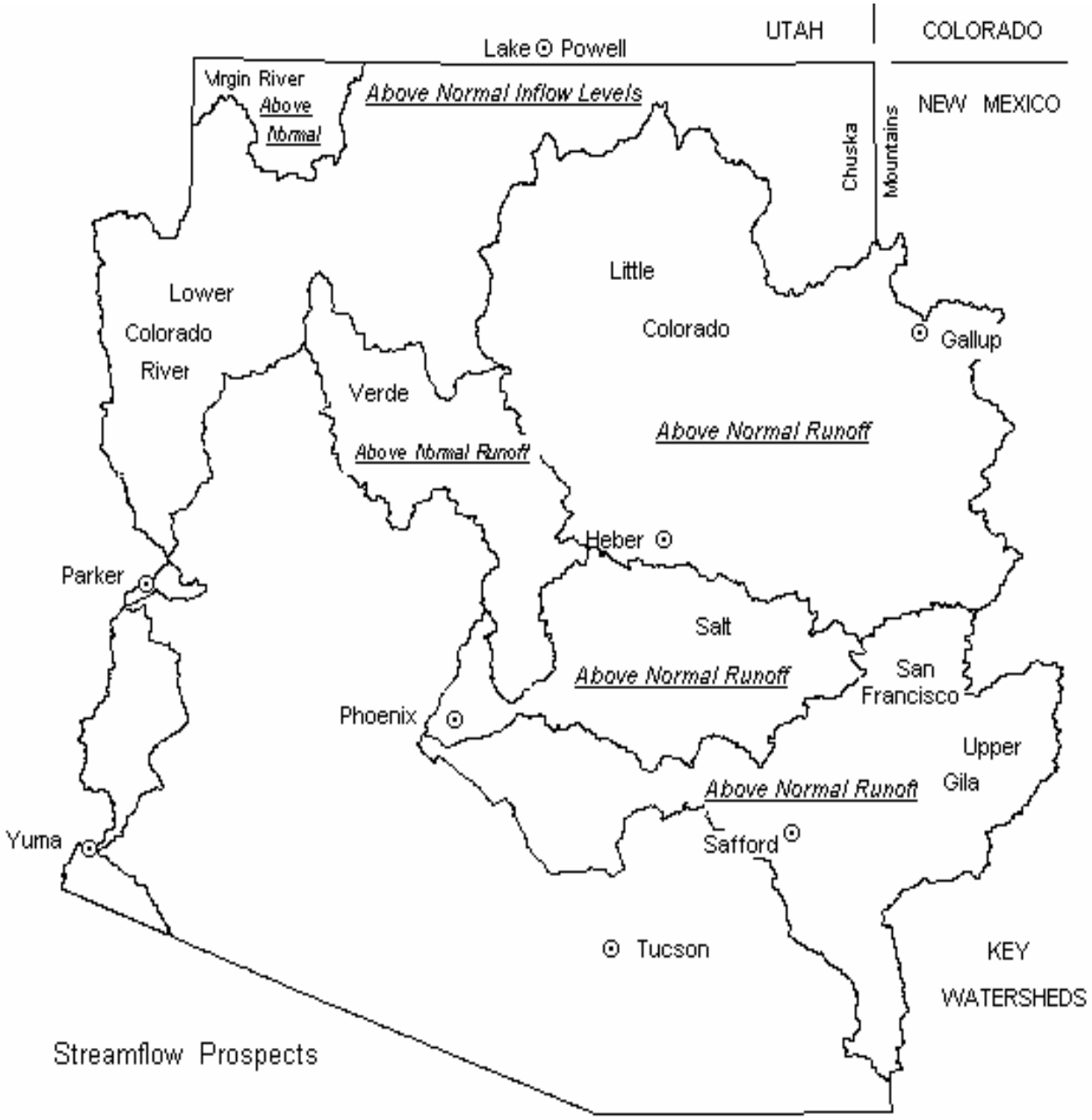


Key storage volumes displayed in thousands of acre-feet (1000 x):

RESERVOIR	CURRENT STORAGE	LAST YEAR STORAGE	30-YEAR AVERAGE
Salt River System	1423.7	846.9	1216.3
Verde River System	271.1	116.7	161.9
San Carlos Reservoir	201.1	27.3	438.3
Lyman Lake	4.2	2.2	14.8
Show Low Lake	6.2	3.2	2.9
Lake Pleasant	793.0	609.3	----
Lake Havasu	587.2	538.8	553.6
Lake Mohave	1656.0	1622.3	1685.2
Lake Mead	15338.0	15429.0	22072.0
Lake Powell	8343.0	10743.0	18448.0

STREAMFLOW

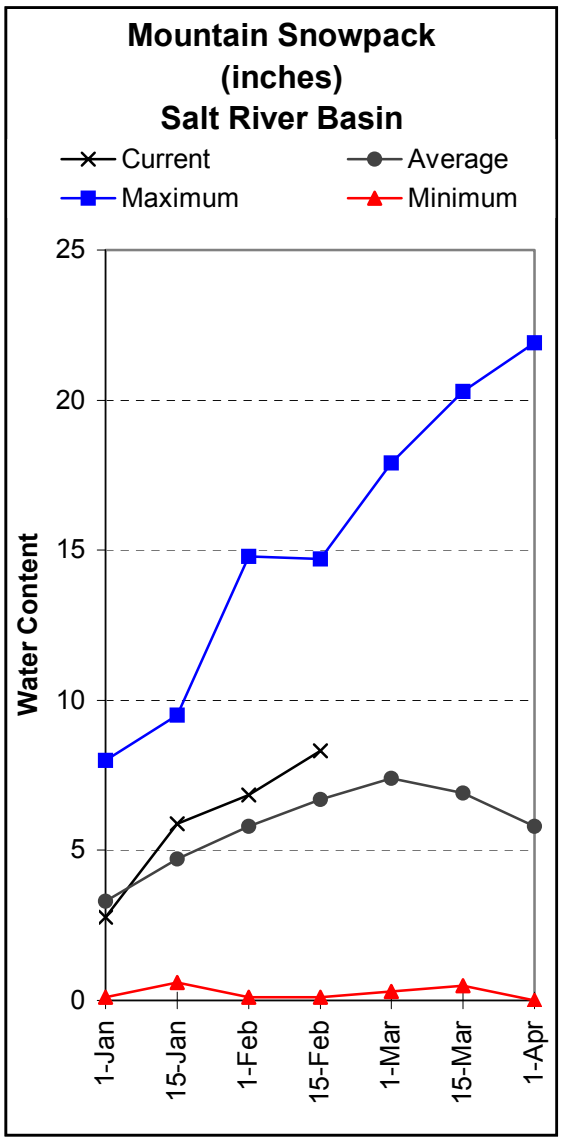
As a result of significant precipitation since January 1, well above median streamflow levels are forecast through springtime for all major streams monitored in this report. For more information regarding this years predicted surface water supplies, please refer to the basin forecast tables found in the report.

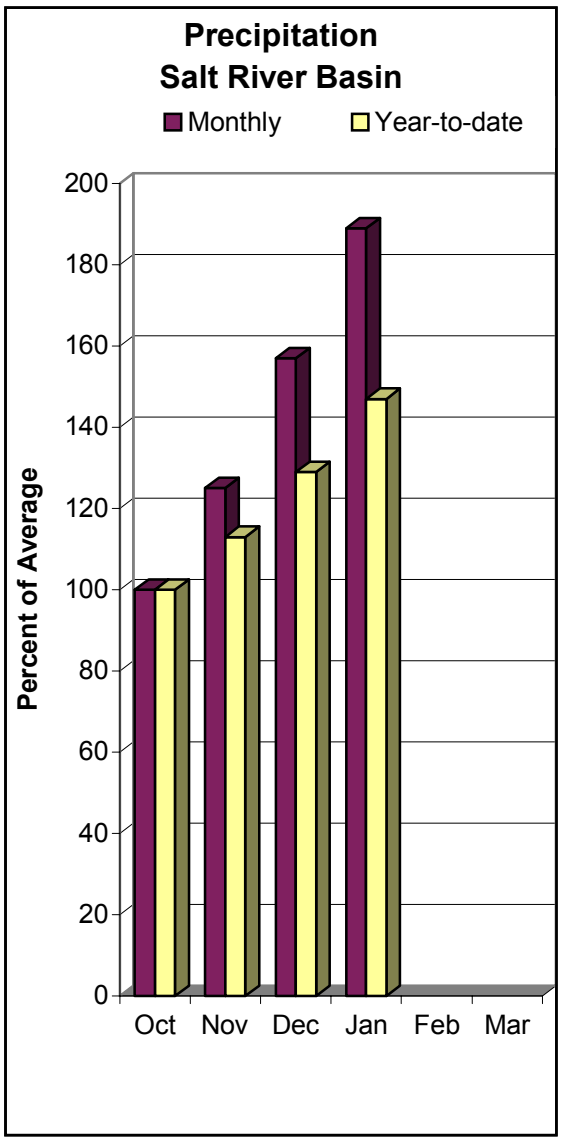


SALT RIVER BASIN as of February 15, 2005

Well above median streamflow levels are forecast for the basin. In the Salt River, near Roosevelt, the forecast calls for 222 % of median streamflow levels through MAY, while at Tonto Creek, the forecast calls for 345 % of median streamflow levels through MAY.

Snow survey measurements show the Salt snowpack to be 124 % of the 30-year average, while combined reservoir storage in the Salt River system is reported at 1,423,681 acre-feet.





SALT RIVER BASIN
Streamflow Forecasts - February 15, 2005

Forecast Pt / Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (1000AF)	50% (% MED.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Med (1000AF)
Salt River nr Roosevelt							
FEB15-MAY	417	574	700	222	843	1088	315
FEBRUARY	221	252	275	598	299	335	46
Tonto Creek ab Gun Creek nr Roosevelt							
FEB15-MAY	40	71	100	345	135	201	29
FEBRUARY	67	91	109	865	129	162	12.6

* 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) Mid-February

Reservoir	Usable Capacity	********** Usable Storage ********* This Year	Last Year	Average
SALT RIVER RES SYSTEM	2025.8	1423.7	846.9	1216.3

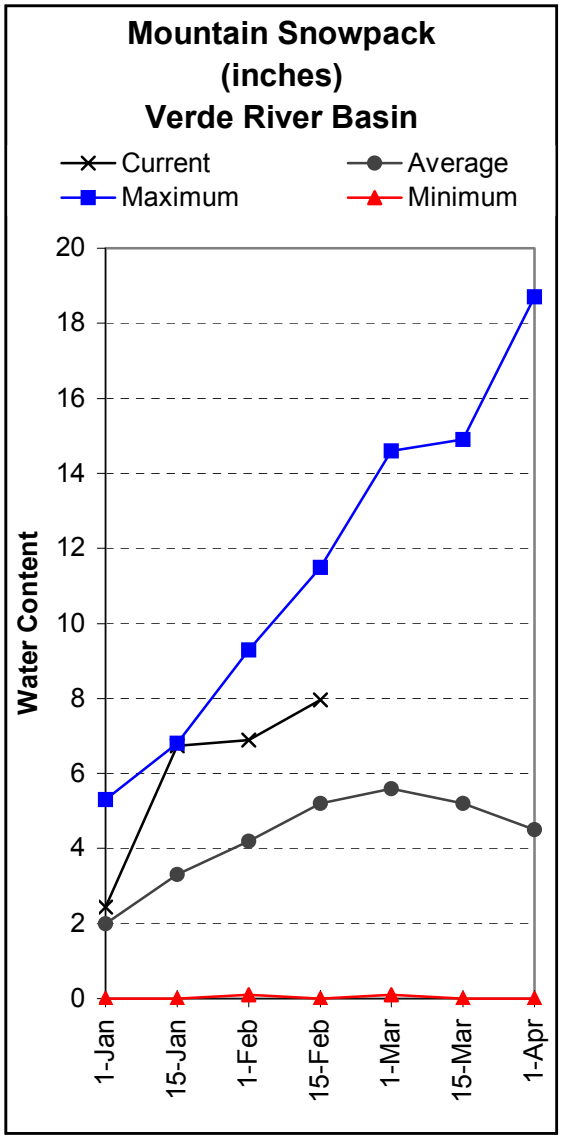
SALT RIVER BASIN
Watershed Snowpack Analysis - February 15, 2005

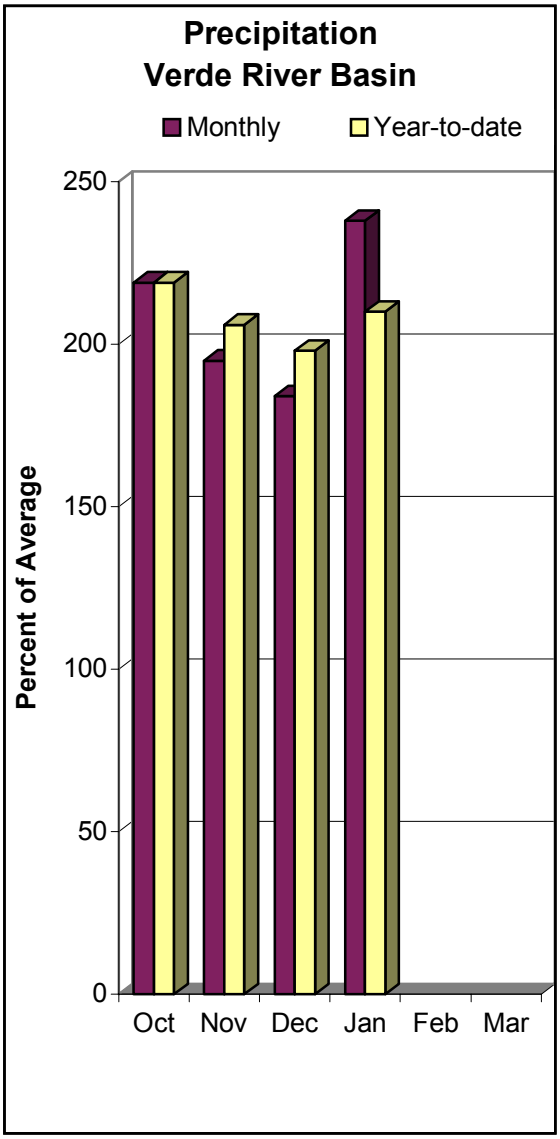
Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SALT RIVER BASIN	8	172	124

VERDE RIVER BASIN as of February 15, 2005

Well above median streamflow levels are forecast for the basin. In the Verde River, at Horseshoe Dam, the forecast calls for 303 % of median streamflow levels through MAY.

Snow survey measurements show the Verde snowpack to be 153 % of the 30-year average, while combined reservoir storage in the Verde River system is reported at 271,146 acre-feet.





VERDE RIVER BASIN
Streamflow Forecasts - February 15, 2005

Forecast Pt / Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (1000AF)	50% (% MED.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Med (1000AF)
Verde River abv Horseshoe Dam							
FEB15-MAY	280	400	500	303	615	813	165
FEBRUARY	308	361	400	1143	442	509	35

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

Reservoir	Usable Capacity	********** Usable Storage ********* This Year	Last Year	Average
VERDE RIVER RES SYSTEM	287.4	271.1	116.7	161.9

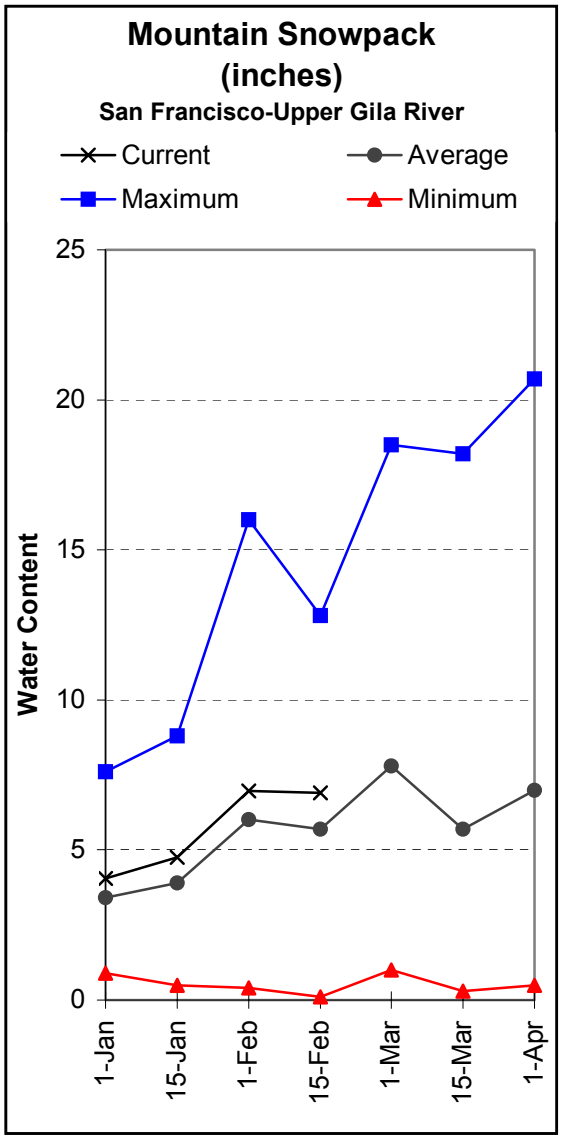
VERDE RIVER BASIN
Watershed Snowpack Analysis - February 15, 2005

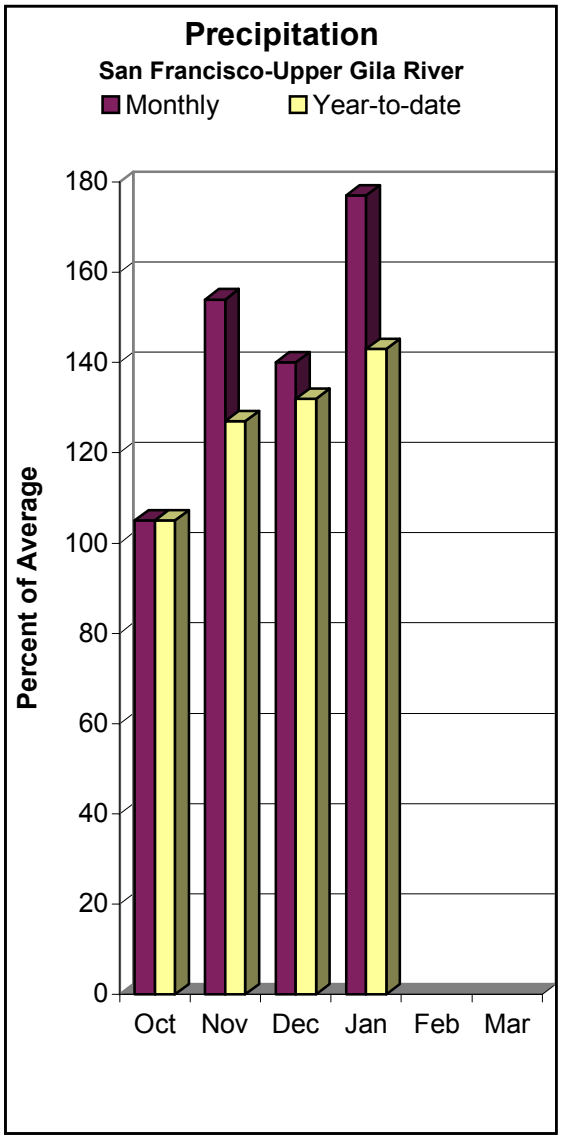
Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
VERDE RIVER BASIN	10	271	153
SAN FRANCISCO PEAKS	3	368	252

SAN FRANCISCO-UPPER GILA RIVER BASIN as of February 15, 2005

Well above median streamflow levels are forecast for the basin. In the San Francisco River, at Clifton, the forecast calls for 209 % of median streamflow levels through MAY, while in the Gila River, near Solomon, the forecast calls for 234 % of median streamflow levels through MAY. At San Carlos Reservoir, inflow into the lake is forecast at 348 % of median through MAY.

At San Carlos, reservoir storage stands at 201,129 acre-feet, while snow survey measurements show the snowpack to be 121 % of the 30-year average.





SAN FRANCISCO - UPPER GILA RIVER BASIN
Streamflow Forecasts - February 15, 2005

Forecast Pt / Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (1000AF)	50% (% MED.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Med (1000AF)
Gila River at Gila							
FEB15-MAY	48	69	86	191	106	140	45
Gila River nr Virden							
FEB15-MAY	80	110	130	197	150	180	66
San Francisco River at Glenwood							
FEB15-MAY	24	37	48	218	61	84	22
San Francisco River at Clifton							
FEB15-MAY	58	90	111	209	132	164	53
Gila River nr Solomon							
FEB15-MAY	160	234	285	234	335	410	122
FEBRUARY			205	854			24
San Carlos Reservoir inflow							
FEB15-MAY	198	244	275	348	305	350	79

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

Reservoir	Usable Capacity	********** Usable Storage ********* This Year	Last Year	Average
SAN CARLOS	875.0	201.1	27.3	438.3

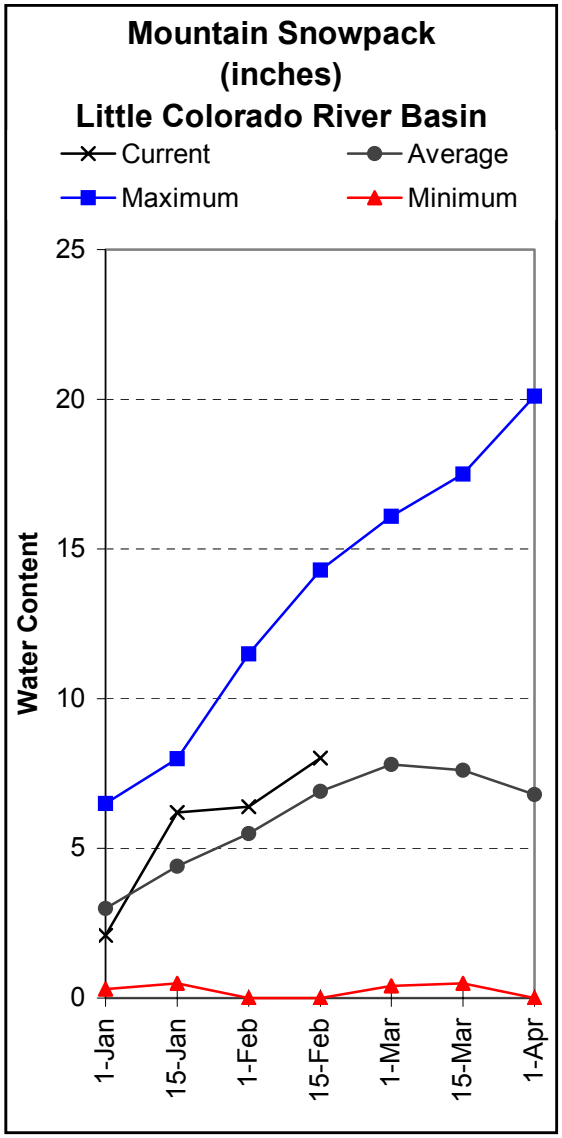
SAN FRANCISCO - UPPER GILA RIVER BASIN
Watershed Snowpack Analysis - February 15, 2005

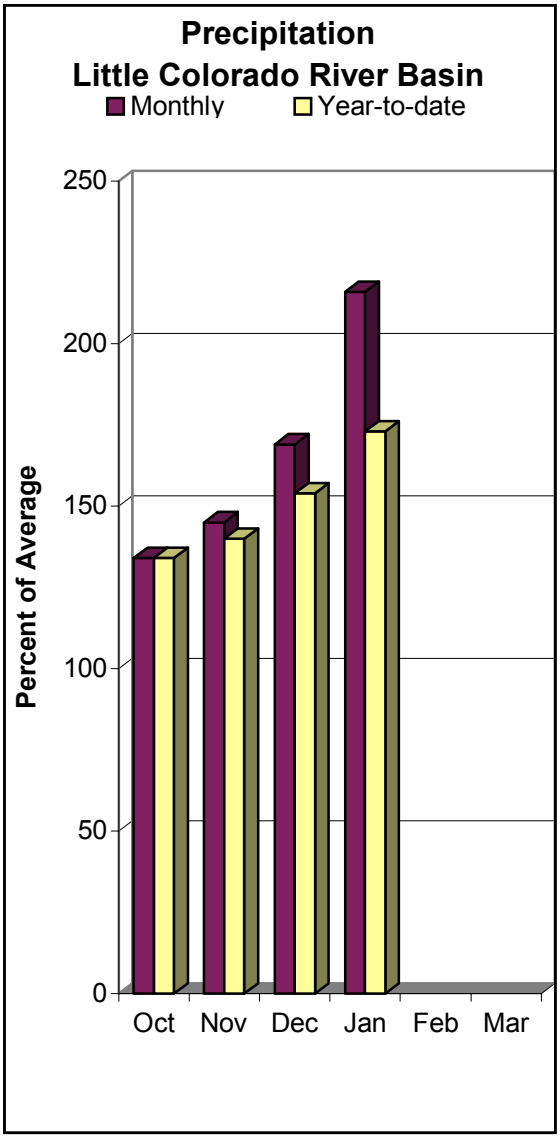
Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SAN FRANCISCO - UPPER GILA R	8	179	121

LITTLE COLORADO RIVER BASIN as of February 15, 2005

Well above median streamflow levels are forecast for the basin. In the Little Colorado River, at Lyman Lake, the forecast calls for 197 % of median streamflow levels through JUNE, while at Woodruff, the forecast calls for 171 % of median streamflow levels through MAY.

Snowpack levels along the southern headwaters of the Little Colorado River, and along the central Mogollon Rim, was measured at 116 % and 121 % of the 30-year average, respectively.





LITTLE COLORADO RIVER BASIN
Streamflow Forecasts - February 15, 2005

Forecast Pt / Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions 50% (1000AF)	50% (% MED.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Med (1000AF)
Little Colorado River abv Lyman Lake							
FEB-JUN	6.83	10.88	14.40	203	18.61	26.17	7.10
Little Colorado River at Woodruff							
FEB-MAY	4.26	6.78	8.50	304	10.22	12.70	2.80
Blue Ridge Reservoir inflow							
FEB-MAY	38	45	50	307	56	64	16.3
Lake Mary inflow							
FEB-MAY	6.79	9.66	12.00	250	14.70	19.37	4.80

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

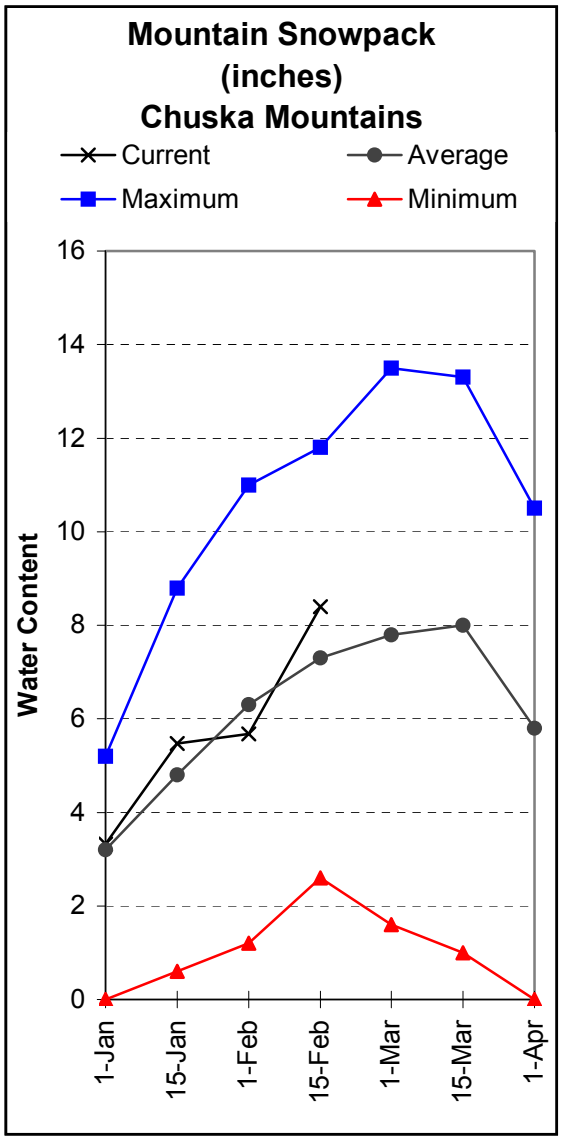
Reservoir	Usable Capacity	********** Usable Storage ********* This Year	Last Year	Average
LYMAN RESERVOIR	30.0	4.2	2.2	14.8
SHOW LOW LAKE	5.1	6.2	3.2	2.9

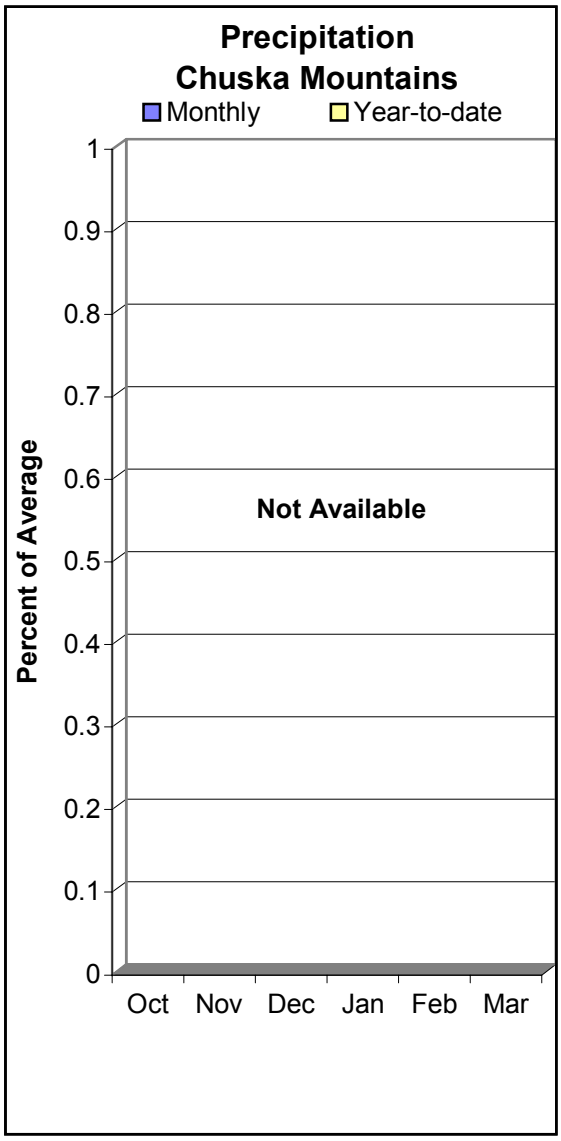
LITTLE COLORADO RIVER BASIN
Watershed Snowpack Analysis - February 15, 2005

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
LITTLE COLORADO - SOUTHERN H	9	198	116
CENTRAL MOGOLLON RIM	4	215	121

CHUSKA MOUNTAINS as of February 15, 2005

Snow survey measurements conducted by staff of the Navajo Tribe show the Chuska snowpack to be 115 % of average, while above average streamflow levels are forecast this season for Captain Tom Wash, Wheatfields Creek, and Bowl Canyon Creek.





CHUSKA MOUNTAINS
Streamflow Forecasts - February 15, 2005

Forecast Pt / Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (1000AF)	50% (% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
Captain Tom Wash nr Two Gray Hills							
MAR-MAY	1.06	3.00	4.30	152	5.60	7.50	2.83
Wheatfields Creek nr Wheatfields							
MAR-MAY	0.99	3.00	4.30	148	5.60	7.60	2.90
Bowl Canyon Creek abv Assayi Lake							
MAR-MAY	0.46	1.14	1.60	160	2.06	2.72	1.00

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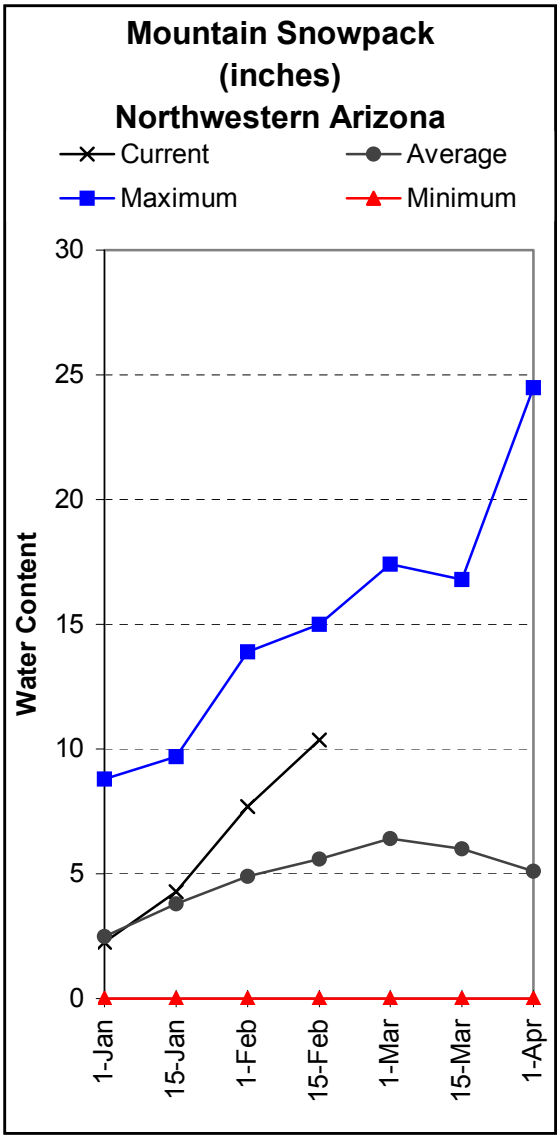
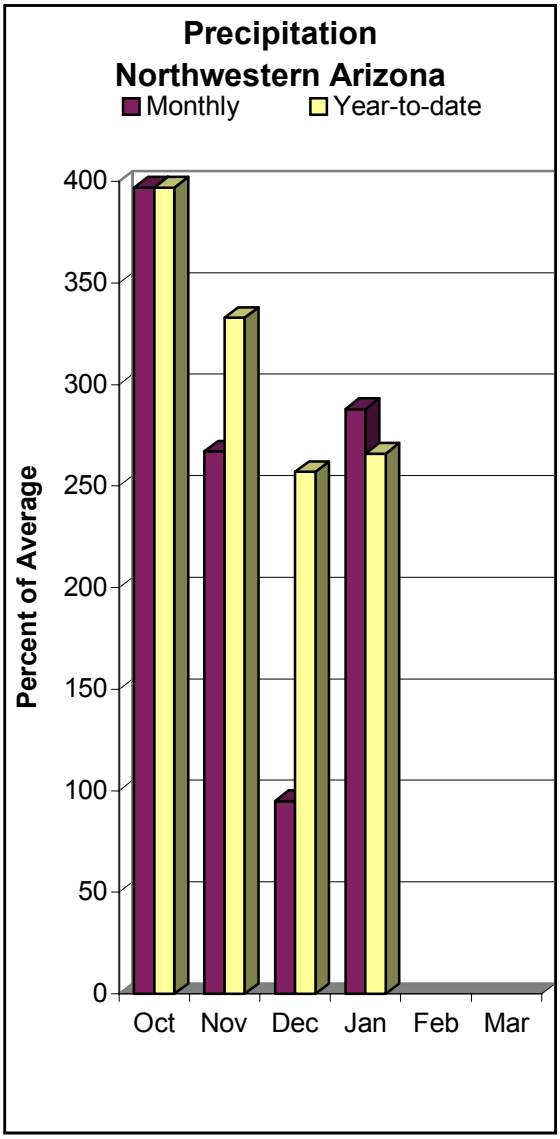
CHUSKA MOUNTAINS
Watershed Snowpack Analysis - February 15, 2005

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
CHUSKA MOUNTAINS	7	142	115
DEFIANCE PLATEAU	2	62	52

NORTHWESTERN ARIZONA as of February 15, 2005

Inflow into Lake Powell, on the Colorado River, is forecast to be 114 % of average through JULY, while at the Grand Canyon, snow measurements conducted by staff from the National Park Service show the snowpack to be 185 % of average.





NORTHWESTERN ARIZONA
Streamflow Forecasts - February 15, 2005

Forecast Pt / Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (1000AF)	50% (% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
Lake Powell inflow							
APR-JUL	6495	7987	9000	114	10009	11509	7930

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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	587.2	538.8	553.6
LAKE MOHAVE	1810.0	1656.0	1622.3	1685.2
LAKE MEAD	26159.0	15338.0	15429.0	22072.0
LAKE POWELL	24322.0	8343.0	10743.0	18448.0

NORTHWESTERN ARIZONA
Watershed Snowpack Analysis - February 15, 2005

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
GRAND CANYON	1	244	185

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

FEBRUARY 15, 2005

SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
ARBABS FOREST (AK)	7680	2/14	1	0.4	2.0	2.7
BAKER BUTTE SNOTEL	7330	2/15	-	6.6	3.1	5.7
BAKER BUTTE #2	7700	2/14	37	14.4	4.6	10.7
BALDY SNOTEL	9220	2/15	-	8.8	4.9	7.0
BEAVER HEAD	8000				2.2	2.9
BEAVER HEAD SNOTEL	7990	2/15	-	6.2	2.5	3.3
BEAVER SPRING	9220	2/14	37	11.4	6.7	8.7
BRIGHT ANGEL	8400	2/15	39	16.1	6.6	8.7
BUCK SPRING	7400	2/14	4	1.0	1.6	4.3
CHALENDER	7100	2/15	5	1.0	0.3	3.1
CHEESE SPRINGS	8600	2/14	15	5.3	3.2	5.0
CORONADO TRL SNOTEL	8400	2/15	-	6.3	2.7	3.4
CORONADO TRAIL	8400				1.9	2.9
FLUTED ROCK	7800	2/14	7	2.8	3.2	3.4
FORT APACHE	9160	2/14	30	8.5	4.8	6.8
FORT VALLEY	7350	2/10	12	4.1	1.1	2.7
FRY SNOTEL	7220	2/15	-	13.4	4.1	7.0
GRAND CANYON	7500				1.6	2.6
HANNAGAN MDWS SNOTEL	9020	2/15	-	16.1	7.4	10.2
HAPPY JACK	7630	2/16	18	5.9	1.6	4.8
HAPPY JACK SNOTEL	7630	2/15	-	10.2	4.0	4.6
HEBER SNOTEL	7640	2/15	-	5.3	4.1	5.5
LAKE MARY	6970	2/10	14	5.3	1.8	3.2
MAVERICK FORK SNOTEL	9200	2/15	-	11.5	5.4	8.3
MORMON MTN SNOTEL	7500	2/15	-	10.3	4.2	6.2
MORMON MT. SUMMIT #2	8470	2/14	55	18.6	6.1	10.8
NEWMAN PARK	6750	2/10	14	5.1	2.9	3.0
NUTRIOSO	8500				0.7	1.7
PROMONTORY SNOTEL	7900	2/15	-	14.2	7.0	11.5
SNOW BOWL #1 ALT.	10260	2/16	76	25.8	4.8	10.6
SNOW BOWL #2	11000	2/16	98	31.8	8.0	14.6
SNOWSLIDE CYN SNTL	9750	2/15	-	31.1	11.3	10.0
TSAILE CANYON #1	8160	2/14	22	7.4	5.7	6.4
TSAILE CANYON #3	8920	2/14	33	10.5	7.8	8.5
WHITE HORSE SNOTEL	7180	2/15	-	5.2	1.4	5.1
WILDCAT SNOTEL	7850	2/15	-	3.0	2.7	4.1
WILLIAMS SKI RUN	7720	2/15	32	11.0	4.4	7.8
WORKMAN CREEK SNOTEL	6900	2/15	-	4.9	6.3	5.9