

*Natural Resources Conservation Service*

# Nevada Water Supply Outlook Report

## February 1, 2016



Photo - 1/20/2016 Snow Surveyor Logan Jensen stands on the debris pile next to the toppled Hole-in-Mountain SNOTEL shelter

### **Hole-in-Mountain SNOTEL wiped out by avalanche!**

Across Nevada the first half of winter is off to an incredible start. Statewide February 1 snowpack percentages are some of the highest in the West. To date the biggest series of storms this winter occurred between mid-December and Christmas. The snowpack more than doubled its water content during that period in the mountains near Elko. The new snow load proved too much for the slope above Hole-in-Mountain SNOTEL. At 7:00am on December 23, 2015 the site sent out a report indicating 28 inches of new snow in the last 72 hours. The 8:00am reading never arrived because an avalanche descended over 3,000 vertical feet, crossed one-third of a mile of flat ground, and leveled the weather station. The site's 12 foot tall shelter was swept 200 feet away. A similar incident occurred in February 1986 which resulted in moving the SNOTEL site further away from the mountain. For 30 years that move was far enough. This summer we'll try again and are working on permitting to re-install the site outside the debris zone of this avalanche. For the rest of this winter snow surveyors will make monthly visits to the site to manually measure the snow to provide water users in Clover Valley as much information as possible about this summer's water supply.

## Background information about this report:

This report provides an analysis of water supply conditions across Nevada and a part of the eastern Sierra in California. It is published monthly from January to May. First of month data are summarized and used to forecast summer streamflow at various points. The report is best read in digital format which allows readers to click on the blue internet links. Email [jeff.anderson@nv.usda.gov](mailto:jeff.anderson@nv.usda.gov) to join a digital subscription list.

**Streamflow Forecasts:** Most of the annual streamflow in the western United States originates as snowfall that accumulates in the mountains during the winter. As the snowpack accumulates, hydrologists can estimate the runoff that will occur when the snow melts. Measurements of [snow water equivalent \(SWE\)](#) at snow courses and SNOTEL sites, along with precipitation, antecedent streamflow, and El Niño / Southern Oscillation indices are used in computerized statistical models to produce streamflow runoff forecasts. **Forecasts in this report give the total volume of water expected to flow past a location during a specified period, such as March 1 to July 31.**

Forecasts of any kind 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. 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. **Unless otherwise stated the 50% exceedance forecast is the one referred to in the text of this report.** To quantify the range around this 50% value, four other forecasts are provided in the forecast tables, two smaller values (90% and 70% exceedances) and two larger values (30% and 10% exceedances). There is a 90% chance that the actual flow will be more than the minimum forecast (90% exceedance forecast). Likewise there is a 10% chance the actual flow will be more than the maximum forecast (10% exceedance forecast). Other forecasts can be interpreted similarly. The wider the spread between these values, the more forecast uncertainty.

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. Water 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 perhaps due to a dry climate outlook for the coming months, 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 if there is a 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, they should be prepared to deal with either more or less water.

Most **streamflow forecast volumes** in this report are expressed in KAF (thousand-acre-feet). Some smaller streams are forecast in acre-feet and noted as such in parentheses after the forecast name, such as “Marlette Lake Inflow (acre-feet)”. Forecasts for Lake Tahoe, Pyramid Lake and Walker Lake are expressed in feet of water surface elevation change during the forecast period. A rise in lake level is indicated by a positive value, while a drop in lake level is indicated by a negative number. The East Fork Carson River has two recession forecasts that provide the dates when spring river flows are expected to recede to 500 cfs and 200 cfs levels as the snowmelt decreases in late spring.

**Streamflow Adjustments:** Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream lakes, reservoirs and diversions. Certain forecasts are adjusted for these structures; these are footnoted with a (2) in the report. A summary of adjustments in this report follows:

**Marlette Lake Inflow (2)** = Marlette Lake Inflow, observed + Marlette Lake storage change

**Little Truckee River above Boca Reservoir (2)** = Little Truckee R above Boca Reservoir, observed + Sierra Valley Diversion + Independence Lake storage change + Stampede Reservoir storage change

**Truckee River at Farad (2)** (externally adjusted by US Water Master) = Truckee River at Farad, obs – Lake Tahoe outflow + Sierra Valley Diversion + Donner Lake storage change + Martis Lake storage change + Prosser Reservoir storage change + Independence Lake storage change + Stampede Reservoir storage change + Boca Reservoir storage change

**East Walker River near Bridgeport (2)** = East Walker River near Bridgeport, observed + Bridgeport Reservoir storage change

**Owyhee River near Gold Creek (2)** = Owyhee River near Gold Creek + Wildhorse Reservoir storage change

**Lake Powell Inflow (2)** (externally adjusted by Bureau of Reclamation)

**“Normal” (Averages and Medians):** Throughout this report conditions are expressed as a “percent of normal”. In this context “normal” is meant to be a catch-all word that refers to the statistical **average** for the 1981-2010 period when related to streamflow, precipitation and reservoir storage, and the statistical **median** for the 1981-2010 period when related to snowpack. For an explanation of why snowpack uses median visit: [www.wcc.nrcs.usda.gov/normals/median\\_average.htm](http://www.wcc.nrcs.usda.gov/normals/median_average.htm). Soil moisture has only been measured at SNOTEL sites since ~2006. Due to the short record the soil moisture normal is based on the short-term average for water years 2006-2015.

**Maximums and Minimums:** Graphs in this report display “Max” and “Min” lines for snowpack, precipitation and soil moisture. For snow and precipitation these are basin-wide, daily maximums and minimums for water years 1981-2015; for soil moisture the period is 2006-2015.

**Watershed Snowpack Analysis:** These tables summarize the snowpack percent of median for each main basin, and its sub-basins. Percentages are based on SNOTEL and snow course measurements. By selecting “Nevada” and report type “Snow” a full report with station-by-station data can be found here: <http://www.wcc.nrcs.usda.gov/basin.html>.

# ***Nevada Water Supply Outlook Report***

## ***February 1, 2016***

### **SUMMARY**

Allow me to compare this winter to the upcoming Super Bowl. Our team has a comfortable halftime lead and last weekend's storm was like Hank Williams Jr. singing "All my rowdy friends..." during the halftime show. Basin snowpacks across the region are 114-158% of median (that's the lead), an increase of 5-10% over the weekend (halftime show). SNOTEL precipitation totals between Friday and Monday morning averaged nearly 2 inches of water, with the largest amounts along Lake Tahoe's western crest totaling 5 to nearly 8 inches! The storm came in warm and wet boosting river flows and bumping up reservoir storage before finishing off cold, leaving 2-3 feet of first class powder. A perfect half for our water supply and for snow dogs! The game isn't finished and there is still most of the second half to play. 2013 started off similarly, but stalled mid-season. By April let's hope for a different outcome, one where El Niño gets the MVP and Nevada's water supply brings home the trophy.

### **SNOWPACK**

The snowpack continues to be well above normal statewide. Current percentages range from 114-135% of median for the eastern Sierra basins and Upper Humboldt to over 150% for the rest of Northern Nevada. A large number of SNOTEL stations across the state are approaching or have already exceeded their normal [peak amounts](#); this comes one to two months ahead of schedule. Leading the pack in this respect is Green Mountain SNOTEL in the Ruby Mountains, which already has 17.5 inches of snow water and is 122% of its normal March 15<sup>th</sup> peak amount of 11.5 inches. While no sites are setting February 1 snow records, certain SNOTELs in the Santa Rosa, Independence, Jarbidge, Diamond and Ruby mountain ranges have snow water contents that [rank in the top five](#) since SNOTEL records begin around 1980. Snow levels have remained low for many storms this winter. All SNOTELs and snow courses measured this month recorded snow, which is a welcome change from the last couple years when many had bare ground.

### **PRECIPITATION**

Nevada experienced excellent precipitation in January. Statewide SNOTEL precipitation amounts totaled 136% of average compared to only 16% of average last January. The state hasn't had this much precipitation in January since 2008. With 2.11 inches, Ely had one of its wettest January's on record; coming close to its record of 2.5 inches way back in 1907. This water year we've been blessed with above average precipitation each month with statewide percentages of 119% in October, 111% in November, and 136% in December. As of February 1 water year precipitation ranges from 119% of average in the Truckee Basin to 172% for Eastern Nevada. Most Nevada SNOTEL stations east of the Sierra have water year precipitation amounts that [rank in the top five](#) since SNOTEL data begin around 1980. Looking ahead mid-range weather forecasts call for a break in storms until around Valentine's Day, but the long term climate outlook continues to show good chances of wet weather from February through April fueled by El Niño. Based on long term climatology December, January and February are the biggest precipitation months of the year. So far two of the three have been well above average, hopefully the second half of February will bring enough to keep that streak alive.

## SOIL MOISTURE

Soil moisture at lower elevations got a boost from rain at the end of January. Soil moisture continues to be above average in all basins. Decent snow exists at much lower elevations than has been observed in recent years. This should help preserve soil moisture and provide efficient runoff if more rain occurs.

## RESERVOIRS

Reservoirs started to rebound in January, but there is still a lot of room to fill. Reservoirs along the Truckee and Walker rivers average about 22% of capacity, Lahontan Reservoir is 8% of capacity, and Rye Patch is 5% of capacity. Most saw a sizeable rise in inflows from the January 29-30th storm which came in warm and wet before snow levels dropped to the valley bottoms. During the month of January Lahontan Reservoir added 12,000 acre-feet of water, while summed together Stampede, Boca, Donner and Independence added 7,900 acre-feet. Along the Walker River, Bridgeport Reservoir and Topaz Lake combined to collect 7,000 acre-feet. The Humboldt River near Imlay remained dry so Rye Patch Reservoir just downstream had only a minimal increase of 200 acre-feet from local runoff. Unfortunately Rye Patch Reservoir was in the news this month for a [fish die off](#) due to stagnant water. Lake Tahoe rose 0.45 feet in January adding 55,000 acre-feet in January, but the lake remains below its natural rim and needs another foot of water to reach the point where outflow can occur. Lake rise forecasts predict Tahoe could reach about 10 inches above its rim this summer. With some luck college kids will be playing bumper boats between Tahoe City and River Ranch this summer and the Reno whitewater park will impress kayak competitors when it hosts the [National Freestyle Championships](#) in May.

## STREAMFLOW FORECASTS

Streamflow forecasts are very similar to last month. The majority are 90-125% of average for the March – July period. The highest forecasts continue to be for Salmon Falls Creek (153%) and the Owyhee River near Gold Creek (186%). Forecast skill in February is better than in January but a wide range of outcomes is still possible based on the spread between the 10% and 90% exceedences. By March and April this spread will tighten as more of the future becomes known.

## UPCOMING EVENTS

### ***Northern Nevada Streamflow, Weather and Reservoir Forecast Meeting***

The public is invited to attend presentations by the NRCS, NWS, and USBOR regarding the 2016 streamflow, precipitation and reservoir forecasts for the Truckee, Carson, Walker, and Humboldt rivers.

When: Wednesday, March 23, 2016 2:00-4:00 PM, No RSVP necessary.

Where: Nevada Division of Water Resources; 901 S. Stewart Street Suite 2002, Carson City, NV

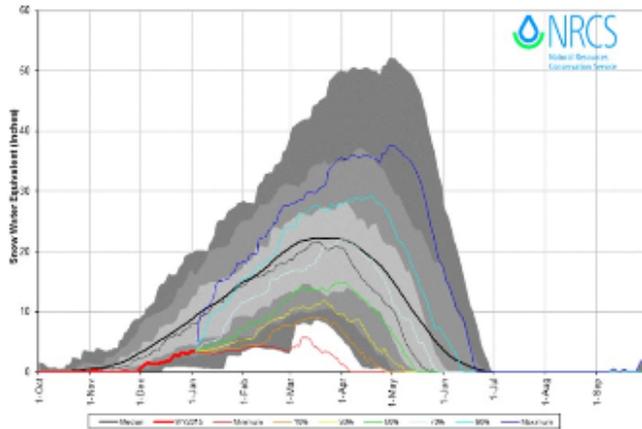
***Snow Survey book event has moved to UNR:*** Pat Armstrong will be discussing his book “The Log of a Snow Survey – Skiing and Working in a Mountain Winter World” with a UNR hydrology class on March 8<sup>th</sup> at 4pm. Public is invited, but space is limited. Please RSVP to [jeff.anderson@nv.usda.gov](mailto:jeff.anderson@nv.usda.gov) for details. Or listen to this [radio interview](#).

***Western Snow Conference***, April 18-21, 2016, Seattle, WA <http://www.westernsnowconference.org>

## SNOW SURVEY PRODUCT HIGHLIGHT

This section highlights products that are linked from the Nevada Snow Survey Program website. This month the [Basin Snowpack Graphs](#) are the focus. Of particular interest may be the snowpack comparison graphs which demonstrate how this winter compares to the last three and in comparison to the median peak. Scroll through the basins, and you'll see most have the best snowpack in the past four seasons and many are already at or near their peak amounts (top of red line).

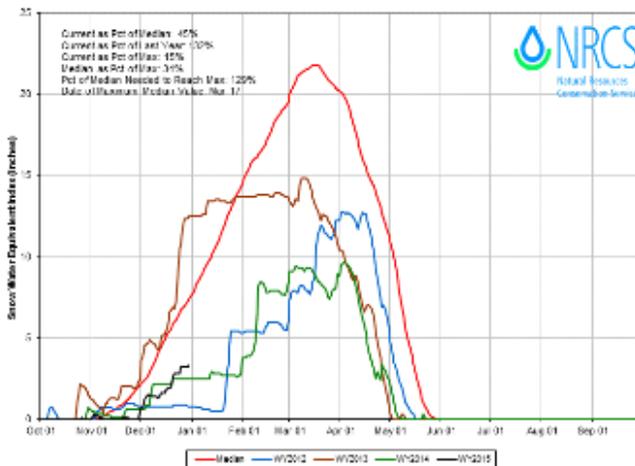
### Basin Snowpack Graphs - 2016



**Snowpack Projection Graphs** - Displays daily time series plot of basin snowpack with non-exceedence projection for future. For further explanation of these graphs: [click here](#)

Select a basin

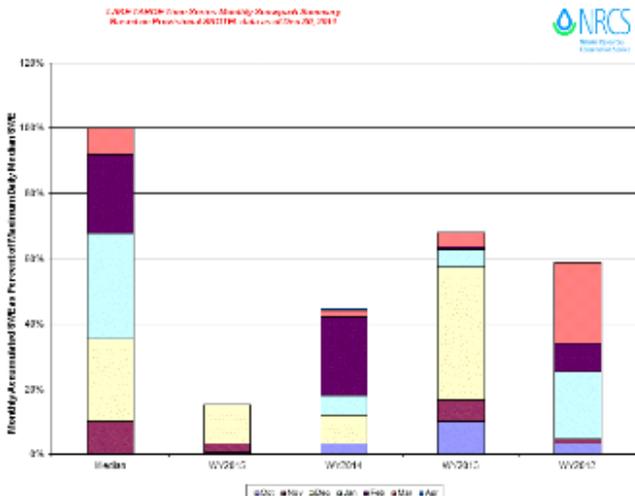
LAMP TAYOR Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Dec 31, 2014



**Snowpack Comparison Graphs (Last 4 Years)** - Daily time series plot of basin snowpack, current year compared with last three years.

Select a basin

LAMP TAYOR Snow Water Monthly Snowpack Summary  
Based on Provisional SNOTEL data as of Dec 31, 2014



**Monthly Snowpack Summary Graphs** - Displays monthly contribution to basin snowpack, current year compared with last three years.

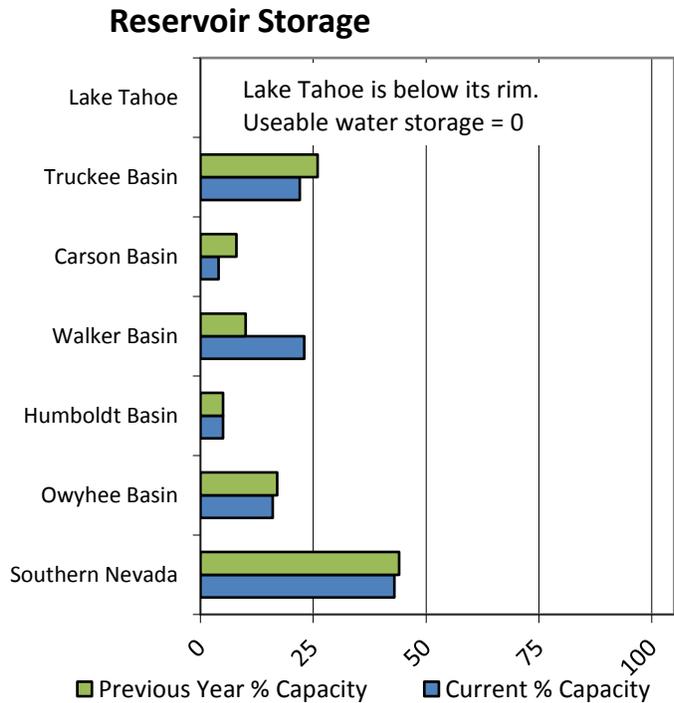
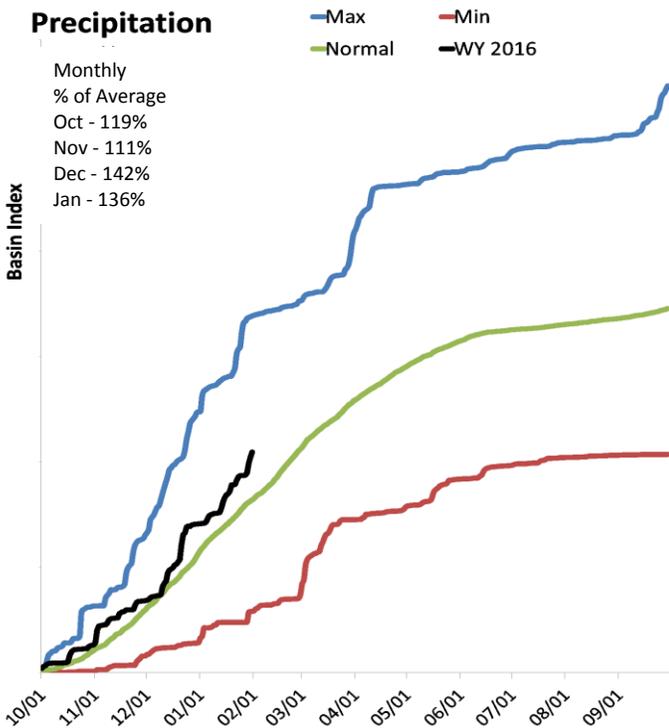
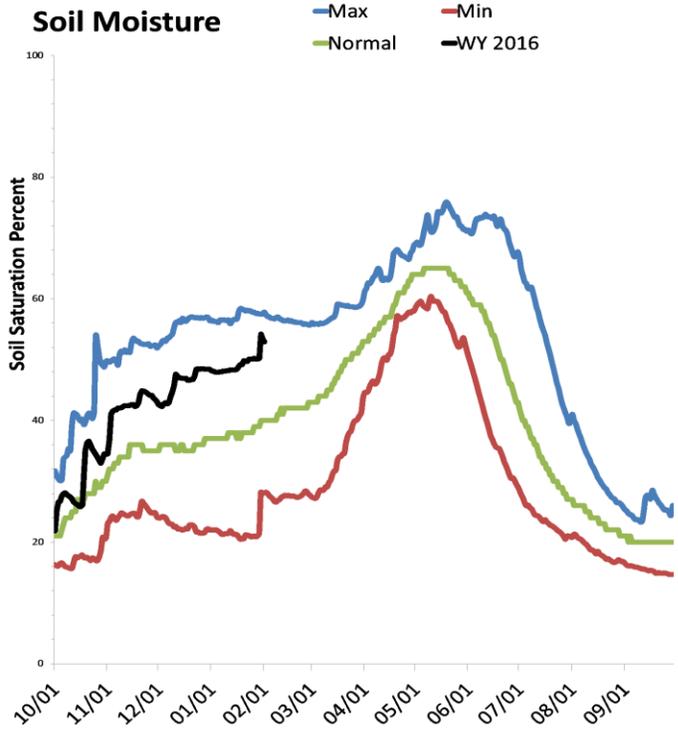
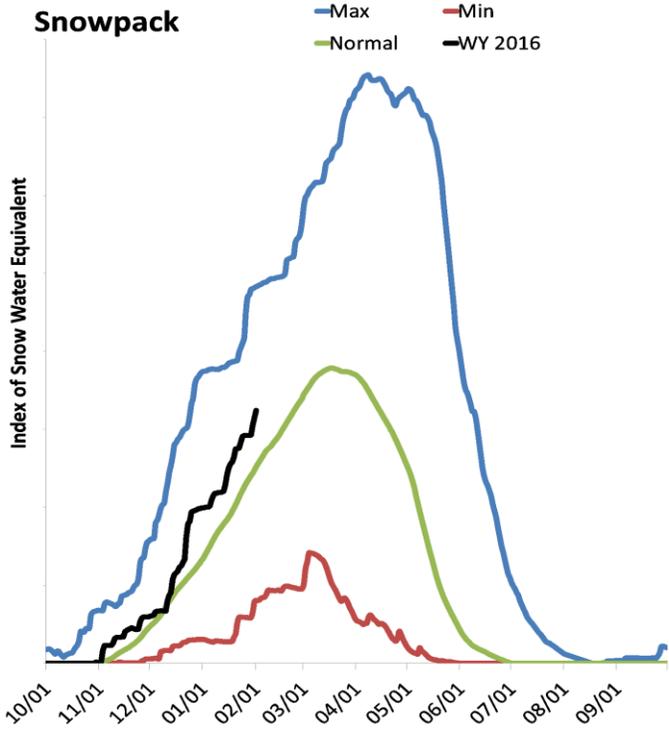
Select a basin

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# State of Nevada & Eastern Sierra

2/1/2016

The snowpack across Northern Nevada and the Eastern Sierra (Truckee, Tahoe, Carson and Walker basins) is much above normal at 133% of median, compared to 45% last year. Precipitation in January was much above average at 136%, which brings the seasonal accumulation (Oct-Jan) to 130% of average. Soil moisture is 53% compared to 45% last year. Reservoir storage ranges from 0% of useable capacity in Lake Tahoe to 43% of capacity in Southern Nevada.

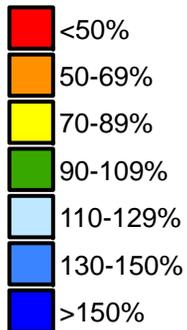


# Nevada & Eastern Sierra

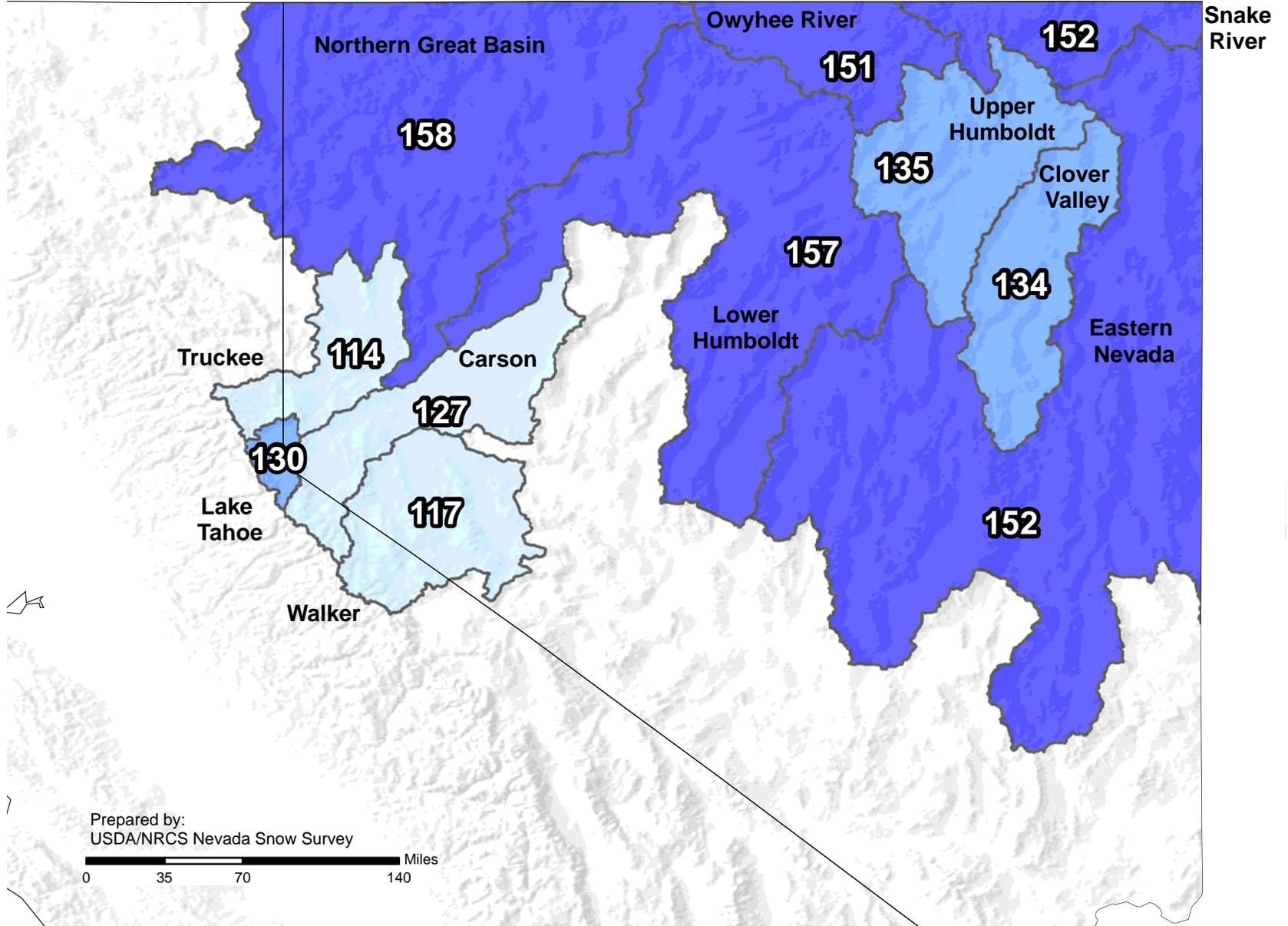
## Percent of Median Snowpack

### February 1, 2016

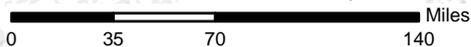
1st of Month Snow  
Water Equivalent  
Basin-wide Percent  
of 1981-2010 Median



*Provisional data  
subject to revision*



Prepared by:  
USDA/NRCS Nevada Snow Survey

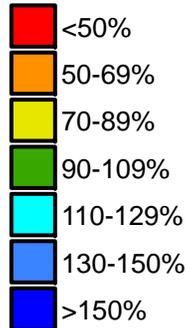


Map data based on the first of month snow water equivalent found at selected SNOTEL and snow course sites in or near the basin compared to the median value for those sites. SNOTEL data based on the first reading of the day (typically midnight). Snow course data based on measurements taken within the last 5 days of preceding month. A table based, station-by-station, report of the underlying data can be found by selecting "Nevada" and report type "Snowpack" for the date listed above on the following webpage: <http://www.wcc.nrcs.usda.gov/basin.html>.

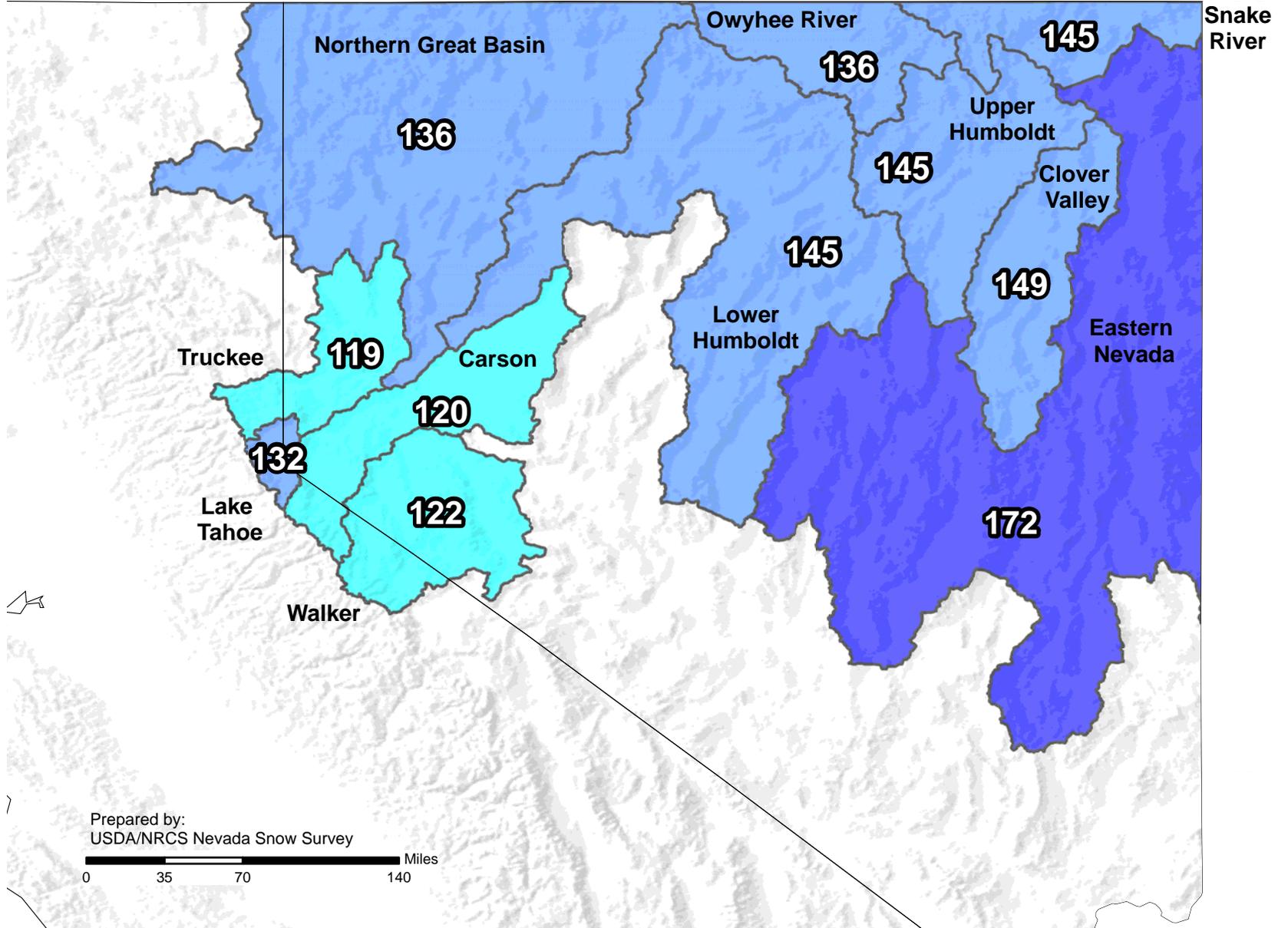


# Nevada & Eastern Sierra Water Year to Date Precipitation February 1, 2016

Basin-wide  
Water Year  
Precipitation to date  
as a Percent of  
the 1981-2010 Average



*Provisional data  
subject to revision*



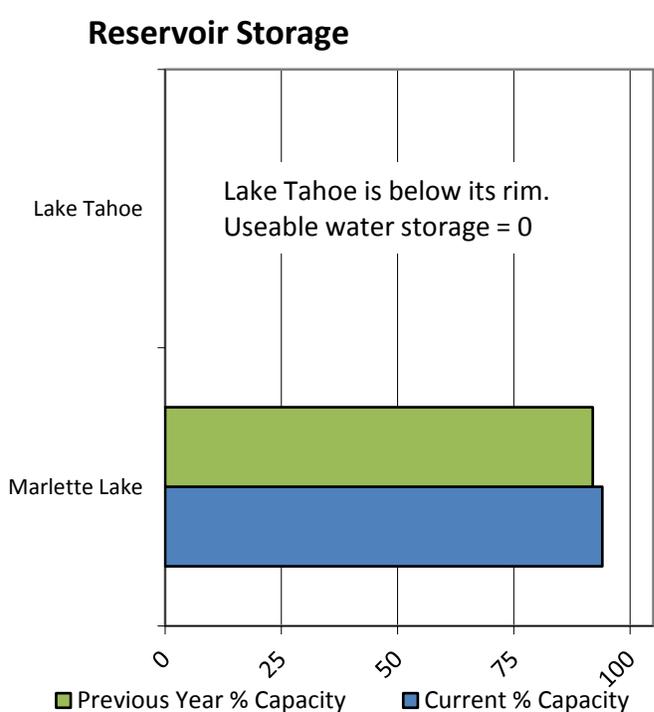
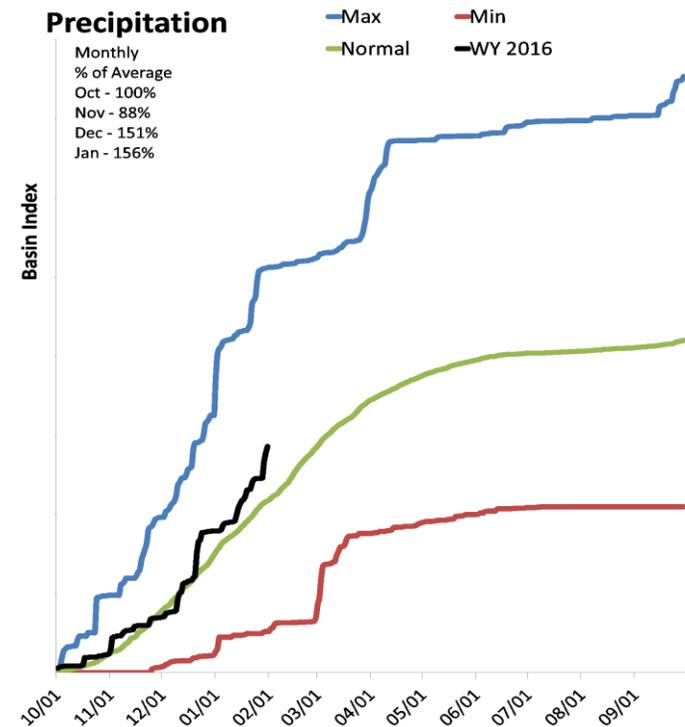
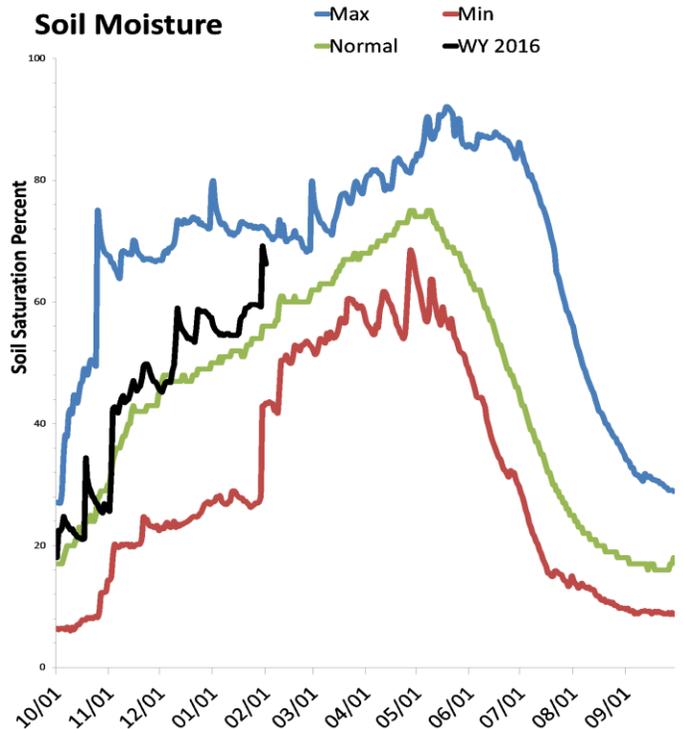
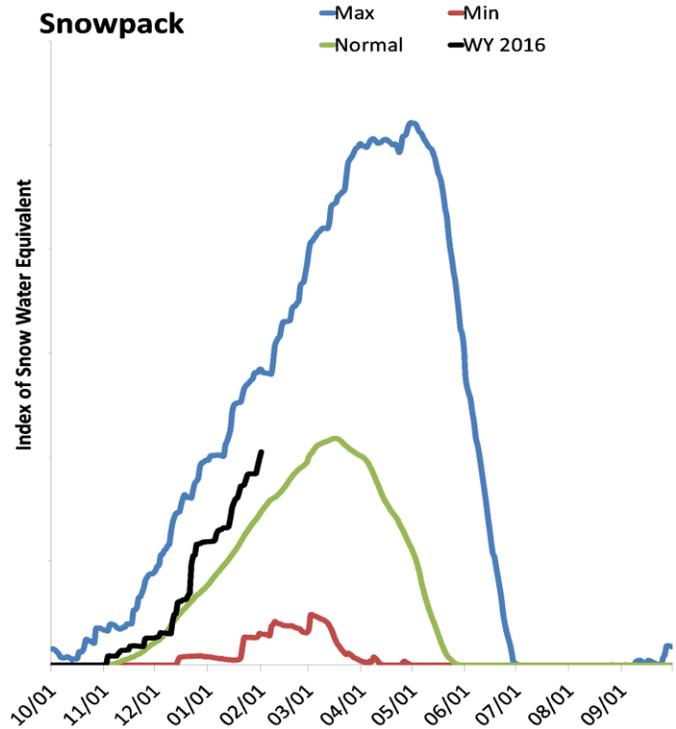
Map data based water year to date precipitation for the first of the month at selected SNOTEL sites in or near the basin compared to the average value for those sites. SNOTEL data based on the first reading of the day (typically midnight). A table based, station-by-station, report of the underlying data can be found by selecting "Nevada" and report type "Precipitation" for the date listed above on the following webpage: <http://www.wcc.nrcs.usda.gov/basin.html>.



# Lake Tahoe Basin

2/1/2016

Snowpack in the Lake Tahoe Basin is above normal at 130% of median, compared to 17% last year. Precipitation in January was much above average at 155%, which brings the seasonal accumulation (Oct-Jan) to 132% of average. Soil moisture is 67% compared to 55% last year. Lake Tahoe's water elevation is 6222.06 ft, which is 0.94 ft below the lake's natural rim and equals a storage deficit of approximately 114 thousand acre-feet. Last year the elevation was 6222.42 ft which equaled a storage deficit of approximately 70 thousand acre-feet. Lake Tahoe is forecast to rise 2.2 feet from October 1 to its highest elevation.



## Lake Tahoe Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Lake Tahoe Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Marlette Lake Inflow <sup>2</sup>	MAR-JUL	121	705	1100	91%	1500	2080	1213
	APR-JUL	64	460	800	88%	1140	1650	911
Lake Tahoe Rise Gates Closed <sup>1</sup>	OCT-HIGH	0.2	1.58	2.2	98%	2.8	4.2	2.24
	MAR-HIGH	0.563	1.345	1.7	98%	2.1	2.8	1.73
	APR-HIGH	0.5	0.9	1.3	99%	1.5	2.4	1.31

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

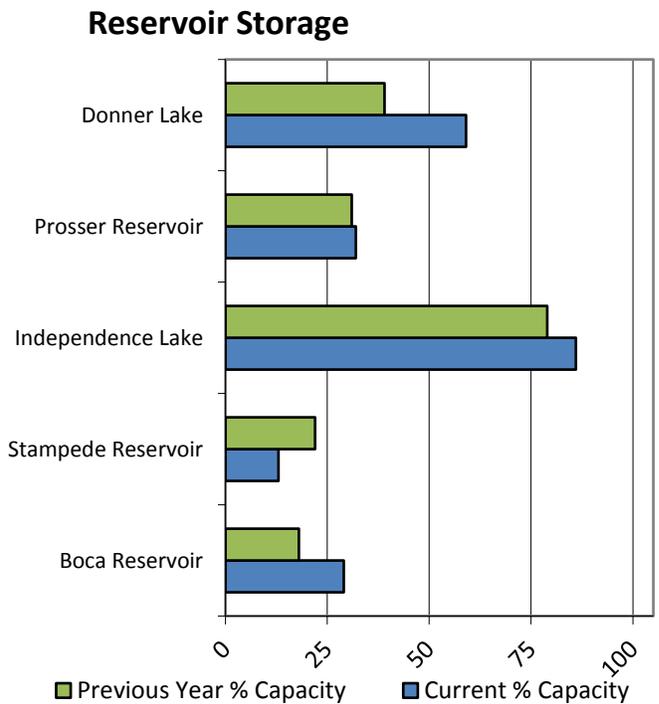
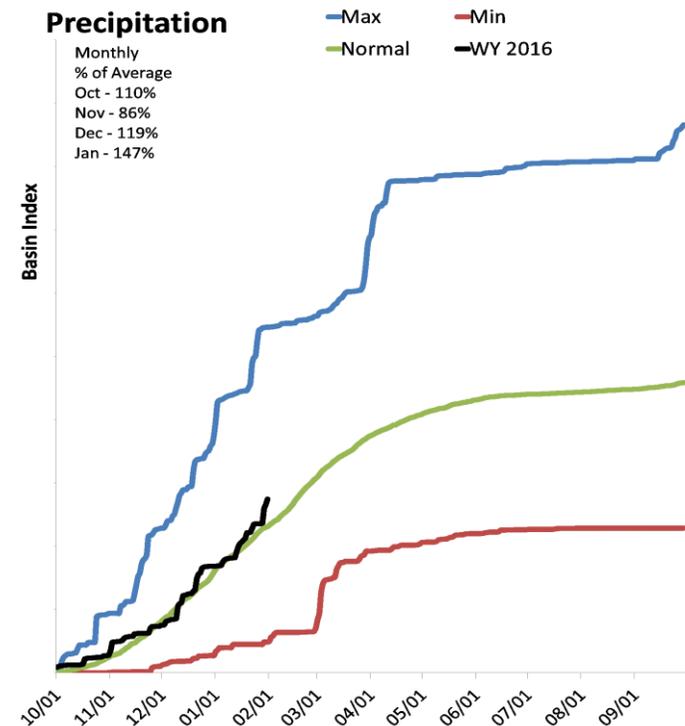
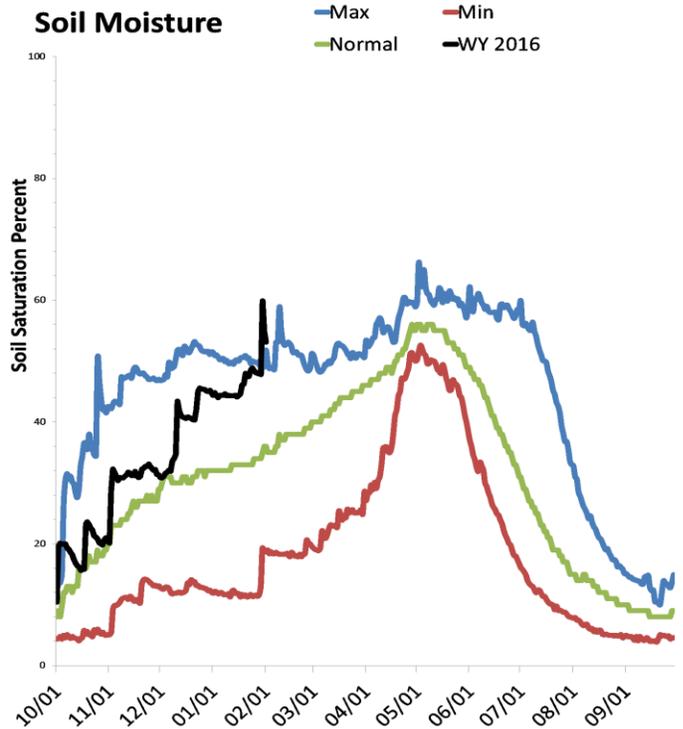
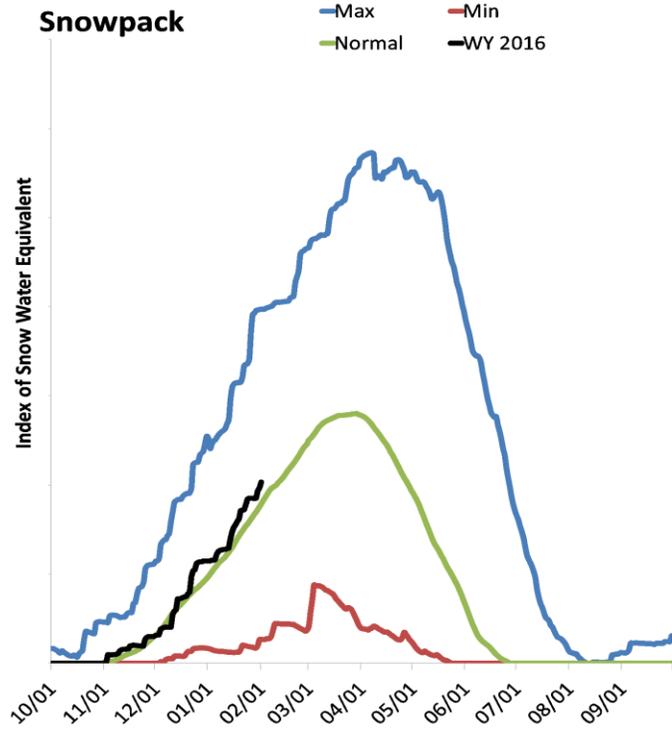
Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Tahoe	0.0	0.0	276.2	744.6
Marlette Lk nr Carson City, NV	11.1	10.8	11.8	11.8
Basin-wide Total	11.1	10.8	288.0	756.4
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Lake Tahoe Basin	14	130%	17%

# Truckee River Basin

2/1/2016

Snowpack in the Truckee River Basin is above normal at 114% of median, compared to 31% last year. Precipitation in January was much above average at 147%, which brings the seasonal accumulation (Oct-Jan) to 119% of average. Soil moisture is 54% compared to 45% last year. Combined reservoir storage is 22% of capacity, compared to 26% last year. Forecast streamflow volumes range from 88% to 106% of average.



## Truckee River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Truckee River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Sagehen Ck nr Truckee	MAR-JUL	3	4.4	5.6	88%	7.2	10.3	6.4
	APR-JUL	2.4	3.7	4.8	86%	6.3	9.4	5.6
L Truckee R ab Boca Reservoir <sup>2</sup>	MAR-JUL	53	84	105	106%	126	157	99
	APR-JUL	48	55	86	102%	104	133	84
Truckee R at Farad <sup>2</sup>	MAR-JUL	175	260	320	104%	380	465	307
	APR-JUL	160	205	260	102%	310	390	255
Galena Ck at Galena Ck State Pk	MAR-JUL	3	4.1	4.8	99%	5.5	6.6	4.85
	APR-JUL	2.6	3.7	4.4	101%	5.1	6.2	4.37
Steamboat Ck at Steamboat	MAR-JUL	1.36	4.1	7.3	92%	11.8	21	7.9
	APR-JUL	1.36	4.1	7.3	92%	11.8	21	7.9
Pyramid Lake Elevation Change <sup>1</sup>	MAR-JUL	-1.25	0.74	1.65	97%	2.6	4.6	1.7
	APR-JUL	-1.25	0.74	1.65	97%	2.6	4.6	1.7

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

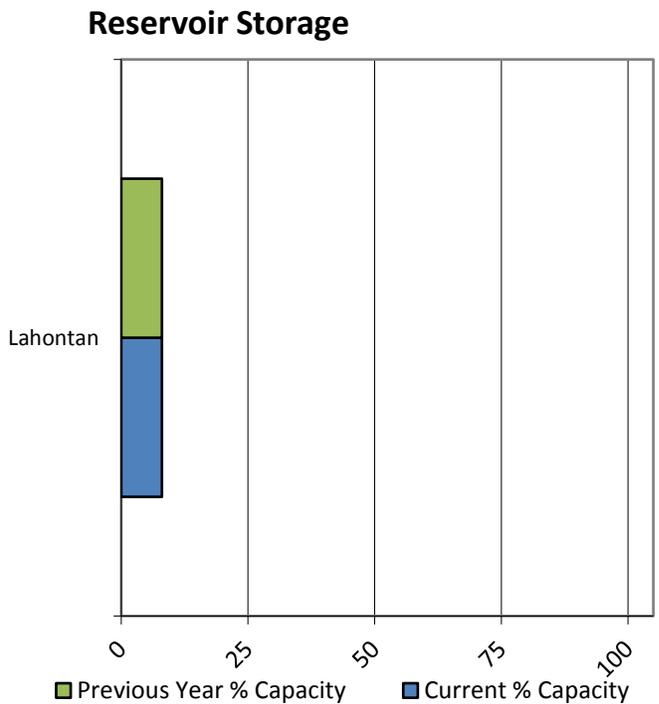
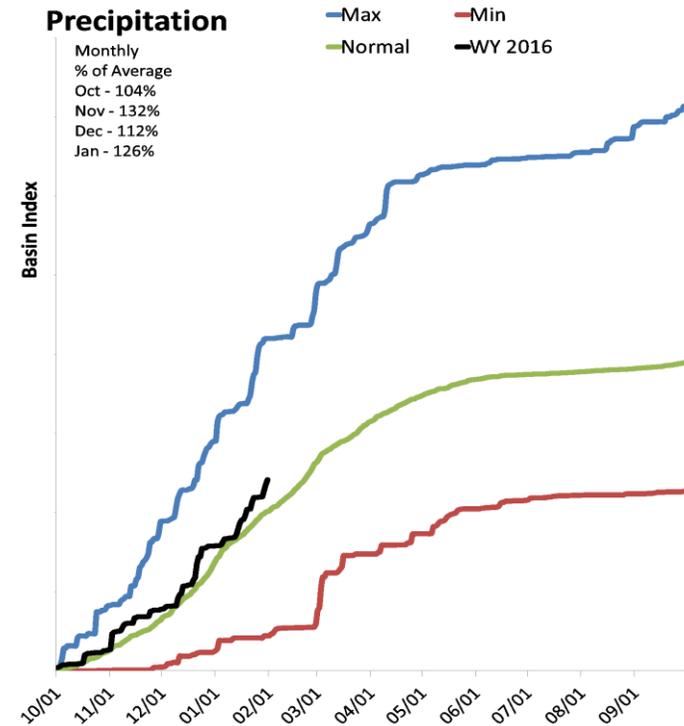
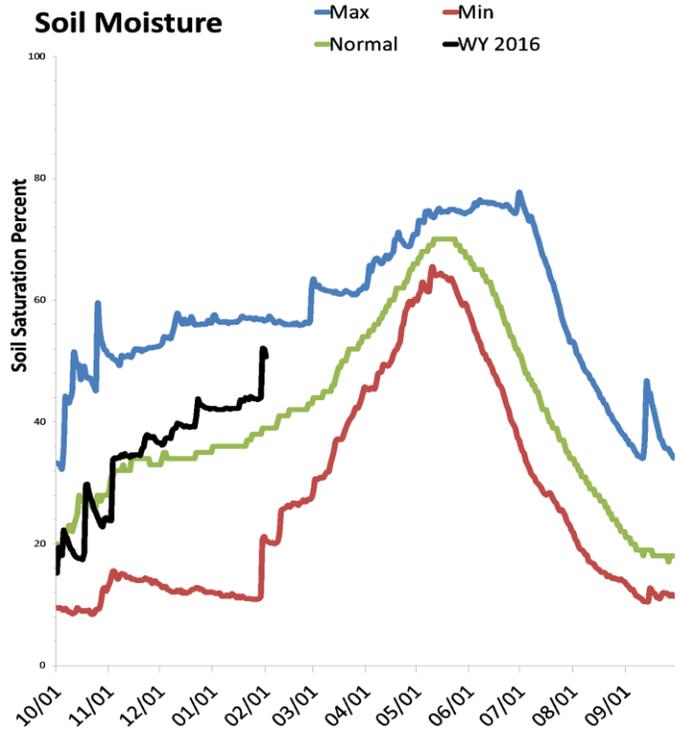
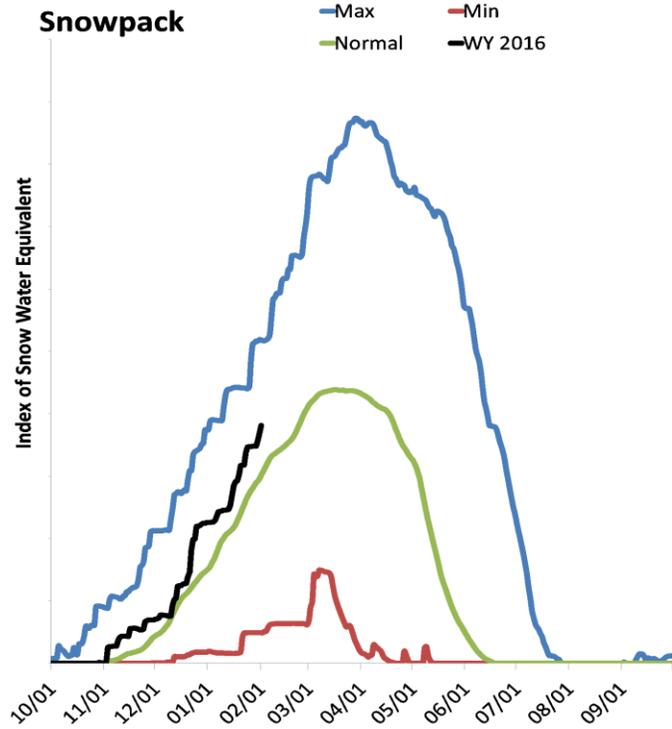
Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Boca Reservoir	11.9	7.2	15.1	40.9
Donner Lake	5.6	3.7	3.5	9.5
Independence Lake	14.8	13.6	13.4	17.3
Prosser Reservoir	9.1	9.0	9.5	28.6
Stampede Reservoir	29.4	50.9	144.6	226.5
Basin-wide Total	70.7	84.4	186.1	322.8
# of reservoirs	5	5	5	5

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Truckee River Basin	14	114%	31%
Little Truckee River	5	107%	31%
Sagehen & Independence Creeks	3	106%	28%
Galena Creek	1	124%	37%
Steamboat Creek	2	131%	32%
Truckee River above Pyramid Lake	28	121%	25%

# Carson River Basin

2/1/2016

Snowpack in the Carson River Basin is above normal at 127% of median, compared to 31% last year. Precipitation in January was above average at 126%, which brings the seasonal accumulation (Oct-Jan) to 120% of average. Soil moisture is 51% compared to 35% last year. Storage in Lahontan Reservoir is 8% of capacity, compared to 8% last year. Forecast streamflow volumes range from 102% to 118% of average.



## Carson River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Carson River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
EF Carson R nr Gardnerville	MAR-JUL	84	159	210	102%	260	335	205
	APR-JUL	67	134	180	97%	225	295	186
	200 cfs	14 Jun	07 Jul	23 Jul		08 Aug	31 Aug	01 Jul
	500 cfs	29 May	17 Jun	30 Jun		13 Jul	01 Aug	25 Jun
WF Carson R nr Woodfords	MAR-JUL	31	51	64	108%	77	97	59
	APR-JUL	32	47	58	107%	69	84	54
Carson R nr Carson City	MAR-JUL	49	151	220	105%	290	390	210
	APR-JUL	52	131	185	103%	240	320	179
King Canyon Ck nr Carson City	MAR-JUL	0.04	0.23	0.45	118%	0.67	1	0.38
	APR-JUL	0.05	0.25	0.44	116%	0.63	0.92	0.38
Ash Canyon Ck nr Carson City	MAR-JUL	0.76	1.23	1.55	110%	1.87	2.3	1.41
	APR-JUL	0.57	0.97	1.25	112%	1.53	1.93	1.12
Carson R at Ft Churchill	MAR-JUL	100	157	205	103%	260	365	200
	APR-JUL	80	115	165	96%	225	270	171

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

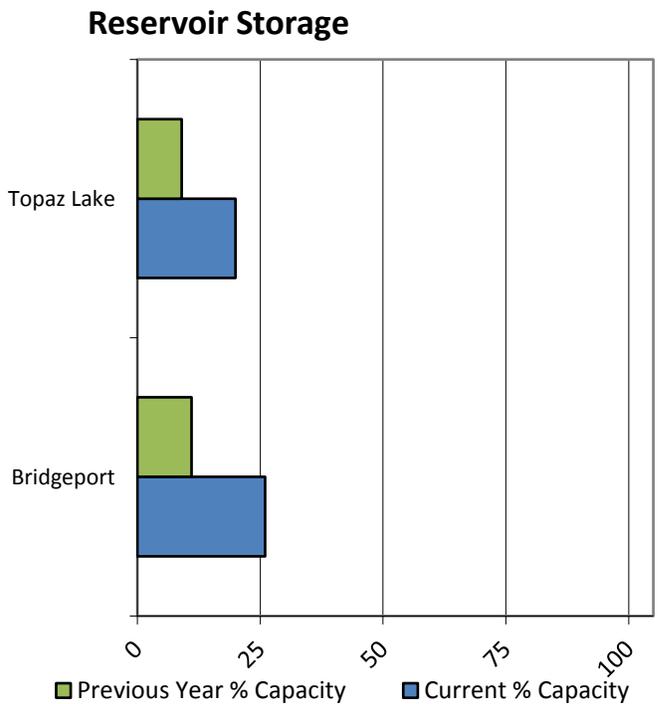
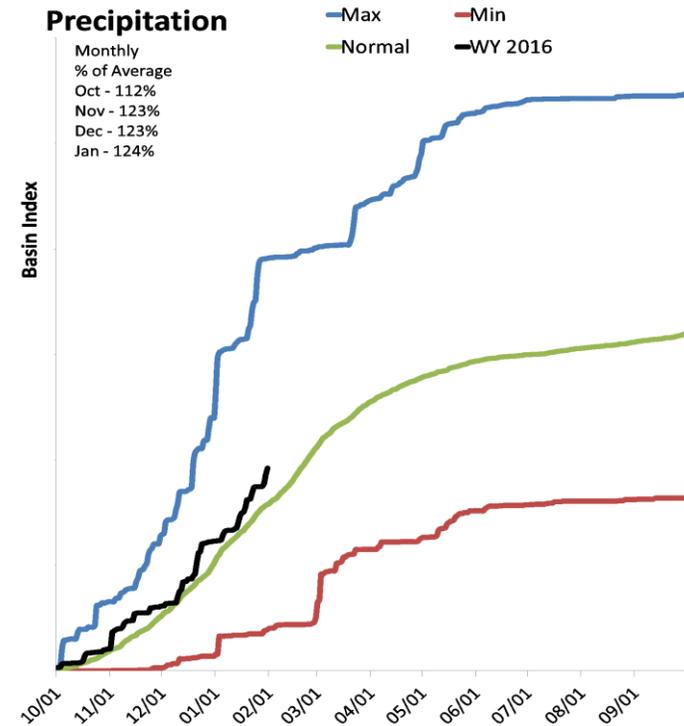
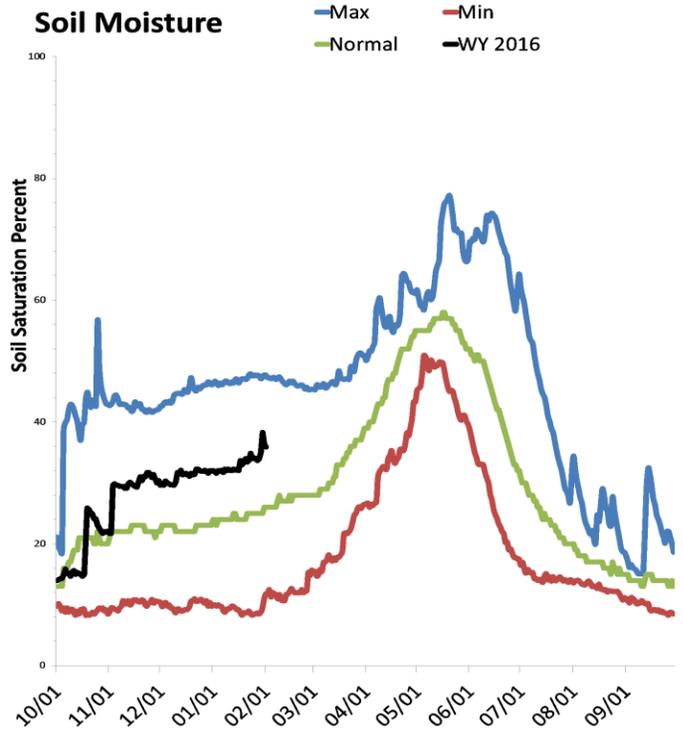
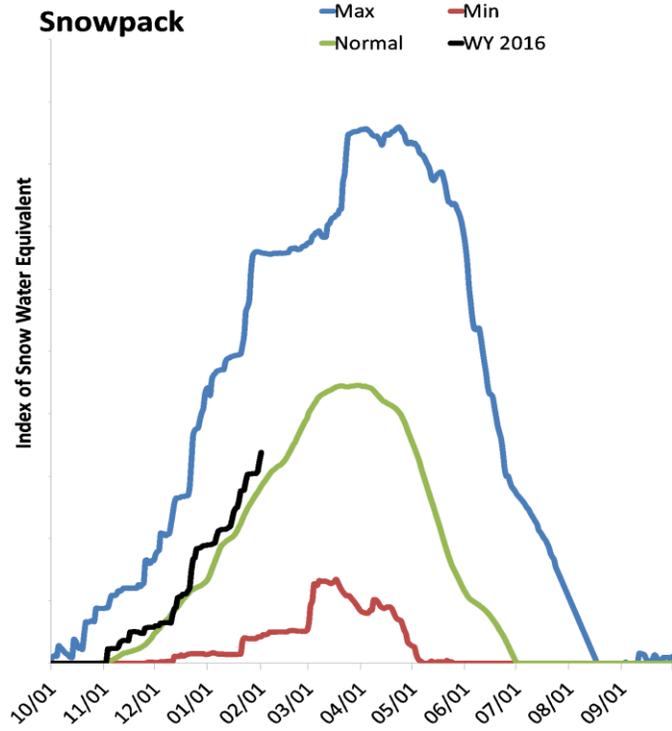
Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lahontan Reservoir, NV	24.4	23.5	146.9	295.1
Basin-wide Total	24.4	23.5	146.9	295.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Carson River Basin	11	127%	31%
East Fork Carson River	6	131%	32%
West Fork Carson River	8	128%	29%

# Walker River Basin

2/1/2016

Snowpack in the Walker River Basin is above normal at 117% of median, compared to 31% last year. Precipitation in January was above average at 124%, which brings the seasonal accumulation (Oct-Jan) to 122% of average. Soil moisture is 36% compared to 20% last year. Combined reservoir storage is 23% of capacity, compared to 10% last year. Forecast streamflow volumes range from 112% to 113% of average.



## Walker River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Walker River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
E Walker R nr Bridgeport <sup>2</sup>	MAR-AUG	33	65	86	113%	107	139	76
	APR-AUG	29	56	74	110%	92	119	67
W Walker R bl L Walker nr Coleville	MAR-JUL	106	156	190	112%	225	275	170
	APR-JUL	93	144	178	110%	210	265	162
W Walker R nr Coleville	APR-JUL	172	177	180	110%	183	188	163
	LOW-HIGH	-1.51	0.17	1.4	99%	2.6	3.9	1.41

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

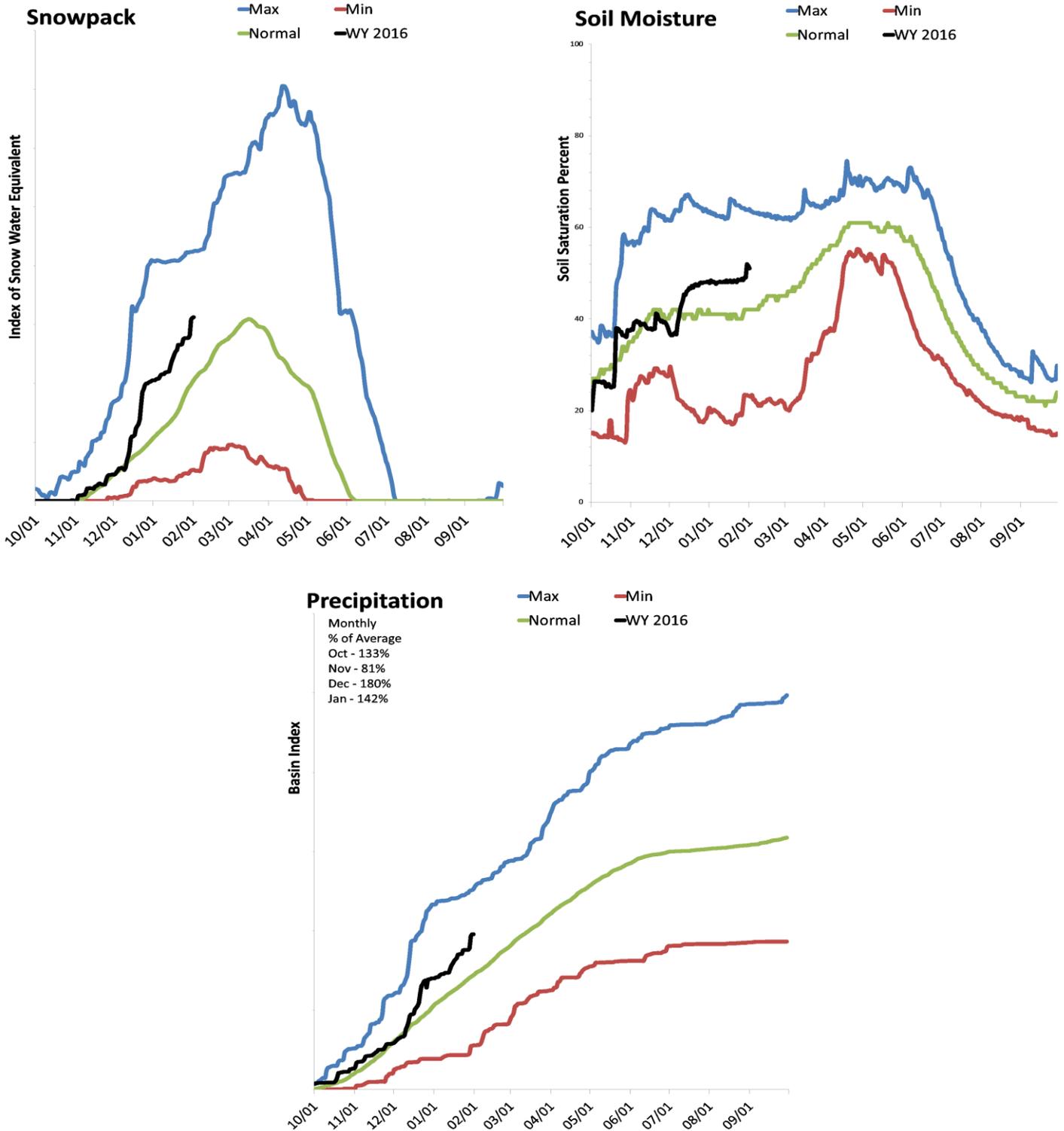
Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bridgeport Reservoir	11.0	4.7	20.8	42.5
Topaz Lk nr Topaz, CA	12.2	5.6	23.6	59.4
Basin-wide Total	23.1	10.3	44.4	101.9
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Walker River Basin	10	117%	31%
East Walker River above Bridgeport	4	126%	23%
West Walker River above Coleville	6	116%	34%

# Northern Great Basin

2/1/2016

Snowpack in the Northern Great Basin is much above normal at 158% of median, compared to 44% last year. Precipitation in January was much above average at 139%, which brings the seasonal accumulation (Oct-Jan) to 136% of average. Soil moisture is 55% compared to 54% last year. Forecast streamflow volumes range from 84% to 100% of average.



## Northern Great Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Northern Great Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Davis Ck	APR-JUL	2800	4500	6100	84%	8300	13100	7233
	APR-SEP	3400	5100	6900	86%	9200	14000	7991
Bidwell Ck nr Fort Bidwell	APR-JUL	8	10.2	11.8	98%	13.4	15.6	12
	APR-JUL	0.53	2.7	4.2	98%	5.7	7.9	4.3
McDermitt Ck nr McDermitt	MAR-JUN	4.3	12.1	17.5	100%	23	31	17.5
	APR-JUL	3.4	9.3	13.4	96%	17.5	23	14

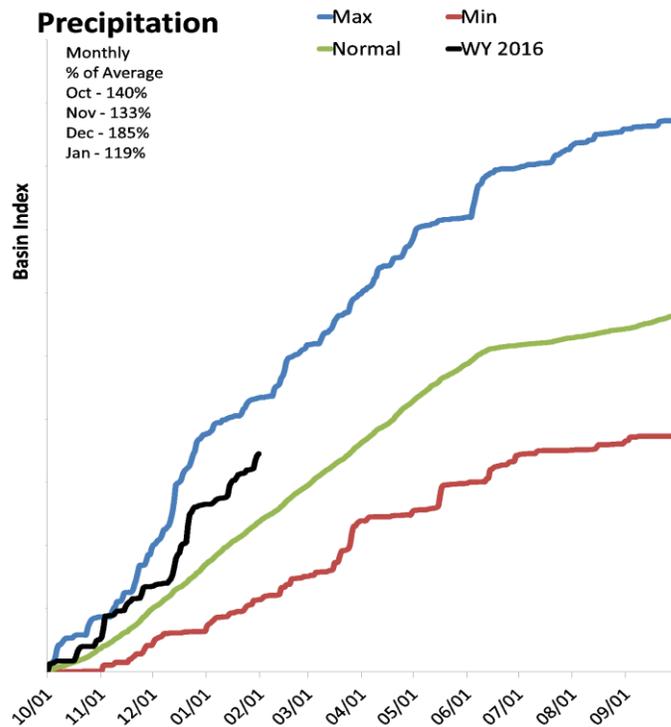
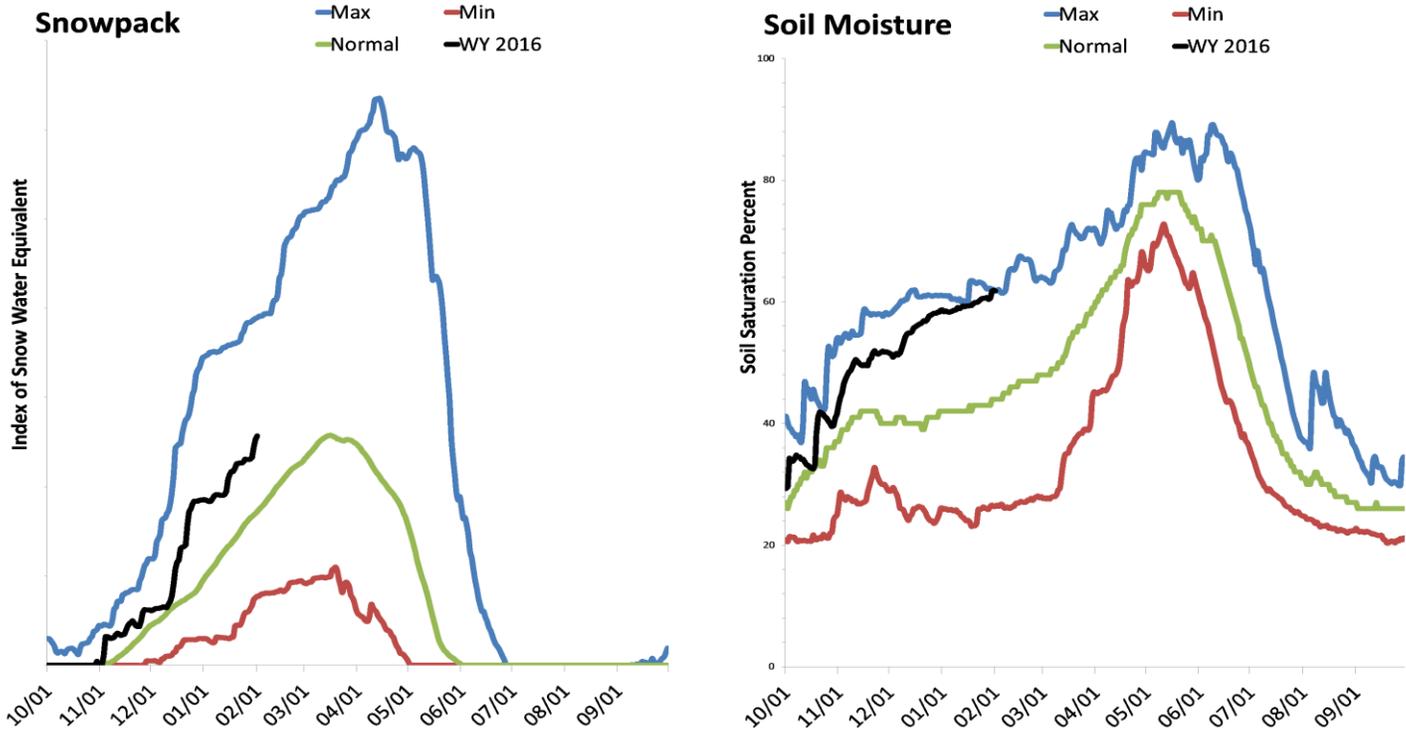
- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Northern Great Basin	16	158%	44%
Surprise Valley - Warner Mtns	3	162%	49%
McDermitt Creek	3	125%	48%
Quinn River	8	148%	37%

# Upper Humboldt River Basin

2/1/2016

Snowpack in the Upper Humboldt River Basin above Palisade is much above normal at 135% of median, compared to 75% last year. Precipitation in January was above average at 118%, which brings the seasonal accumulation (Oct-Jan) to 145% of average. Soil moisture is 61% compared to 57% last year. Forecast streamflow volumes range from 111% to 122% of average.



## Upper Humboldt River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Upper Humboldt River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Marys R nr Deeth	MAR-JUL	25	40	50	122%	60	75	41
	APR-JUL	18.6	33	43	119%	53	67	36
Lamoille Ck nr Lamoille	MAR-JUL	23	31	36	120%	41	49	30
	APR-JUL	22	30	35	121%	40	48	29
NF Humboldt R at Devils Gate	MAR-JUL	28	42	51	116%	60	74	44
	APR-JUL	12.8	28	38	112%	48	63	34
Humboldt R nr Elko	MAR-JUL	109	166	205	113%	244	301	182
	APR-JUL	89	143	180	117%	217	271	154
SF Humboldt R at Dixie	MAR-JUL	34	65	85	118%	105	136	72
	APR-JUL	30	59	79	120%	99	128	66
Humboldt R nr Carlin	MAR-JUL	205	265	310	113%	345	405	274
	APR-JUL	167	220	260	109%	300	355	238
Humboldt R at Palisade	MAR-JUL	199	260	300	111%	340	400	270
	APR-JUL	145	210	250	111%	290	355	225

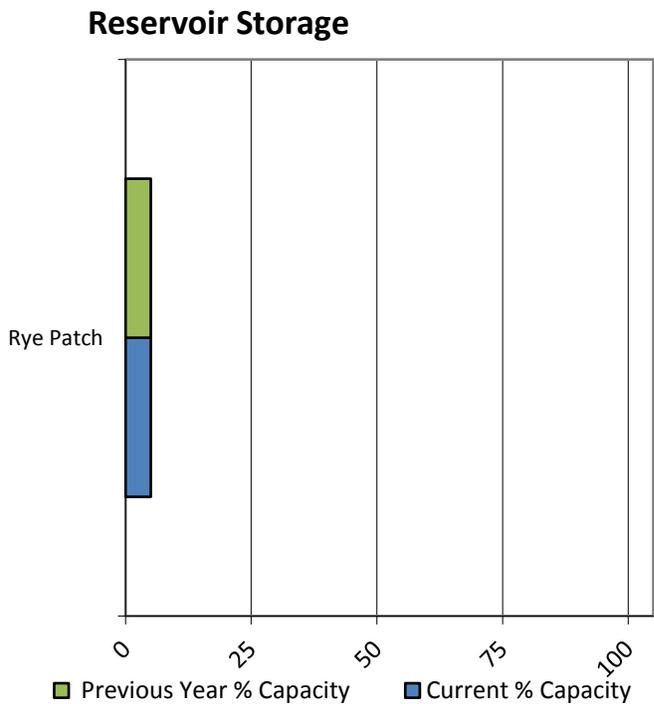
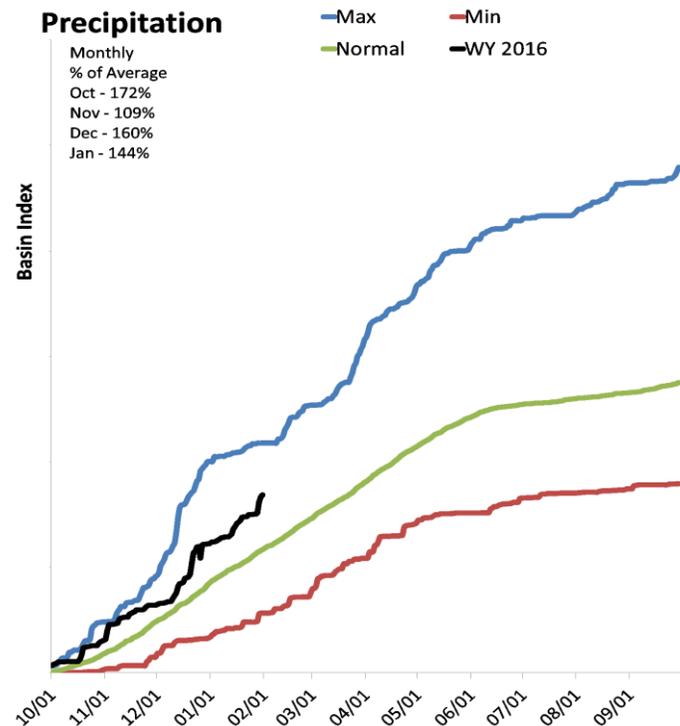
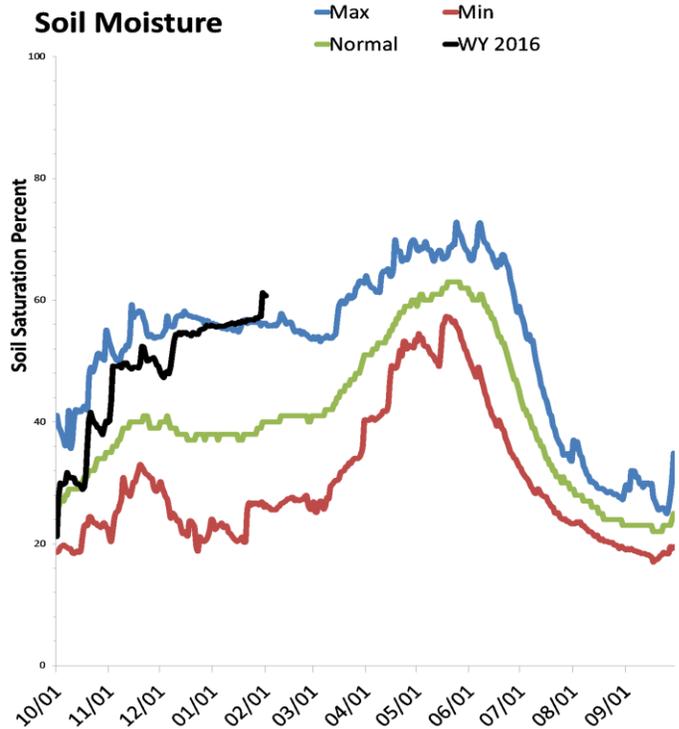
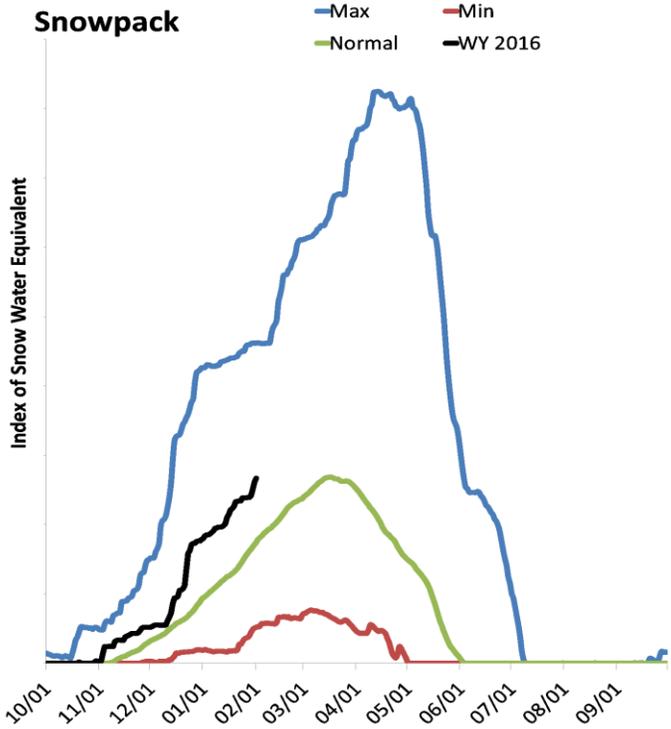
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Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Upper Humboldt River Basin	22	135%	75%
Mary's River	5	140%	98%
Lamoille Creek	3	130%	70%
North Fork Humboldt River	5	149%	61%
South Fork Humboldt River	4	142%	71%

# Lower Humboldt River Basin

2/1/2016

Snowpack in the Lower Humboldt River Basin below Palisade is much above normal at 157% of median, compared to 50% last year. Precipitation in January was much above average at 144%, which brings the seasonal accumulation (Oct-Jan) to 145% of average. Soil moisture is 59% compared to 53% last year. Storage in Rye Patch Reservoir is 5% of capacity, compared to 5% last year. Forecast streamflow volumes range from 90% to 119% of average.



## Lower Humboldt River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Lower Humboldt River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Rock Ck nr Battle Mtn	MAR-JUL	24	29	32	119%	35	40	27
	APR-JUL	16.3	19.1	21	115%	23	26	18.2
Humboldt R at Comus	MAR-JUL	140	215	265	104%	315	390	255
	APR-JUL	96	170	220	102%	270	345	215
L Humboldt R nr Paradise	MAR-JUL	2.7	8.3	12	114%	15.7	21	10.5
	APR-JUL	2.1	7.4	11	113%	14.6	19.9	9.7
Martin Ck nr Paradise	MAR-JUL	9.3	19.3	26	118%	33	43	22
	APR-JUL	5.1	14	20	114%	26	35	17.5
Humboldt R nr Imlay	MAR-JUL	62	144	200	90%	255	340	222
	APR-JUL	25	111	170	90%	230	315	188

- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
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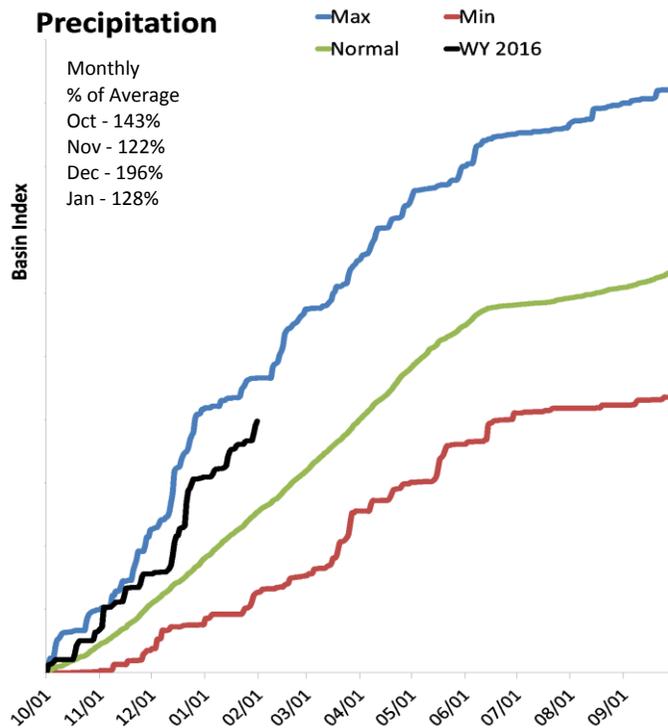
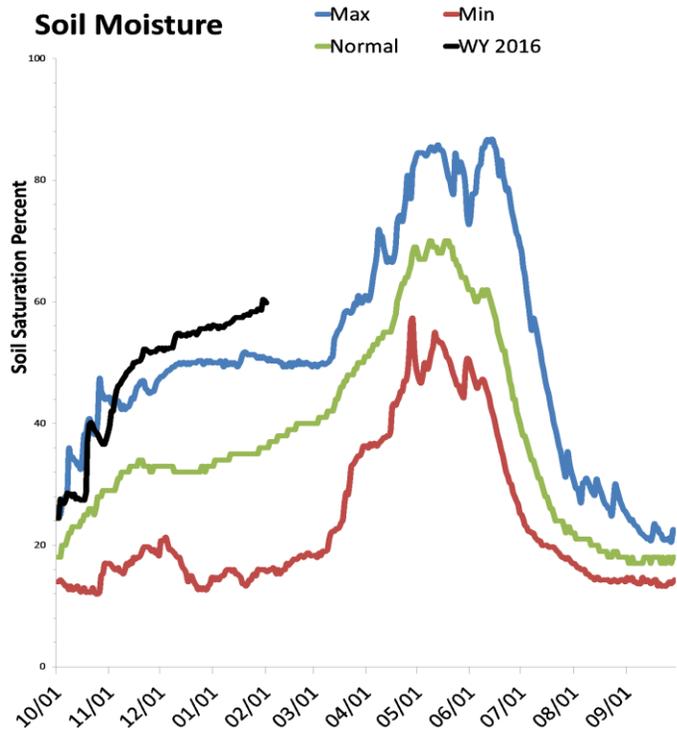
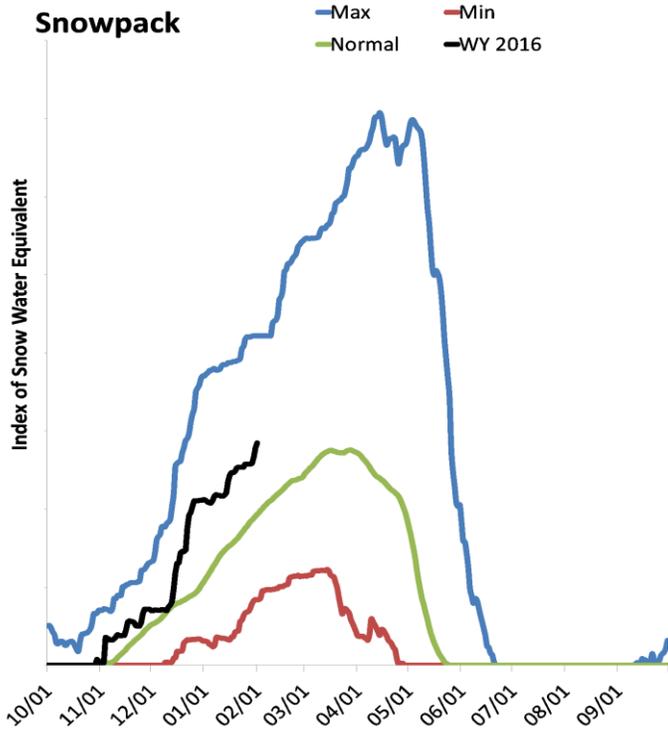
Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Rye Patch Re nr Rye Patch, NV	10.6	9.4	72.1	194.3
Basin-wide Total	10.6	9.4	72.1	194.3
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Lower Humboldt River Basin	7	157%	50%
Rock Creek	1	283%	0%
Reese River	2	164%	54%
Martin Creek	3	146%	38%
Little Humboldt River	5	154%	49%
Humboldt River above Imlay	29	140%	69%

# Clover Valley & Franklin River Basin

2/1/2016

Snowpack in the Clover Valley and Franklin River Basin is much above normal at 134% of median, compared to 81% last year. Precipitation in January was above average at 128%, which brings the seasonal accumulation (Oct-Jan) to 149% of average. Soil moisture is 60% compared to 45% last year. The forecast streamflow volume for the Franklin River is 103% of average.



## ATTENTION WATER USERS:

On December 23, 2015 Hole-in-Mountain SNOTEL was destroyed by an avalanche. That site's data has been removed from the graphs in this report. As such graphs in this report are based the remaining sites listed in the update report. Snow surveyors will continue to visit the Hole-in-Mountain location to make manual snow tube measurements to allow data editors to estimate first of month snow. First of month precipitation will be estimated using statistical relationships with nearby sites. These estimates are reflected in data presented in the paragraph above and the following page's snowpack analysis. Hole-in-Mountain SNOTEL will hopefully be relocated next summer to a safer location and new averages will be developed in the coming years.

## Clover Valley & Franklin River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Clover Valley & Franklin River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Franklin Ck nr Arthur	APR-JUL	4.8	6.2	7.1	103%	8	9.4	6.9

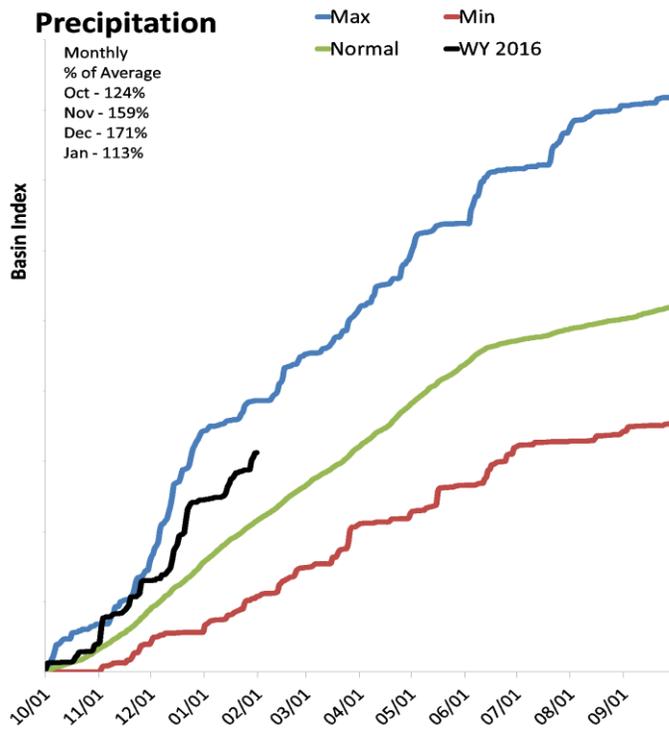
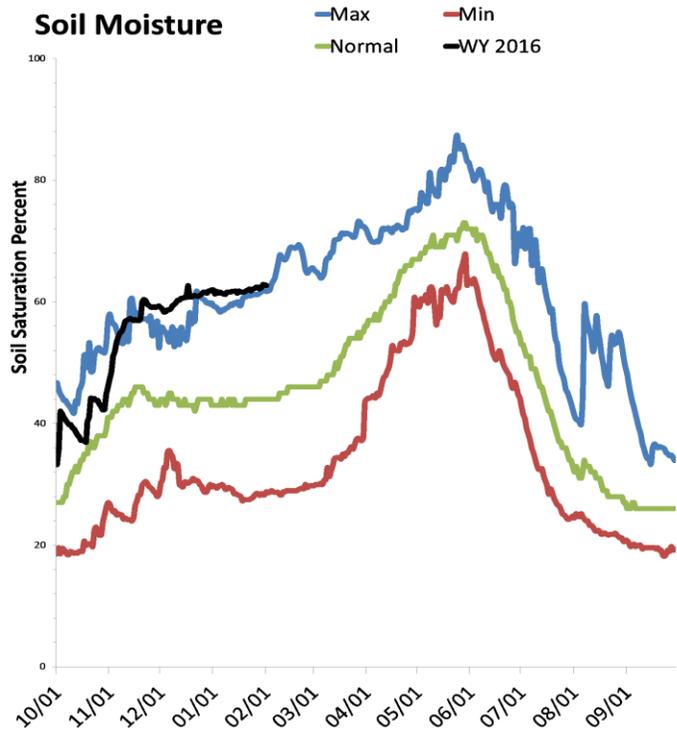
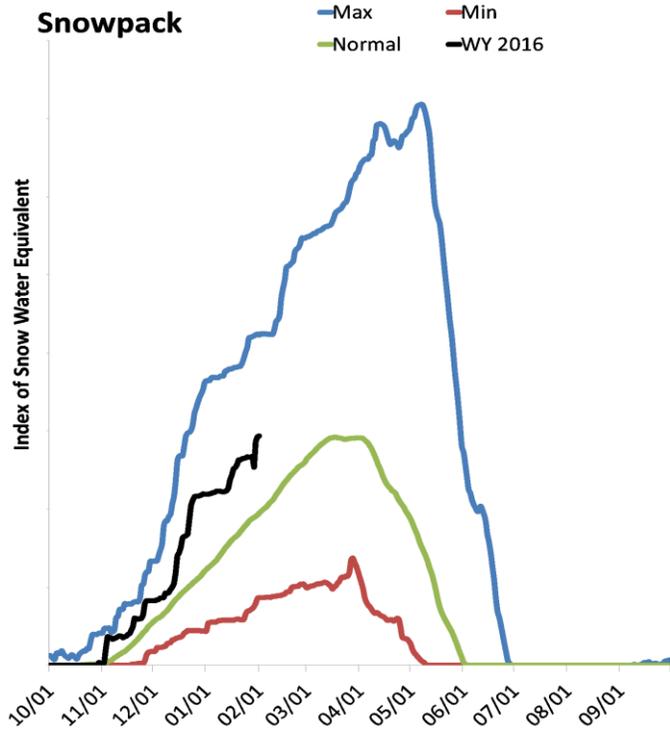
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- 3) Median value used in place of average

<b>Watershed Snowpack Analysis February 1, 2016</b>	# of Sites	% Median	Last Year % Median
Clover Valley & Franklin River Basin	8	134%	81%
Clover Valley	4	117%	81%
Franklin River	7	136%	79%

# Snake River Basin

2/1/2016

Snowpack in the Snake River Basin is much above normal at 152% of median, compared to 95% last year. Precipitation in January was above average at 113%, which brings the seasonal accumulation (Oct-Jan) to 145% of average. Soil moisture is 58% compared to 56% last year. The forecast streamflow volume for Salmon Falls Creek is 153% of average.



## Snake River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Snake River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Salmon Falls Ck nr San Jacinto	MAR-JUL	86	107	124	153%	141	169	81
	MAR-SEP	89	111	128	151%	145	173	85

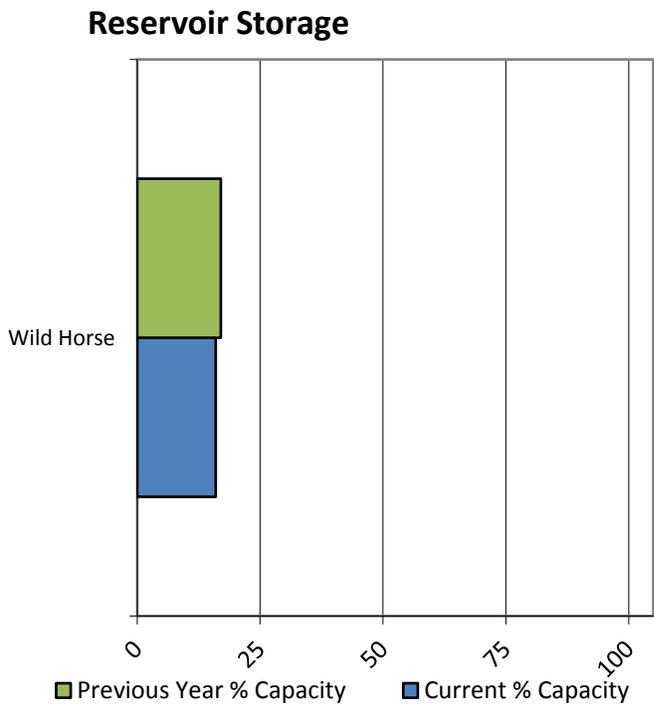
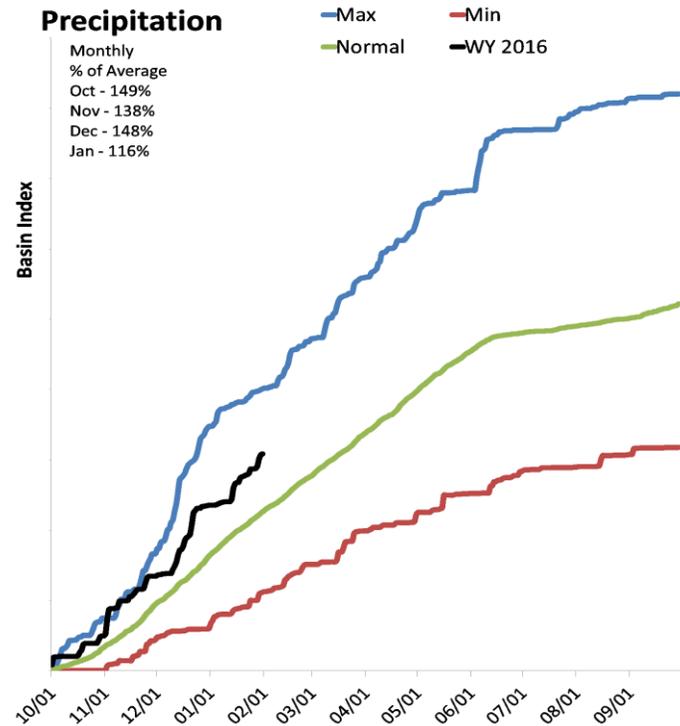
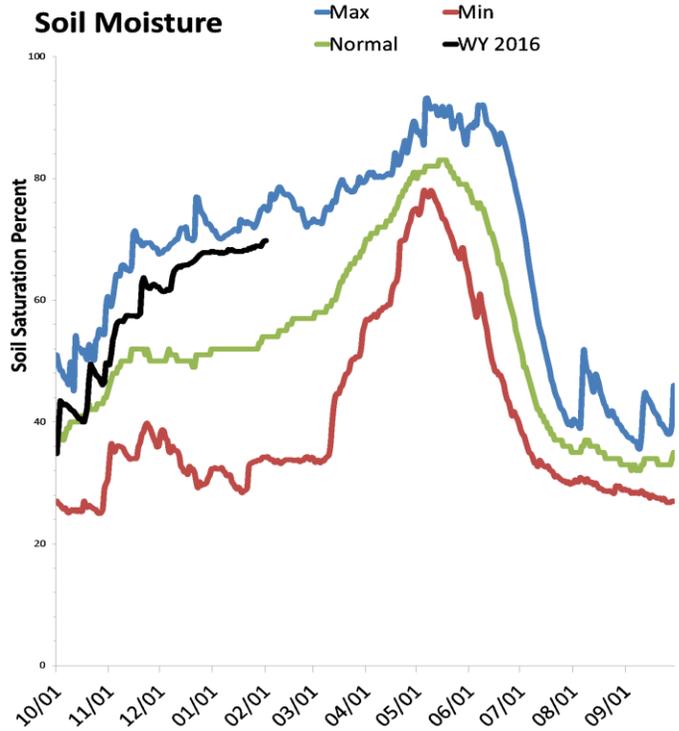
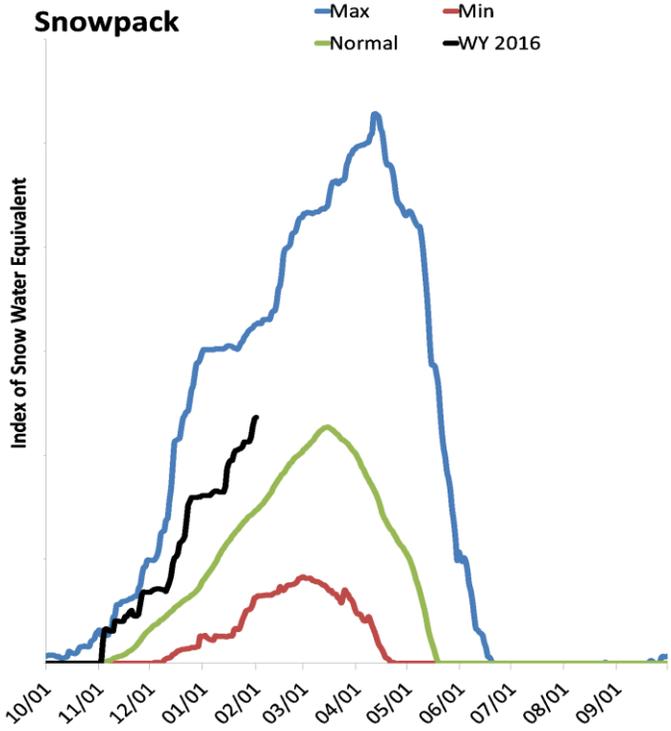
- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
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- 3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Snake River Basin	12	152%	95%
Bruneau River	8	153%	88%
Jarbidge River	3	149%	97%
Salmon Falls Creek	7	153%	104%

# Owyhee River Basin

2/1/2016

Snowpack in the Owyhee River headwaters is much above normal at 151% of median, compared to 62% last year. Precipitation in January was above average at 116%, which brings the seasonal accumulation (Oct-Jan) to 136% of average. Soil moisture is 67% compared to 73% last year. Storage in Wildhorse Reservoir is 16% of capacity, compared to 17% last year. The forecast streamflow volume for the Owyhee River near Gold Creek is 186% of average.



## Owyhee River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Owyhee River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Owyhee R nr Gold Ck <sup>2</sup>	MAR-JUL	30	42	52	186%	63	82	28
	MAR-SEP	29	40	49	181%	59	77	27
	APR-JUL	20	32	42	191%	54	76	22

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- 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
- 3) Median value used in place of average

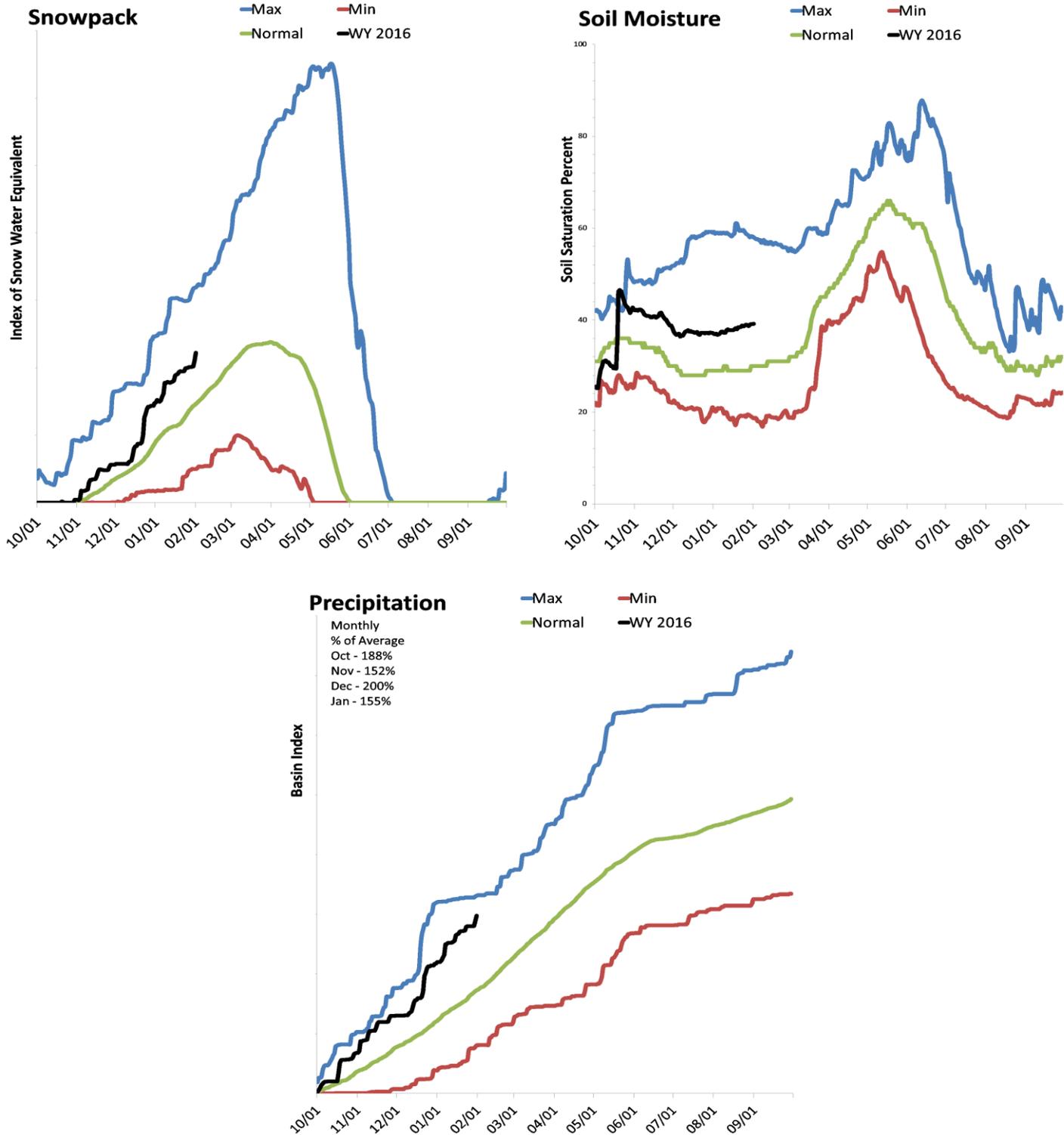
Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Wild Horse Reservoir	11.1	12.2	33.2	71.5
Basin-wide Total	11.1	12.2	33.2	71.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Owyhee River Basin	10	151%	62%
Owyhee River above Owyhee	8	144%	69%
Owyhee River above Gold Creek	4	158%	73%
South Fork Owyhee River	3	153%	63%

# Eastern Nevada

2/1/2016

Snowpack in Eastern Nevada is much above normal at 152% of median, compared to 66% last year. Precipitation in January was much above average at 154%, which brings the seasonal accumulation (Oct-Jan) to 172% of average. Soil moisture is 43% compared to 28% last year. Forecast streamflow volumes range from 118% to 125% of average.



## Eastern Nevada Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Eastern Nevada	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kingston Ck nr Austin	APR-JUL	0.06	2.7	4.5	125%	6.3	8.9	3.6
Steptoe Ck nr Ely	APR-JUL	1.75	2.7	3.3	122%	3.9	4.9	2.7
Cleve Ck nr Ely	APR-JUL	2.8	4.4	5.4	122%	6.4	8	4.41
Lehman Ck nr Baker	APR-JUL	1.26	2.4	3.2	118%	4	5.1	2.72

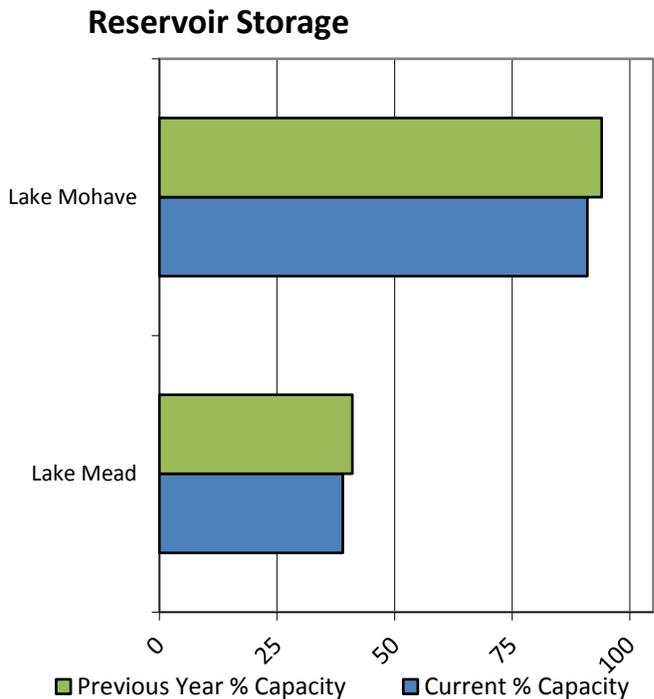
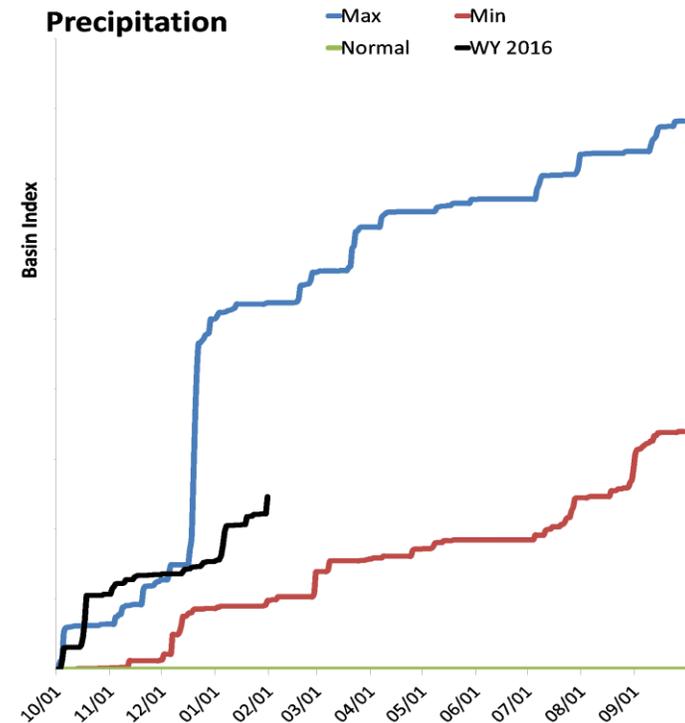
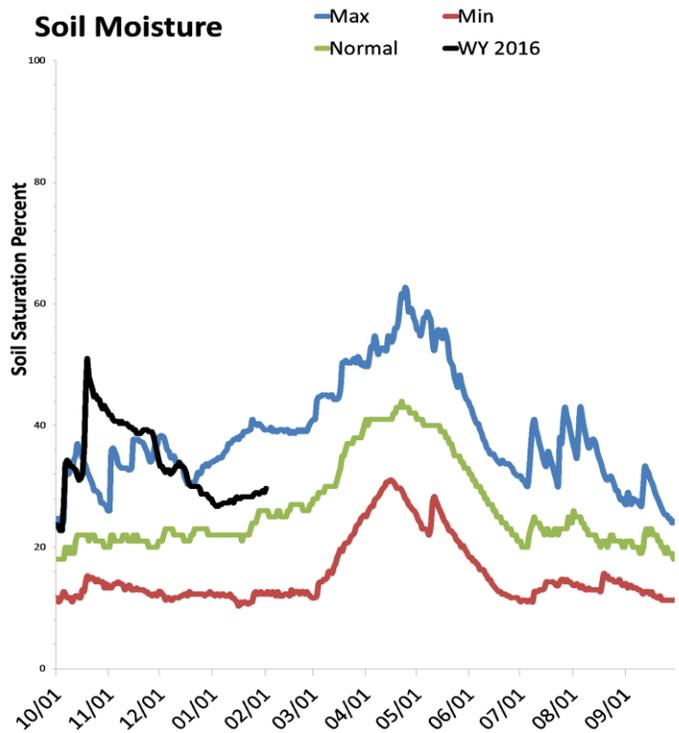
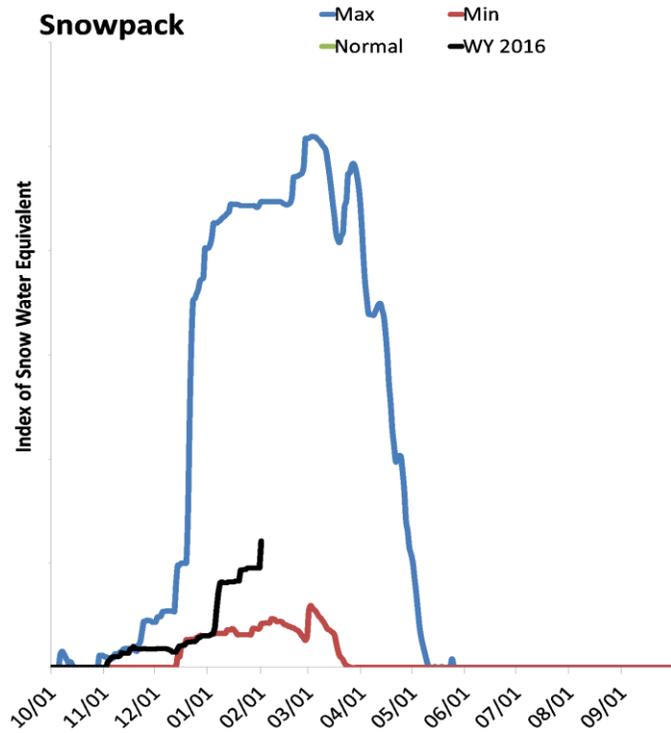
- 1) 90% and 10% exceedance probabilities are actually 95% and 5%
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- 3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Eastern Nevada	4	152%	66%
Kingston Creek	1	174%	61%
Steptoe Valley	2	135%	63%
Baker & Lehman Creeks	0		

# Spring Mountains & Southern Nevada

2/1/2016

Average snow water content at SNOTEL sites in the Spring Mountains is 6.1 inches. Precipitation in January averaged 4.6 in, which brings the seasonal accumulation (Oct-Jan) to 12.3in. Soil moisture is 29% compared to 33% last year. Storage in Lake Mead is 39% of capacity, compared to 41% last year, while Lake Mohave storage is 91% of capacity, compared to 94% last year. Streamflow forecasts range from 98% to 132% of average for the Virgin River and Lake Powell inflow.



\*\*SNOTEL sites in the Spring Mtns were installed in June 2008. Due to the short record snowpack and precipitation normals are not presented. Max and Min lines are based on water years 2009-2015, same goes for the soil moisture normal line.

## Spring Mountains & Southern Nevada Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

Spring Mountains & Southern Nevada	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Virgin R nr Hurricane	APR-JUL	34	58	78	124%	101	140	63
Virgin R at Littlefield	APR-JUL	36	63	86	132%	112	156	65
Lake Powell Inflow <sup>2</sup>	APR-JUL	4100	5730	7000	98%	8390	10700	7160

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- 3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Mead	10318.0	10739.0	20452.0	26159.0
Lake Mohave	1647.0	1698.0	1676.0	1810.0
Basin-wide Total	11965.0	12437.0	22128.0	27969.0
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
Spring Mountains	0		
White River	1	120%	56%
Virgin River	8	162%	62%
Colorado R above Glen Canyon Dam	105	113%	86%

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## Questions?

For more snow and water supply information visit:

[www.nv.nrcs.usda.gov/snow/](http://www.nv.nrcs.usda.gov/snow/)

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