Forecast Review Summary:

Dry spring weather (illustrated on page 2), combined with persistent drought effects, resulted in actual streamflow falling short of the April 1, 50% exceedance forecasts for most points the NRCS published in 2016.

The graphic to the right summarizes April 1, 2016 streamflow forecasts for each exceedance level as a percent of average. The black rectangle shows actual streamflow for comparison.

The graphic on page 3 summarizes these results. Over half the forecasted streams (19 out of 37) experienced actual flows between the 70% and 90% exceedance levels, while another six streams had actual flows less than the 90% exceedance level.

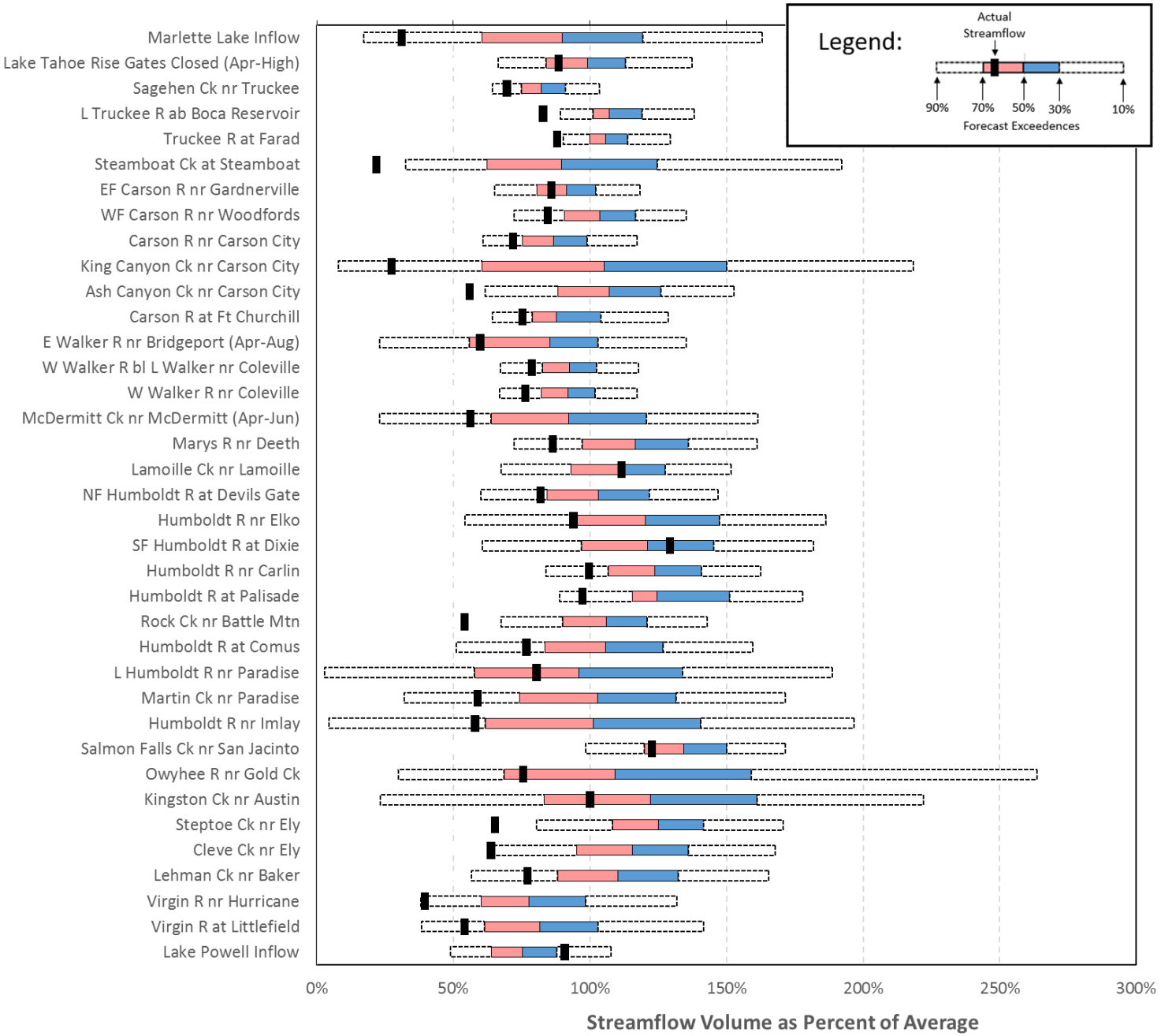
This kind of year causes water users frustration, as allotment numbers are often reduced as the season goes on. In addition to below normal precipitation between April and July, lingering drought effects, such as reduced base flows and depleted streambank storage, likely also played a part reducing runoff efficiency in some areas.

The takeaway from 2016 is that any forecast is a range of exceedance levels. Never rely solely on the 50% exceedance forecast. Forecast statistics dictate that, even in April, there is a one in ten chance that actual flows will not meet that 90% exceedance level, especially under extreme conditions. The 50% exceedance is the middle of the road, there is a 50% chance of more streamflow occurring is conditions are wet, and conversing, a 50% chance of less streamflow occurring if conditions turn dry.

For a more detailed summary of volumes by basin refer to page 4-14.

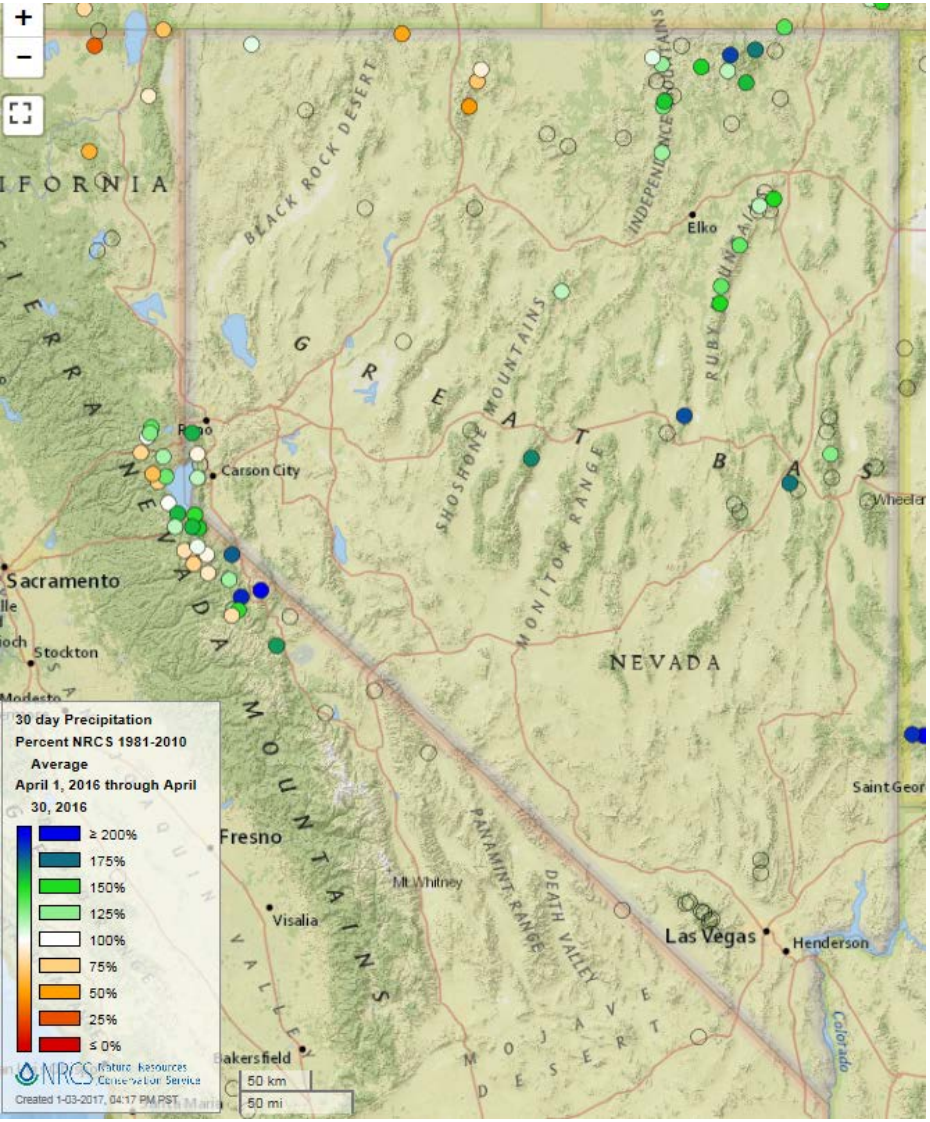
2016 NRCS Streamflow Forecast Review

Actual Streamflow vs April 1, 2016 NRCS Streamflow Forecasts for April-July Period (unless otherwise noted)

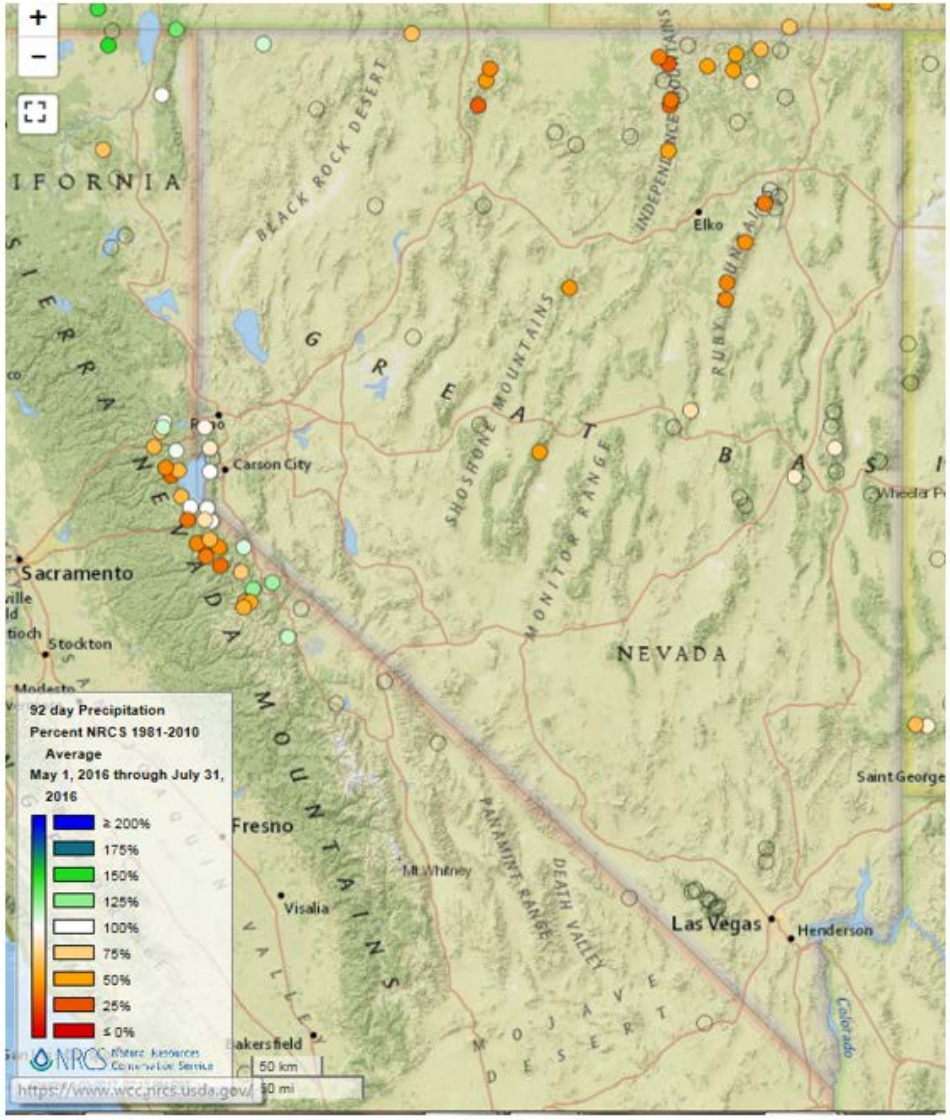


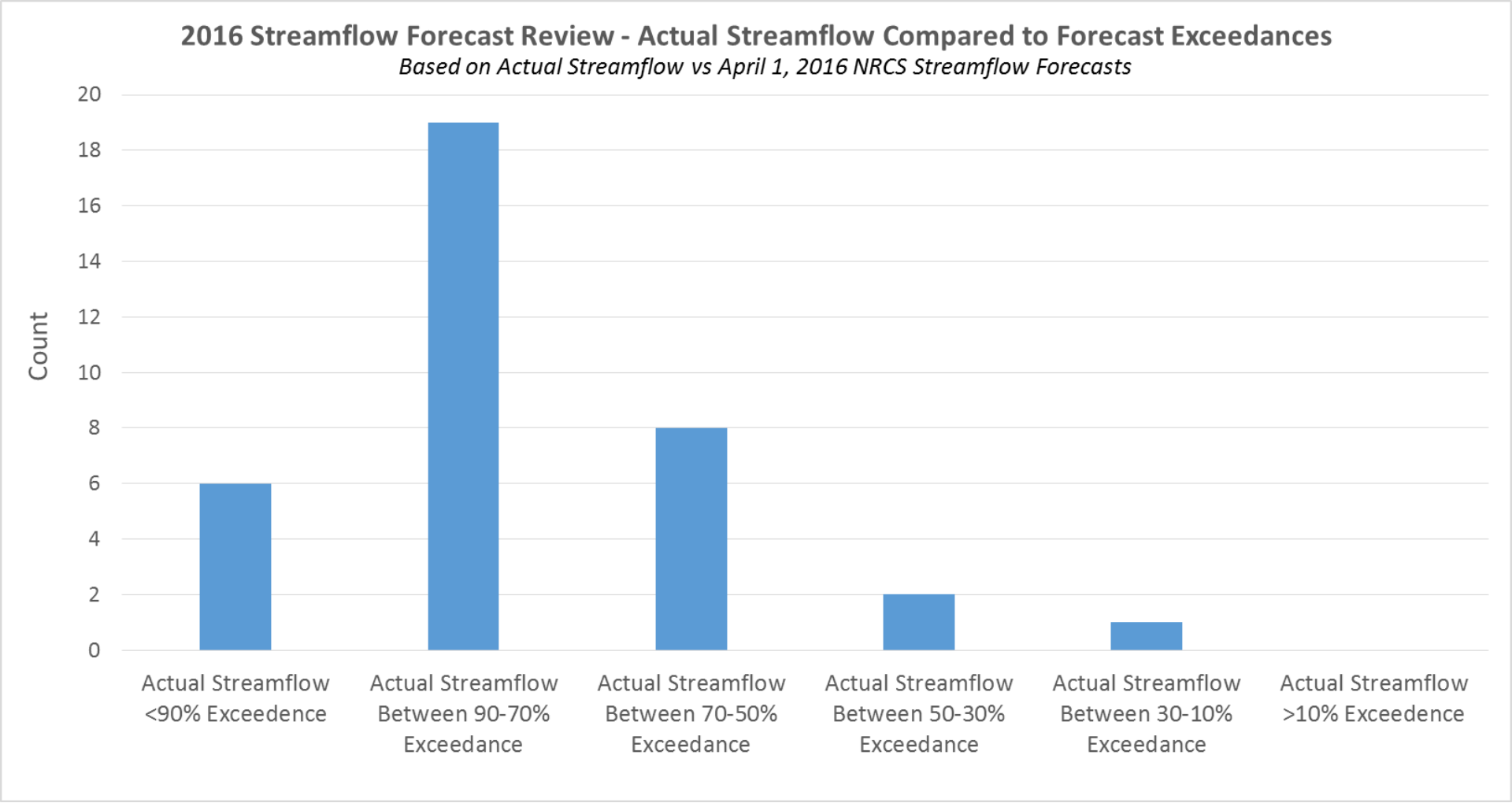
Spring Precipitation: April precipitation was in general above average, however May – July was dry in many areas.

Precipitation as a Percent of Average
April 1-30, 2016



Precipitation as a Percent of Average
May 1 – July 31, 2016




2016 Streamflow Forecast Review - Actual Streamflow Compared to Forecast Exceedances
Based on Actual Streamflow vs April 1, 2016 NRCS Streamflow Forecasts
Count
20
18
16
14
12
10
8
6
4
2
0
Actual Streamflow <90% Exceedence
Actual Streamflow Between 90-70% Exceedance
Actual Streamflow Between 70-50% Exceedance
Actual Streamflow Between 50-30% Exceedance
Actual Streamflow Between 30-10% Exceedance
Actual Streamflow >10% Exceedence

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Lake Tahoe Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Marlette Lake Inflow (acre-feet)[2]											
	APR-JUL	144	505	750	90%	995	1360	834	272	33%	-57%
Lake Tahoe Rise Gates Closed[1]											
	APR-HIGH	0.87	1.1	1.3	99%	1.48	1.8	1.31	1.2	90%	-9%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Truckee River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Sagehen Ck nr Truckee											
	APR-JUL	3.6	4.2	4.6	82%	5.1	5.8	5.6	4.0	71%	-11%
L Truckee R ab Boca Reservoir[2]											
	APR-JUL	75	85	90	107%	100	116	84	71	84%	-23%
Truckee R at Farad[2]											
	APR-JUL	230	255	270	106%	290	330	255	228	89%	-17%
Galena Ck at Galena Ck State Pk											
	APR-JUL	3	3.7	4.2	96%	4.7	5.4	4.37	----------Gage data unavailable----------		
Steamboat Ck at Steamboat											
	APR-JUL	2.5	4.8	6.9	90%	9.6	14.8	7.7	1.8	23%	-67%
Pyramid Lake Elevation Change[1]											
	LOW-HIGH	-1.358	0.607	1.5	88%	2.4	4.4	1.7	-0.25	-15%	-103%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Carson River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
EF Carson R nr Gardnerville											
	APR-JUL	121	150	170	91%	190	220	186	162	87%	-4%
	200 cfs	27 Jun	07 Jul	14 Jul		21 Jul	31 Jul	25 Jul	12 Jul	-	- 2 days
	500 cfs	05 Jun	15 Jun	21 Jun		27 Jun	07 Jul	01 Jul	26 Jun	-	+5 days
WF Carson R nr Woodfords											
	APR-JUL	39	49	56	104%	63	73	54	46	86%	-18%
Carson R nr Carson City											
	APR-JUL	109	135	155	87%	177	210	179	131	73%	-14%
King Canyon Ck nr Carson City											
	APR-JUL	0.03	0.23	0.4	105%	0.57	0.83	0.38	0.11	29%	-76%
Ash Canyon Ck nr Carson City											
	APR-JUL	0.69	0.99	1.2	107%	1.41	1.71	1.12	0.64	58%	-50%
Carson R at Ft Churchill											
	APR-JUL	110	135	150	88%	178	220	171	131	77%	-11%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Walker River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
E Walker R nr Bridgeport[2]											
	APR-AUG	15.6	38	58	85%	70	92	68	42	61%	-24%
W Walker R bl L Walker nr Coleville											
	APR-JUL	109	134	150	93%	166	191	162	130	80%	-13%
W Walker R nr Coleville											
	APR-JUL	109	134	150	92%	166	191	163	127	78%	-14%
Walker Lake Elevation Change[1]											
	LOW-HIGH	-2.3	0.1	1.2	85%	2.3	4.7	1.41	0.23	16%	-69%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Northern Great Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Davis Ck (acre-feet)											
	APR-JUL	4000	5200	6400	88%	7700	10300	7233	----------Gage data unavailable----------		
Bidwell Ck nr Fort Bidwell											
	APR-JUL	7.1	9.2	10.6	88%	12	14.1	12	----------Gage data unavailable----------		
Eagle Ck nr Eagleville											
	APR-JUL	1.89	3.3	4.2	98%	5.1	6.5	4.3	----------Gage data unavailable----------		
McDermitt Ck nr McDermitt											
	APR-JUN	3	8.3	12	92%	15.7	21	13	7.5	58%	-34%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Upper Humboldt River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Marys R nr Deeth											
	APR-JUL	26	35	42	117%	49	58	36	32	88%	-29%
Lamoille Ck nr Lamoille											
	APR-JUL	19.6	27	32	110%	37	44	29	33	113%	+3%
NF Humboldt R at Devils Gate											
	APR-JUL	19.2	27	33	103%	39	47	32	27	83%	-20%
Humboldt R nr Elko											
	APR-JUL	72	124	160	120%	196	248	133	127	96%	-25%
SF Humboldt R at Dixie											
	APR-JUL	40	64	80	121%	96	120	66	86	131%	+10%
Humboldt R nr Carlin											
	APR-JUL	173	220	255	124%	290	335	206	208	101%	-23%
Humboldt R at Palisade											
	APR-JUL	200	260	280	124%	340	400	225	222	99%	-25%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Lower Humboldt River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Rock Ck nr Battle Mtn											
	APR-JUL	12.3	16.4	19.3	106%	22	26	18.2	10	56%	-50%
Humboldt R at Comus											
	APR-JUL	109	178	225	106%	270	340	213	167	78%	-28%
L Humboldt R nr Paradise											
	APR-JUL	0.27	5.6	9.3	96%	13	18.3	9.7	8.0	82%	-14%
Martin Ck nr Paradise											
	APR-JUL	5.6	13	18	103%	23	30	17.5	10.6	60%	-43%
Humboldt R nr Imlay											
	APR-JUL	7.8	110	180	101%	250	350	178	106	59%	-42%

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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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Snake River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Salmon Falls Ck nr San Jacinto											
	APR-JUL	69	84	94	134%	105	120	70	87	124%	-10%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Owyhee River Basin	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Owyhee R nr Gold Ck[2]											
	APR-JUL	6.6	15.1	24	109%	35	58	22	17	77%	-32%

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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Eastern Nevada	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Kingston Ck nr Austin											
	APR-JUL	0.84	3	4.4	122%	5.8	8	3.6	3.7	102%	-20%
Steptoe Ck nr Ely											
	APR-JUL	1.93	2.6	3	125%	3.4	4.1	2.4	1.6	67%	-58%
Cleve Ck nr Ely											
	APR-JUL	2.8	4.2	5.1	116%	6	7.4	4.41	2.9	65%	-51%
Lehman Ck nr Baker											
	APR-JUL	1.54	2.4	3	110%	3.6	4.5	2.72	2.1	79%	-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

Streamflow Forecast Verification Summary: April 1, 2016 Forecast vs. Actual Flow
(averages based on 1981-2010 reference period)

		April 1, 2016 Published Streamflow Forecast Exceedance Probabilities Chance that actual volume will exceed forecast							Actual 2016 Streamflow for Listed Period		
Spring Mountains & Southern Nevada	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)	(KAF)	% Avg	% Difference (Actual minus 50% Forecast)
Virgin R nr Hurricane											
	APR-JUL	24	38	49	78%	62	83	63	26	41%	-37%
Virgin R at Littlefield											
	APR-JUL	25	40	53	82%	67	92	65	36	56%	-26%
Lake Powell Inflow [2]											
	APR-JUL	3500	4580	5400	75%	6290	7710	7160	6610	92%	+17%

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