Water Supply Outlook

California and Northern Nevada

April 2012

California Nevada River Forecast Center
NOAA - National Weather Service
Sacramento, California

DEFINITIONS:

Acre-Feet: The volume equal to one acre covered one foot deep (43,560 cubic feet).

Forecast Period: Generally, April 1st through July 31st, unless otherwise noted.

April-High Forecast Period: For the Lake Tahoe Stage Rise, the period from April 1st to the highest recorded lake stage level.

April 1st Average: The April 1st snowpack average is used as a reference point because it is normally the end of the winter snowfall season and the beginning of the spring runoff season.

Residual Period: The forecast period from the first of the current month through September 30th.

Probability Forecasts: Precipitation and snowfall accumulation of known probability as determined by analysis of past records are utilized in the preparation of probability runoff forecasts. The forecasts include an evaluation of the standard error of the prediction model. The forecasts are presented at three levels of probability as follows:

- **Most Probable Volume:** Given the current hydrometeorological conditions to date, this is the best estimate of what the actual runoff volume will be this season.
- **Most Probable Volume (% Normal):** Most probable volume in percent of the 1961-1990 average.
- **Reasonable Maximum Volume:** Given current hydrometeorological conditions, the seasonal runoff that has a 10 percent chance of being exceeded.
- **Reasonable Minimum Volume:** Given current hydrometeorological conditions, the seasonal runoff that has a 90 percent chance of being exceeded.

SNOTEL: Acronym for SNOw TELemetry. This is a automated snow measurement system operated by the USDA - Natural Resources Conservation Service. These sites use meteor burst communications technology to transmit hydrometeorological information such as snow water equivalent from snow pillows, accumulated precipitation and maximum, minimum and average air temperature.

Water equivalent: The depth of water that would result from melting the snowpack at a point.

Water Year: The period from October 1st through September 30th.

General Outlook April 01, 2012

Plentiful rain and snow fell during March but it was snow basins in the North Coast and Upper Sacramento regions that benefited the most. The first major storm period was around the 12th through the 18th producing moderate to significant precipitation amounts through most of the state; the second occurred during the last week of March, favoring the North Coast and much of the Upper Sacramento River watershed. Snow packs increased during March due to the predominantly cold nature of the storms, with packs in the Scott/Trinity/McCloud/Upper Sacramento showing the largest increases. Spring runoff forecasts range from 84 to 105 percent in this region.

Other watersheds in California are projected to have below to much below average spring runoff. Although there was some improvement in conditions due to the wet March, it was not enough to overcome the previous dry months although good reservoir storage conditions should lessen impacts this summer.

PRECIPITATION: March percent of average precipitation was highest in Northern California, ranging from 196 percent in the Trinity River basin to 165 percent in the Mokelumne. Monthly averages then drop off substantially from the Stanislaus to the Tulare basin, varying from 103 percent for the Stanislaus to 83 percent in the Kaweah. Seasonal (October 31, 2011 to March 31, 2012) averages range from below to much below average for the region.

Basin	Mar % of Avg Pcpn	WY % of Avg Pcpn
Trinity	196	87
Upper Sacramento	183	74
Central Sierra	115	60
Southern Sierra	106	55
Walker	83	54
Carson	130	59
Truckee	154	67
Klamath	188	87

SNOWPACK: The Upper Klamath Lake, Scott, and McCloud River basins have the highest April 1st average, standing at 101, 97 and 95 percent, respectively. Percentages then drop down gradually from the Pit River basin to the Kern with very little improvement from last month in the San Joaquin Valley and Tulare Lake regions.

Basin	% of Avg Snowpack April 1, 2012	% of Avg Snowpack April 1, 2011
Upr Sac/Nrn Sierra	57	171
San Joaquin Valley	43	176
Tulare Lake	39	183
Tahoe-Truckee	59	171
Carson-Walker	42	154
Humboldt	40	131
Upper Klamath	97	138

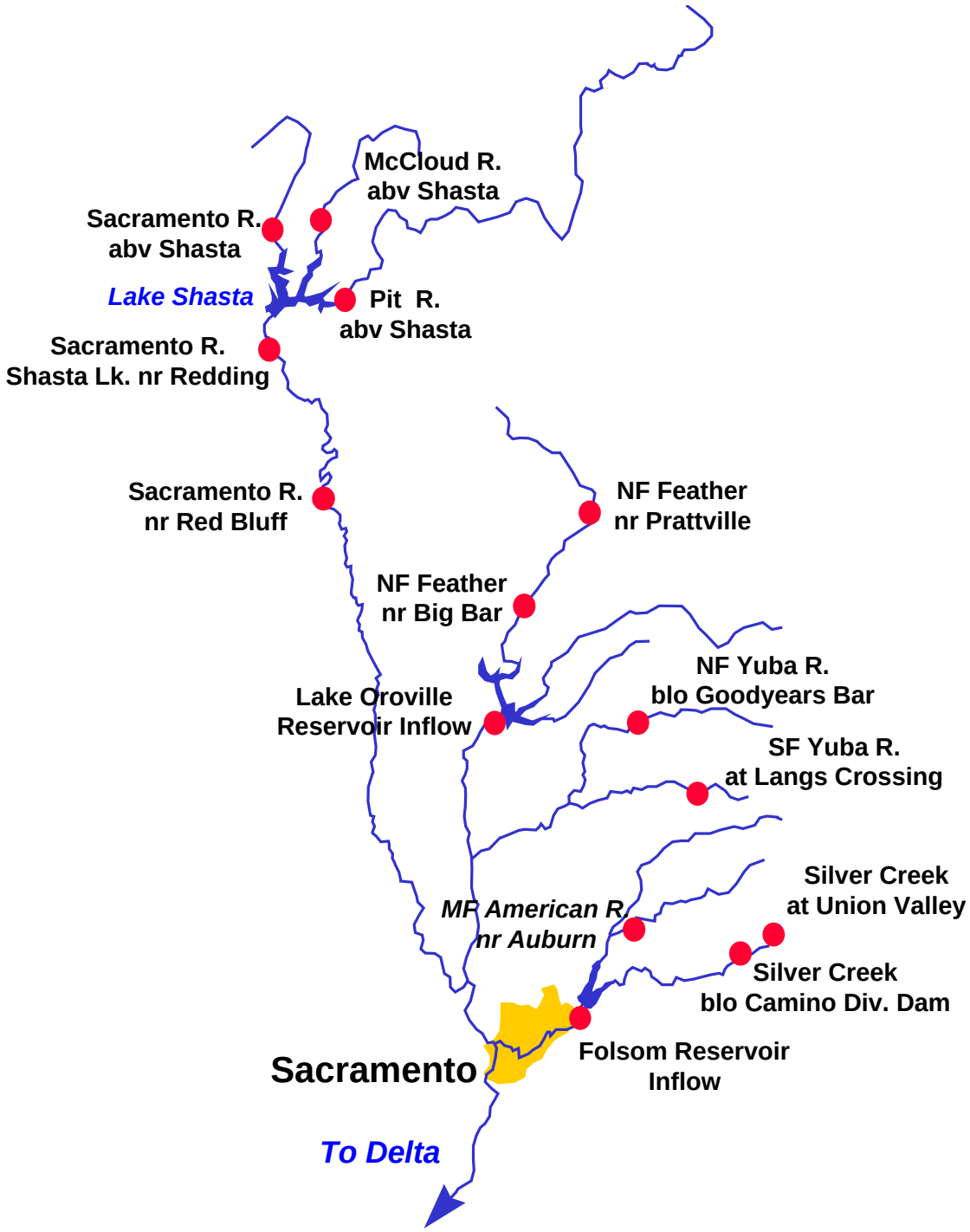
RUNOFF: March runoff was greatest in the Trinity-Sacramento region, where much precipitation fell. Seasonal runoff remains much below average.

Basin	Mar % of Avg Runoff	WY % of Avg Runoff
Trinity-Sacramento	88	50
San Joaquin	48	39
Tulare Lake	47	62
East Side Sierra	48	66
Humboldt	36	52
Upper Klamath	59	60

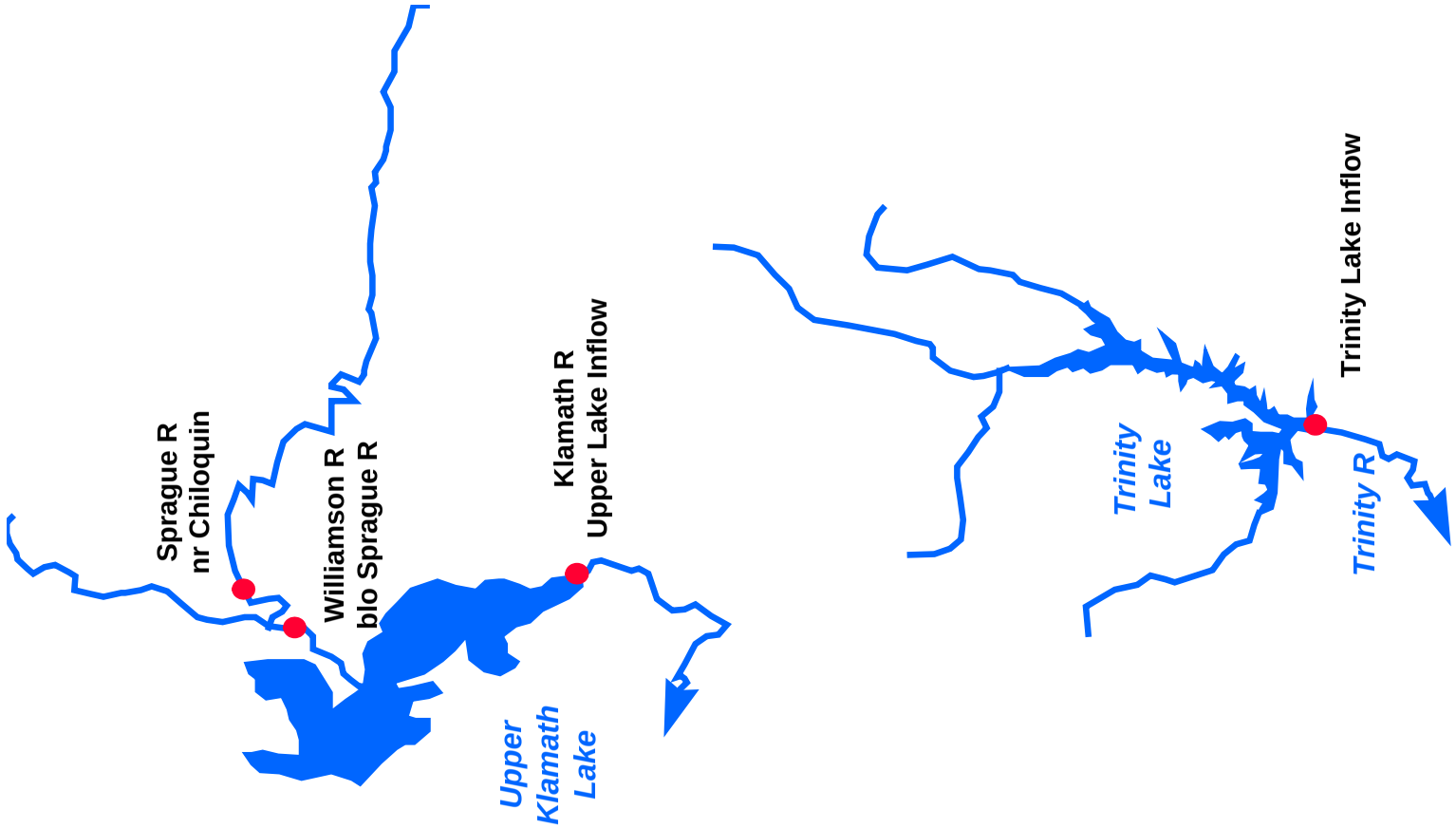
RESERVOIR STORAGE: Reservoir storage in California is above average thanks largely to runoff from last winter's storms. There was significant gain in storage to reservoirs in northern California due to the wet March. The state's two largest reservoirs, Shasta Lake and Lake Oroville, stand at 106 percent of average as of the end of March. Taken together, Shasta and Oroville gained 1.107 MAF during March. Stored water in the Sacramento region as of March 31 was at 106 percent of average for the date, the San Joaquin at 113, and the Tulare Lake at about 104 percent. East-side Sierra reservoirs were at 125 percent of average. The lake level at Lake Tahoe stood at 6227.06 feet (or 4.06 feet above its natural rim altitude of 6223.0 feet) as of March 31. Usable storage was 494,100 acre-feet or 127 percent of average. It was 319,800 acre-feet (82 percent of average) at about this time last year. Storage at Lahontan Reservoir in Nevada stands at 98 percent of average as of March 31 while Rye Patch Reservoir is at 129 percent. Storage at Upper Klamath Lake is about 105 percent of average.

FORECASTS: Median April through July runoff forecasts vary from 105 to 53 percent of average (1971-2000) from the Scott River basin to the Cosumnes and 52 to 41 percent from the Stanislaus River basin to the Kern. Projections range from 22 to 52 percent for the east side Sierra Nevada watersheds and 12 to 30 percent for forecast points on the main stem Humboldt River. The April through September forecast for the Upper Klamath Lake inflow is 78 percent.

Sacramento River Basin



Upper Klamath and Trinity River Basins



Water Supply Forecasts

COASTAL BASINS

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Williamson River						
Sprague, blo	Apr-Sep	310	81	370	250	385
Sprague River						
Chiloquin, nr	Apr-Sep	185	80	235	135	230
Upper Klamath Falls River						
Inflow	Apr-Sep	400	78	505	295	515
Lost River						
Gerber Reservoir Inflow	Apr-Jul	11.0	65	23	1.00	16.9
Clear Lake Reservoir Inflow	Apr-Jul	30	73	55	2.0	41
Scott River						
Fort Jones, nr	Apr-Jul	190	105	280	160	181
Trinity River						
Trinity Lake	Apr-Jul	620	98	840	490	635

Trinity River – Inflow at Lewiston Lake Distribution (kAF) Exceedence

Probability	Oct-Mar	Apr	May	Jun	Jul	Aug	Sep	Apr-Jul	Water Yr
90%	369	180	200	80	30	12	9	490	880
50%	369	220	240	120	40	21	15	620	1025
10%	369	310	330	150	50	29	22	840	1260

SACRAMENTO RIVER BASIN

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
SACRAMENTO RIVER ABOVE BEND BRIDGE						
Pit River						
Montgomery Ck, nr	Apr-Jul	710	76	880	510	940
Mccloud River						
Shasta Lake, abv	Apr-Jul	320	86	400	250	370
Sacramento River						
Delta	Apr-Jul	280	97	420	210	290
Shasta Dam	Apr-Jul	1570	88	2120	1020	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	2060	84	2900	1550	2440

Water Supply Forecasts

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
FEATHER RIVER ABOVE OROVILLE RESERVOIR						
North Fork Feather River						
Prattville, nr	Apr-Jul	230	69	310	170	333*
Big Bar	Apr-Jul	670	70	970	530	962*
Feather River						
Oroville Dam	Apr-Jul	1180	67	1870	920	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	215	79	340	155	273*
South Yuba River						
Langs Crossing	Apr-Jul	170	76	280	120	225*
Yuba River						
Englebright Reservoir	Apr-Jul	730	73	1210	580	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
Middle Fork American River						
Auburn, nr	Apr-Jul	340	69	530	260	490*
Silver Creek						
Union Valley	Apr-Jul	60	61	100	50	98*
Camino Dam, blo	Apr-Jul	100	63	160	75	158*
American River						
Folsom Reservoir	Apr-Jul	820	67	1300	630	1230

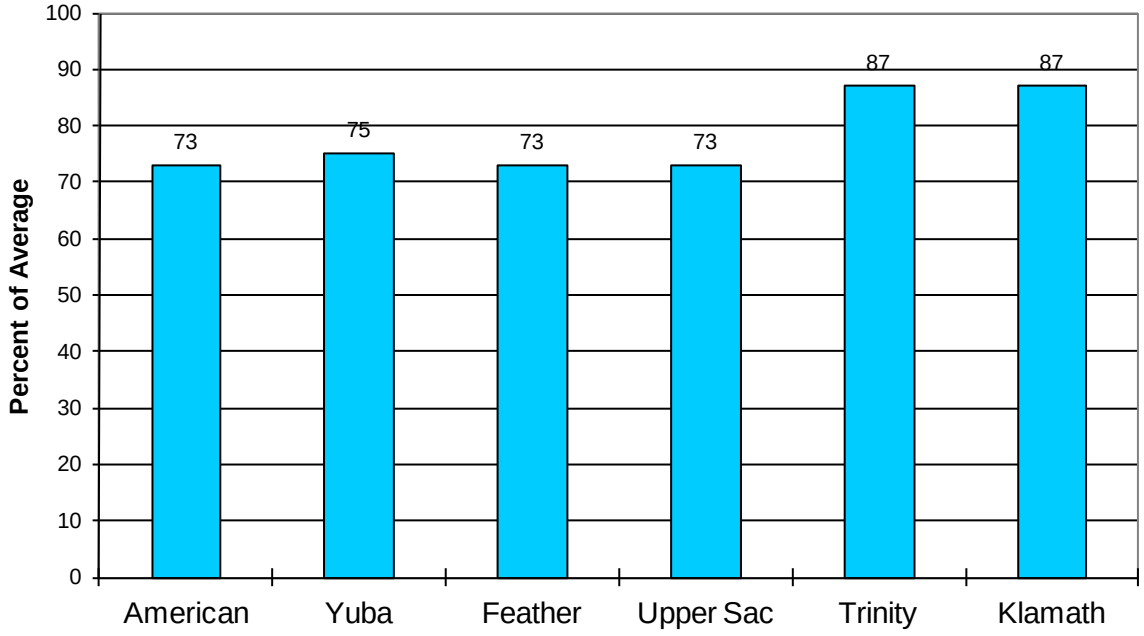
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

**** Pit River 30-year average is full natural flow.**

Sacramento/Trinity/Klamath River Basins

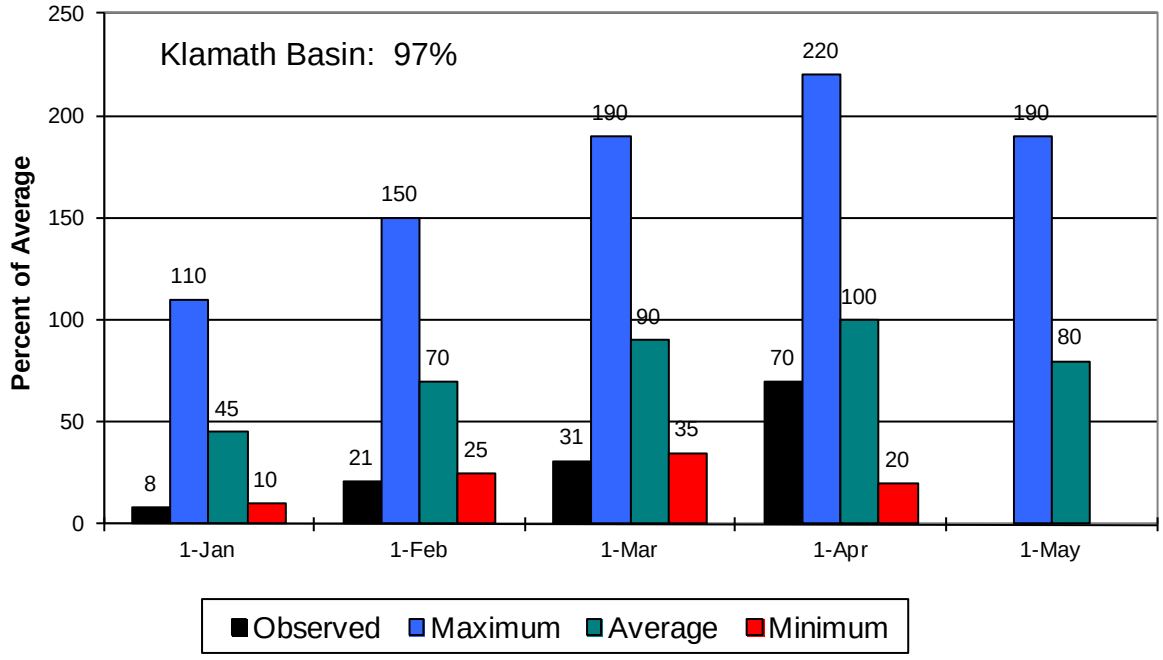
Seasonal Basin Precipitation

October 1 to Date

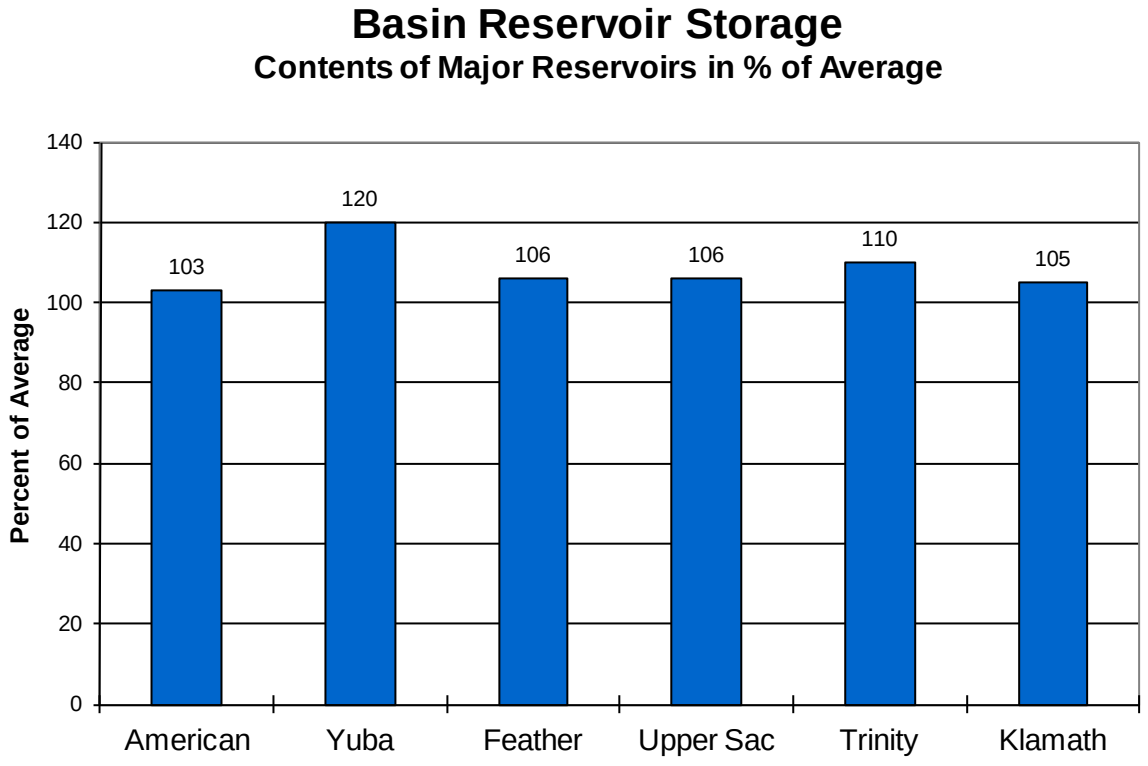


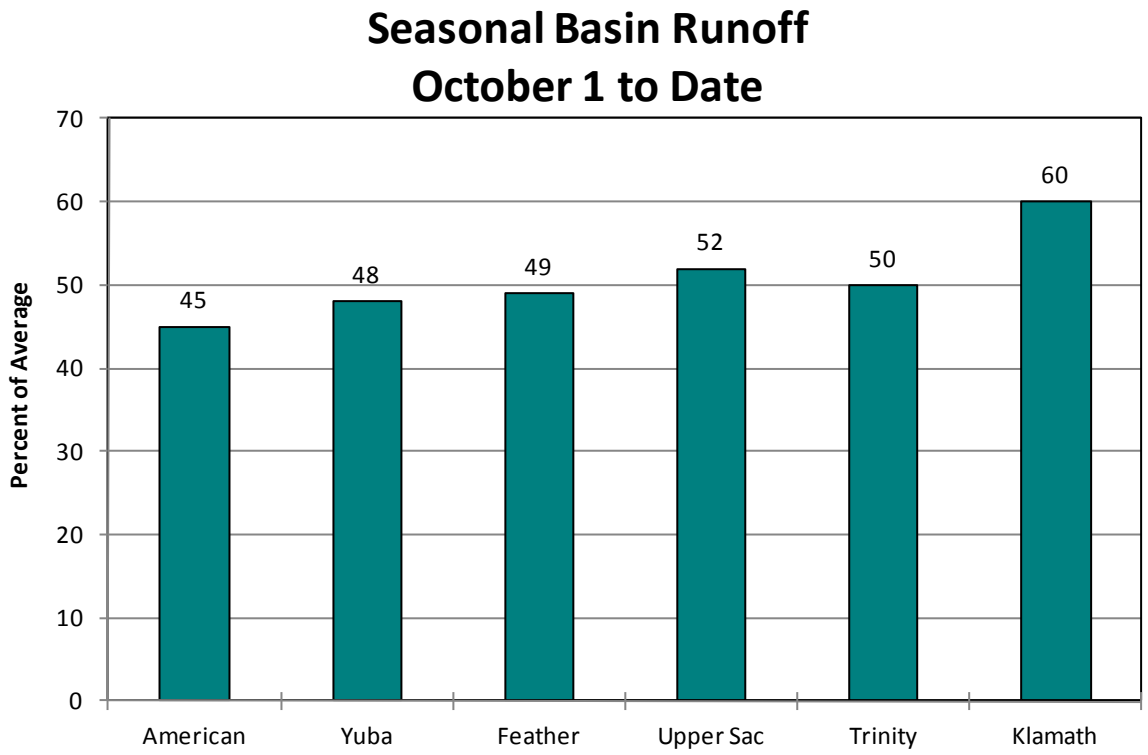
Seasonal Basin Snowpack

Water Content in % of April 1 Average



Sacramento/Trinity/Klamath River Basins





San Joaquin Basin

Water Supply Forecasts

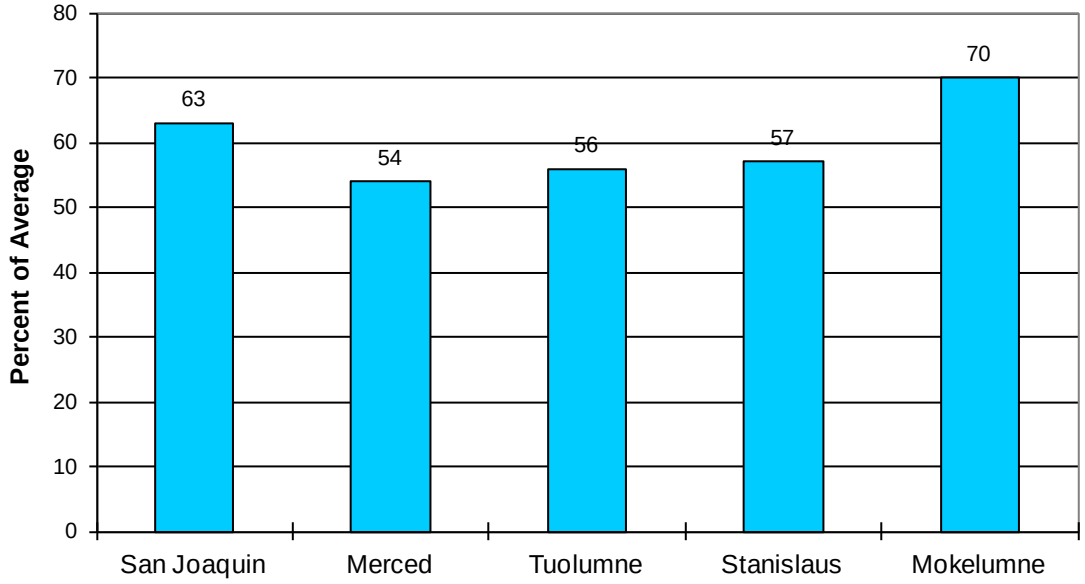
SAN JOAQUIN BASIN

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
South Fork San Joaquin River						
Hooper Ck, blo, Florence Lk, nr	Apr-Jul	100	52	160	60	192*
San Joaquin River						
Millerton Lake	Apr-Jul	620	49	1040	400	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	200	56	300	110	360*
Merced Falls, blo	Apr-Jul	300	47	520	200	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	310	52	500	200	596*
La Grange, nr	Apr-Jul	600	49	1020	400	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	150	47	270	110	320*
Stanislaus River						
New Melones Dam	Apr-Jul	310	45	570	220	695
North Fork Mokelumne River						
West Point	Apr-Jul	200	48	320	130	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	220	48	340	150	460
Cosumnes River						
Michigan Bar	Apr-Jul	65	53	135	35	123

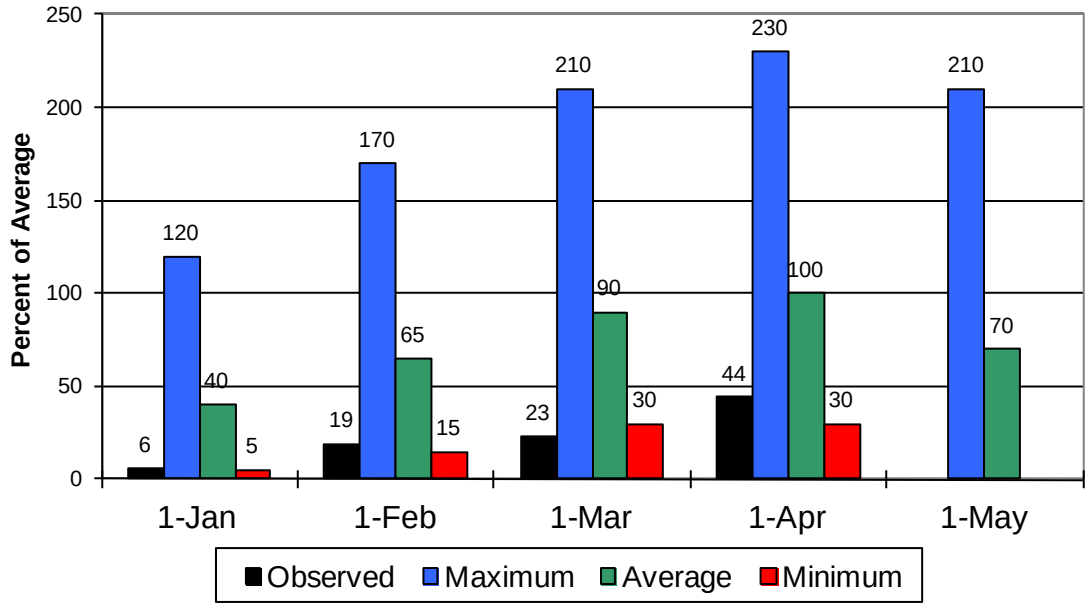
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

San Joaquin Basin

Seasonal Basin Precipitation
October 1 to Date

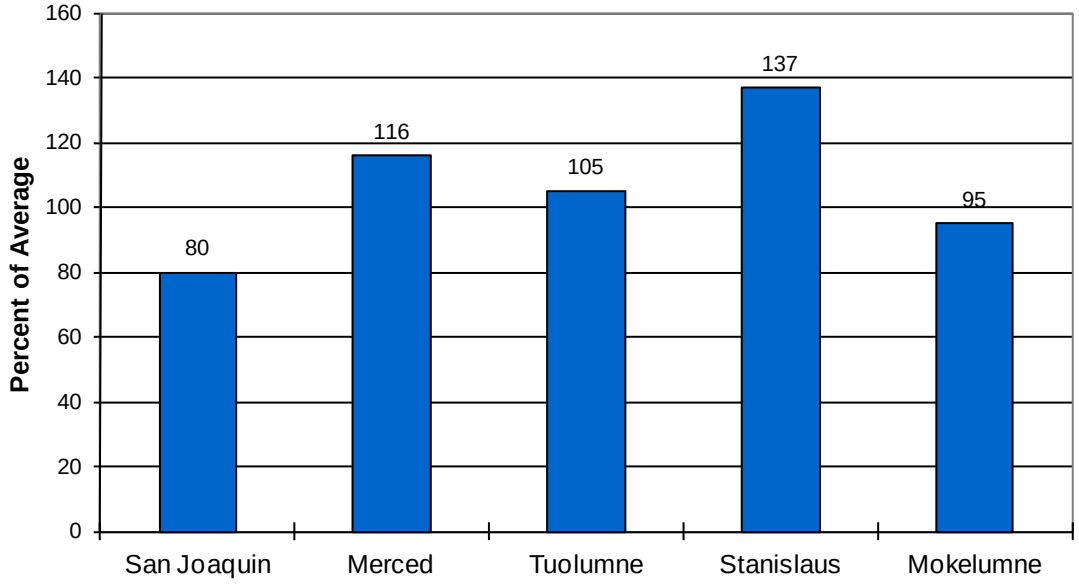


Seasonal Basin Snowpack
Water Content in % of April 1 Average

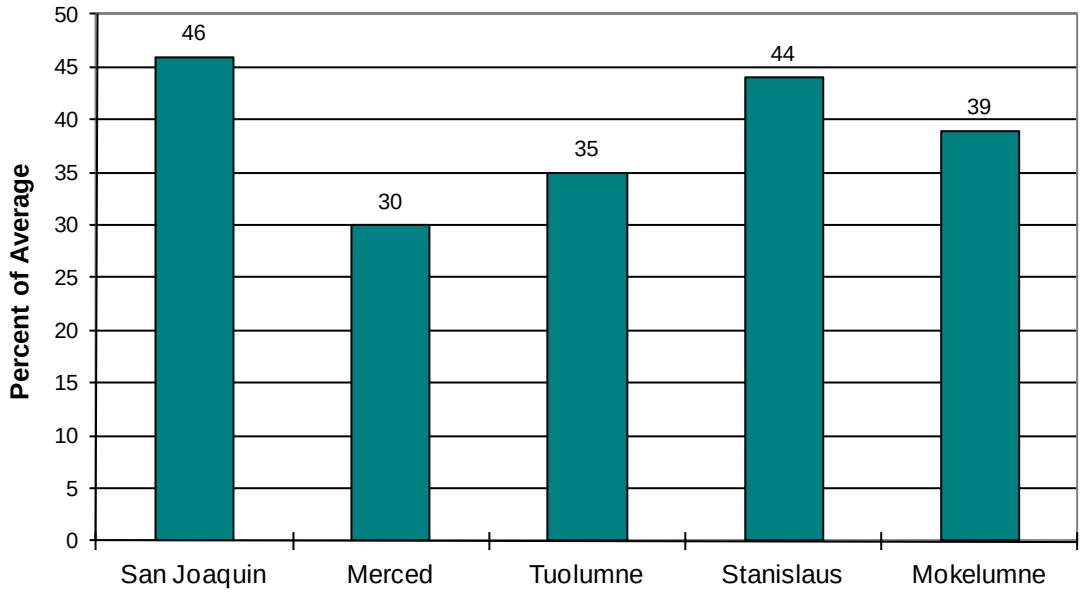


San Joaquin Basin

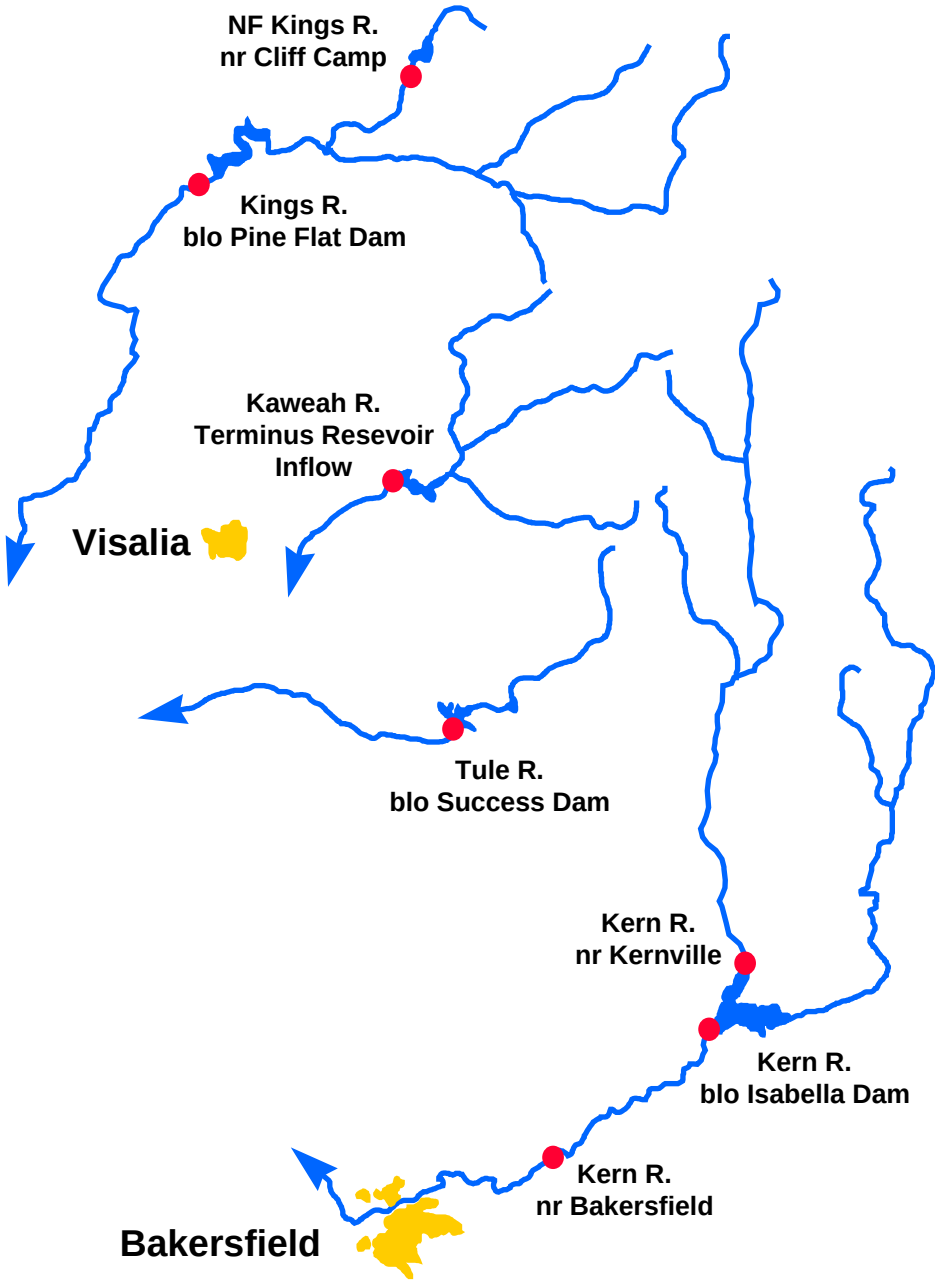
Basin Reservoir Storage
Contents of Major Reservoirs in % of Average



Season Basin Runoff
October 1 to Date



Tulare Basin



Water Supply Forecasts

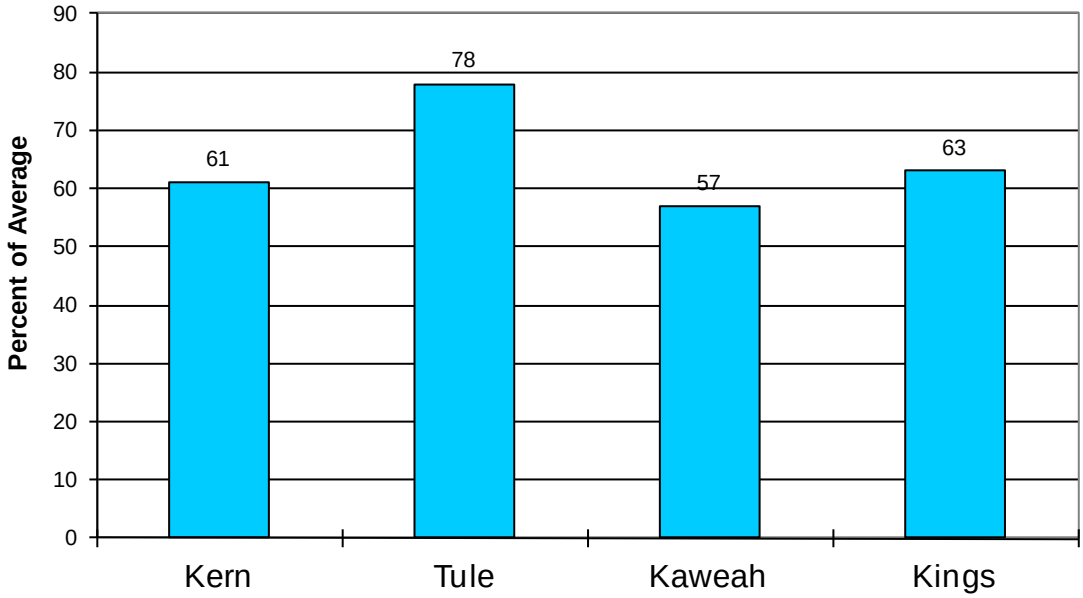
TULARE LAKE BASIN

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Kern River						
Kernville, nr	Apr-Jul	180	45	320	120	398*
Isabella Dam, blo	Apr-Jul	210	44	380	140	480
Bakersfield, nr	Apr-Jul	210	43	370	130	490
Tule River						
Success Dam	Apr-Jul	27	41	50	18.0	66
Kaweah River						
Terminus Dam	Apr-Jul	130	45	230	80	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	120	50	200	80	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	590	47	1010	380	1250

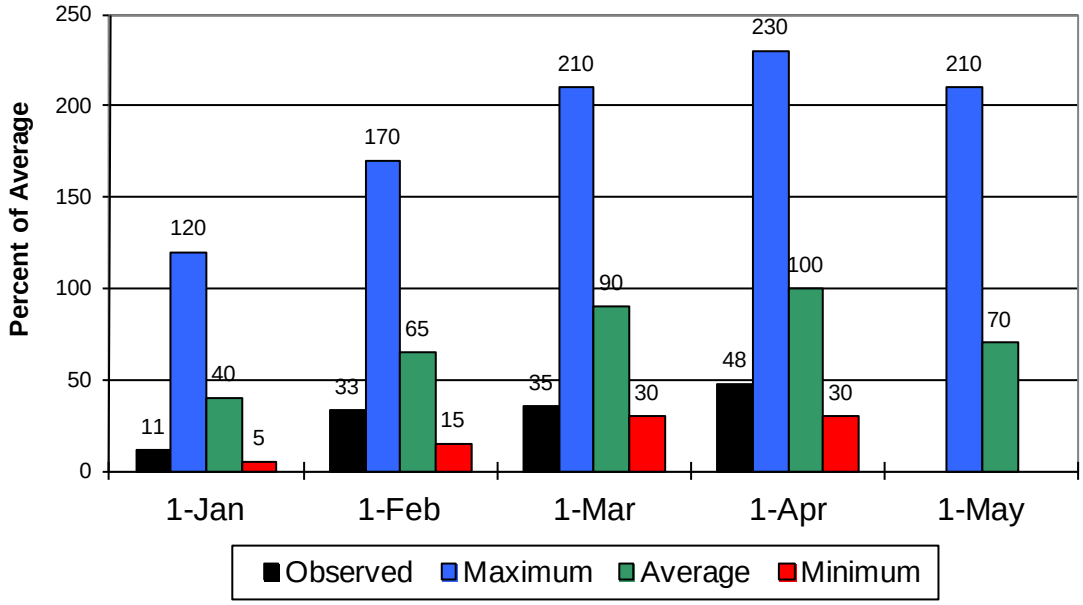
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

Tulare Lake Basin

Seasonal Precipitation
October 1 to Date



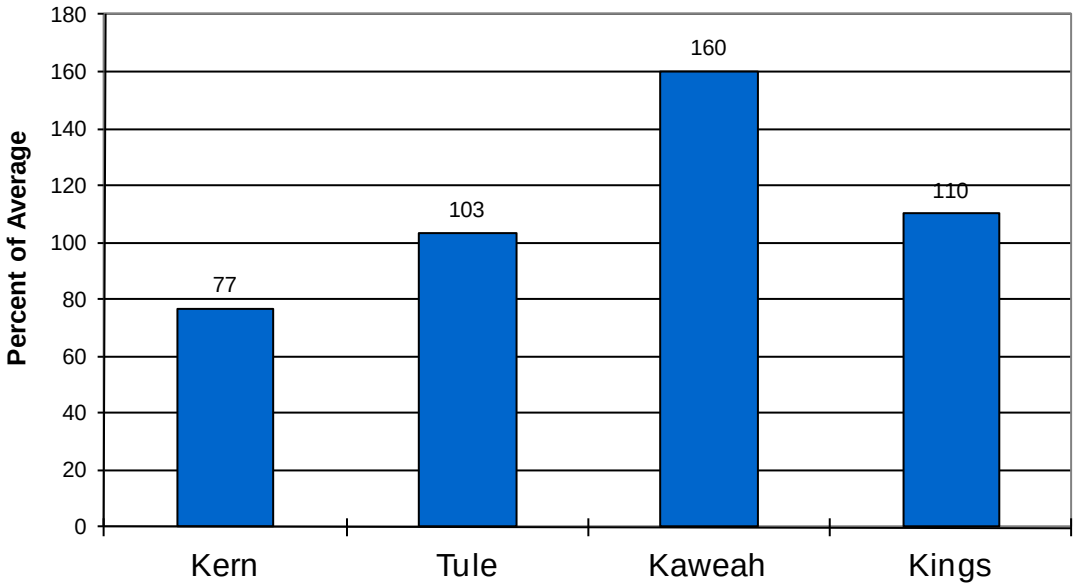
Seasonal Basin Snowpack
Water Content in % of April 1 Average



Tulare Lake Basin

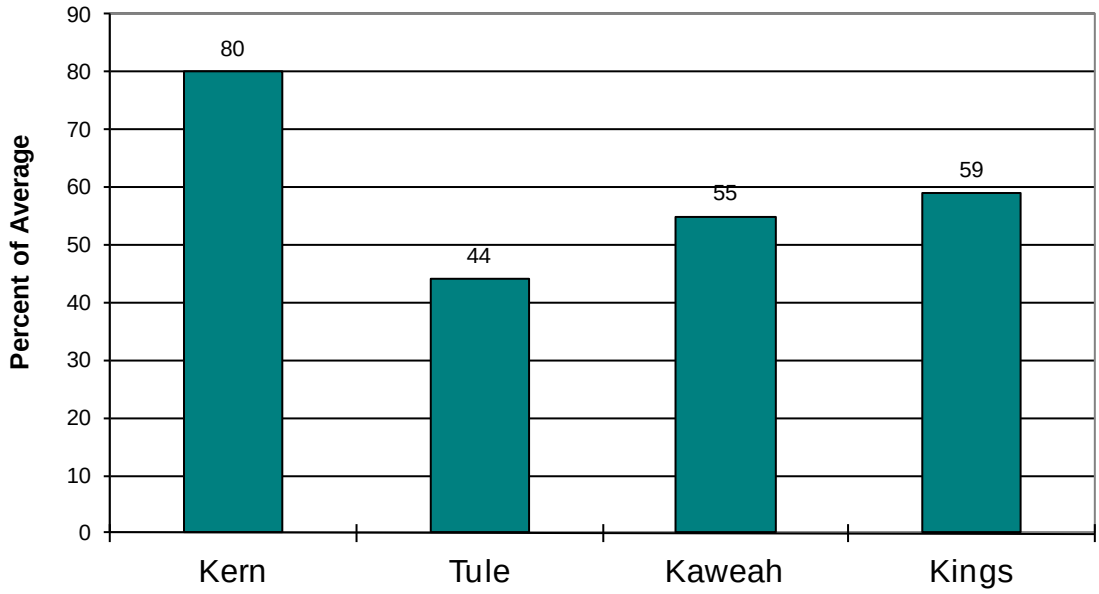
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

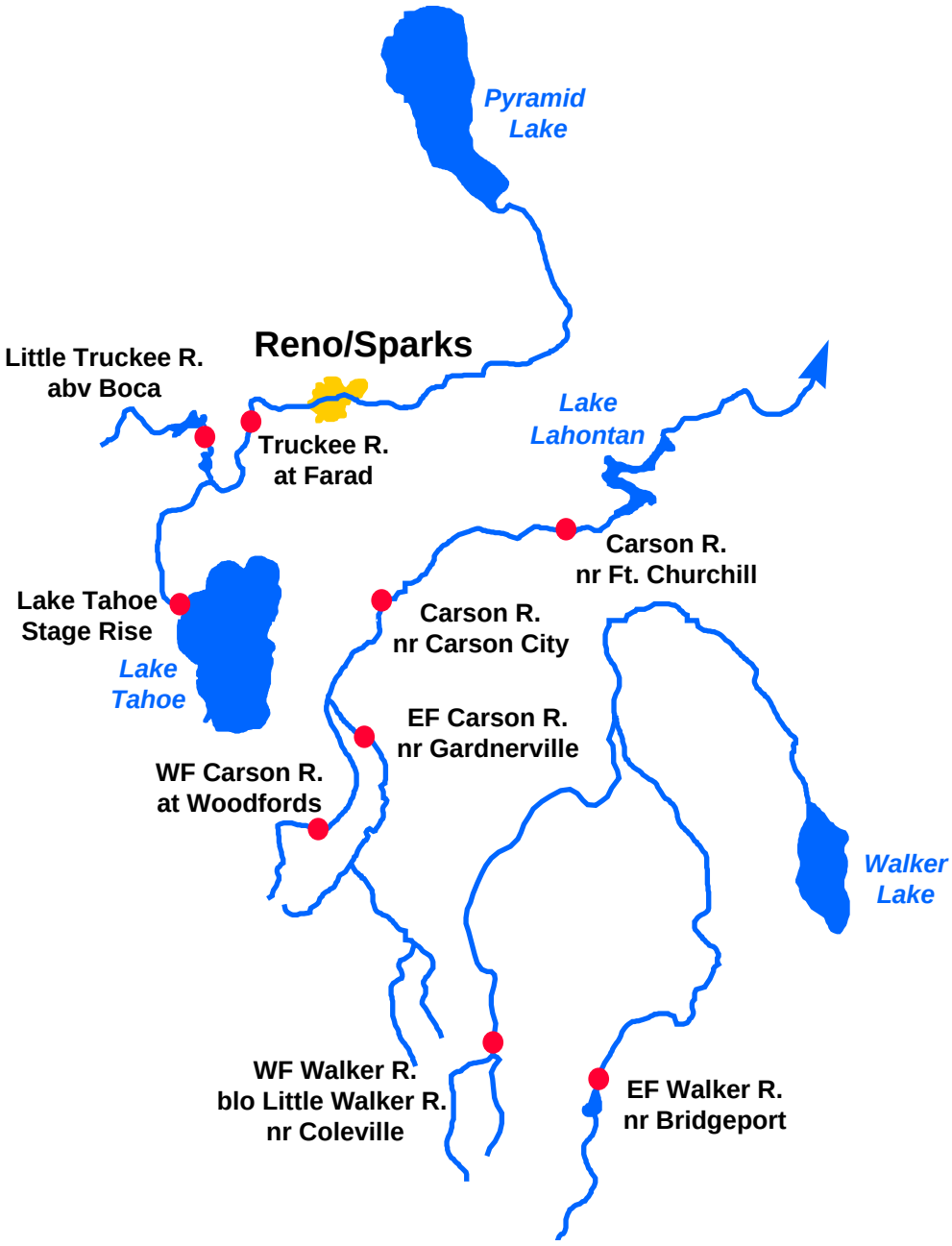


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



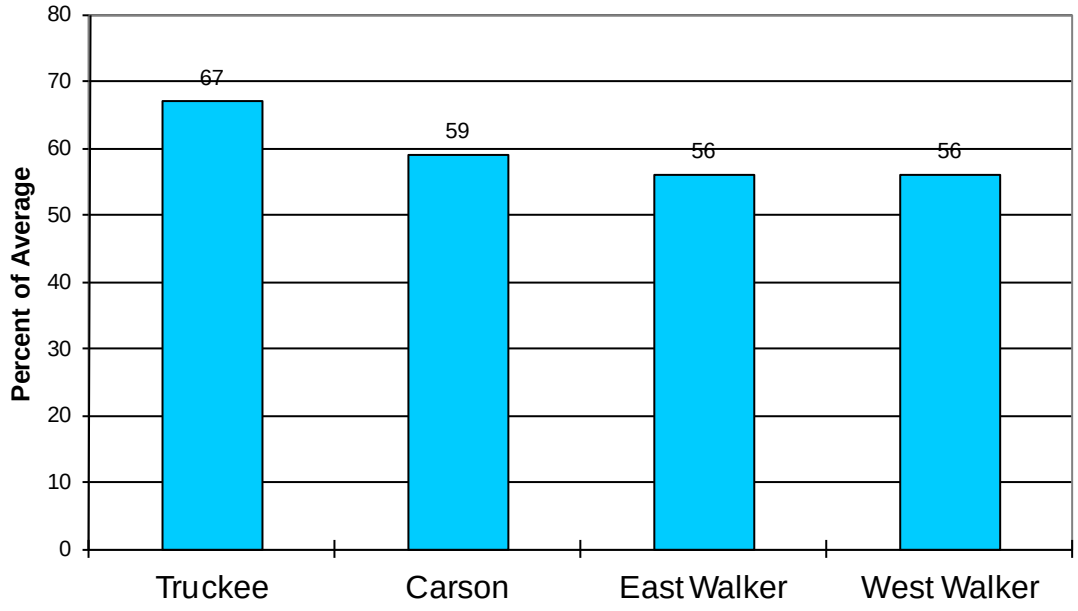
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

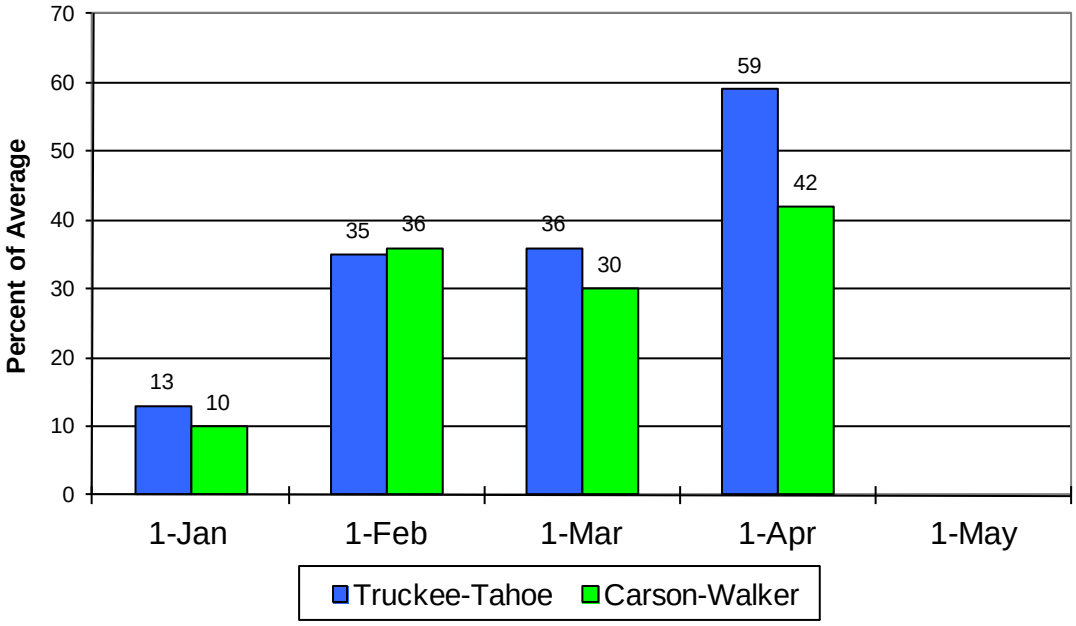
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Truckee River						
Truckee River						
Lake Tahoe Stage Rise	Apr-High	0.60	43	1.18	0.04	1.38
Little Truckee River						
Stampede Dam	Apr-Jul	42	52	118	2.4	80
Truckee River						
Farad	Apr-Jul	118	45	230	4.7	260
Carson River						
Eest Fork Carson River						
Gardnerville, nr	Apr-Jul	83	44	132	34	189
West Fork Carson River						
Woodfords	Apr-Jul	25	45	42	8.1	56
Carson River						
Carson City, nr	Apr-Jul	46	24	73	27	188
Fort Churchill, nr	Apr-Jul	40	22	74	18.4	178
Walker River						
East Walker River						
Bridgeport, nr	Apr-Aug	27	40	65	9.0	67
West Walker River						
Ltl Walker, blo, Coleville, nr	Apr-Jul	66	42	107	25	156

East Side Sierra Nevada Basins

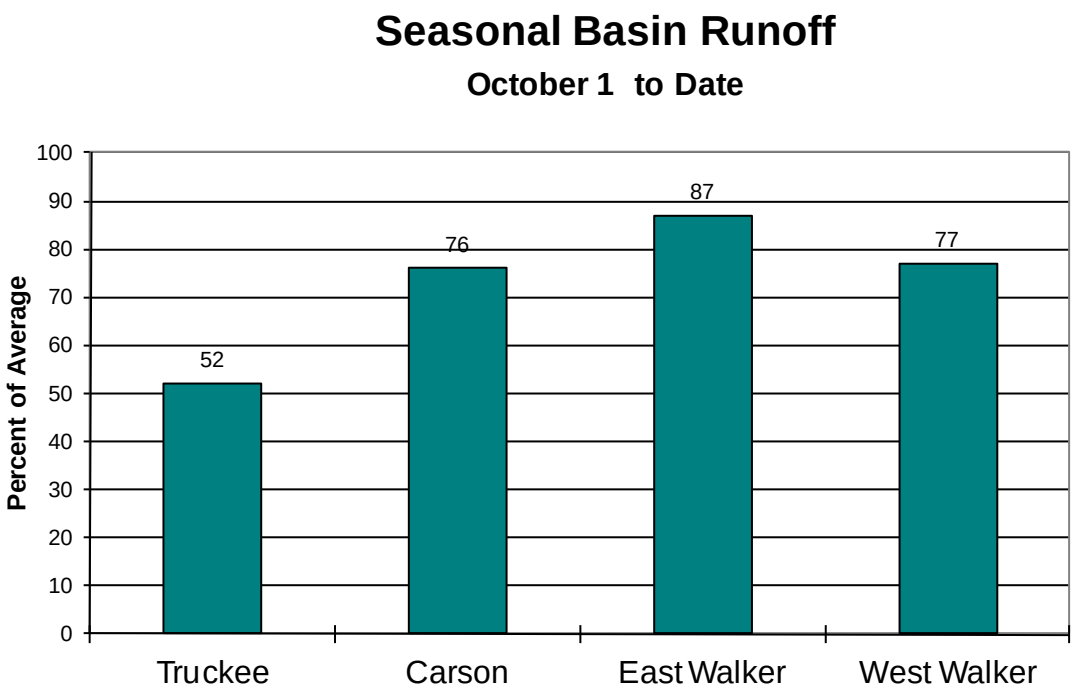
Seasonal Basin Precipitation
October 1 to Date



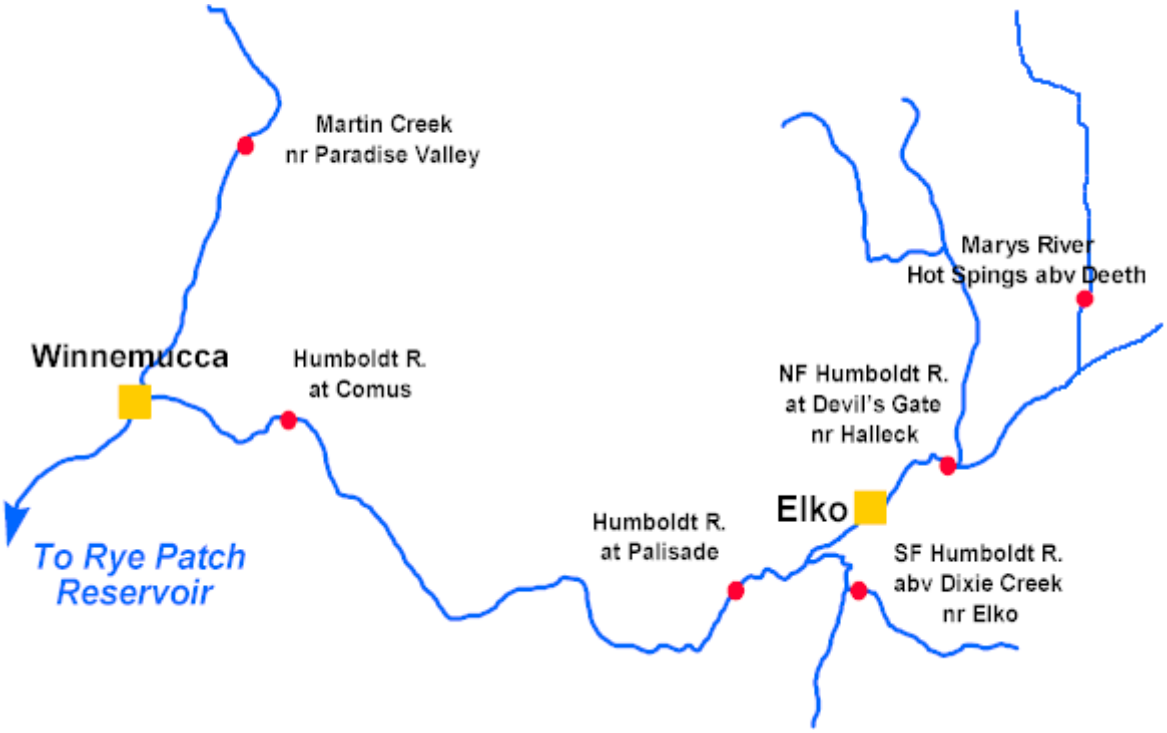
Basin Snowpack
% of Average SWE to Date



East Side Sierra Nevada Basins



Humboldt River Basin



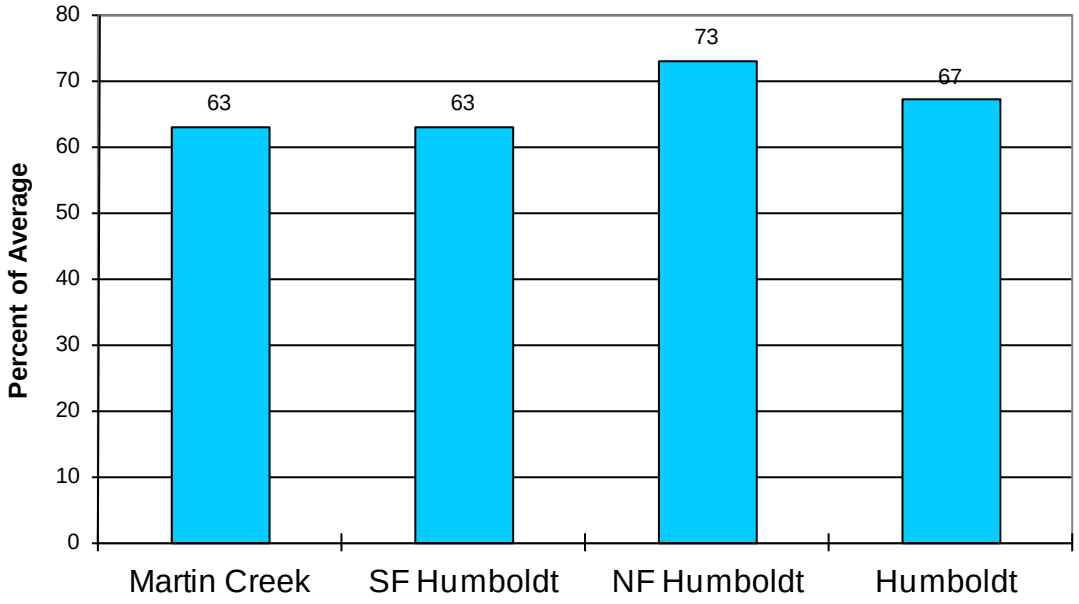
Water Supply Forecasts

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
North Fork Humboldt River						
Devils Gate, at, Halleck, nr	Apr-Jul	11.0	32	25	0.68	34*
South Fork Humboldt River						
Dixie Creek, abv, Elko, nr	Apr-Jul	26	34	66	2.3	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	17.0	44	33	4.0	39
Humboldt River						
Elko, nr	Apr-Jul	45	29	113	4.6	154
Palisade	Apr-Jul	75	30	175	7.5	250
Comus	Apr-Jul	50	22	166	2.2	225
Imlay, nr	Apr-Jul	22	12	162	1.88	188
Martin Creek						
Paradise Valley, nr	Apr-Jul	5.8	31	18.2	0.37	18.7

***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

Humboldt River Basin

Seasonal Basin Precipitation
October 1 to Date



Basin Snowpack
% of Average SWE to Date