Water Supply Outlook

California and Northern Nevada

March 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

March 01, 2012

California received some precipitation during February, but monthly percentages were much below average for the Sierra Nevada and there was only a modest accumulation to the mountain snowpack during the month. It is highly unlikely that snow packs can recover from the current deficit during the remainder of this wet season. Consequently, water supply forecasts have been revised downward since last month. All basins are expected to receive much below average spring runoff.

February percent of average precipitation was highest in the Upper Klamath Basin at 61 percent. Percentages then greatly diminish as one moves down the Sierra Nevada. Seasonal (October 31, 2011 to February 29, 2012) averages remain much below average for the region.

Basin	Feb % of Avg Pcpn	WY % of Avg Pcpn
Trinity	31	63
Upper Sacramento	35	48
Central Sierra	28	46
Southern Sierra	34	55
Walker	26	48
Carson	30	44
Truckee	42	49
Klamath	61	68

Manual snow measurements and readings from electronic snow sensors confirm that California's mountain snowpack holds far less water than normal for this time of year. According to the California Department of Water Resources Snow Surveys, the current conditions in the northern Sierra rank 4th driest in the 62 year record while the conditions in the Central Sierra are 3rd driest and the Southern Sierra 5th driest for the same period.

Basin	% of Avg Snowpack March 1, 2012	% of Avg Snowpack March 1, 2011
Upr Sac/Nrn Sierra	27	120
San Joaquin Valley	27	133
Tulare Lake	34	145
Tahoe-Truckee	36	131
Carson-Walker	30	124
Humboldt	45	105
Upper Klamath	67	90

Only a few large storm systems arrived during February. They were cold in nature, increasing snow levels but contributing little to runoff:

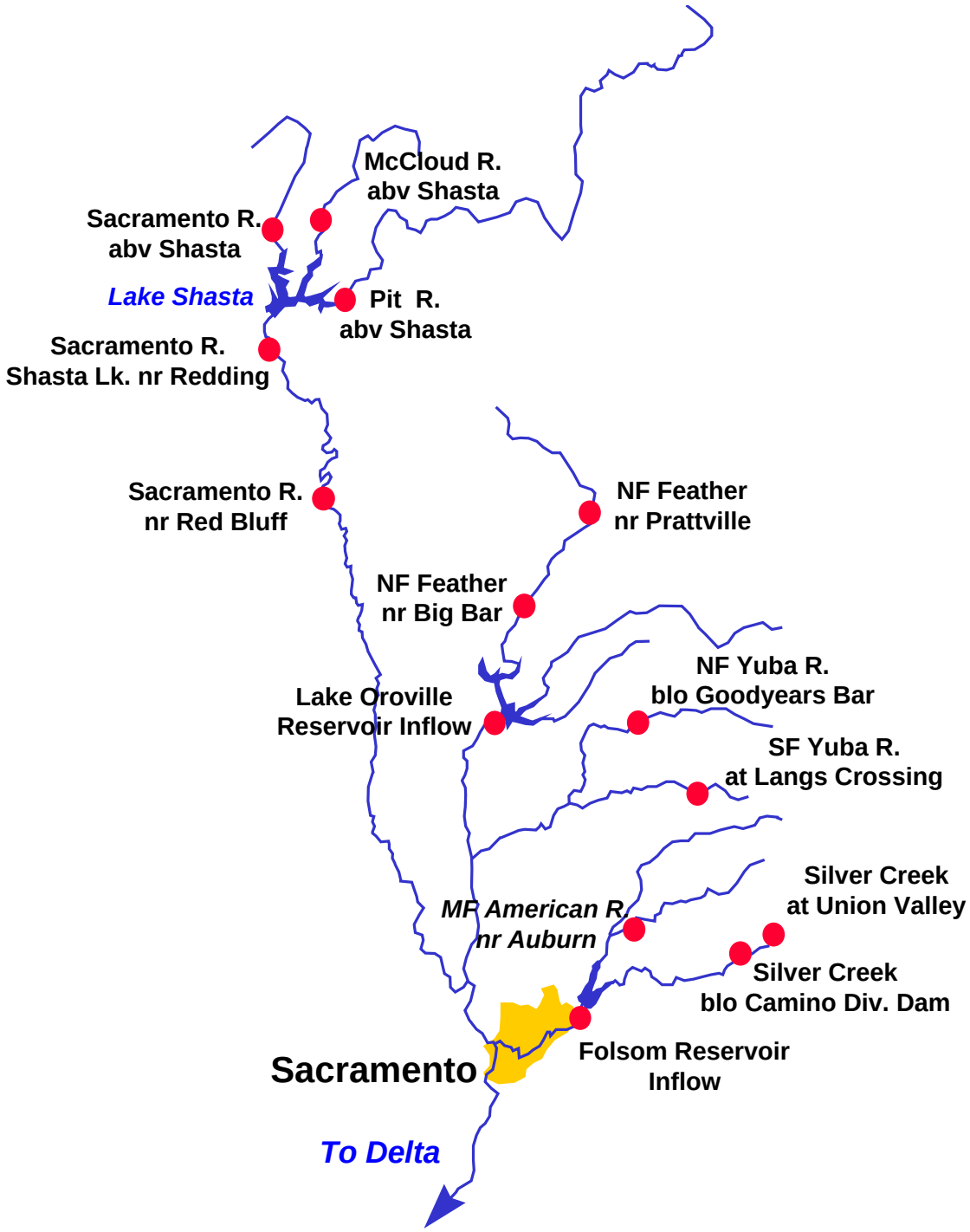
Basin	Feb % of Avg Runoff	WY % of Avg Runoff
Trinity-Sacramento	26	35
San Joaquin	22	35
Tulare Lake	37	69
East Side Sierra	46	74
Humboldt	49	68
Upper Klamath	49	60

Storage in California's major reservoirs continues to be a bright spot in what may turn to be a dismal water year. Shasta Lake and Lake Oroville stand at 96 and 99 percent of average, respectively. Stored water in the Sacramento region as of February 29 was at 98 percent of average for the date, the San Joaquin at 115, and the Tulare Lake at about 105 percent. East-side Sierra reservoirs were at 133 percent of average. The lake level at Lake Tahoe stood at

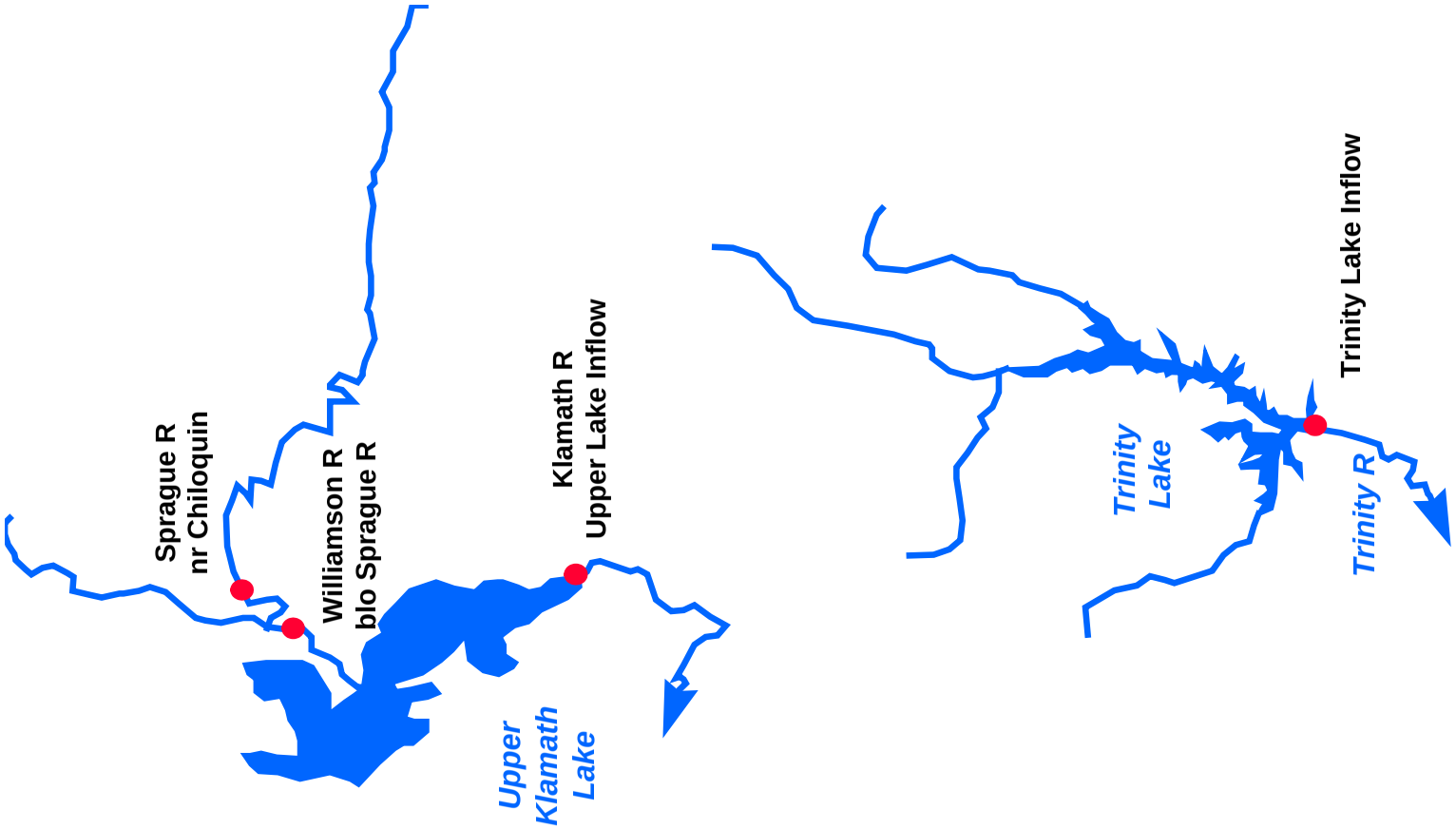
6226.81 feet (or 3.81 feet above its natural rim altitude of 6223.0 feet) as of February 29. Usable storage was 463,600 acre-feet or 121 percent of average. It was 223,500 acre-feet (58 percent of average) at about this time last year. Storage at Lahontan Reservoir in Nevada stands at 107 percent of average as of February 29 while Rye Patch Reservoir is at 136 percent. Storage at Upper Klamath Lake is about 96 percent of average.

April through July runoff forecasts vary from 32 to 68 percent of average (1971-2000) for Upper Sacramento/west slope Sierra Nevada basins. They range from 18 to 39 percent for the east side Sierra Nevada watersheds and 17 to 34 percent for forecast points on the main stem Humboldt River. The April through September forecast for the Upper Klamath Lake inflow is 46 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	190	49	280	101	385
Sprague River						
Chiloquin, nr	Apr-Sep	105	46	176	34	230
Upper Klamath Falls River						
Inflow	Apr-Sep	235	46	385	86	515
Lost River						
Gerber Reservoir Inflow	Mar-Jul	16.0	43	38	1.10	37
Clear Lake Reservoir Inflow	Mar-Jul	34	42	89	2.4	80
Scott River						
Fort Jones, nr	Apr-Jul	90	50	185	40	181
Trinity R River						
Trinity Lake	Apr-Jul	340	54	600	210	635

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

Probability	Oct-Jan	Mar	Apr	May	Jun	Jul	Aug	Sep	Apr-Jul	Water Yr
90%	179	60	100	75	25	10	4	3	210	456
50%	179	110	160	125	35	20	12	7	340	648
10%	179	160	200	250	110	40	15	10	600	964

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 Creek, nr	Apr-Jul	590	63	880	510	940
Mccloud River						
Shasta Lake, abv	Apr-Jul	250	68	370	185	370
Sacramento River						
Delta	Apr-Jul	155	53	340	85	290
Shasta Dam	Apr-Jul	1100	61	1900	825	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	1350	55	2700	960	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	150	45	300	110	333*
Big Bar	Apr-Jul	350	36	800	220	962*
Feather River						
Oroville Dam	Apr-Jul	570	32	1580	350	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	105	38	260	50	273*
South Yuba River						
Langs Crossing	Apr-Jul	85	38	200	55	225*
Yuba River						
Englebright Reservoir	Apr-Jul	375	38	960	190	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
Middle Fork American River						
Auburn, nr	Apr-Jul	210	43	460	105	490*
Silver Creek						
Union Valley	Apr-Jul	45	46	80	20	98*
Camino Dam, blo	Apr-Jul	70	44	140	35	158*
American River						
Folsom Reservoir	Apr-Jul	510	41	1180	240	1230

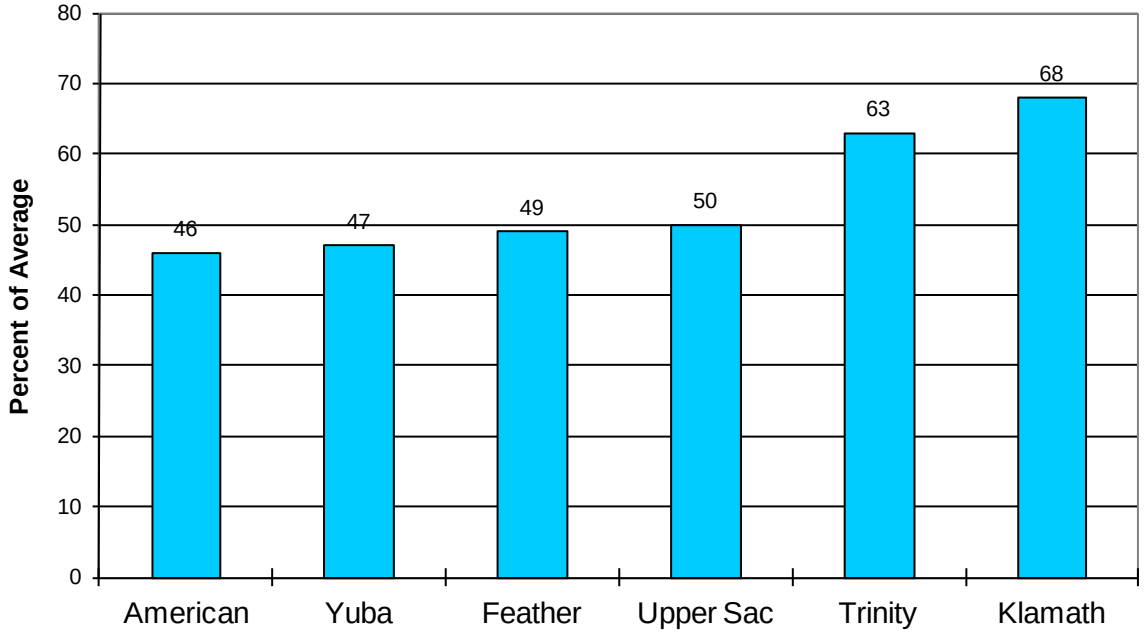
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

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

Sacramento/Trinity/Klamath River Basins

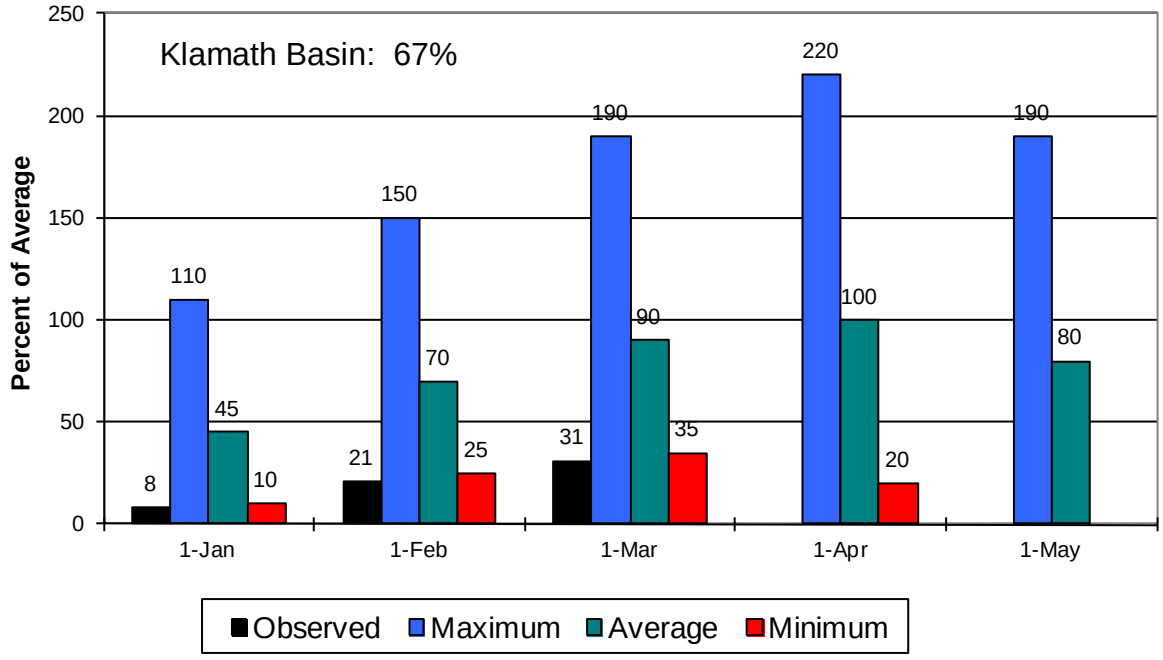
Seasonal Basin Precipitation

October 1 to Date



Seasonal Basin Snowpack

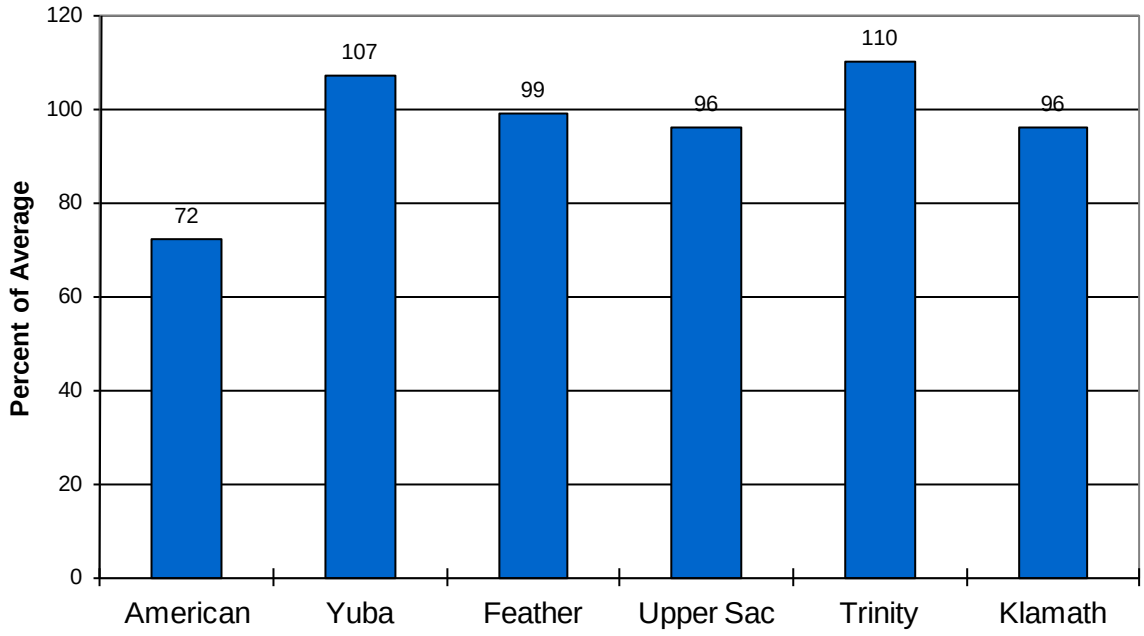
Water Content in % of April 1 Average



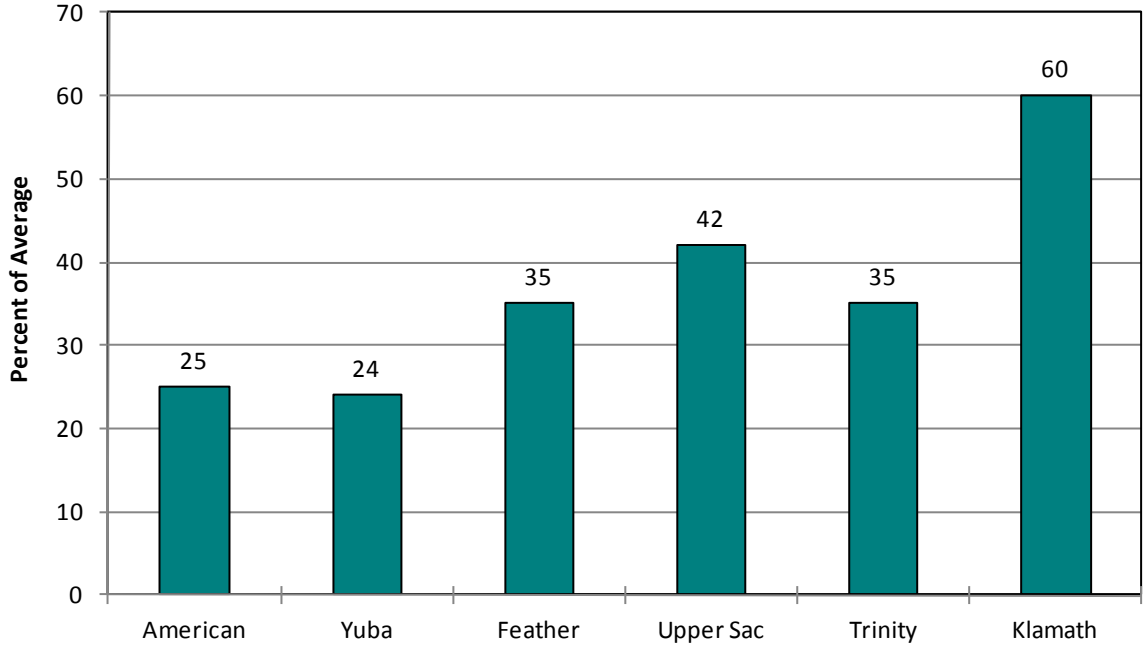
Sacramento/Trinity/Klamath River Basins

Basin Reservoir Storage

Contents of Major Reservoirs in % of Average



Seasonal Basin Runoff
October 1 to Date



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, n	Apr-Jul	80	42	160	60	192*
San Joaquin River						
Millerton Lake	Apr-Jul	500	39	1000	300	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	170	47	310	100	360*
Merced Falls, blo	Apr-Jul	225	35	520	140	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	270	45	490	160	596*
La Grange, nr	Apr-Jul	480	39	1000	330	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	120	38	260	80	320*
Stanislaus River						
New Melones Dam	Apr-Jul	250	36	550	150	695
North Fork Mokelumne River						
West Point	Apr-Jul	140	34	340	80	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	160	35	360	105	460
Cosumnes River						
Michigan Bar	Apr-Jul	40	33	115	9.0	123

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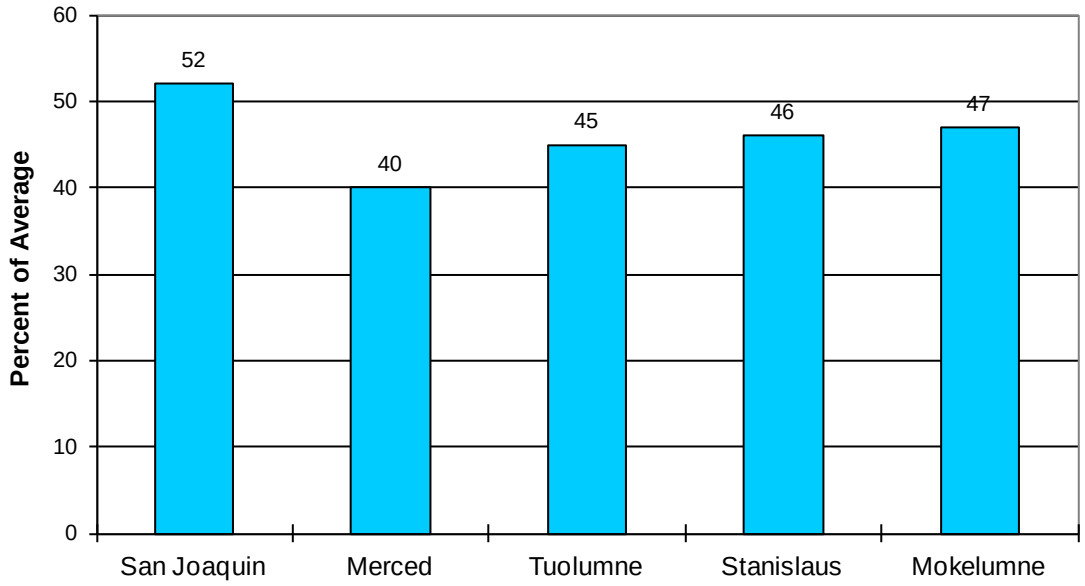
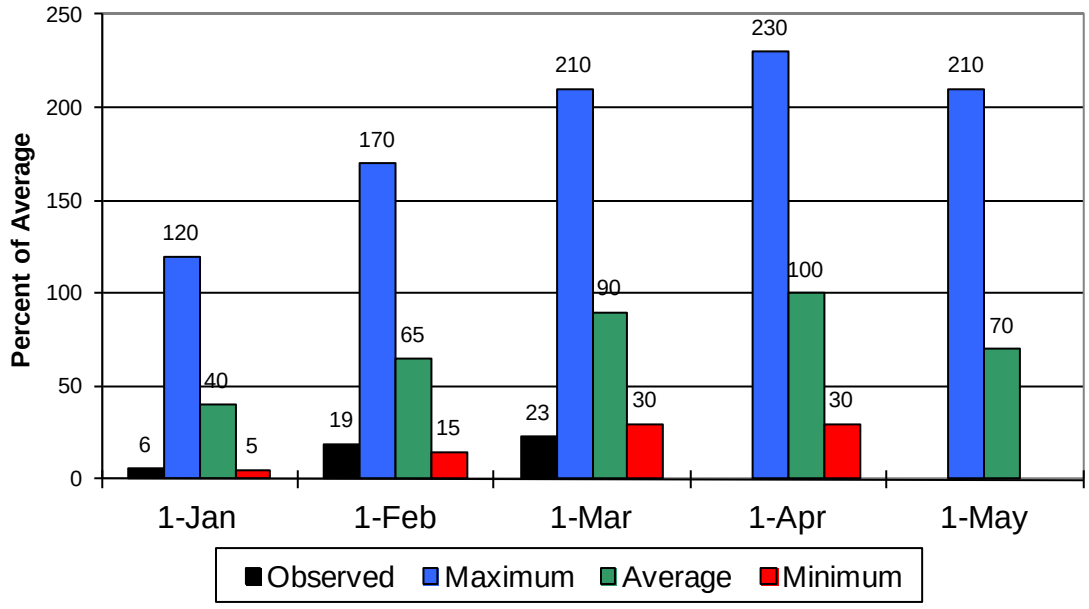
San Joaquin Basin

Seasonal Basin Precipitation
October 1 to Date

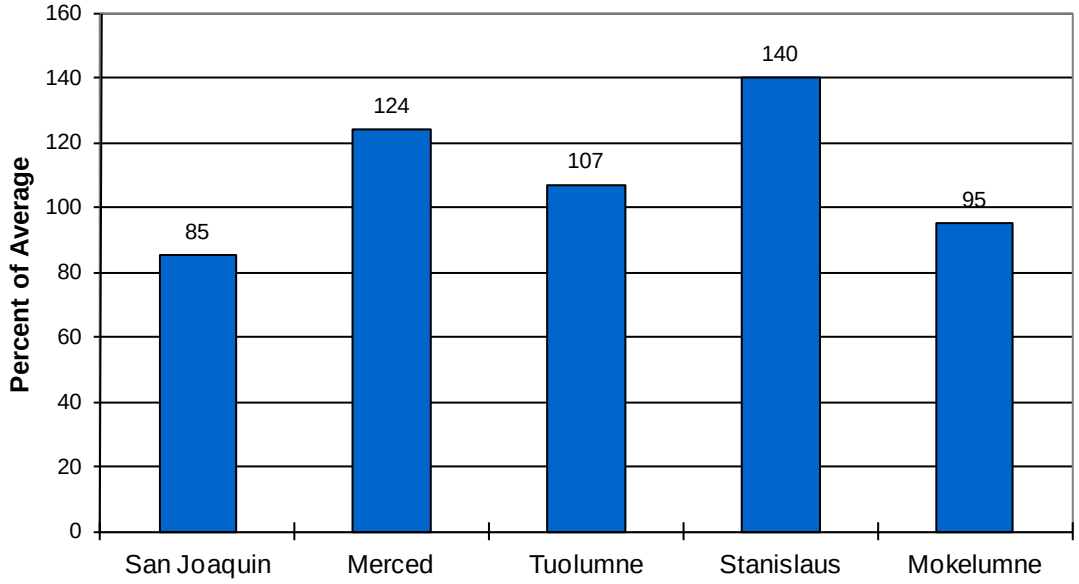


Seasonal Basin Snowpack
Water Content in % of April 1 Average

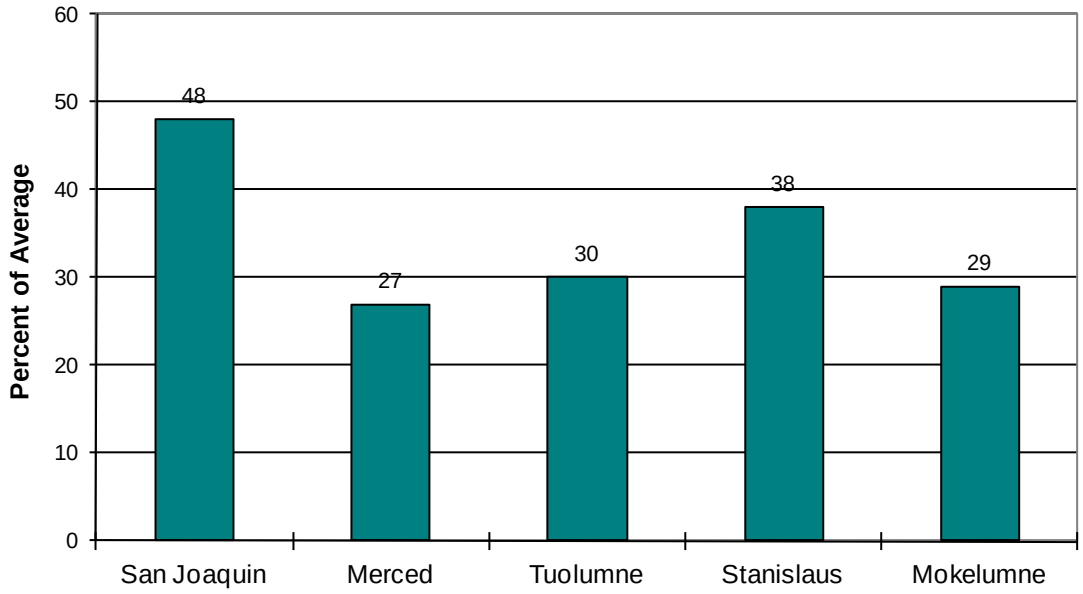


San Joaquin Basin

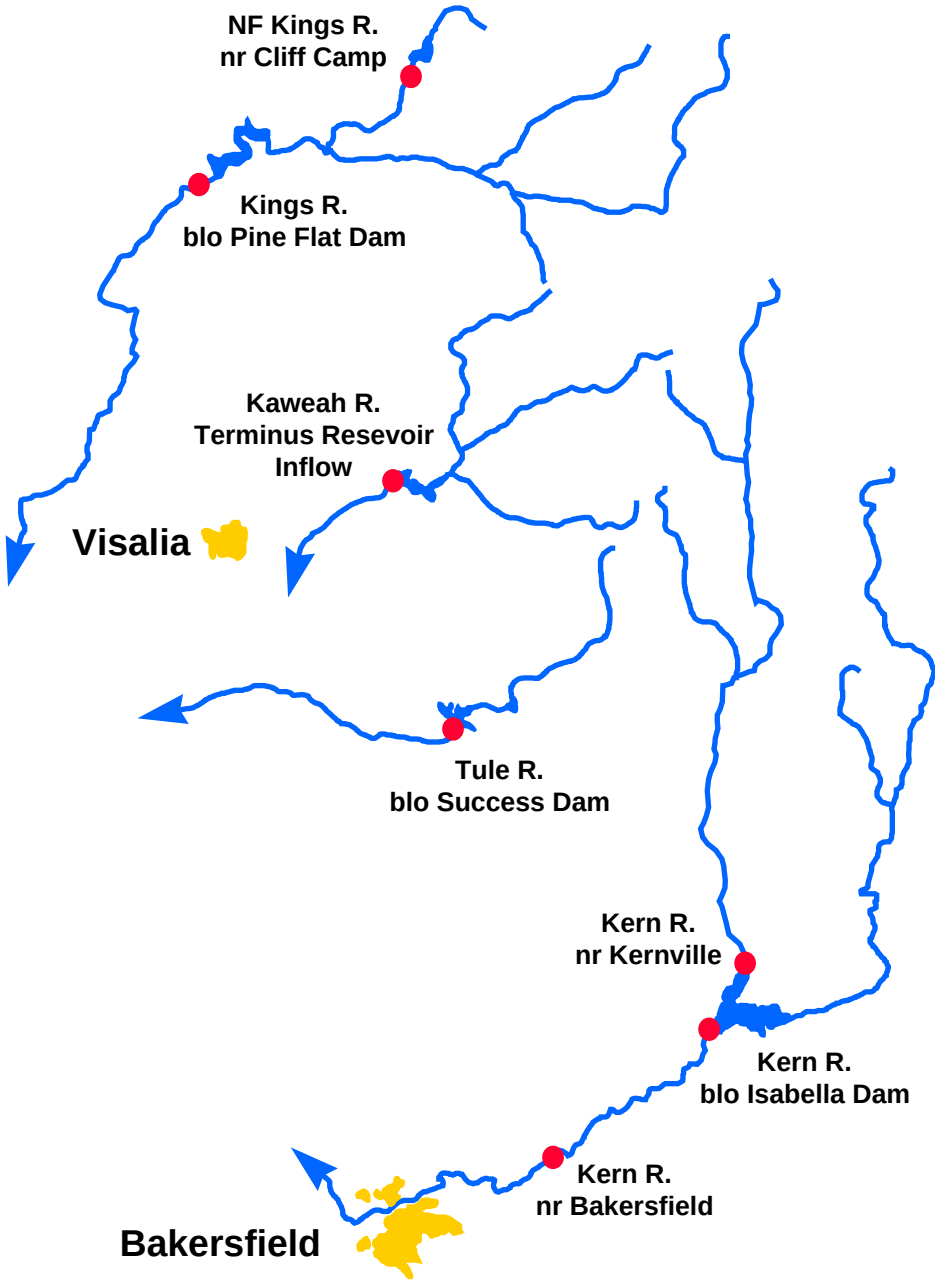
Basin Reservoir Storage
Contents of Major Reservoirs in % of Average



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	155	39	320	90	398*
Isabella Dam, blo	Apr-Jul	180	38	390	100	480
Bakersfield, nr	Apr-Jul	185	38	400	110	490
Tule River						
Success Dam	Apr-Jul	22	33	55	15.0	66
Kaweah River						
Terminus Dam	Apr-Jul	110	38	230	70	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	100	42	190	60	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	510	41	1010	300	1250

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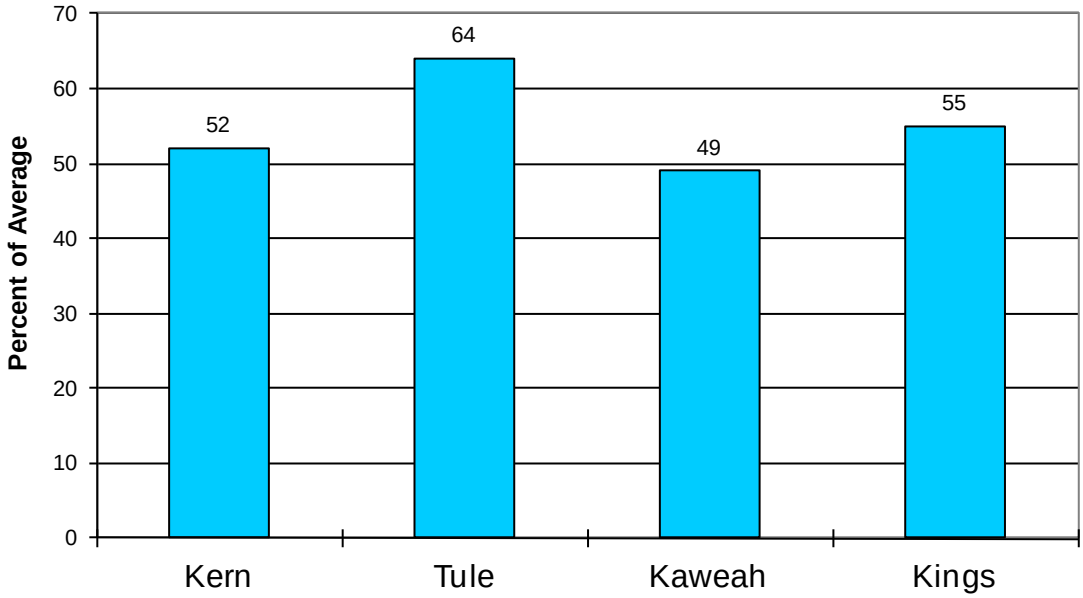
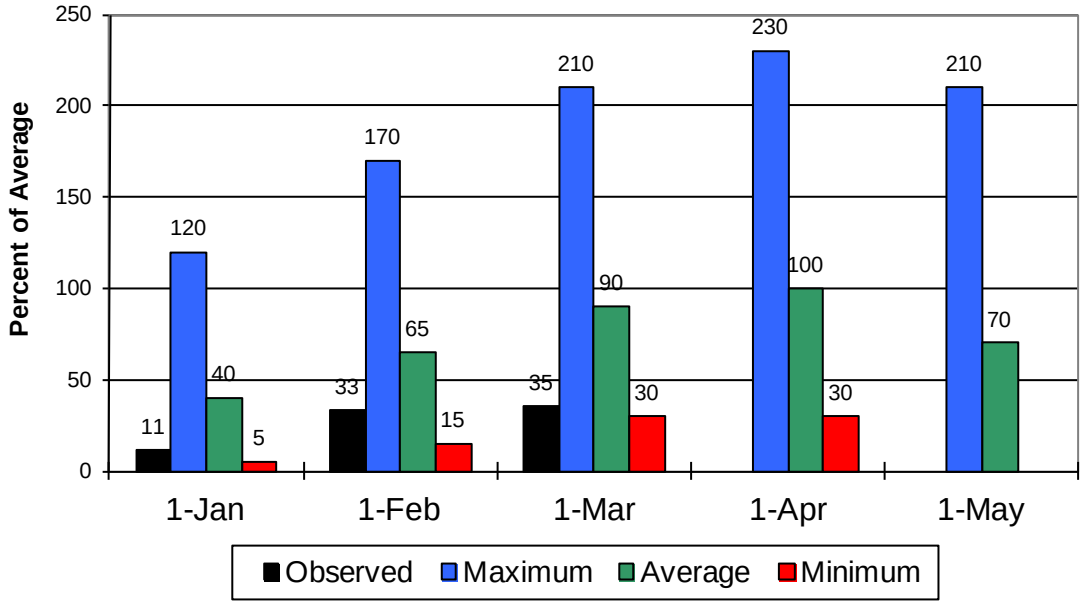
Tulare Lake Basin

Seasonal Precipitation
October 1 to Date



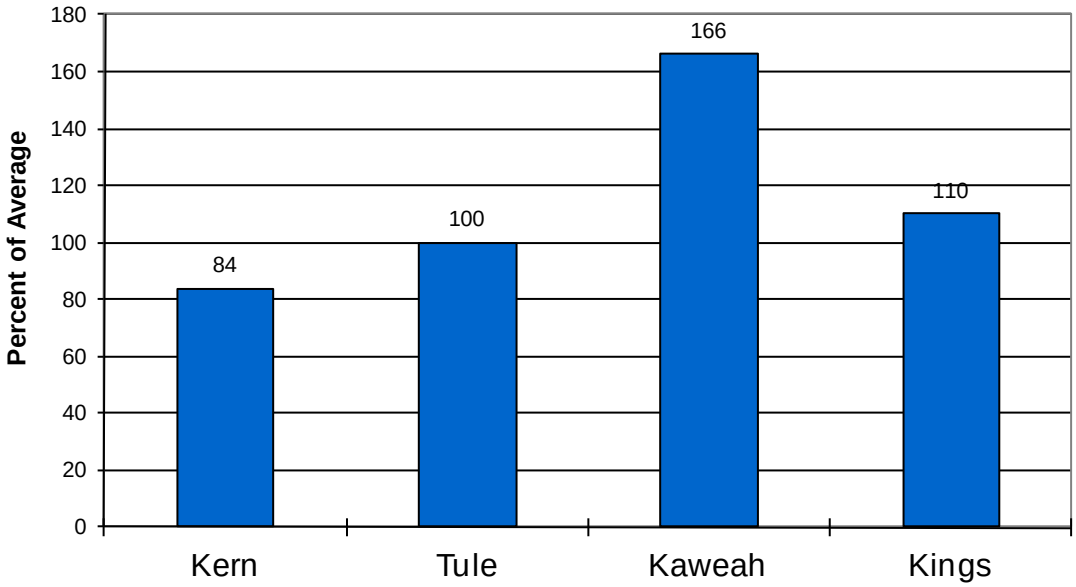
Seasonal Basin Snowpack
Water Content in % of April 1 Average



Tulare Lake Basin

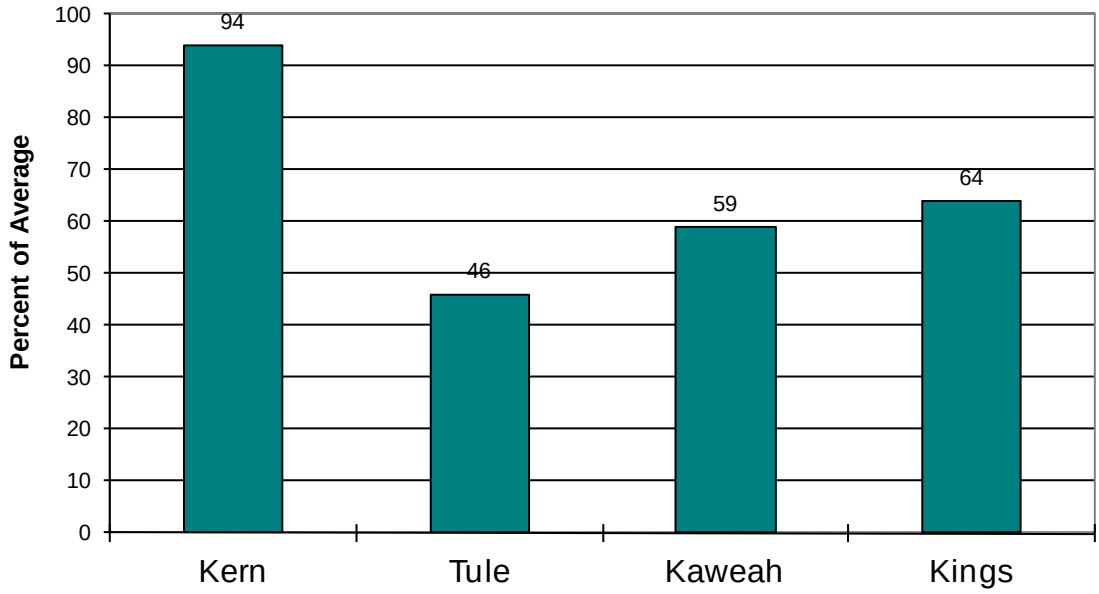
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

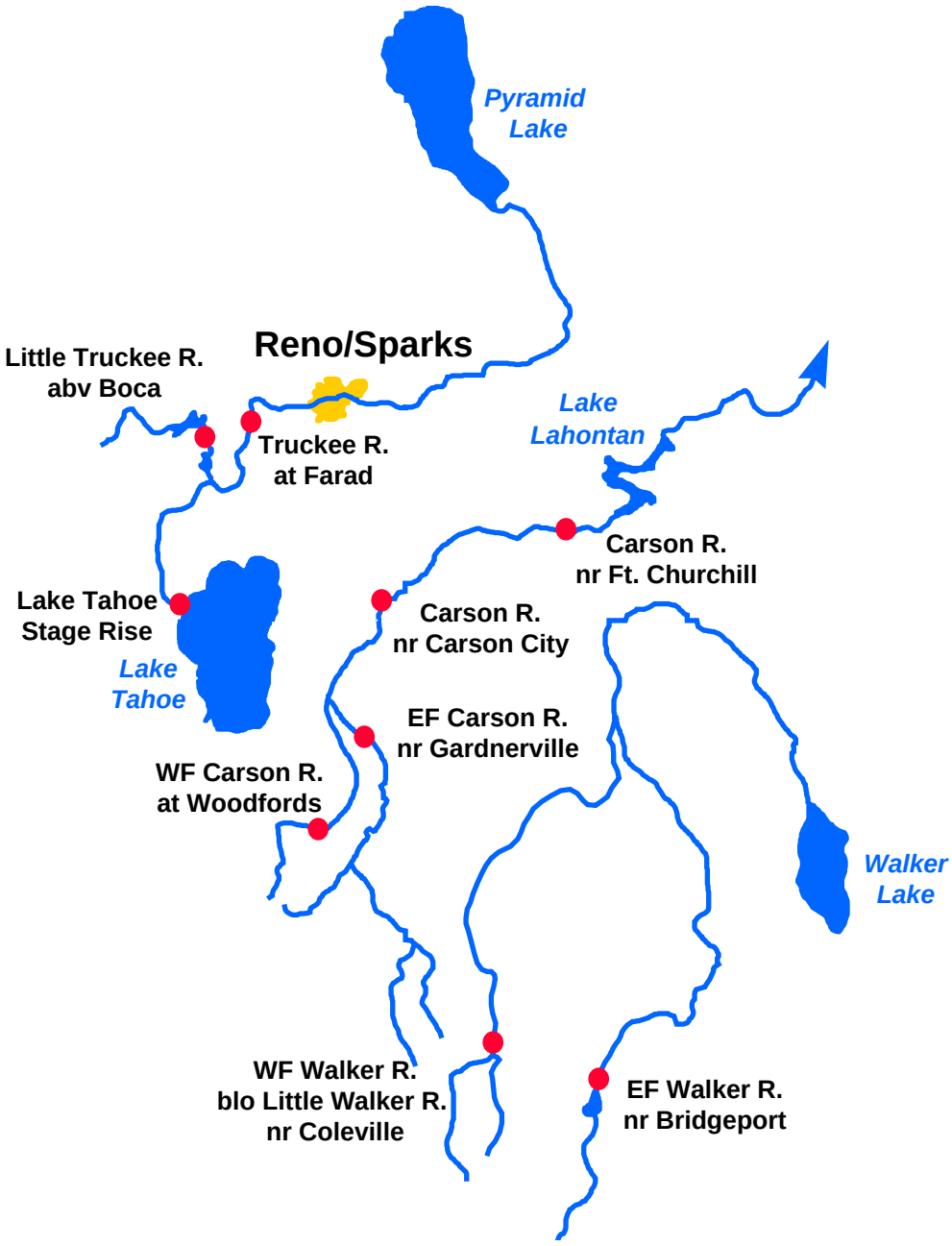


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



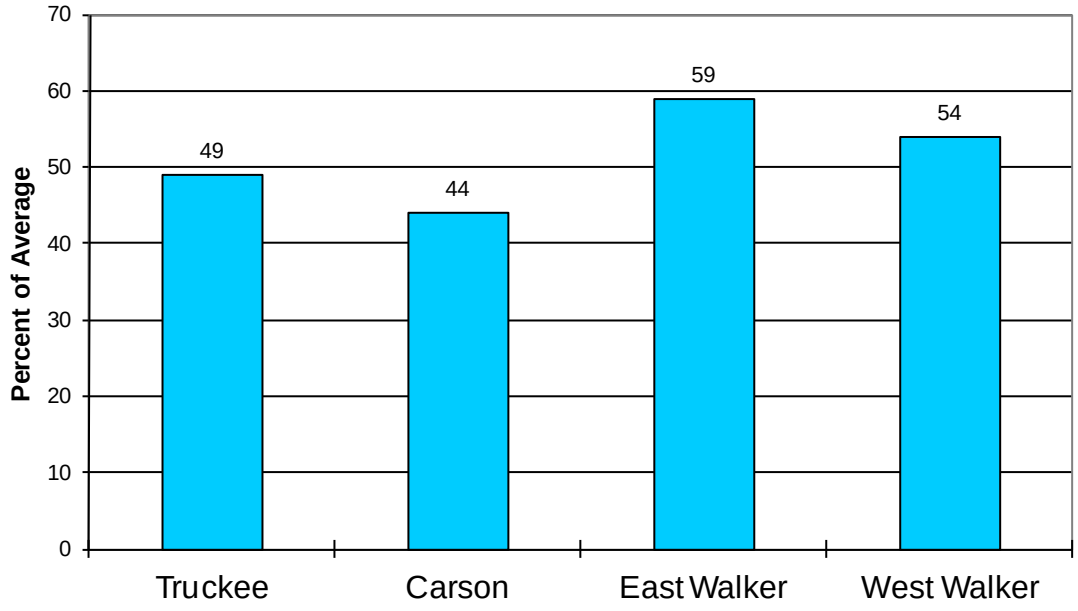
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

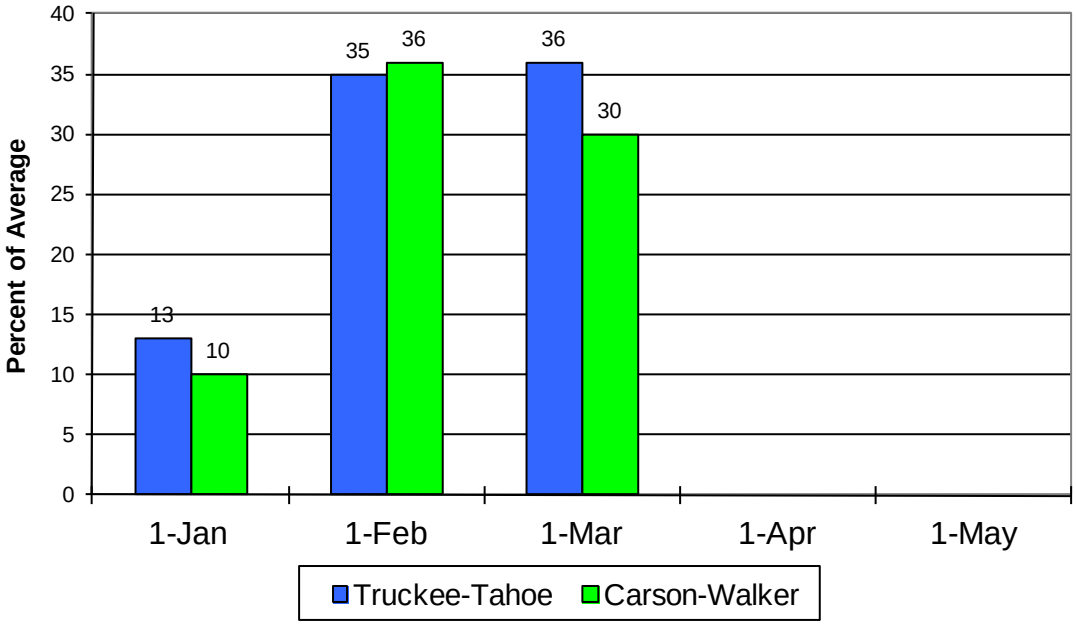
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Truckee River						
Truckee River						
Lake Tahoe Stage Rise	Apr-High	0.40	29	1.25	0.03	1.38
Little Truckee River						
Stampede Dam	Apr-Jul	31	39	110	0.80	80
Truckee River						
Farad	Apr-Jul	85	33	250	7.8	260
Carson River						
East Fork Carson River						
Gardnerville, nr	**Apr-Jul**	**70**	**37**	**164**	**5.7**	**189**
West Fork Carson River						
Woodfords	**Apr-Jul**	**21**	**38**	**48**	**1.12**	**56**
Carson River						
Carson City, nr	**Apr-Jul**	**40**	**21**	**115**	**3.7**	**188**
Fort Churchill, nr	**Apr-Jul**	**32**	**18**	**83**	**7.8**	**178**
Walker River						
East Walker River						
Bridgeport, nr	**Apr-Aug**	**22**	**33**	**59**	**0.67**	**67**
West Walker River						
Ltl Walker, blo, Coleville, nr	**Apr-Jul**	**59**	**38**	**119**	**3.1**	**156**

East Side Sierra Nevada Basins

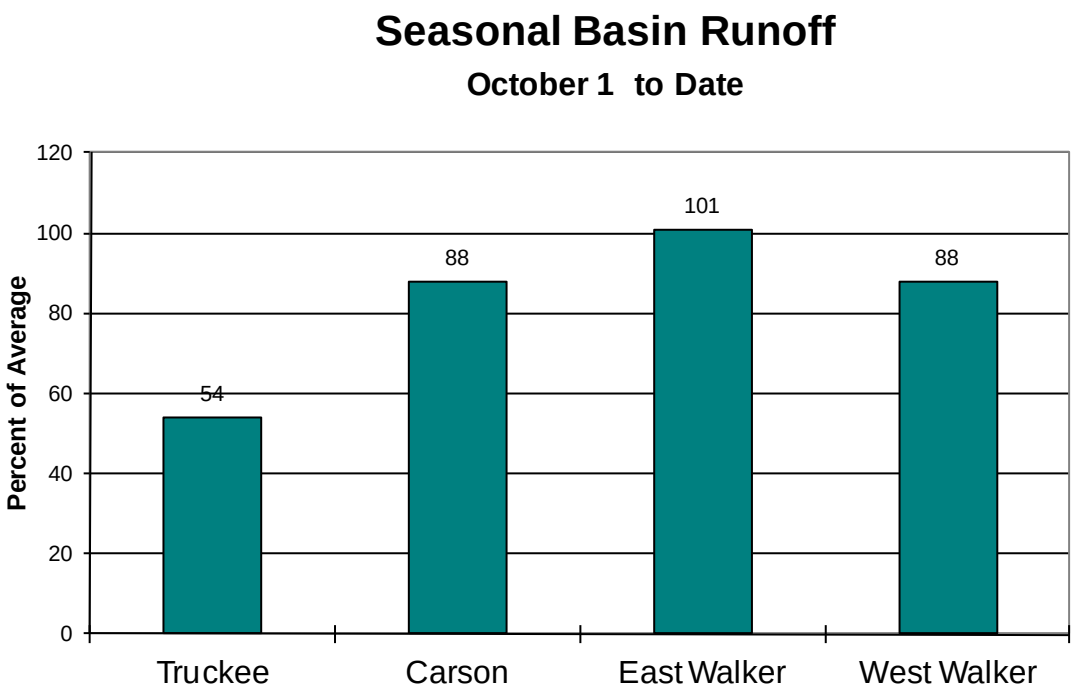
Seasonal Basin Precipitation
October 1 to Date



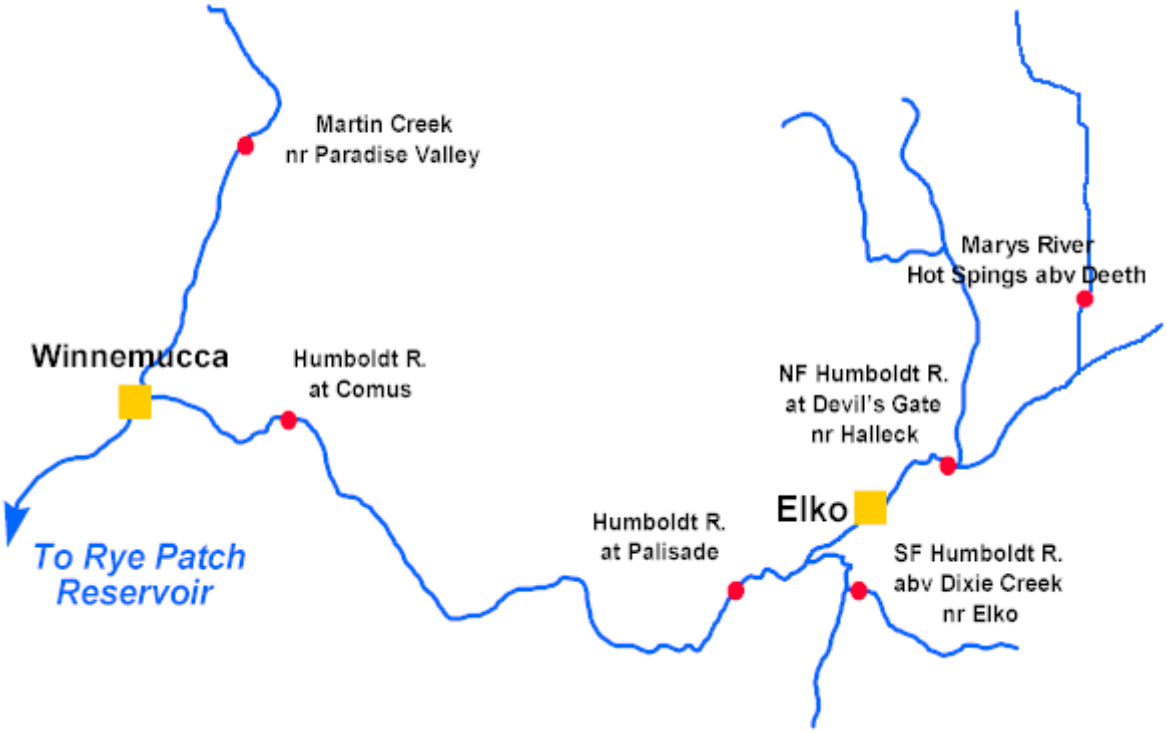
Basin Snowpack
% of Average SWE to Date



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	14.0	41	39	1.02	34*
South Fork Humboldt River						
Dixie Ck, abv, Elko, nr	Apr-Jul	30	39	77	2.3	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	17.0	44	34	4.0	39
Humboldt River						
Elko, nr	Apr-Jul	53	34	138	10.0	154
Palisade	Apr-Jul	85	34	190	7.5	250
Comus	Apr-Jul	55	24	174	6.8	225
Imlay, nr	Apr-Jul	32	17	175	1.00	188
Martin Creek						
Paradise Valley, nr	Apr-Jul	5.0	27	17.8	0.37	18.7

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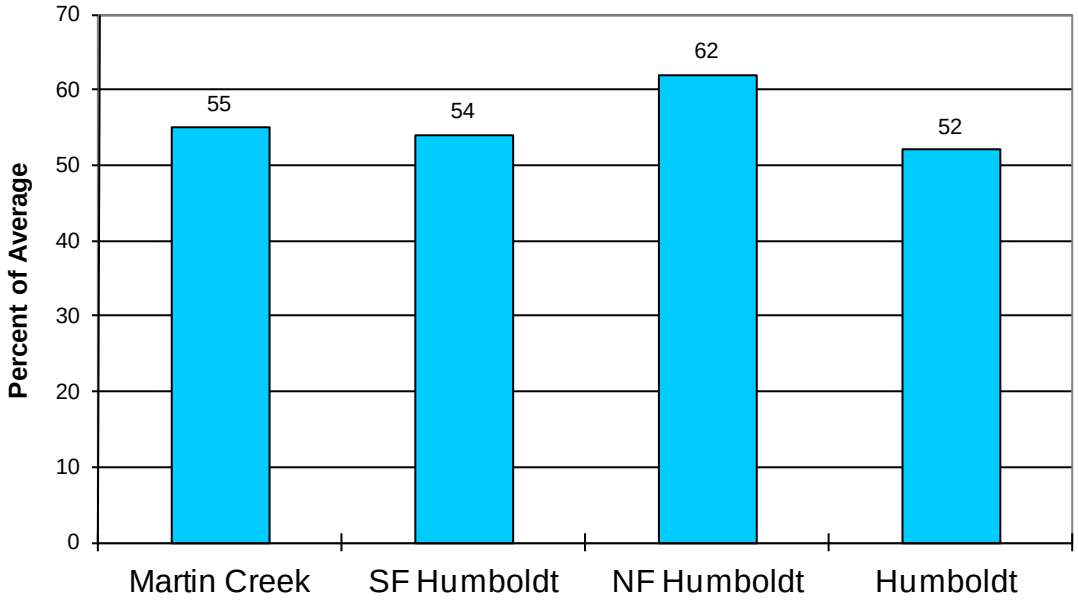
Humboldt River Basin

Seasonal Basin Precipitation
October 1 to Date



Basin Snowpack
% of Average SWE to Date