

WATER SUPPLY OUTLOOK



CALIFORNIA AND NORTHERN NEVADA

**MARCH
2009**



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

DEFINITIONS:

Acre-Foot: 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 1, 2009

NOTE: PER AGREEMENT WITH THE NRCS, PORTLAND, OR, FORECASTS FOR THE EASTSIDE SIERRA NEVADA BASINS ARE THROUGH MARCH 3 DUE TO SIGNIFICANT PRECIPITATION THAT FELL BETWEEN MARCH 1 AND MARCH 3.

Heavy precipitation finally fell over northern California during February, adding some relief to the drought situation in the region. Although snow basins from the Upper Sacramento to the San Joaquin also saw additional gains to water equivalent from a wet storm system that lasted from March 1 through March 4, snow packs still remain below average. Storage continues to be below average for many of the region's major reservoirs and spring runoff is forecast to be below average. There is still a need for improvement to the water supply picture with less than a month left in the wet season.

The storm event during the last week of February favored northern California watersheds and improved the snow pack conditions in the Trinity and Upper Sacramento River basins. Average to above average February precipitation also fell from the Mokelumne basin to the Kern. Monthly precipitation varies from 55 percent for the Trinity to 135 percent for the Upper Sacramento basin. There was some improvement to seasonal precipitation amounts (October 1 to February 28) to snow basins in California and western Nevada but totals still remain below average. The Upper Sacramento River basin now stands at 81 percent of seasonal average. It was only 57 percent of average last month. Seasonal averages range from 60 percent for the Trinity to 100 percent for the Kern River basin. Seasonal averages for the east side Sierra Nevada vary from 76 percent for the Truckee to 83 percent for the Walker River basin. Seasonal averages are about 105 percent for the upper Humboldt and 81 percent for the lower Humboldt basin. It is about 77 percent for the Upper Klamath Lake basin.

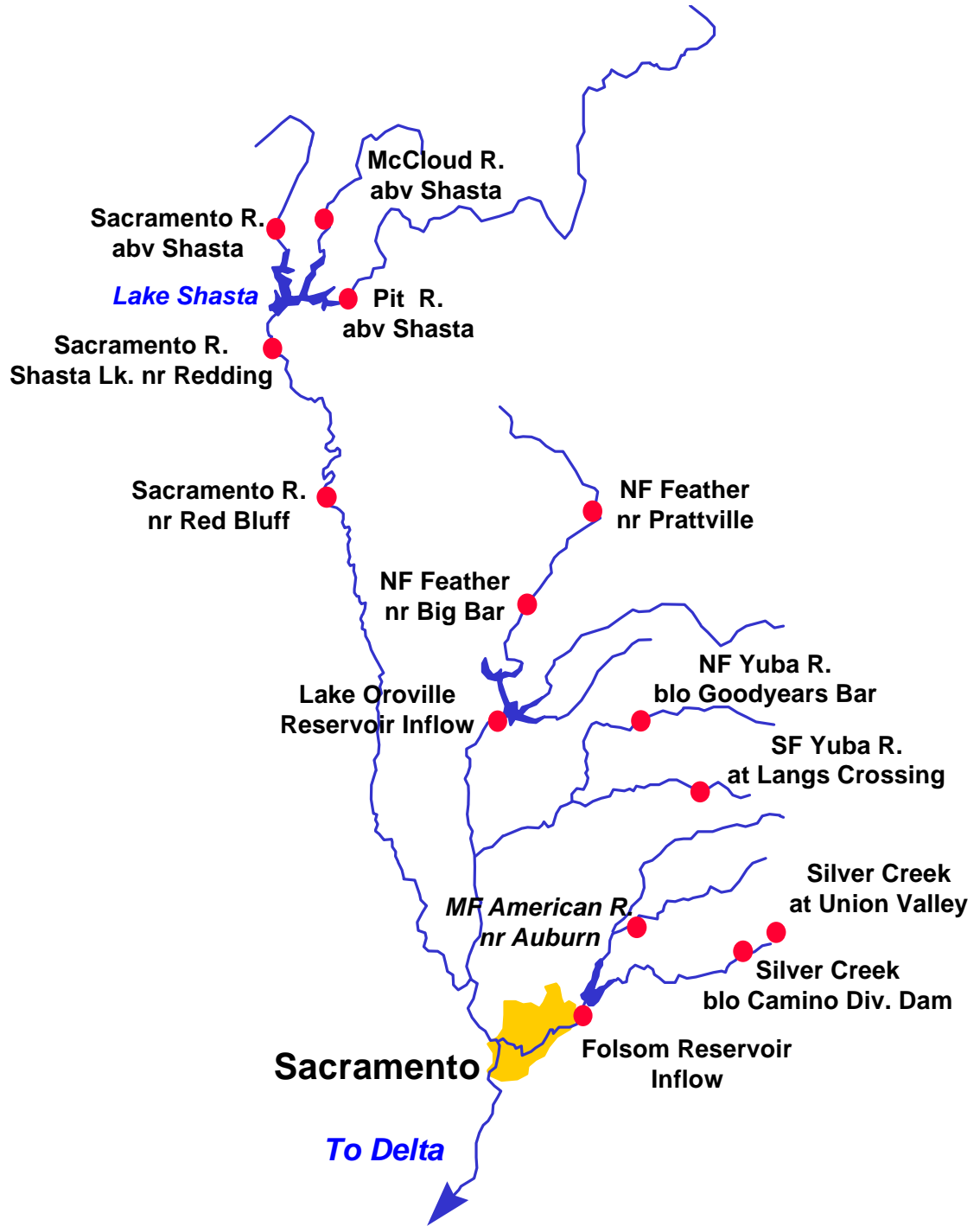
There was substantial accumulation to the mountain snowpack during the last week of February and the first four days of March. The following figures are as of March 1st: The April 1st average water content stands at about 69 percent for the Shasta-northern Sierra, 77 percent for the San Joaquin and 79 percent for the Tulare Lake basin as of March 1st. Snowpacks in the Tahoe-Truckee basins are about 68 percent of the average-to-date; the Carson-Walker, 73 percent and the Humboldt basin, 77 percent. The pack stands at about 83 percent of the average-to-date for the Upper Klamath Lake basin. Although the subtropical nature of some of the storms led to some loss of the lower elevation snow pack, much of it remains, especially in the upper Sacramento and northern Sierra Nevada.

Runoff from the late February and early March storm systems resulted in significant runoff in the Trinity, Upper Sacramento and northern Sierra Nevada watersheds. The Trinity-Upper Sacramento received 72 percent of the monthly average; the San Joaquin, 64 percent and the Tulare Lake region, 59 percent. East side Sierra basins received 53 percent of a February average while the Humboldt River at Palisade recorded 46 percent. The Upper Klamath Lake basin received 56 percent of a February average.

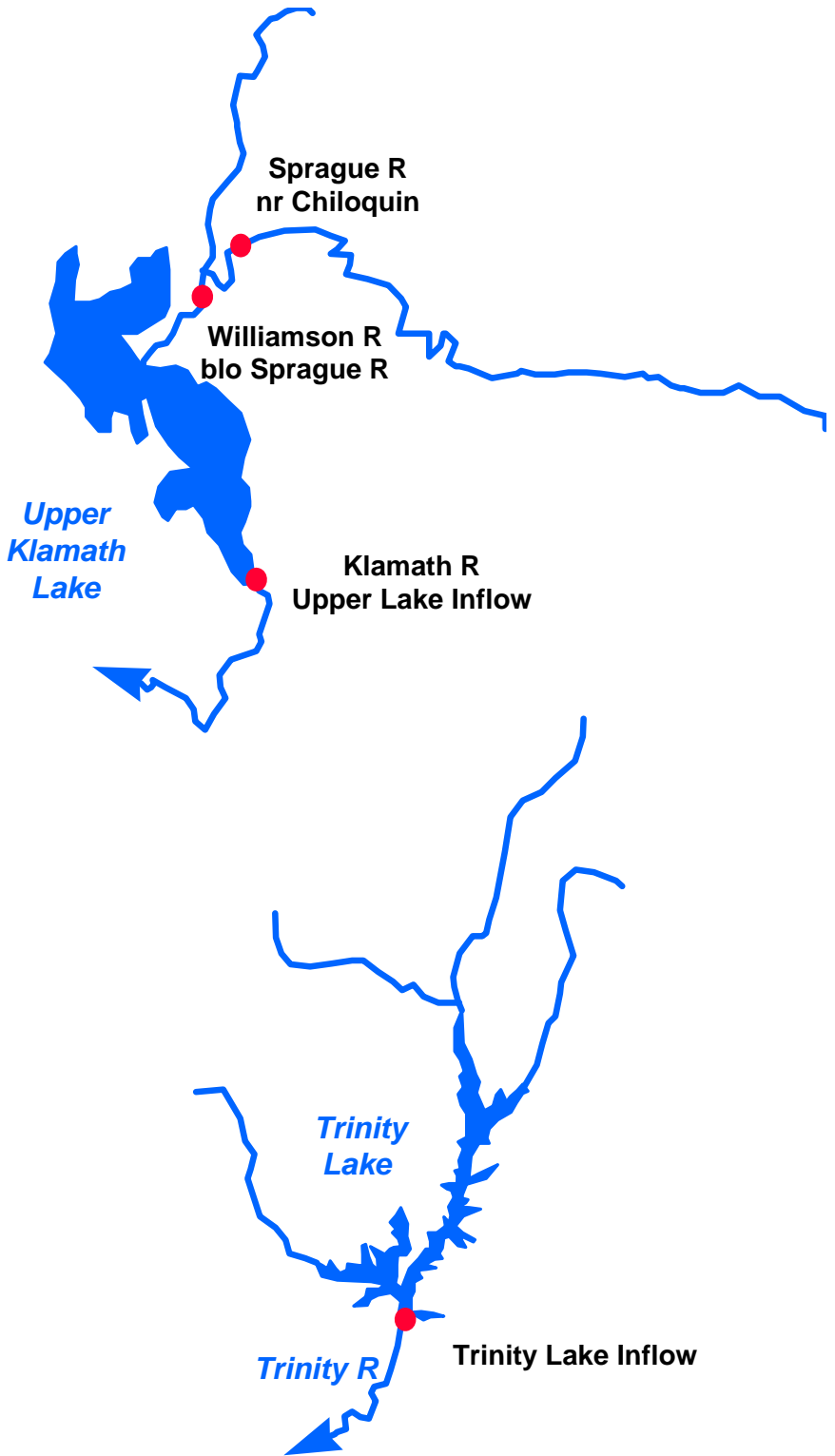
Storage conditions improved somewhat but still remains below average for two of the important large reservoirs in Northern California. As of the end of February 28, Shasta Lake increased 554 KAF since the end of January and stands at 60 percent of average while Lake Oroville gained 340 KAF to end up at 53 percent of average. Between February 28 and March 4, both have increased a further 313 and 213 KAF, respectively. Stored water in the Sacramento region as of February 28 was at 71 percent of the average to date, the San Joaquin at 78 percent, and the Tulare Lake region at 64 percent. East-side Sierra reservoirs were at 63 percent of average. The lake level at Lake Tahoe stood at 6223.34 feet or 11 percent of average as of February 28. It was 6223.65 feet on March 4, gaining 0.31 feet in 4 days! Storage at Lahontan Reservoir in Nevada stands at 37 percent of the seasonal average while Rye Patch Reservoir is at 14 percent. Storage at Upper Klamath Lake is about 80 percent of average.

Most spring runoff forecasts increased from 5 to 23 percent from those issued last month; the largest increases were in the Upper Sacramento basin. Forecasts in the Tulare, Humboldt and Upper Klamath basins saw no change or decreased slightly from last month. April through July runoff forecasts vary from 65 to 78 percent for the Upper Sacramento-Northern Sierra region, 78 to 83 percent for the San Joaquin and 52 to 78 percent for the Tulare region. Runoff projections range from 66 to 71 percent of average for the east side Sierra Nevada basins and 59 to 71 percent for forecast points on the main stem Humboldt River. The April through September forecast for the Upper Klamath Lake inflow is 71 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	280	73	370	192	385
Sprague River						
Chiloquin, nr	Apr-Sep	140	61	210	71	230
Upper Klamath Falls River						
Inflow	Apr-Sep	365	71	510	220	515
Lost River						
Gerber Reservoir Inflow	Mar-Jul	22	59	44	1.00	37
Clear Lake Reservoir Inflow	Mar-Jul	48	60	103	1.00	80
Scott River						
Fort Jones, nr	Apr-Jul	125	69	215	80	181
Trinity River						
Trinity Lake Inflow	Apr-Jul	480	76	790	320	635

Trinity River - Inflow at Lewiston Lake Distribution (kAF)

Exceedence Probability	Oct-Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Apr-Jul	Water Yr
90%	190	115	115	135	50	20	10	7	320	643
50%	190	170	175	200	75	30	15	10	480	866
10%	190	280	285	330	125	50	25	16	790	1301

SACRAMENTO RIVER BASIN

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Pit River						
Montgomery Creek, nr	Apr-Jul	810	76	1300	580	1070
Mccloud River						
Shasta Lake, abv	Apr-Jul	315	85	480	220	370
Sacramento River						
Delta	Apr-Jul	215	74	350	140	290
Shasta Dam	Apr-Jul	1400	78	2180	1010	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	1870	77	2700	1300	2440

SACRAMENTO RIVER ABOVE BEND BRIDGE

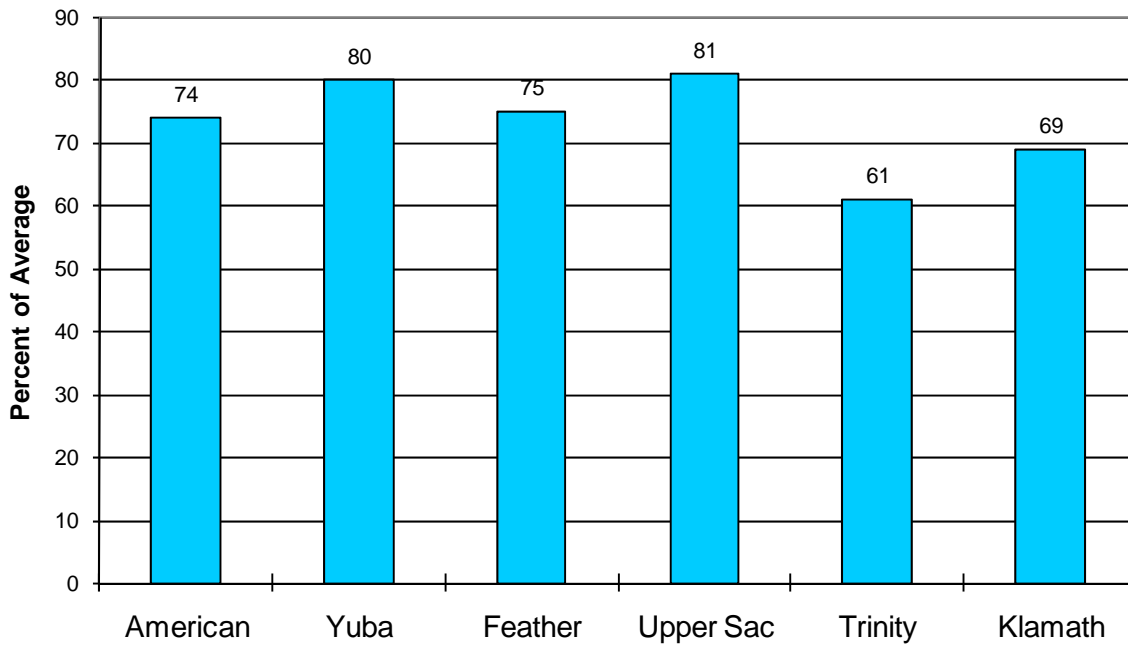
Water Supply Forecasts

		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	225	68	400	142	333*
Big Bar	Apr-Jul	655	68	1170	410	962*
Feather River						
Oroville	Apr-Jul	1150	65	2090	690	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	210	77	365	130	273*
South Yuba River						
Langs Crossing	Apr-Jul	170	76	295	105	225*
Yuba River						
Smartsville, nr	Apr-Jul	760	76	1330	450	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
MF American River						
Auburn, nr	Apr-Jul	370	76	645	225	490*
Silver Ck						
Union Valley	Apr-Jul	74	76	128	43	98*
Camino Dam, blo	Apr-Jul	120	76	210	70	158*
American River						
Folsom Reservoir Inflow	Apr-Jul	940	76	1620	530	1230

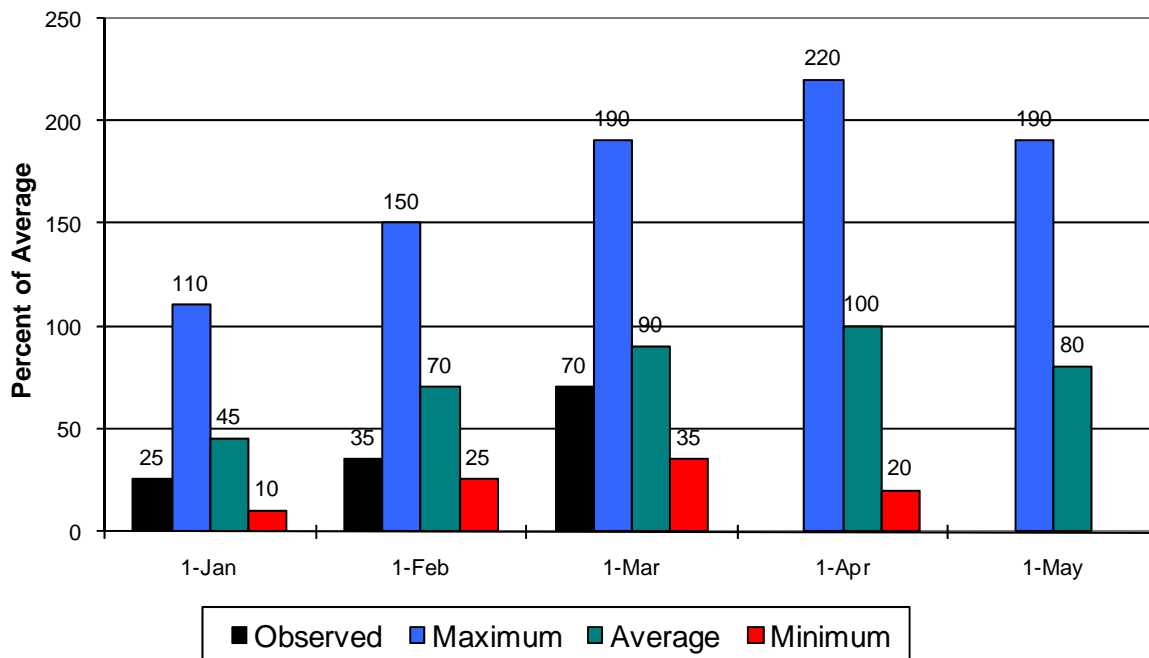
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Sacramento/Trinity/Klamath River Basins

Seasonal Basin Precipitation October 1 to Date

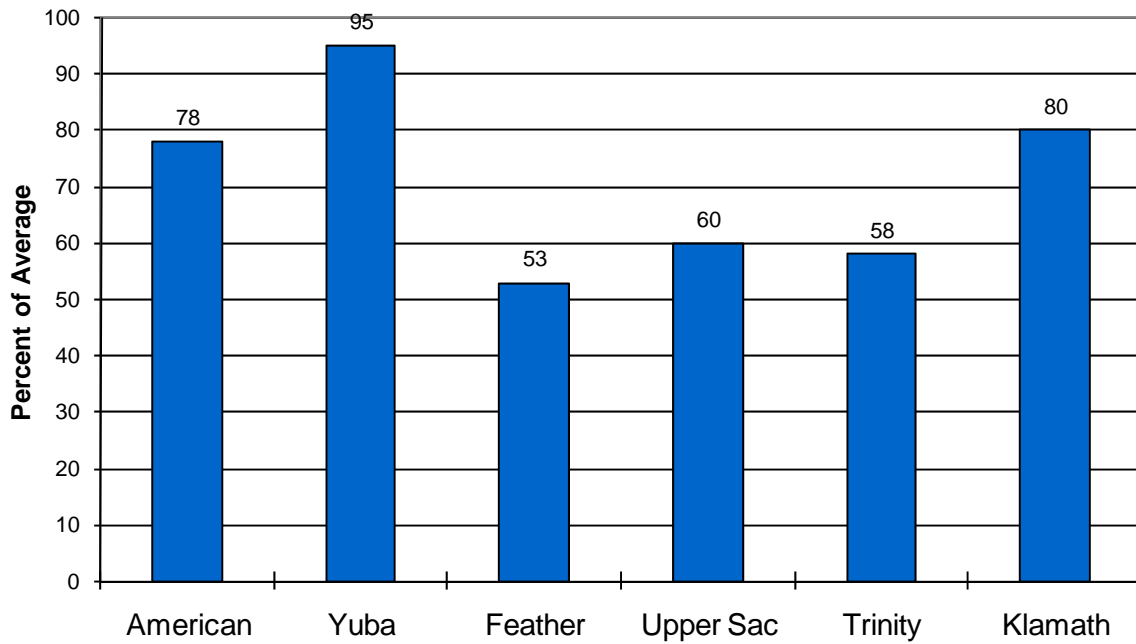


Seasonal Basin Snowpack Water Content in % of April 1 Average

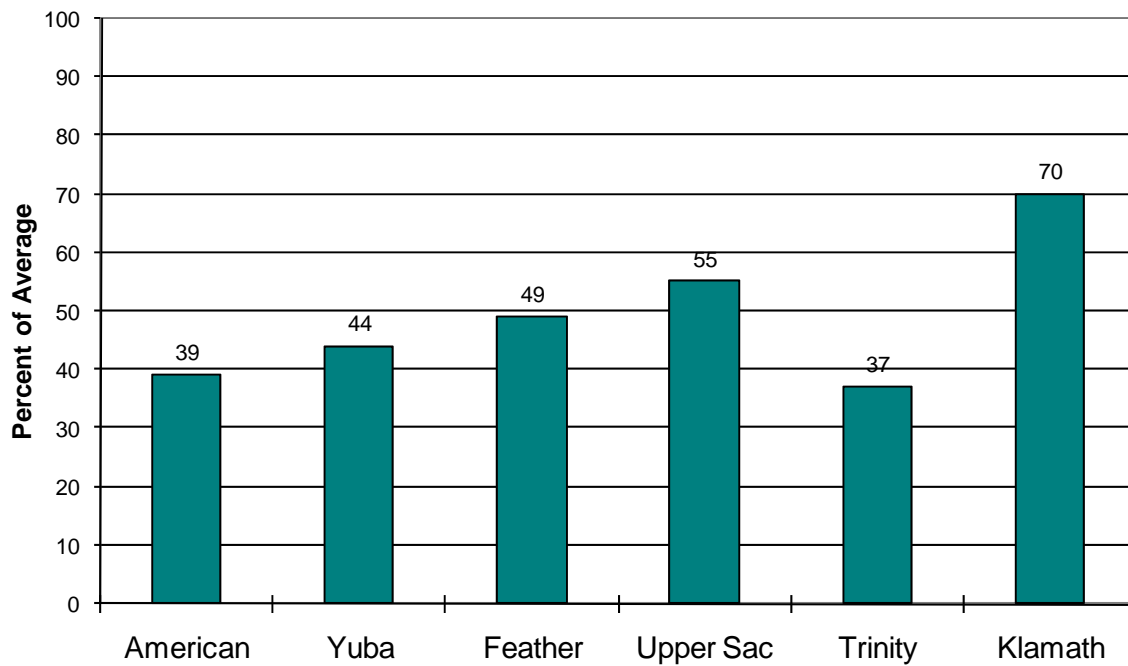


Sacramento/Trinity/Klamath River Basins

Basin Reservoir Storage Contents of Major Reservoirs in % of Average



Seasonal Basin Runoff October 1 to Date



San Joaquin Basin



Water Supply Forecasts

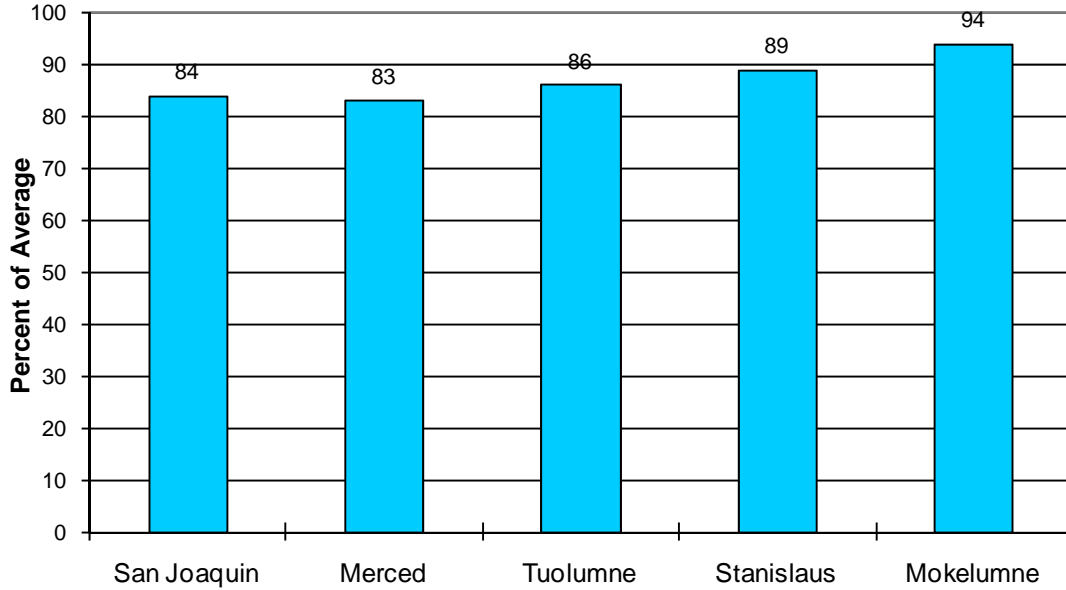
SAN JOAQUIN BASIN

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
<hr/>						
South Fork San Joaquin River						
Hooper Ck, blo, Florence Lk, nr	Apr-Jul	160	83	245	90	192*
San Joaquin River						
Millerton Lake	Apr-Jul	1010	80	1550	625	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	290	81	430	173	360*
Merced Falls, blo	Apr-Jul	500	78	800	300	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	520	87	700	330	596*
La Grange, nr	Apr-Jul	1020	83	1500	670	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	270	84	420	155	320*
Stanislaus River						
New Melones Dam	Apr-Jul	570	82	900	345	695
North Fork Mokelumne River						
West Point	Apr-Jul	340	82	510	170	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	370	80	580	200	460
Cosumnes River						
Michigan Bar	Apr-Jul	88	72	190	25	123

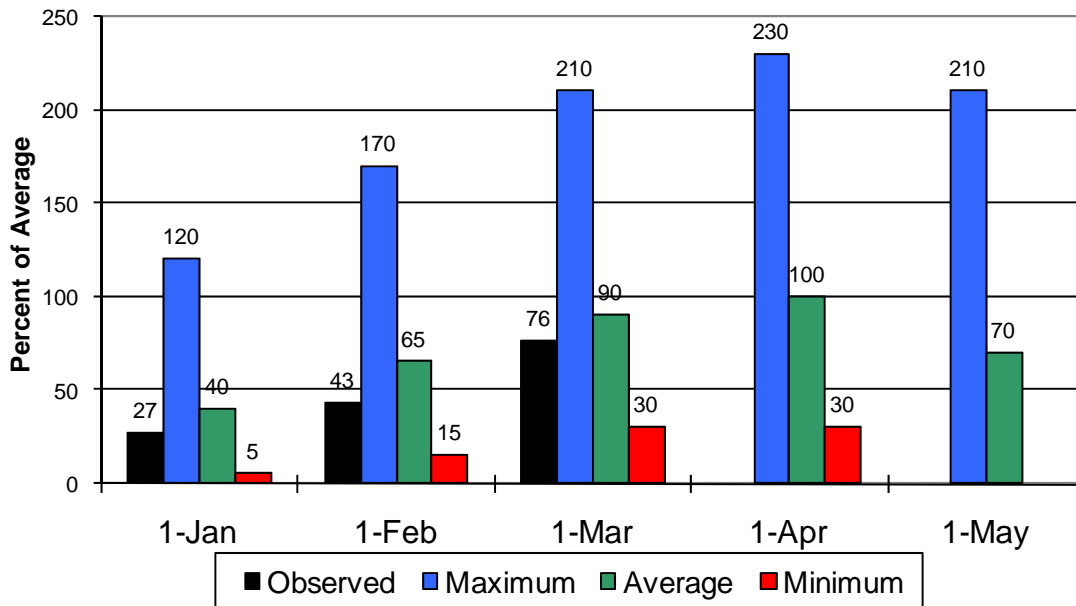
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San Joaquin Basin

Seasonal Basin Precipitation October 1 to Date

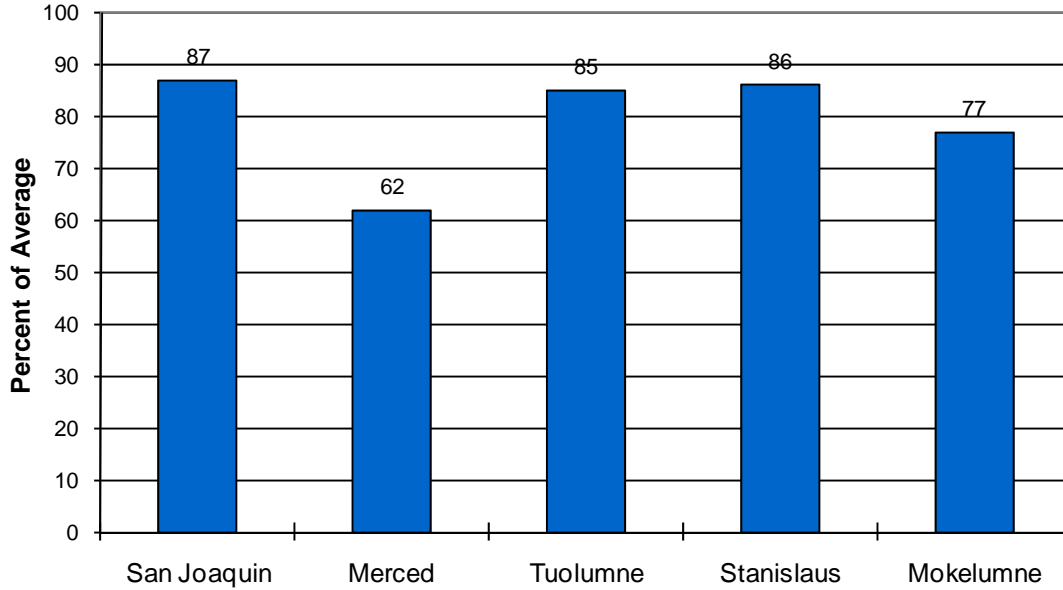


Seasonal Basin Snowpack Water Content in % of April 1 Average

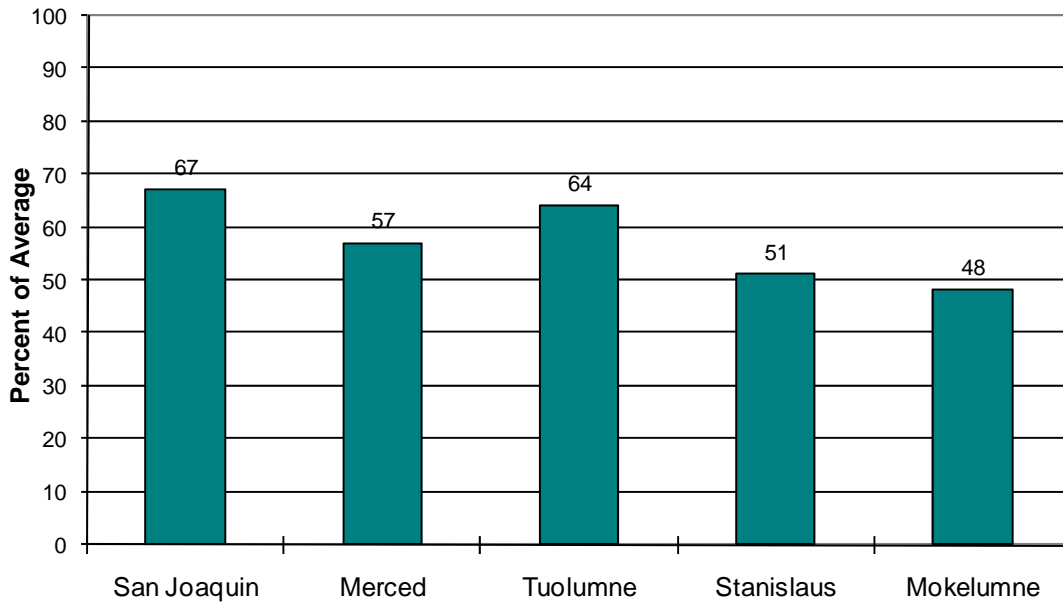


San Joaquin Basin

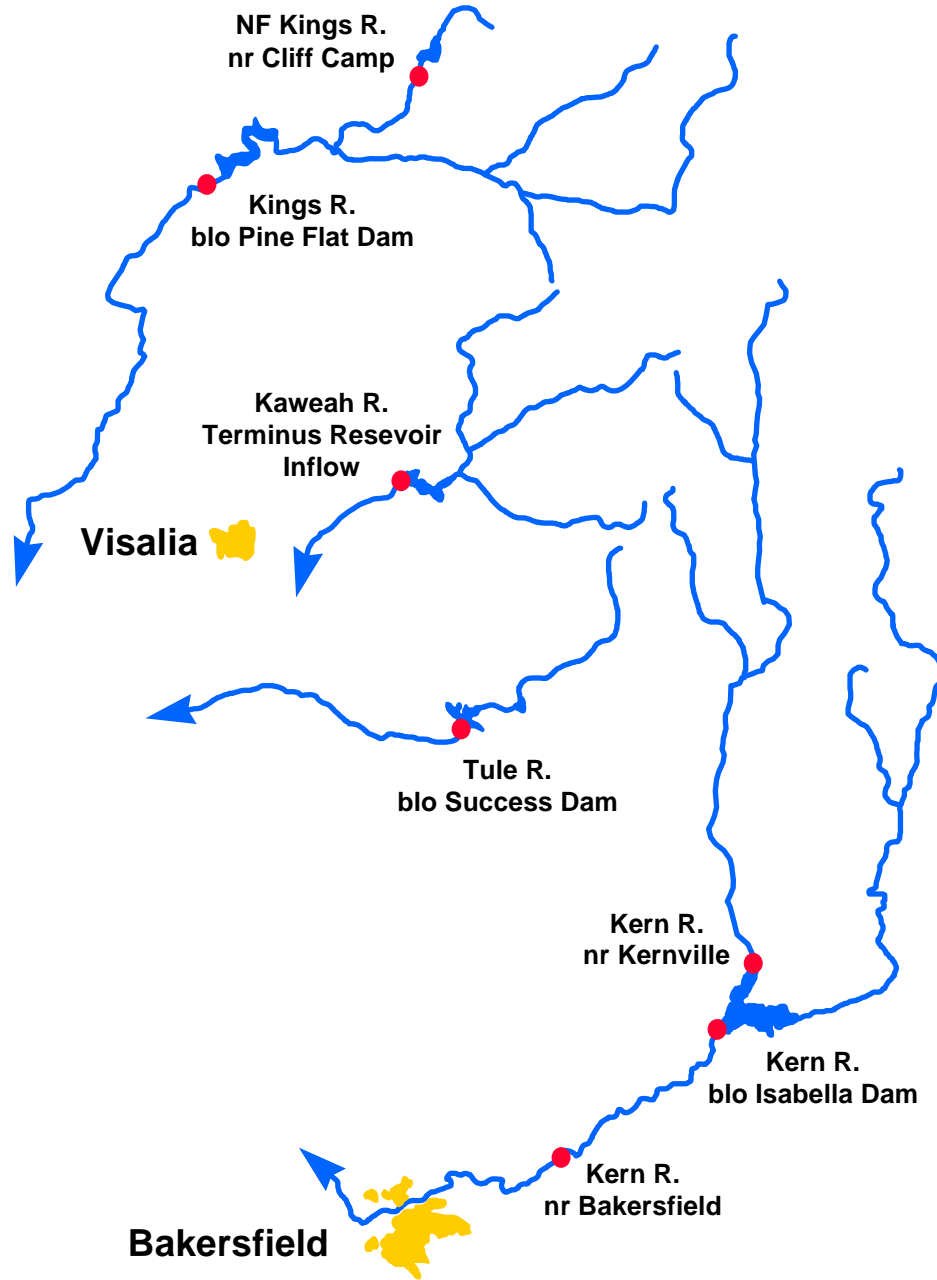
Basin Reservoir Storage Contents of Major Reservoirs in % of Average



Season Basin Runoff October 1 to Date



Tulare Basin



Water Supply Forecasts

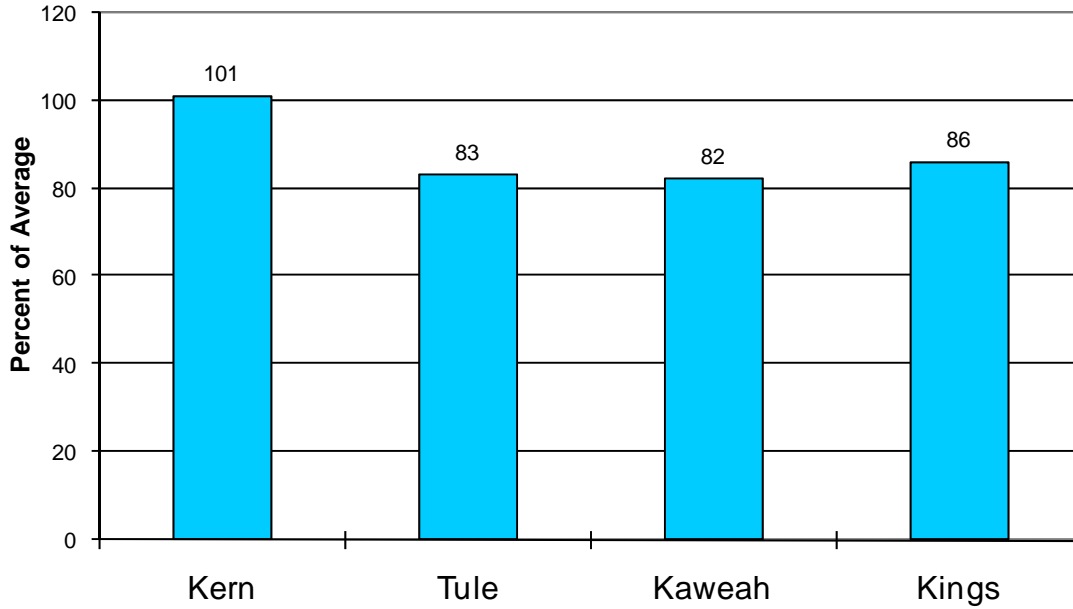
TULARE LAKE BASIN

		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	270	68	460	155	398*
Isabella Dam, blo	Apr-Jul	300	62	550	180	480
Bakersfield, nr	Apr-Jul	310	63	560	190	490
Tule River						
Success Dam	Apr-Jul	34	52	80	15.0	66
Kaweah River						
Terminus Dam	Apr-Jul	225	78	360	125	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	200	83	280	122	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	960	77	1310	615	1250

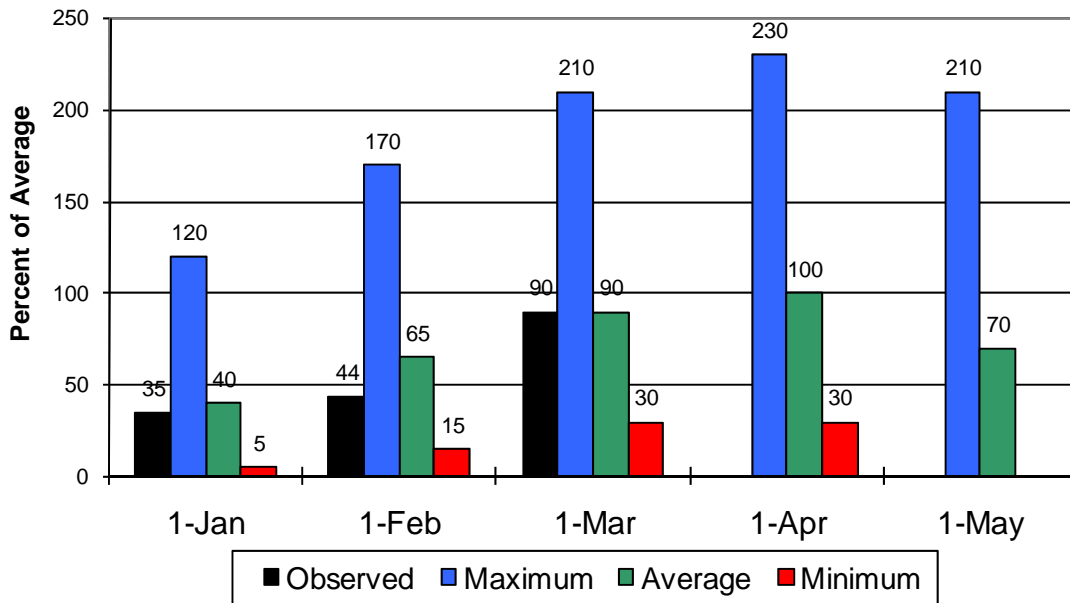
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Tulare Lake Basin

Seasonal Precipitation October 1 to Date



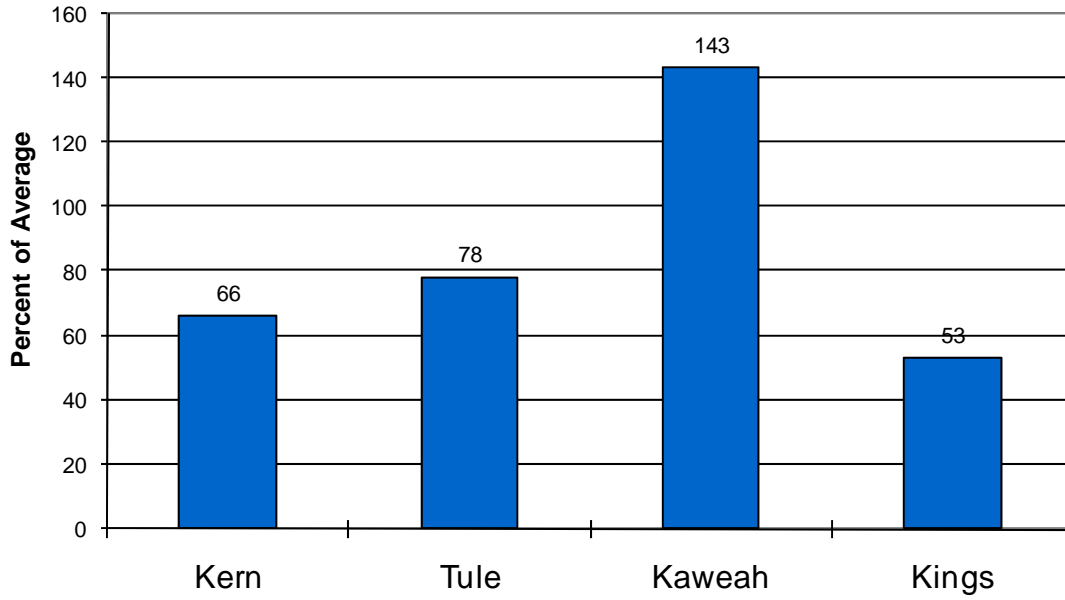
Seasonal Basin Snowpack Water Content in % of April 1 Average



Tulare Lake Basin

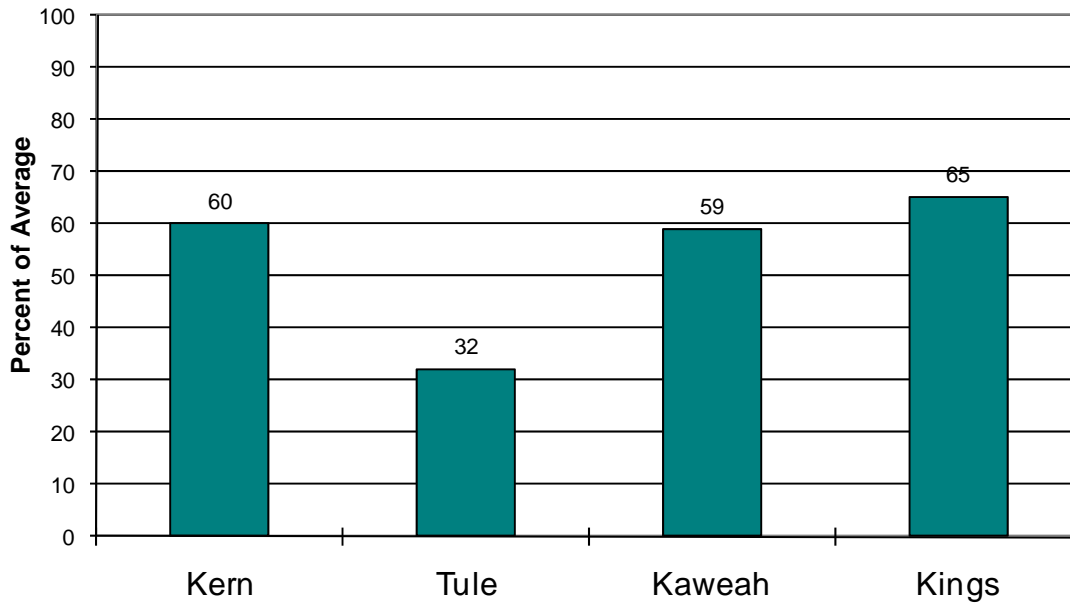
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

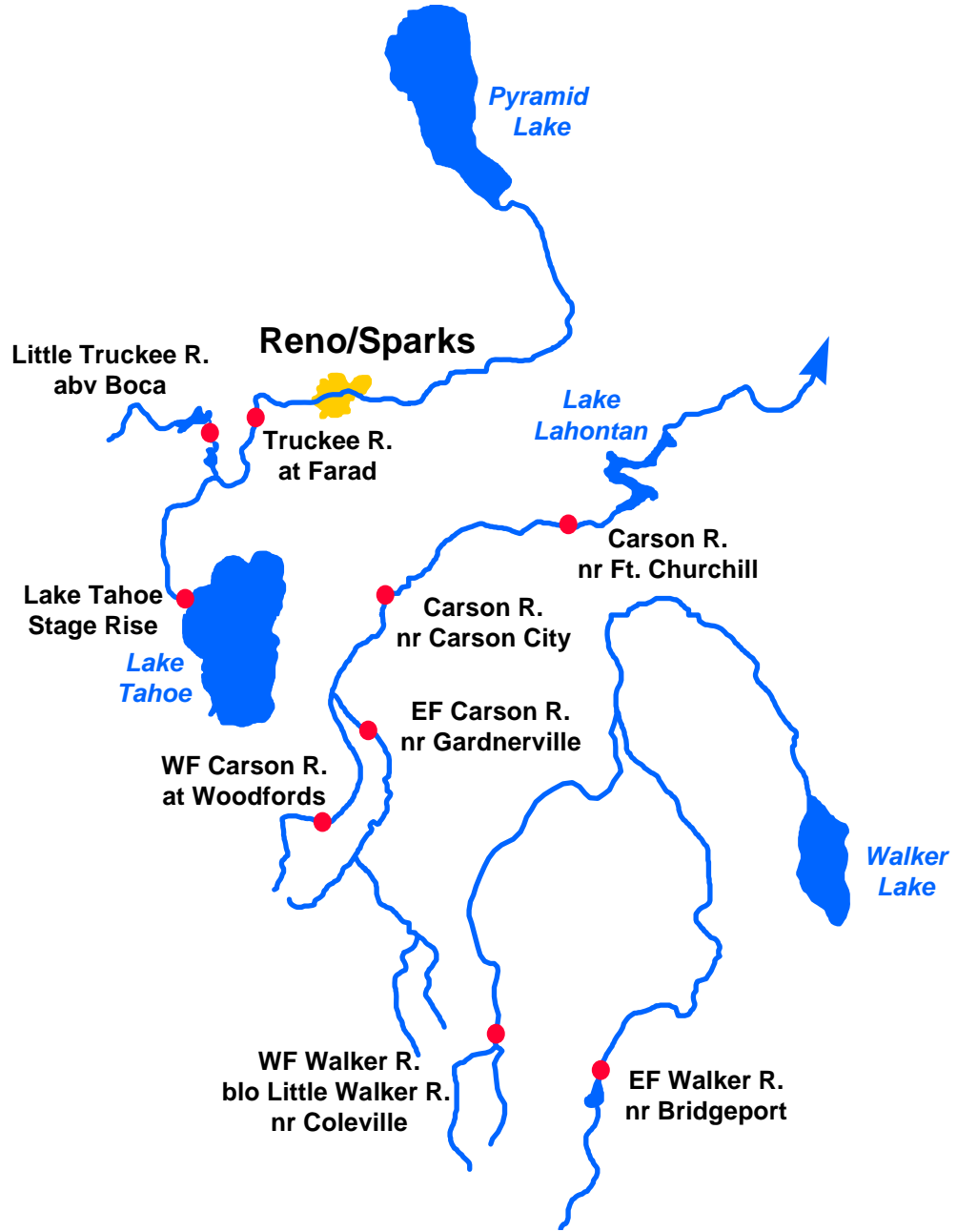


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



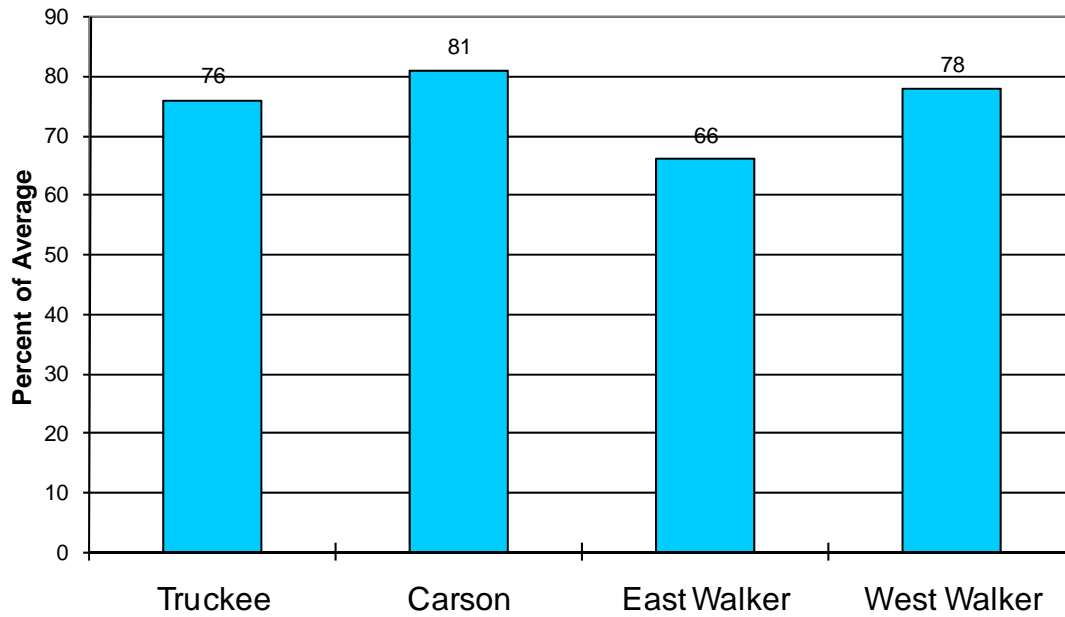
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

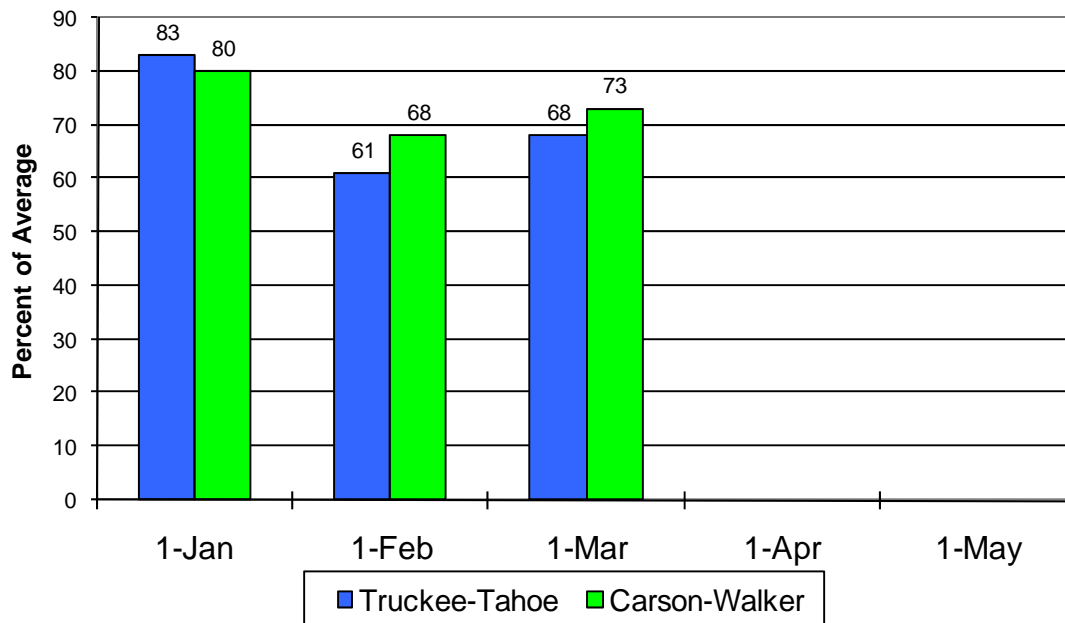
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Truckee River						
Truckee River Lake Tahoe Stage Rise	Apr-High	1.00	72	1.85	0.30	1.38
Little Truckee River Stampede Dam	Apr-Jul	55	69	103	33	80
Truckee River Farad	Apr-Jul	180	69	290	70	260
Carson River						
East Fork Carson River Gardnerville, nr	Apr-Jul	135	71	210	62	189
West Fork Carson River Woodfords	Apr-Jul	37	66	59	15.1	56
Carson River Carson City, nr	Apr-Jul	105	56	182	49	188
Fort Churchill, nr	Apr-Jul	95	53	162	36	178
Walker River						
East Walker River Bridgeport, nr	Apr-Aug	45	67	72	20	67
West Walker River Itl Walker, blo, Coleville, nr	Apr-Jul	110	71	142	78	156

East Side Sierra Nevada Basins

Seasonal Basin Precipitation October 1 to Date

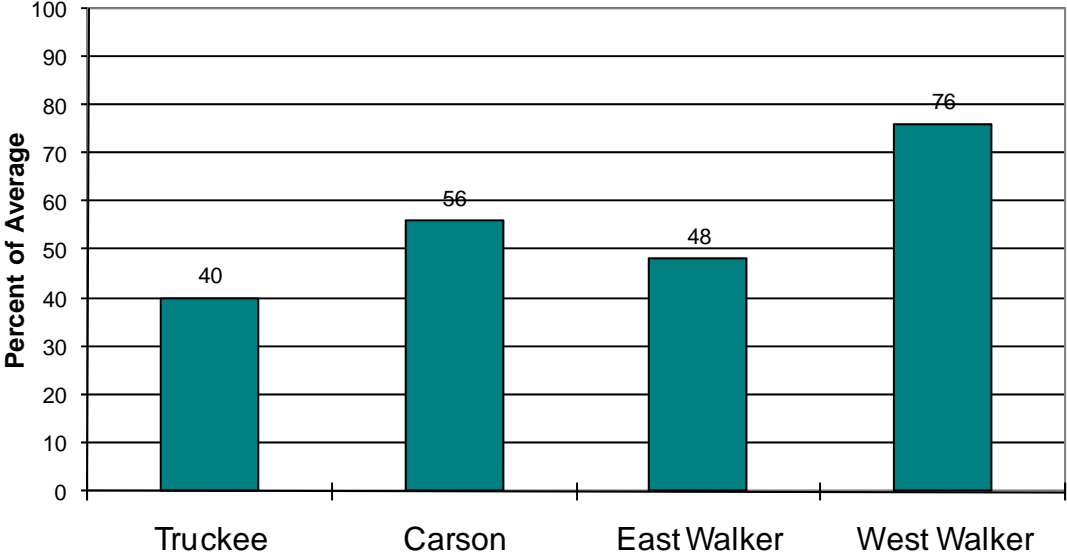


Basin Snowpack % of Average SWE to Date

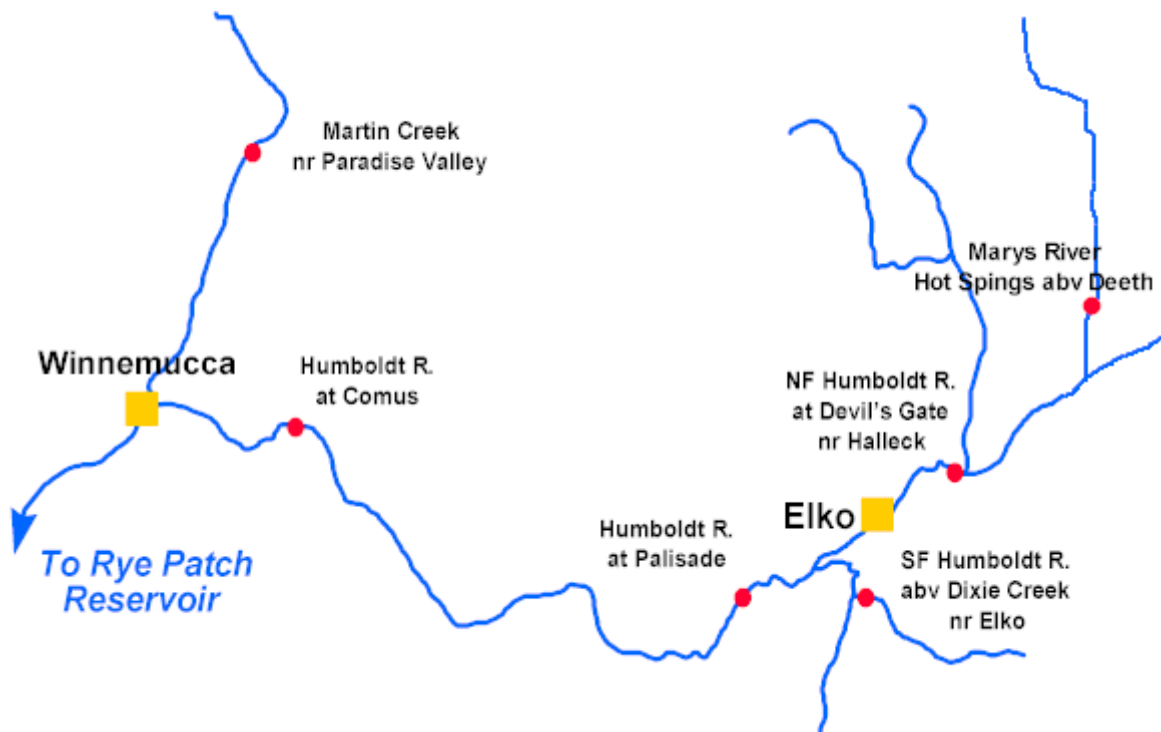


East Side Sierra Nevada Basins

Seasonal Basin Runoff October 1 to Date



Humboldt River Basin



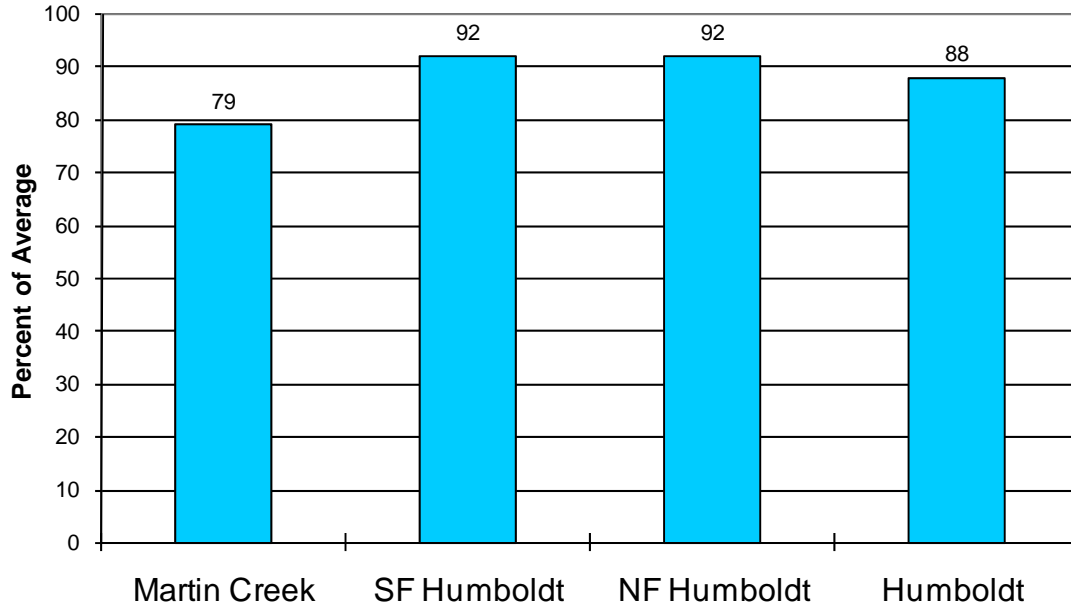
Water Supply Forecasts

		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	28	82	44	12.0	34*
South Fork Humboldt River						
Dixie Ck, abv, Elko, nr	Apr-Jul	58	76	105	20	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	32	82	49	15.0	39
Humboldt River						
Elko, nr	Apr-Jul	110	71	195	25	154
Palisade	Apr-Jul	170	68	280	60	250
Comus	Apr-Jul	145	64	260	30	225
Imlay, nr	Apr-Jul	110	59	280	20	188
Martin Ck						
Paradise Valley, nr	Apr-Jul	13.0	70	24	2.5	18.7

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Humboldt River Basin

Seasonal Basin Precipitation October 1 to Date



Basin Snowpack % of Average SWE to Date

