

WATER SUPPLY OUTLOOK



CALIFORNIA AND NORTHERN NEVADA

**MAY
2009**



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

www.cnrfc.noaa.gov/water_supply

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

May 1, 2009

NOTE: WITH THE EXPECTATION OF THE UPPER KLAMATH LAKE BASIN, FORECASTS ARE AS OF MAY 5 DUE TO THE SIGNIFICANT AMOUNT OF PRECIPITATION THAT FELL BETWEEN MAY 1 AND MAY 5. FORECASTS FOR THE UPPER KLAMATH LAKE BASIN ARE AS OF MAY 1.

Except for portions of the Upper Klamath Lake Basin and northern Nevada, April turned out to be somewhat dry. However, an unusually warm and wet storm system arrived during May 1 through May 5, dropping significant amounts of precipitation in the Shasta-Sierra Nevada region and melting some of the lower elevation snow pack. Many mountain precipitation gauging sites from the Trinity River basin to the Upper San Joaquin have already recorded greater than 200 percent of a May average. Although runoff from this storm is a welcome addition to the region's reservoirs, it is not enough to compensate for the moisture deficits built up during the past 3 years. It is now becoming evident that California and northern Nevada will experience a third consecutive year of below average spring runoff.

April precipitation varies from 33 percent for the Trinity to 83 percent for the Stanislaus. Monthly precipitation was below average for the east side Sierra and above average for the Humboldt basin in Nevada. It is about 67 percent of an April average for the Upper Klamath Lake basin. Seasonal precipitation amounts (October 1, 2008 to April 30, 2009) remain below average for snow basins in California. Seasonal averages range from 57 percent for the Trinity to 90 percent for the Kern River basin. Seasonal average precipitation for the east side Sierra Nevada varies from 83 percent for the Truckee to 89 percent for the Walker River basin. Seasonal averages are about 111 percent for the upper Humboldt basin and 84 percent for the lower Humboldt. It is about 80 percent for the Upper Klamath Lake basin.

Snowmelt commenced quickly with the arrival of sustained periods of warm temperatures during April. The May 1st average water content stands at about 55 percent for the Shasta-northern Sierra, 69 percent for the San Joaquin and 60 percent for the Tulare Lake basin. Snow packs in the Tahoe-Truckee basins are about 56 percent of the average-to-date; the Carson-Walker stands at 78 percent. Record snow amounts were recorded in parts of northeastern Nevada during the late-season storm event on April 15. The upper Humboldt basin stands at 106 percent of the average-to-date, the lower Humboldt, 75 percent. The pack is about 97 percent of the average-to-date for the Upper Klamath Lake basin—with the best snow pack conditions along the Cascade side of the basin and much of it melted in the eastern portion of the watershed as of May 1st.

There was accelerated snowmelt runoff during the unusually warm interval from April 18 through the 23rd. Many stations reported near record to record daily maximum temperatures during that period. The Trinity-Upper Sacramento received 70 percent of the monthly average runoff, the San Joaquin, 98 percent and the Tulare Lake region, 85 percent. East side Sierra basins received 83 percent of an April average while the Humboldt River at Palisade recorded 51 percent. The Upper Klamath Lake basin received 47 percent of an April average. The May 1 through May 5 storm system added additional runoff to basins from the Trinity to the Upper San Joaquin comparable to a moderate wintertime precipitation event.

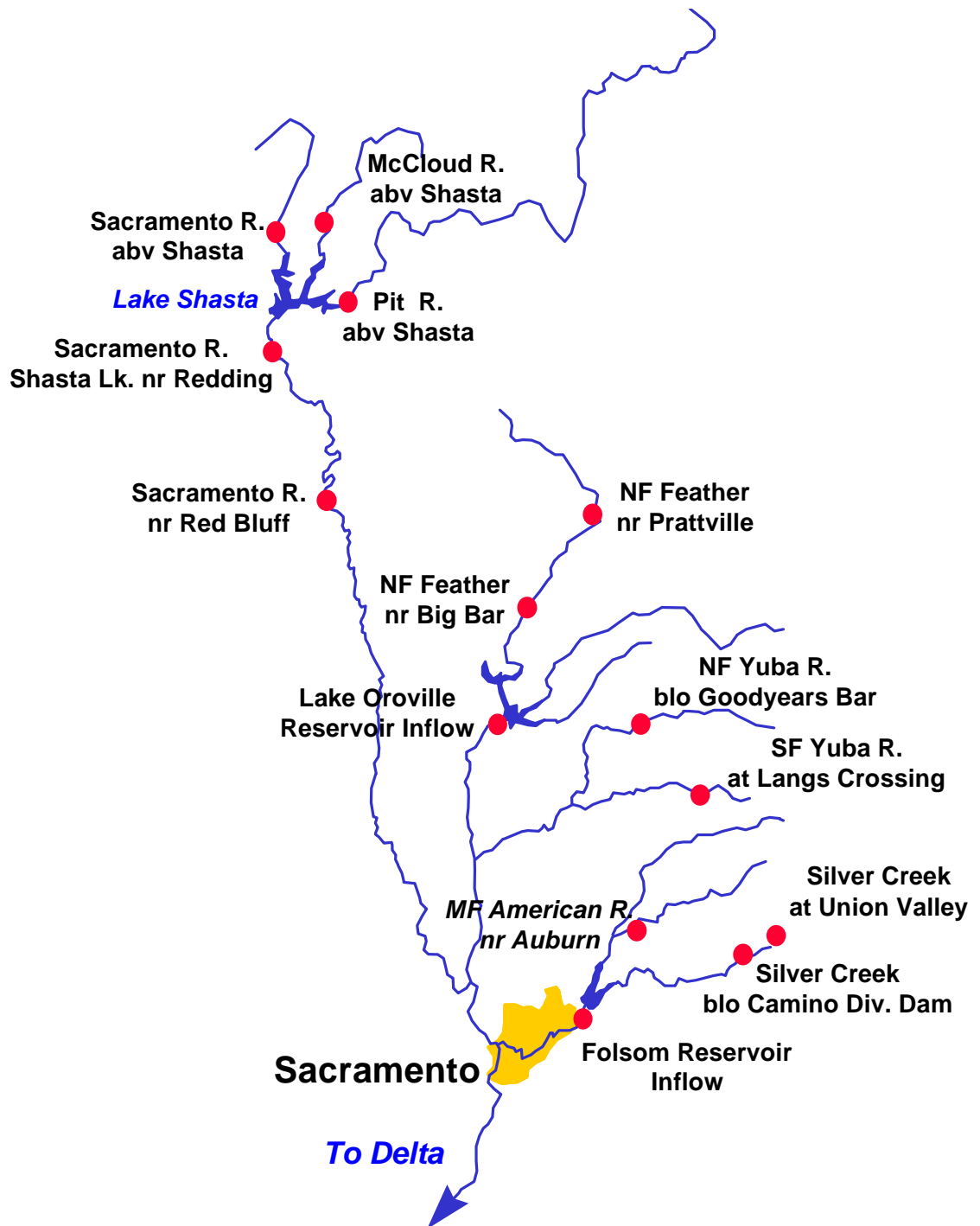
Some of California's major reservoirs are now reporting near to above average storage as of April 30, however, many are still below average. As of April 30, Shasta Lake increased 118 KAF since the end of March and stands at 2,998 MAF or 78 percent of average while Lake Oroville gained 77 KAF to end up at 2,055 MAF or 69 percent of average. It was 77 percent of average for Shasta Lake and 58 percent for Lake Oroville at this time last year. Stored water in the upper Sacramento-northern Sierra Nevada region as of April 30 was 85 percent of the average to date, the San Joaquin at 88 percent, and the Tulare Lake region at 84 percent. East-side Sierra reservoirs stand at 69 percent of average. The lake level at Lake Tahoe stood at 6223.74 feet and usable storage was 89.8 KAF or 22 percent of average as of April 30. Last year on April 30, it was 6225.08 feet for a usable storage of 252.8 KAF or 63 percent. Storage at Lahontan Reservoir in Nevada stands at 48 percent of the seasonal average while Rye Patch Reservoir remains meager at 27 percent. Storage at Upper Klamath Lake is about 92 percent of average.

Between April 1st and May 5th, most runoff forecasts increased primarily as a result of the early May storms. These increases range from 1 to 10 percent for the Upper Klamath Lake basin, the Upper Sacramento and the west slope Sierra Nevada. Projections increased from 3 to 12 percent for the East Side Sierra with the exception of the Lake Tahoe April-High stage rise which decreased 7 percentage points. Some mainstem Humboldt forecast points decreased from 3 to 11 percent. April through July runoff forecasts vary from 75 to 91 percent for the Upper Sacramento-Northern Sierra region, 80 to 96 percent for the San Joaquin and 45 to 78 percent for the Tulare Lake region. Runoff projections range from 62 to 82 percent of average for the east side Sierra Nevada basins and 48 to 68 percent for forecast points on the main stem Humboldt River. The May through September forecast for the Upper Klamath Lake inflow is 79 percent.

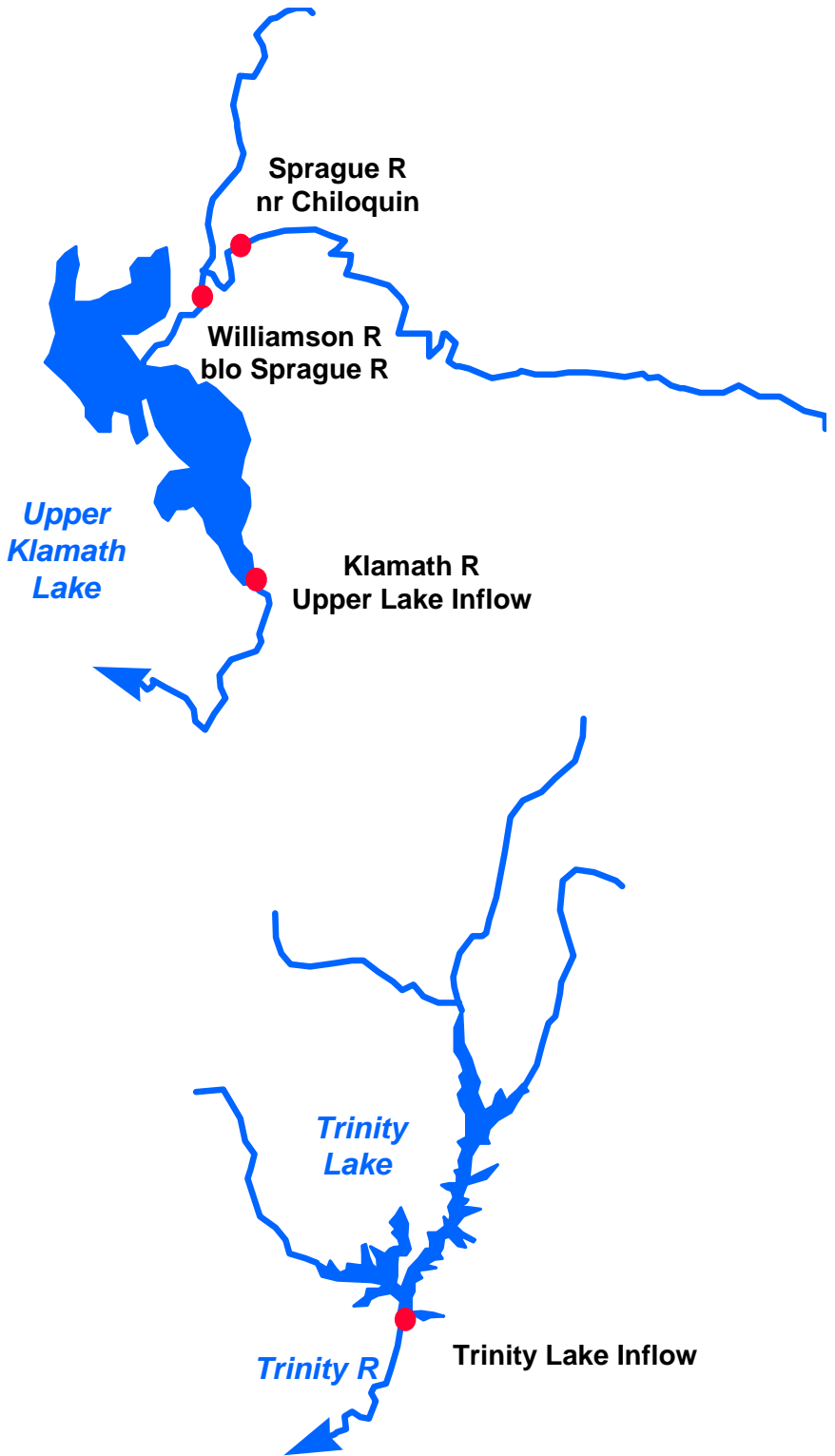
Mid-month updates are scheduled for selected east side Sierra Nevada forecast points and the Upper Klamath Lake Inflow. These will be posted on the CNRFC web page. This will be the last Water Supply Outlook for Water Year 2009.

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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	May-Sep	220	82	270	168	267
Sprague River						
Chiloquin, nr	May-Sep	115	74	160	70	155
Upper Klamath Falls River						
Inflow	May-Sep	270	79	365	177	340
Lost River						
Gerber Reservoir Inflow	May-Jul	4.3	67	14.4	0.10	6.4
Clear Lake Reservoir Inflow	May-Jul	12.5	65	29	1.00	19.3
Scott River						
Fort Jones, nr	Apr-Jul	130	72	170	110	181
Trinity River						
Trinity Lake Inflow	Apr-Jul	500	79	640	430	635

Trinity River - Inflow at Lewiston Lake Distribution (kAF)

Exceedence Probability	Oct-Mar	Apr	May	Jun	Jul	Aug	Sep	Apr-Jul	Water Yr
90%	375	138	200	75	17	7	5	430	817
50%	375	138	250	90	22	10	7	500	892
10%	375	138	345	125	32	16	12	640	1043

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 Ck, nr	Apr-Jul	800	75	1070	630	1070
Mccloud River						
Shasta Lk, abv	Apr-Jul	330	89	420	270	370
Sacramento River						
Delta	Apr-Jul	240	83	315	195	290
Shasta Dam	Apr-Jul	1550	87	1960	1330	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	2050	84	2550	1750	2440

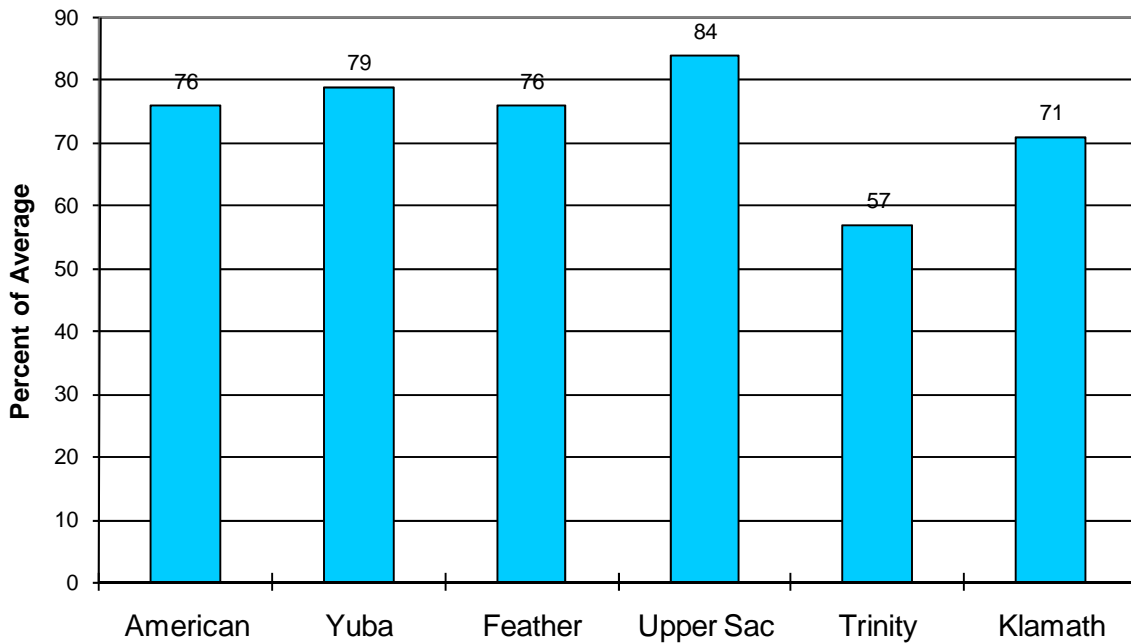
Water Supply Forecasts

		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	250	75	330	200	333*
Big Bar	Apr-Jul	740	77	970	590	962*
Feather River						
Oroville	Apr-Jul	1370	78	1780	1100	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	235	86	290	195	273*
South Yuba River						
Langs Crossing	Apr-Jul	195	87	240	160	225*
Yuba River						
Smartsville, nr	Apr-Jul	890	89	1090	730	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
Middle Fork American River						
Auburn, nr	Apr-Jul	445	91	545	365	490*
Silver Ck						
Union Valley	Apr-Jul	88	90	107	72	98*
Camino Dam, blo	Apr-Jul	142	90	172	117	158*
American River						
Folsom Reservoir Inflow	Apr-Jul	1120	91	1390	950	1230

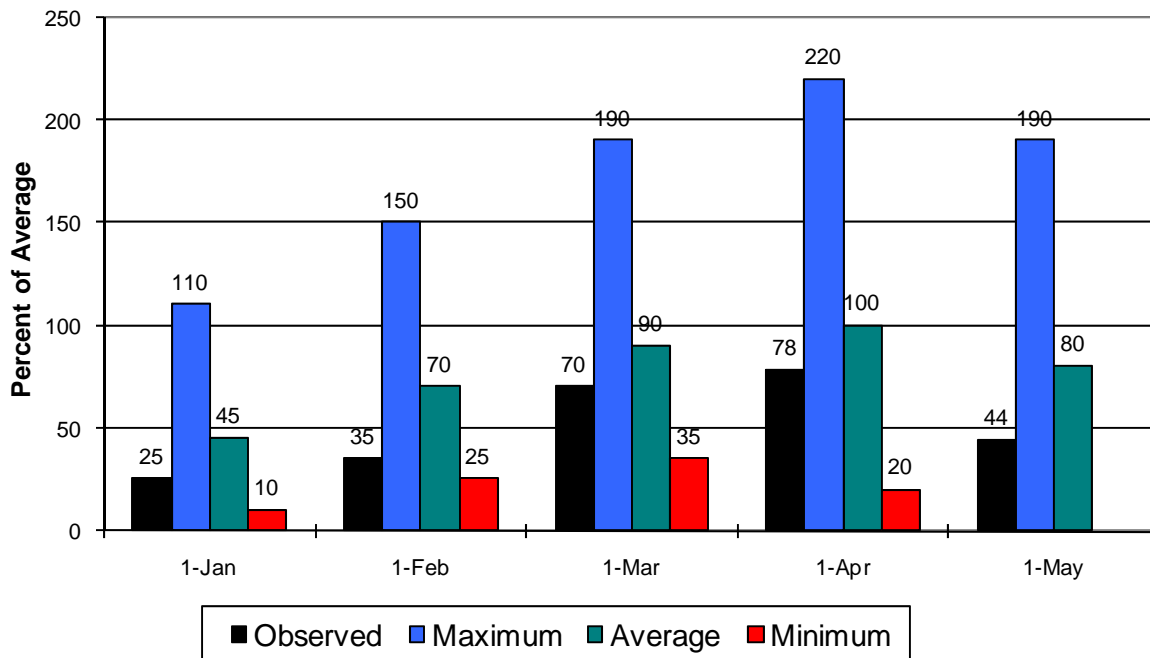
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Sacramento/Trinity/Klamath River Basins

Seasonal Basin Precipitation October 1 to Date

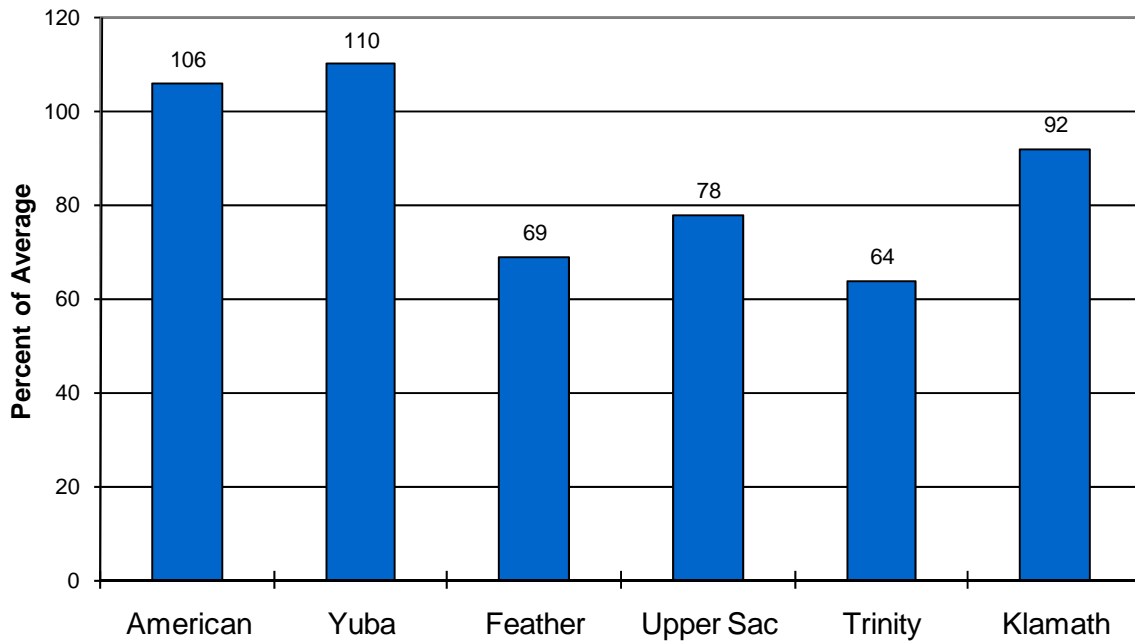


Seasonal Basin Snowpack Water Content in % of April 1 Average

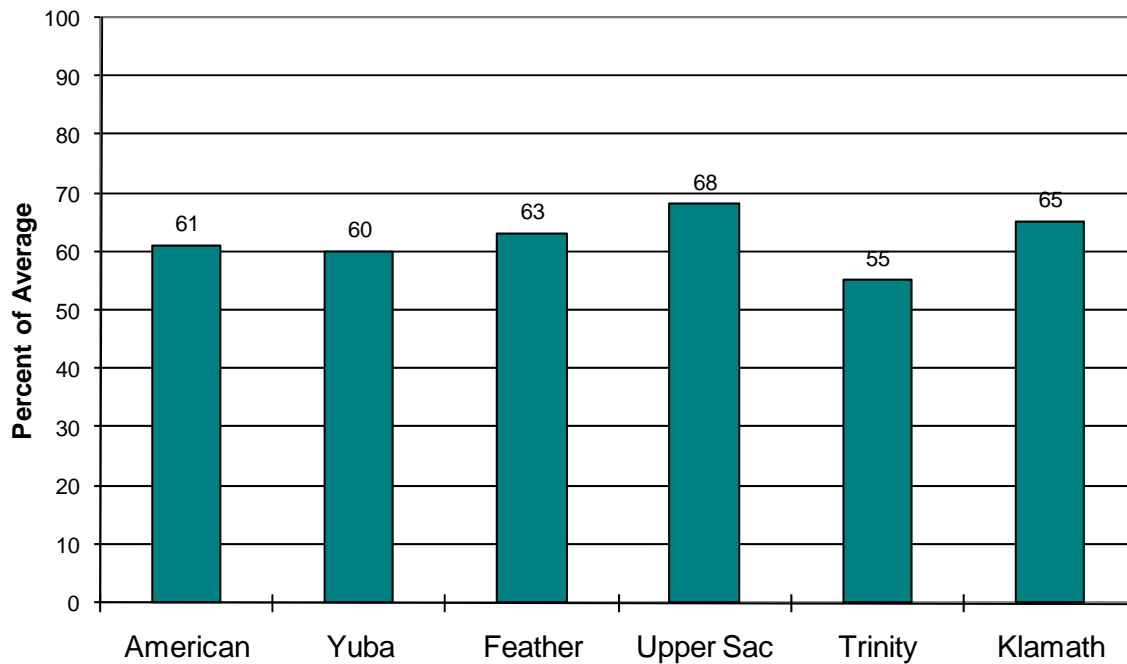


Sacramento/Trinity/Klamath River Basins

Basin Reservoir Storage Contents of Major Reservoirs in % of Average



Seasonal Basin Runoff October 1 to Date



San Joaquin Basin



Water Supply Forecasts

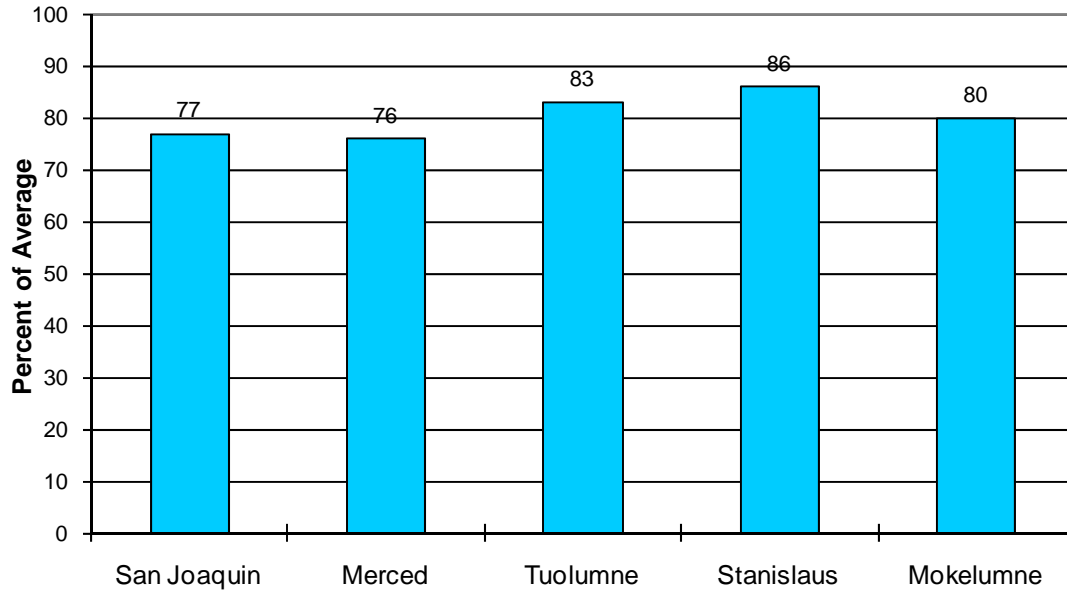
SAN JOAQUIN BASIN

		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	165	86	200	120	192*
San Joaquin River						
Millerton Lk	Apr-Jul	1020	80	1240	800	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	340	94	385	235	360*
Merced Falls, blo	Apr-Jul	550	85	680	420	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	560	94	615	450	596*
La Grange, nr	Apr-Jul	1110	90	1280	940	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	300	94	370	240	320*
Stanislaus River						
New Melones Dam	Apr-Jul	660	95	800	520	695
North Fork Mokelumne River						
West Point	Apr-Jul	400	96	480	320	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	440	96	530	350	460
Cosumnes River						
Michigan Bar	Apr-Jul	90	73	140	40	123

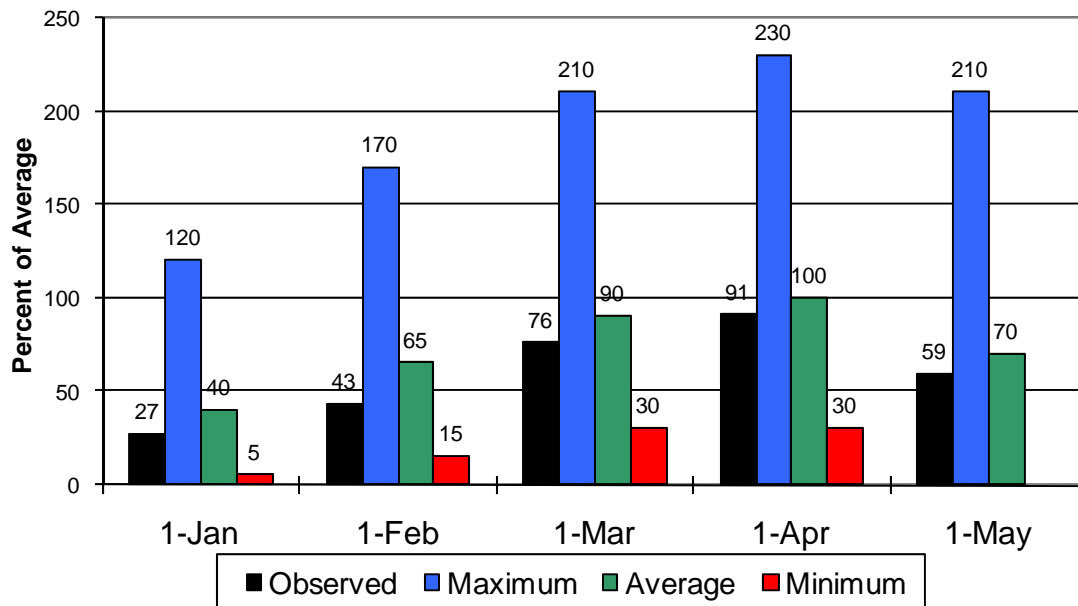
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San Joaquin Basin

Seasonal Basin Precipitation October 1 to Date

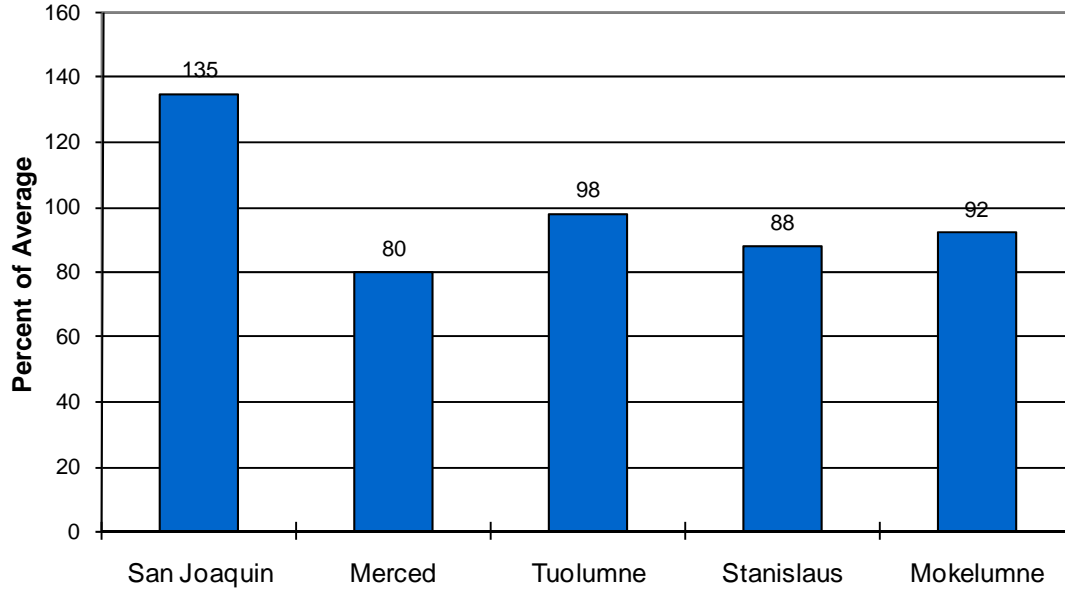


Seasonal Basin Snowpack Water Content in % of April 1 Average

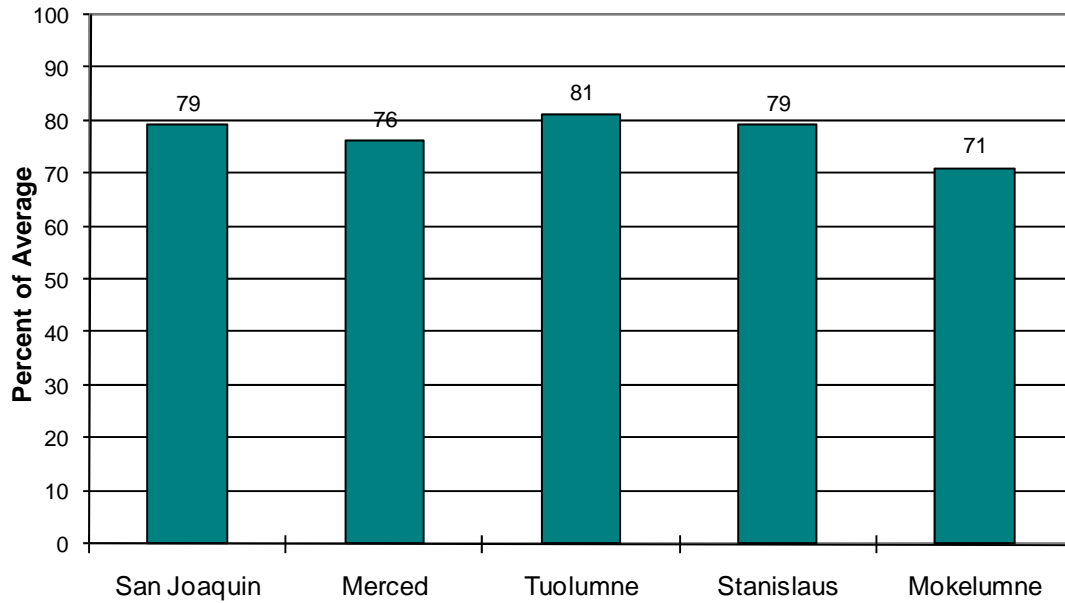


San Joaquin Basin

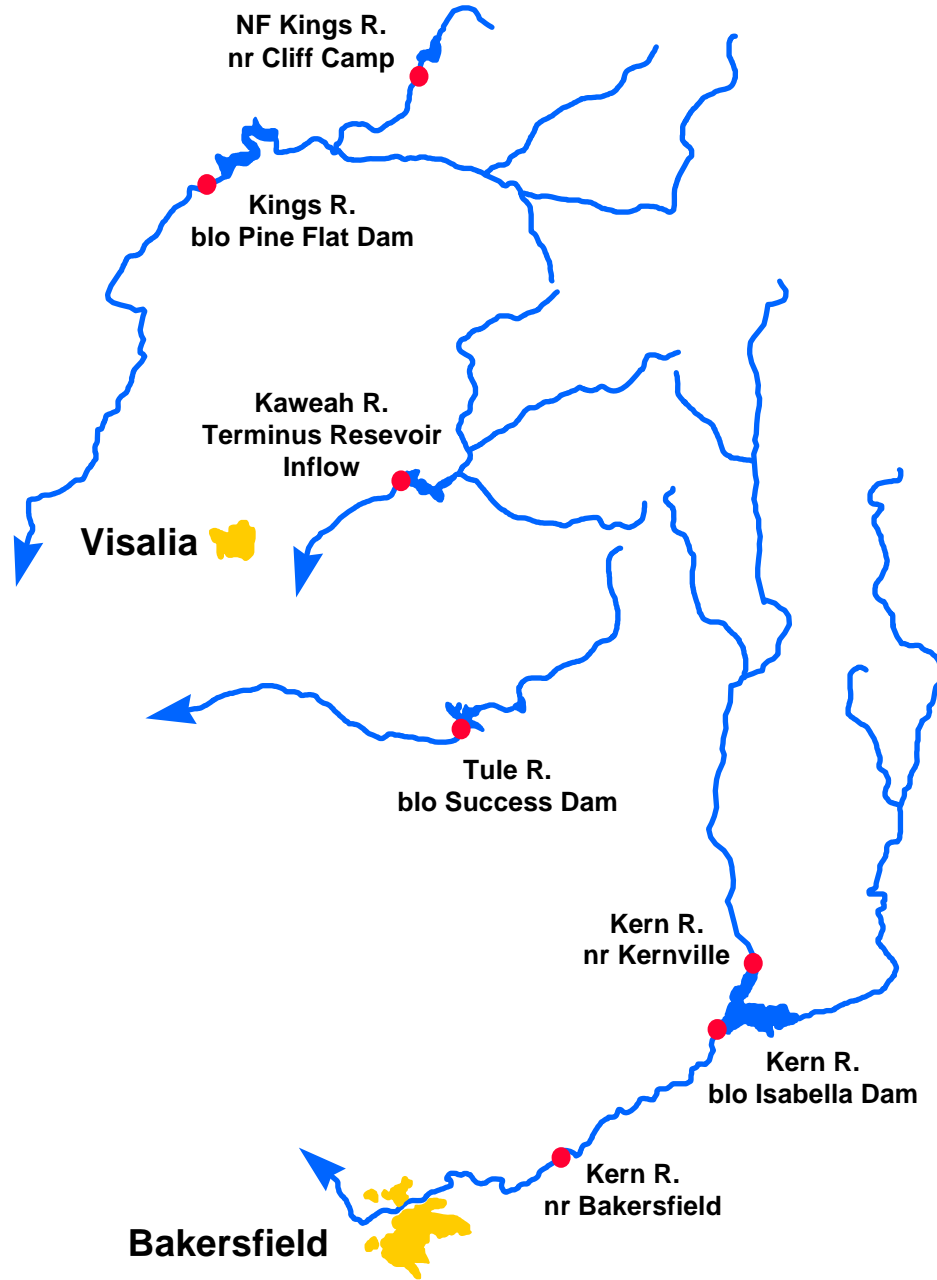
Basin Reservoir Storage Contents of Major Reservoirs in % of Average



Season Basin Runoff October 1 to Date



Tulare Basin



Water Supply Forecasts

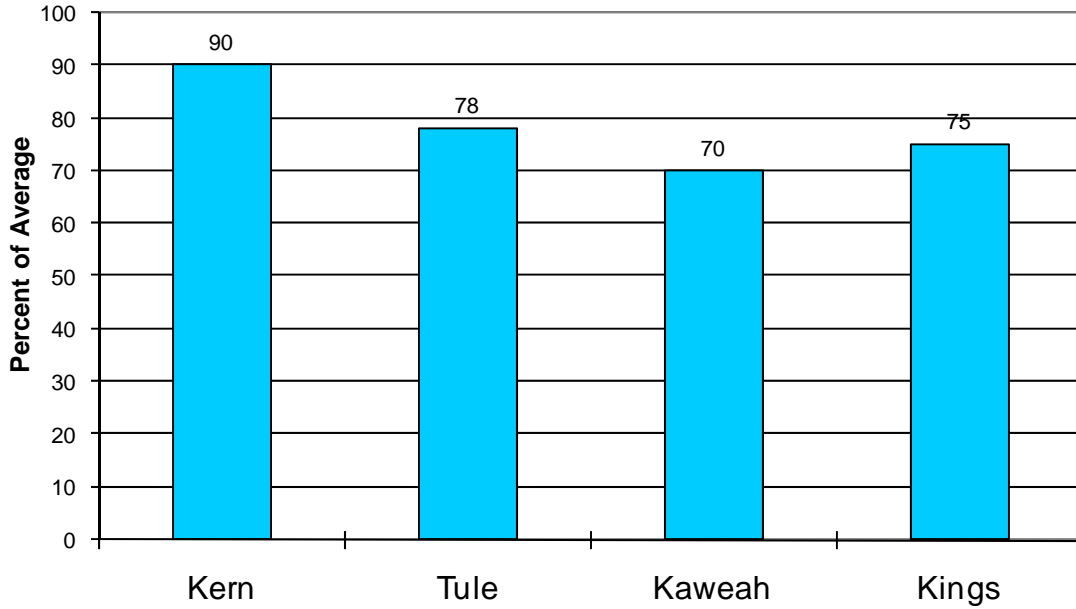
TULARE LAKE BASIN

		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	265	67	330	180	398*
Isabella Dam, blo	Apr-Jul	300	62	400	210	480
Bakersfield, nr	Apr-Jul	310	63	410	215	490
Tule River						
Success Dam	Apr-Jul	30	45	50	20	66
Kaweah River						
Terminus Dam	Apr-Jul	220	76	270	170	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	205	85	245	160	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	980	78	1120	830	1250

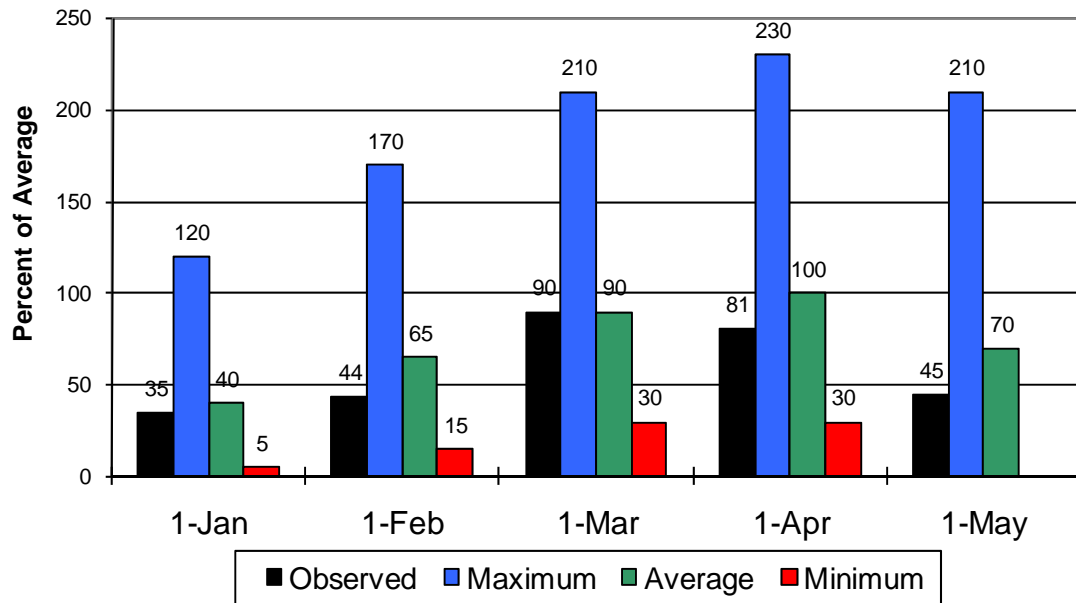
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Tulare Lake Basin

Seasonal Precipitation October 1 to Date



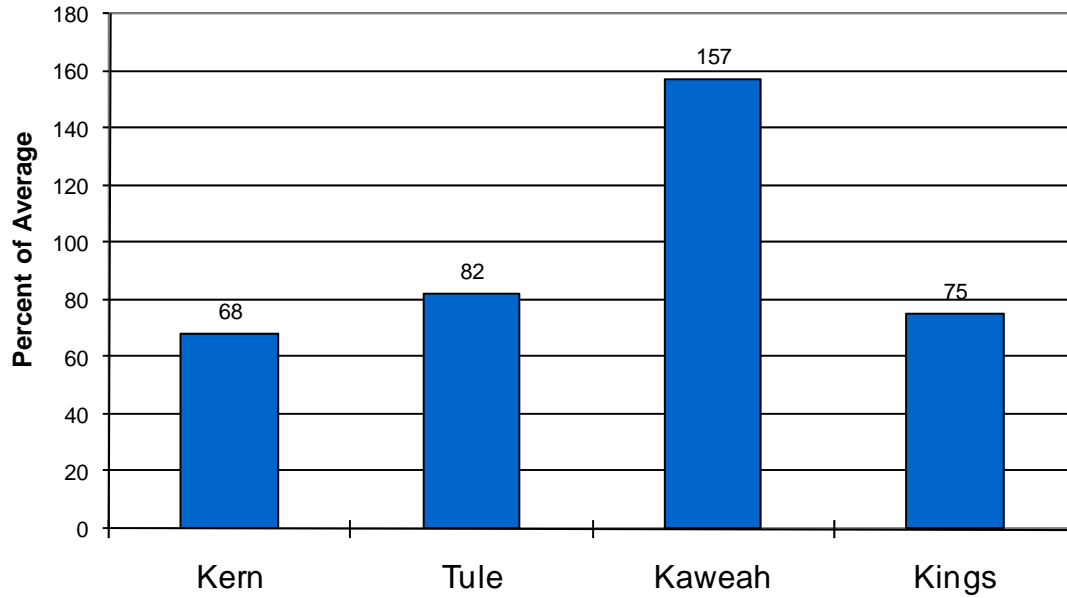
Seasonal Basin Snowpack Water Content in % of April 1 Average



Tulare Lake Basin

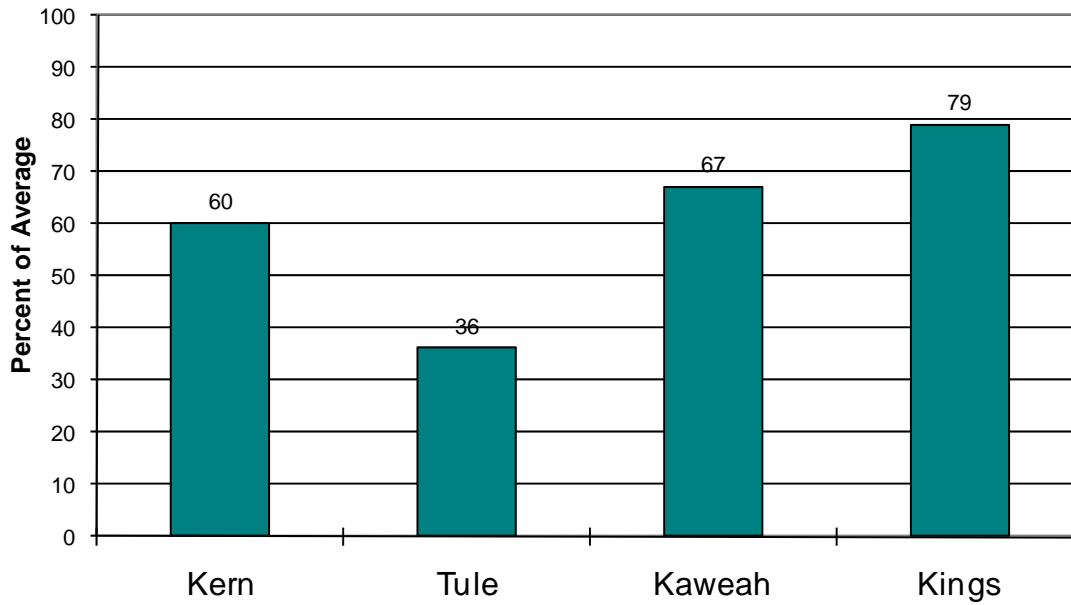
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

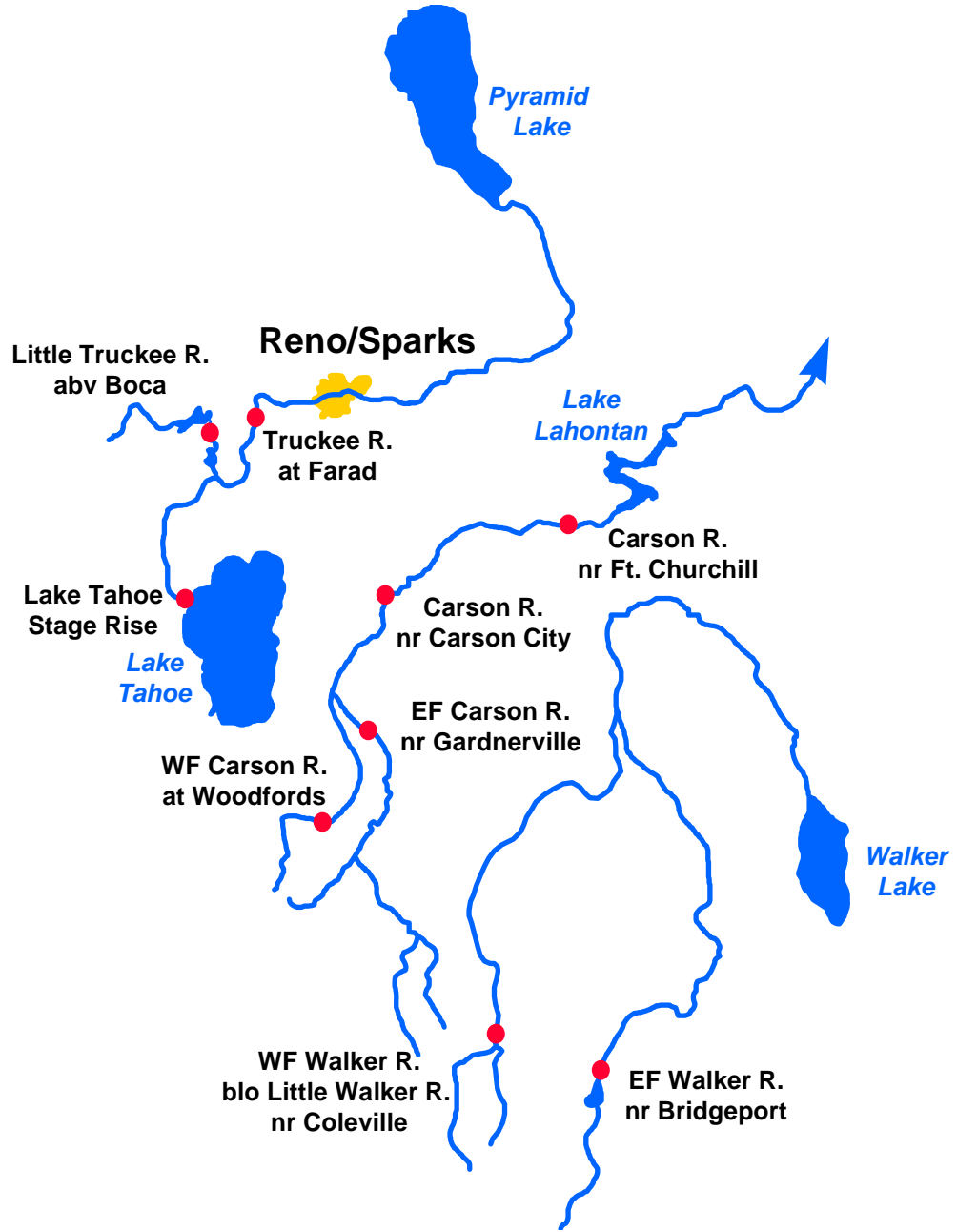


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



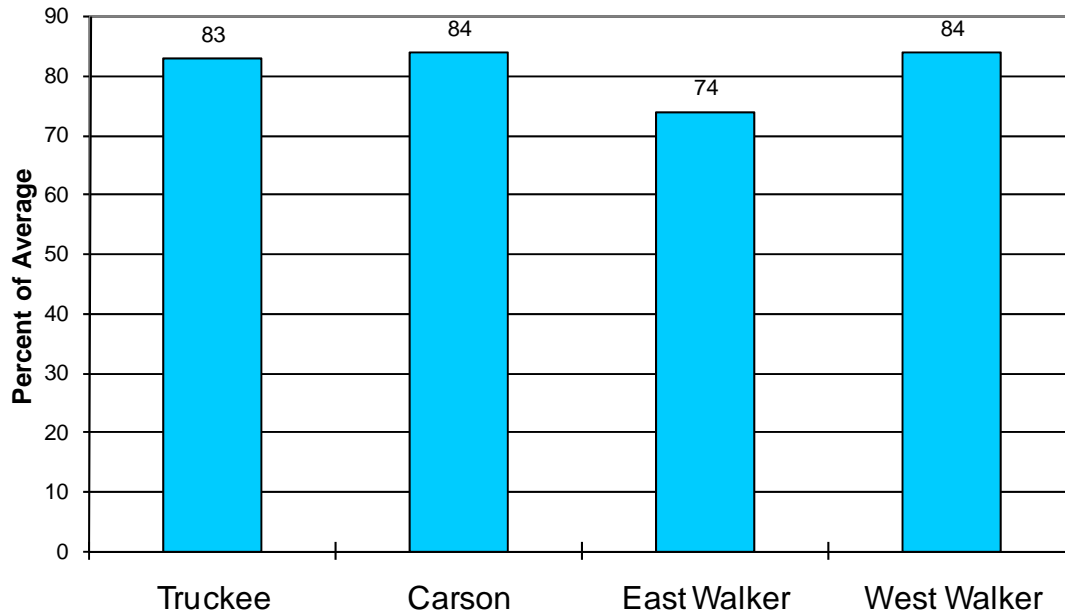
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

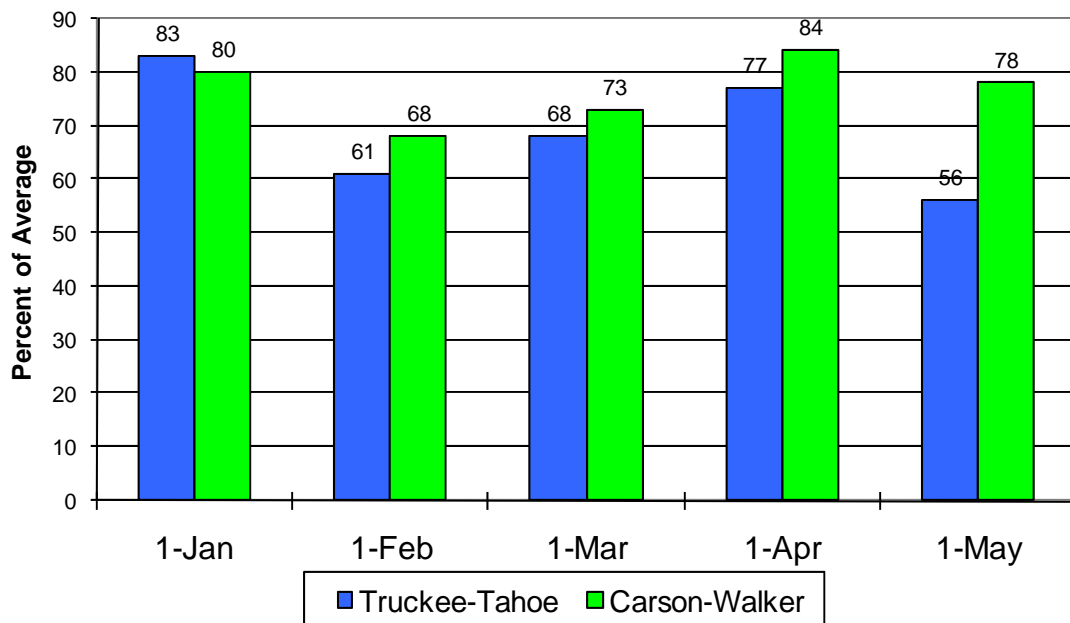
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Truckee River						
Truckee River Lake Tahoe Stage Rise	Apr-High	0.85	62	1.16	0.54	1.38
Little Truckee River Stampede Dam	Apr-Jul	60	75	75	48	80
Truckee River Farad	Apr-Jul	195	75	230	159	260
Carson River						
East Fork Carson River Gardnerville, nr	Apr-Jul	155	82	180	132	189
West Fork Carson River Woodfords	Apr-Jul	45	80	52	38	56
Carson River Carson City, nr	Apr-Jul	125	66	152	100	188
Fort Churchill, nr	Apr-Jul	115	65	142	87	178
Walker River						
East Walker River Bridgeport, nr	Apr-Aug	48	72	65	31	67
West Walker River Ltl Walker, blo, Coleville, nr	Apr-Jul	115	74	135	95	156

East Side Sierra Nevada Basins

Seasonal Basin Precipitation October 1 to Date

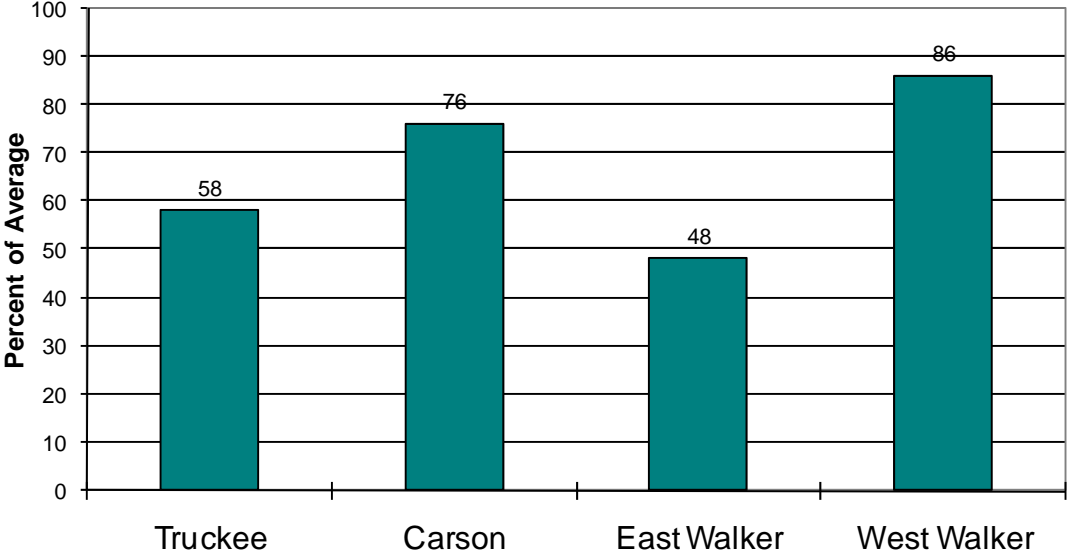


Basin Snowpack % of Average SWE to Date

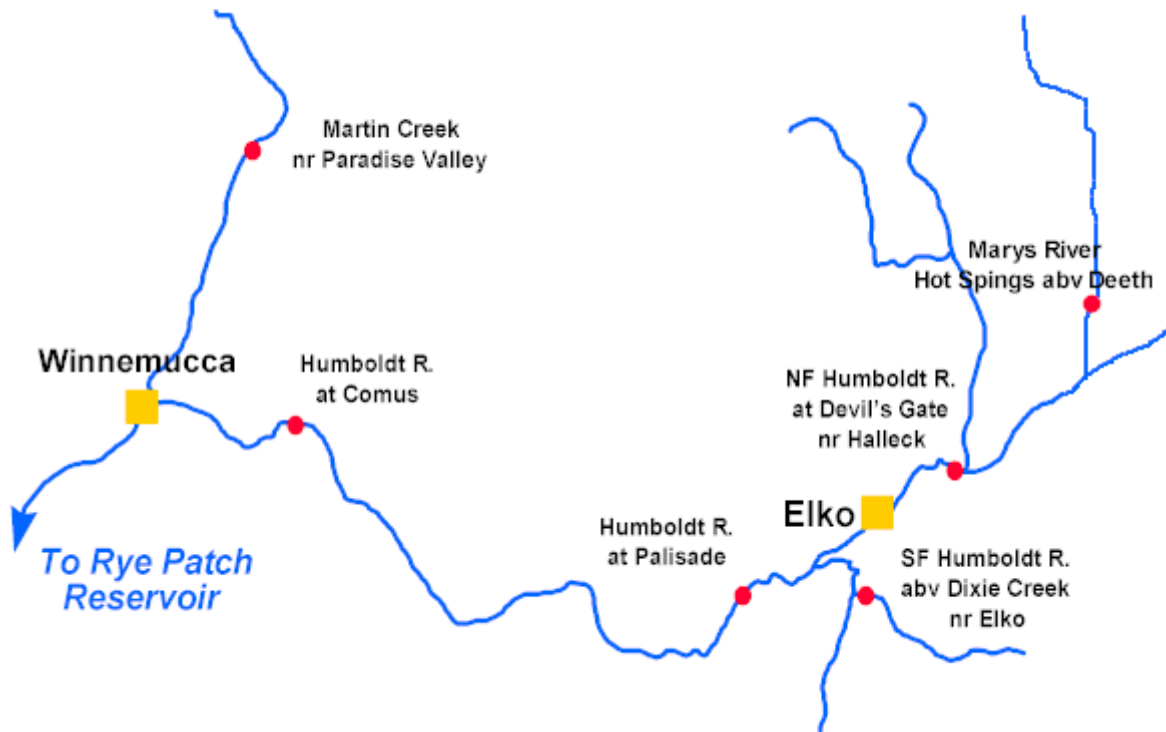


East Side Sierra Nevada Basins

Seasonal Basin Runoff October 1 to Date



Humboldt River Basin



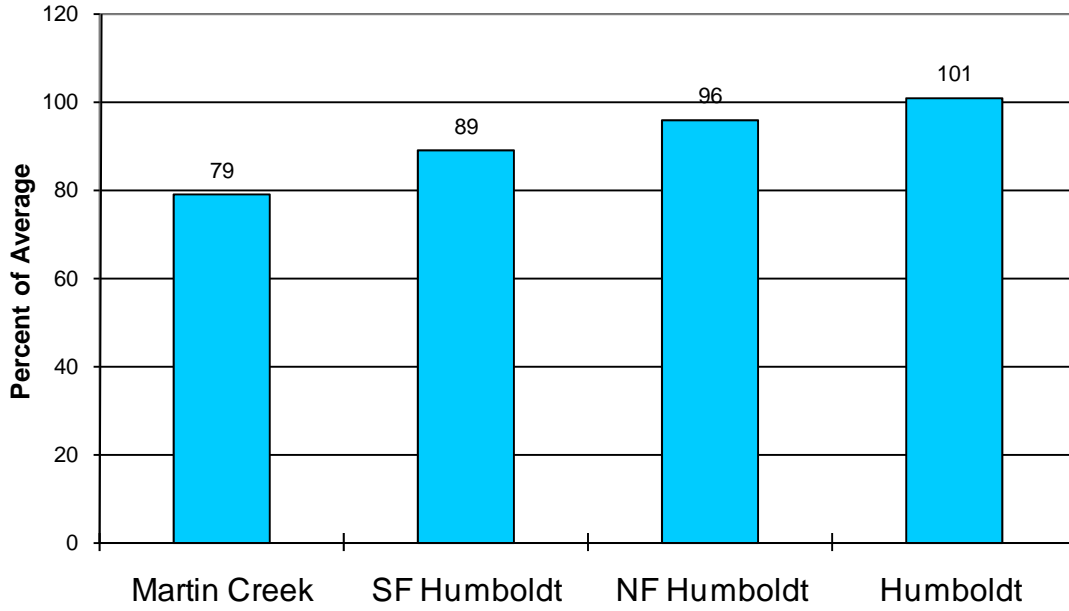
Water Supply Forecasts

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
NF Humboldt River						
Devl's Gate, at, Halleck, nr	Apr-Jul	25	74	35	15.0	34*
SF Humboldt River						
Dixie Ck, abv, Elko, nr	Apr-Jul	60	79	95	25	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	30	77	40	20	39
Humboldt River						
Elko, nr	Apr-Jul	105	68	157	53	154
Palisade	Apr-Jul	170	68	255	85	250
Comus	Apr-Jul	130	58	220	40	225
Imlay, nr	Apr-Jul	90	48	165	15.0	188
Martin Ck						
Paradise Vly, nr	Apr-Jul	9.0	48	16.0	2.0	18.7

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Humboldt River Basin

Seasonal Basin Precipitation October 1 to Date



Basin Snowpack % of Average SWE to Date

