

WATER SUPPLY OUTLOOK



CALIFORNIA AND NORTHERN NEVADA

**APRIL
2009**



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 1, 2009

Snow packs improved noticeably in the Sacramento, San Joaquin and Upper Klamath Lake region as a result of precipitation that fell in March. However, some basins experienced extended periods of dry weather during the month, especially those in the upper San Joaquin and Tulare Lake regions. There were instances of high winds blowing across snow basins during March, especially over the east side Sierra Nevada. Although the majority of California's large reservoirs reported significant gains in storage during March, many still remain below average. Despite gains to most of the region's snow pack, it remains below average with the exception of the Upper Klamath. Spring runoff predicted for the California, northern Nevada and western Nevada region remains below average. With the wet season essentially completed, substantial improvement to this water year's water supply situation will be difficult.

Significant precipitation fell in the northern and central California snow basins during the first four days of March. Some basins received additional amounts on the 16th and 22nd of the month. March precipitation varies from 30 percent for the Kings and Kaweah basins to 125 percent for the Feather. Monthly precipitation was above average for the east side Sierra. Seasonal precipitation amounts (October 1 to March 31) remain below average for snow basins in California and western Nevada. Seasonal averages range from 58 percent for the Trinity to 94 percent for the Stanislaus and Kern River basins. Seasonal average precipitation for the east side Sierra Nevada varies from 86 percent for the Truckee to 92 percent for the Walker River basin. Seasonal averages are about 101 percent for the upper Humboldt and 80 percent for the lower Humboldt basin. It is about 82 percent for the Upper Klamath Lake basin.

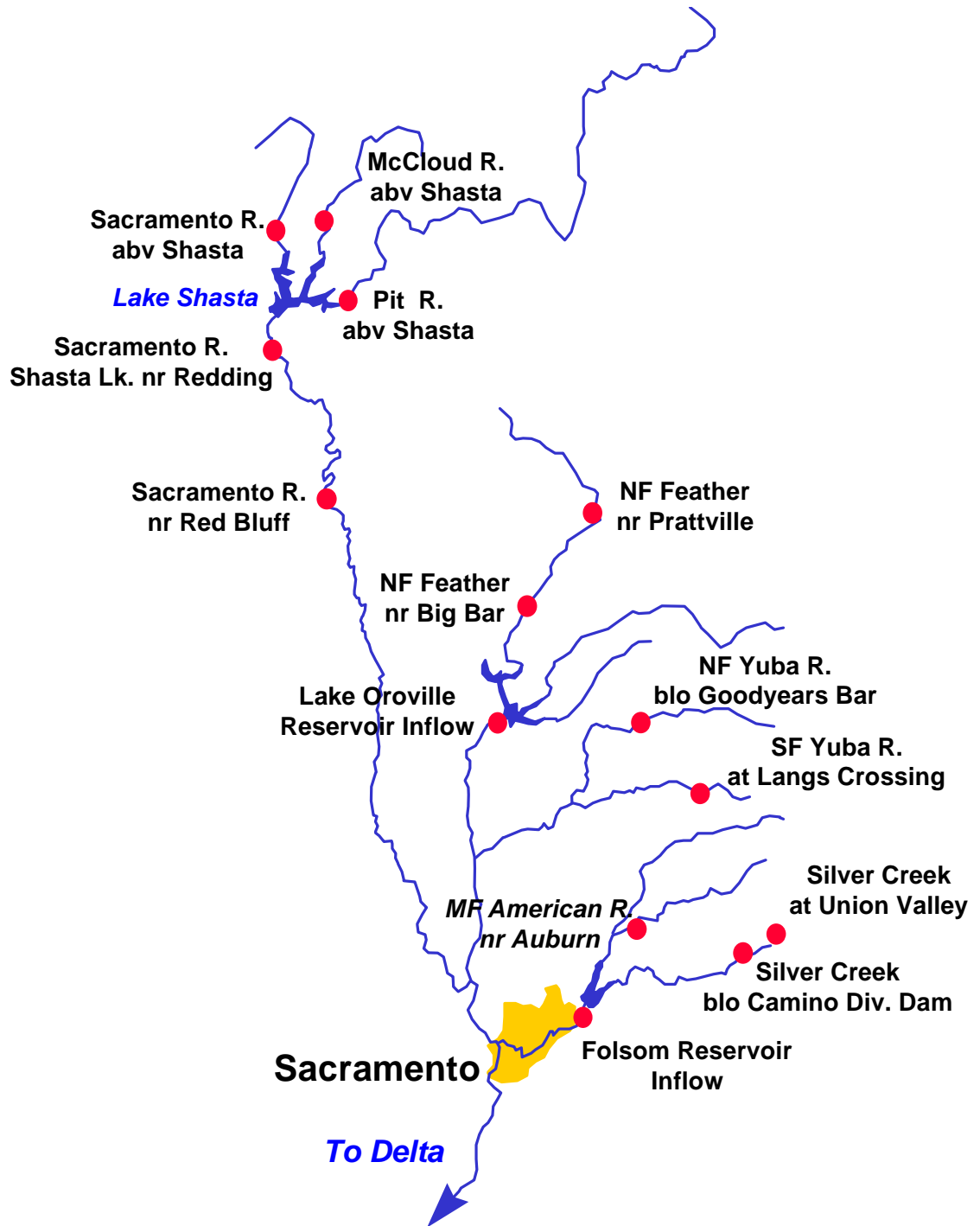
There was a noticeable gain in the snowpack water equivalent during March for all snow basins except in the Kaweah, Tule, Kern and Humboldt. With the exception of the Upper Klamath basin, snow packs remain below average as of April 1st, the typical date of maximum snow accumulation. The April 1st average water content stands at about 82 percent for the Shasta-northern Sierra, 89 percent for the San Joaquin and 80 percent for the Tulare Lake basin. Snow packs in the Tahoe-Truckee basins are about 77 percent of the average-to-date; the Carson-Walker, 84 percent and the Humboldt basin, 74 percent. The pack stands at about 100 percent of the average-to-date for the Upper Klamath Lake basin.

The March 1 through 4 storm event added significant runoff to basins from the Trinity to the Merced. Most basins in California experienced some snowmelt runoff during the last half of March. The Trinity-Upper Sacramento received 97 percent of the monthly average; the San Joaquin, 94 percent and the Tulare Lake region, 64 percent. East side Sierra basins received 77 percent of a March average while the Humboldt River at Palisade recorded 31 percent. The Upper Klamath Lake basin received 61 percent of a March average.

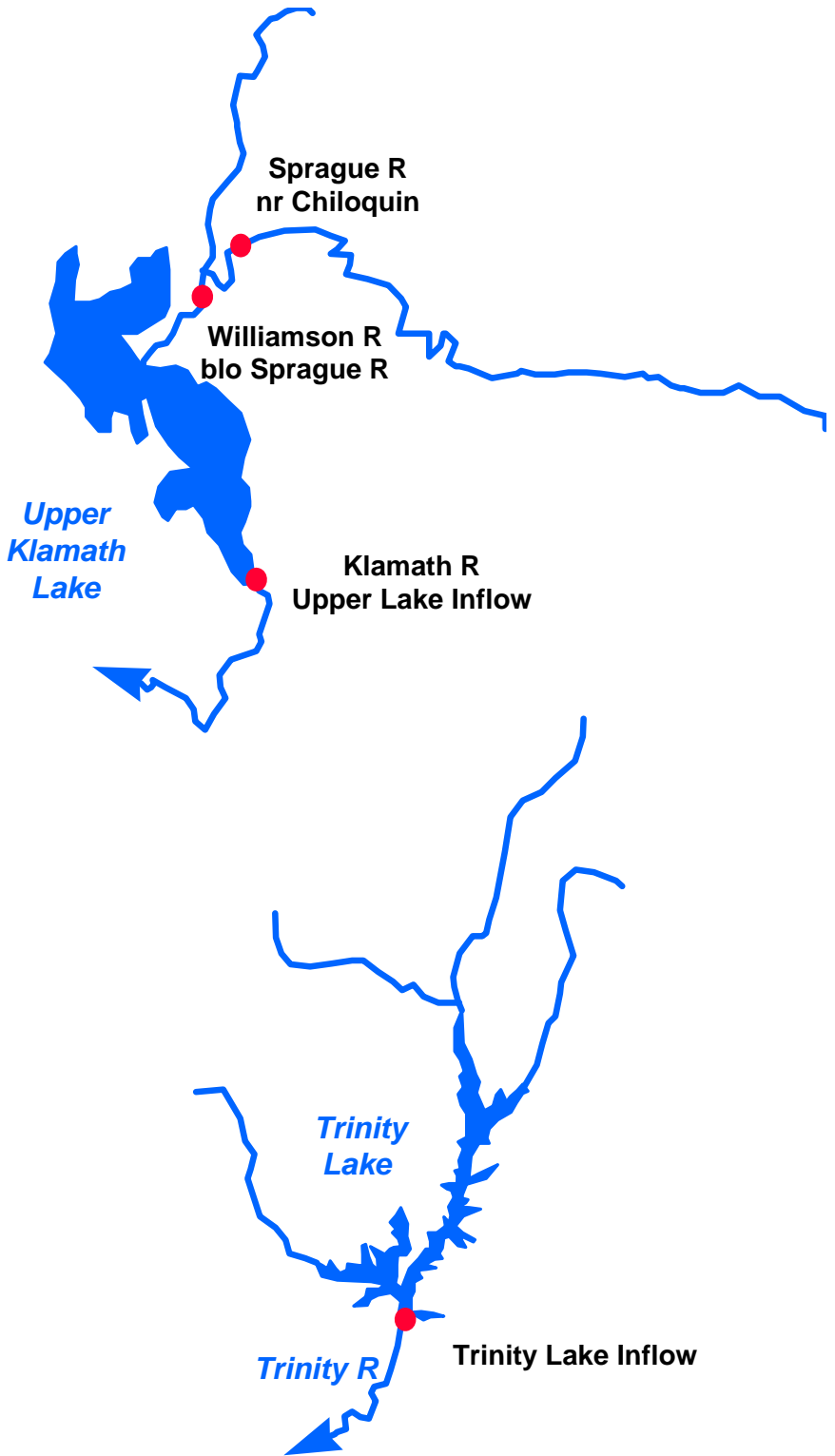
The increased runoff during March translated to substantial gain in storage for two of the important large reservoirs in Northern California. As of March 31, Shasta Lake increased 920 KAF since the end of February and stands at 2.881 MAF or 79 percent of average while Lake Oroville gained 617 KAF to end up at 1.978 MAF or 71 percent of average. It was only 60 percent of average for Shasta Lake and 53 percent for Lake Oroville on February 28. Stored water in the upper Sacramento-northern Sierra Nevada region as of March 31 was 86 percent of the average to date, the San Joaquin at 85 percent, and the Tulare Lake region at 72 percent. East-side Sierra reservoirs stand at 63 percent of average. The lake level at Lake Tahoe stood at 6223.67 feet and usable storage was 81.3 KAF or 21 percent of average as of March 31. Last year on March 31, it was 6225.12 feet for a usable storage of 257.6 KAF or 66 percent. Storage at Lahontan Reservoir in Nevada stands at 46 percent of the seasonal average while Rye Patch Reservoir remains meager at 23 percent. Storage at Upper Klamath Lake is about 87 percent of average.

Most spring runoff forecasts increased from 3 to 9 percent from those issued last month for the Upper Klamath Lake basin and the Sierra Nevada from the Feather River basin to the Merced. Forecasts decreased from 2 to 13 percent for basins in the upper San Joaquin River and Tulare Lake drainages. Projections changed little from last month for the East Side Sierra and points on the mainstem Humboldt. April through July runoff forecasts vary from 70 to 84 percent for the Upper Sacramento-Northern Sierra region, 73 to 88 percent for the San Joaquin and 39 to 74 percent for the Tulare Lake region. Runoff projections range from 53 to 67 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 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	305	79	365	245	385
Sprague River						
Chiloquin, nr	Apr-Sep	160	70	210	109	230
Upper Klamath Falls River						
Inflow	Apr-Sep	400	78	510	290	515
Lost River						
Gerber Reservoir Inflow	Apr-Jul	11.5	68	24	0.10	16.9
Clear Lake Reservoir Inflow	Apr-Jul	26	63	54	1.00	41
Scott River						
Fort Jones, nr	Apr-Jul	125	69	190	90	181
Trinity River						
Trinity Lake Inflow	Apr-Jul	460	72	690	330	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	105	145	65	15	7	5	330	717
50%	375	150	200	90	20	10	7	460	852
10%	375	225	300	135	30	15	11	690	1091

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	750	70	1200	560	1070
Mccloud River						
Shasta Lake, abv	Apr-Jul	310	84	460	230	370
Sacramento River						
Delta	Apr-Jul	220	76	345	155	290
Shasta Dam	Apr-Jul	1400	78	2100	1090	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	1840	75	2630	1400	2440

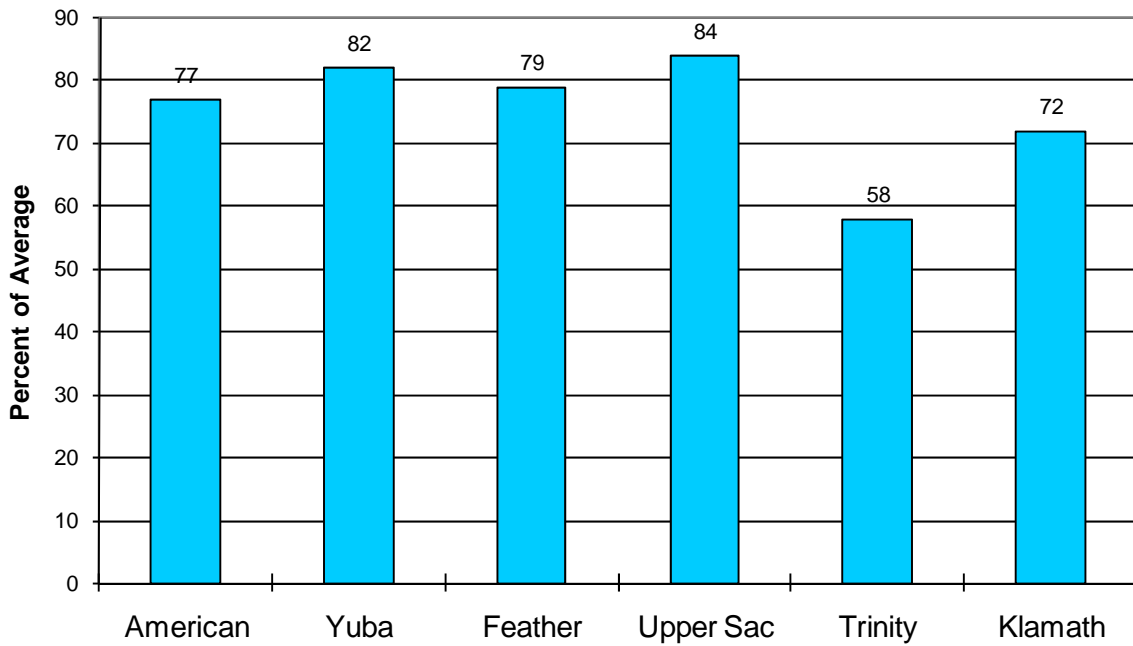
Water Supply Forecasts

		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	240	72	370	180	333*
Big Bar	Apr-Jul	700	73	1080	520	962*
Feather River						
Oroville	Apr-Jul	1300	74	1990	940	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	225	82	350	165	273*
South Yuba River						
Langs Crossing	Apr-Jul	185	82	285	135	225*
Yuba River						
Smartsville, nr	Apr-Jul	810	81	1270	580	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
Middle Fork American River						
Auburn, nr	Apr-Jul	400	82	630	280	490*
Silver Ck						
Union Valley	Apr-Jul	80	82	125	57	98*
Camino Dam, blo	Apr-Jul	130	82	205	91	158*
American River						
Folsom Reservoir Inflow	Apr-Jul	1000	81	1560	700	1230

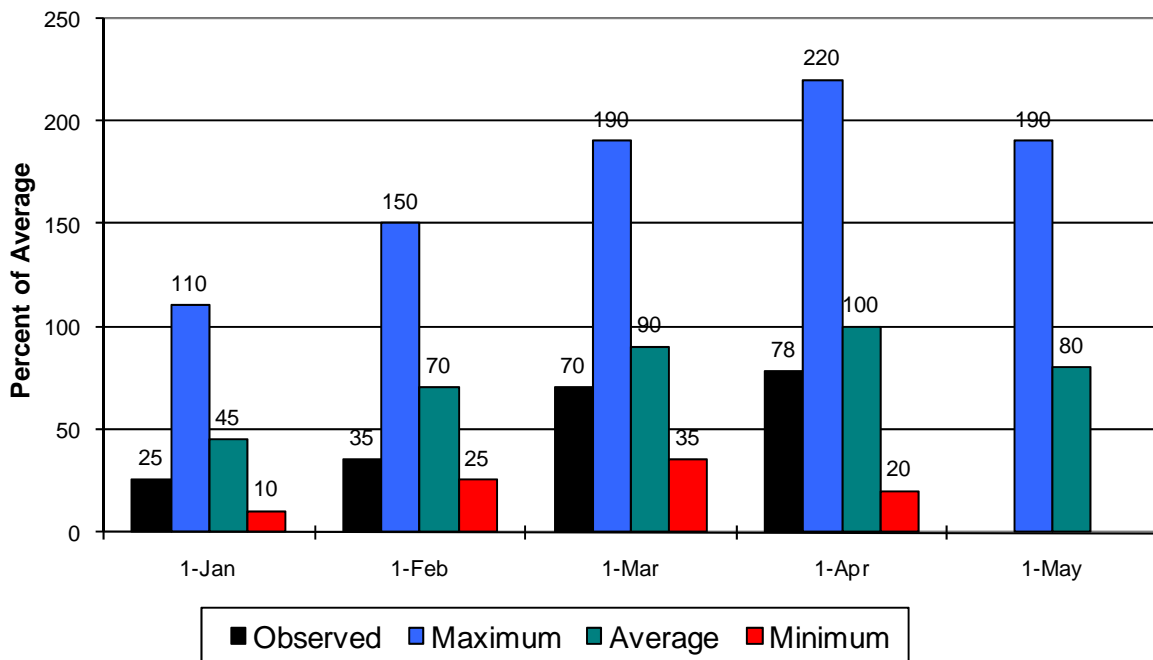
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Sacramento/Trinity/Klamath River Basins

Seasonal Basin Precipitation October 1 to Date

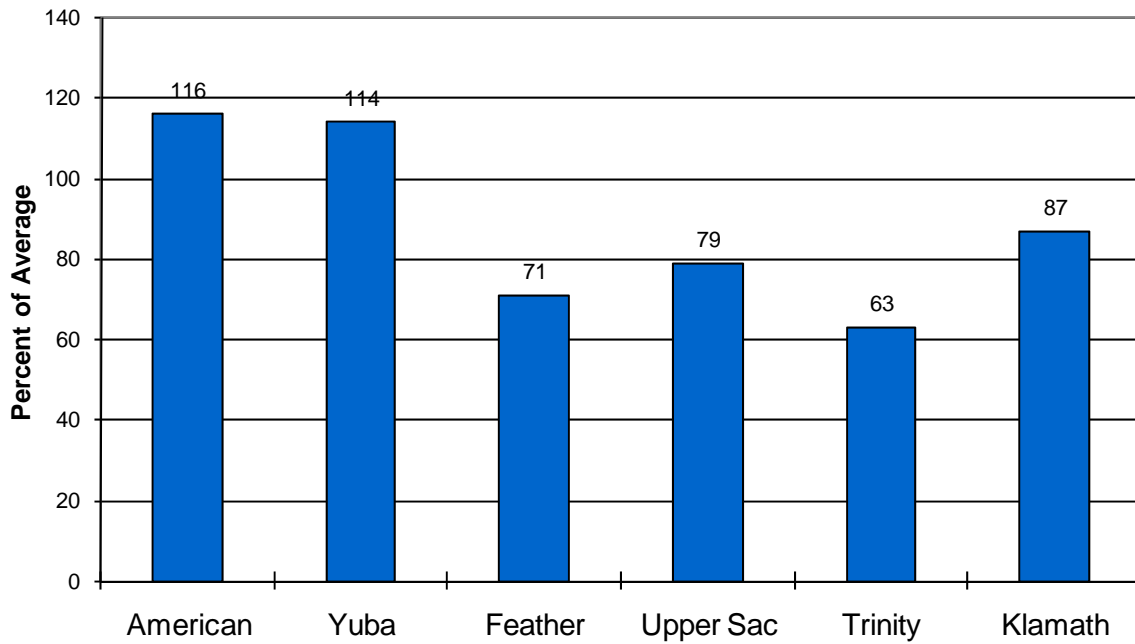


Seasonal Basin Snowpack Water Content in % of April 1 Average

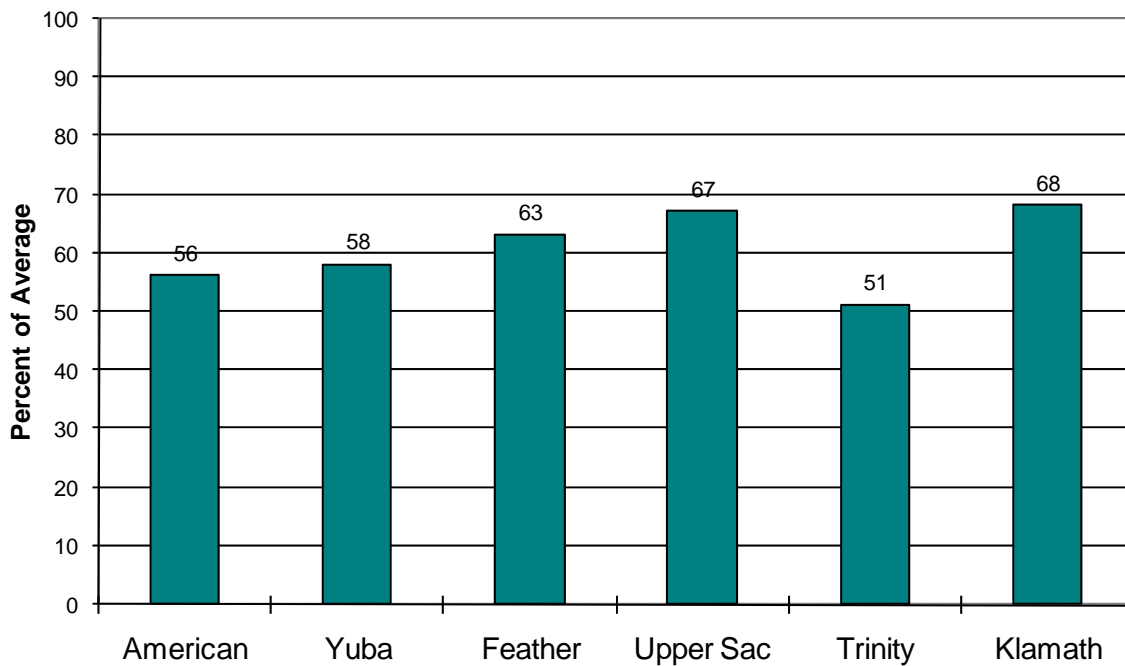


Sacramento/Trinity/Klamath River Basins

Basin Reservoir Storage Contents of Major Reservoirs in % of Average



Seasonal Basin Runoff October 1 to Date



San Joaquin Basin



Water Supply Forecasts

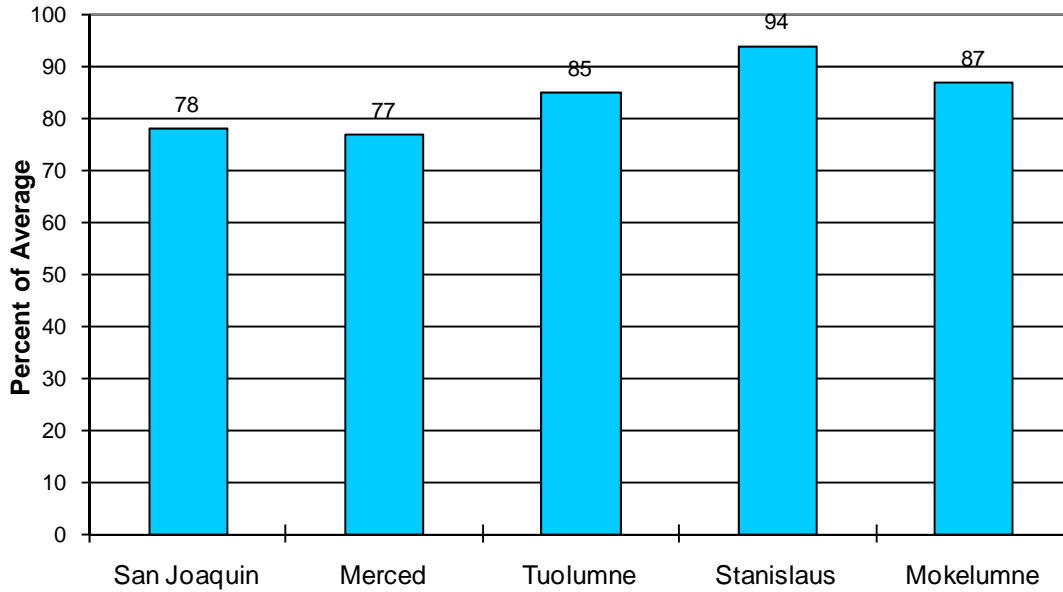
SAN JOAQUIN BASIN

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
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South Fork San Joaquin River						
Hooper Ck, blo, Florence Lk, nr	Apr-Jul	150	78	200	100	192*
San Joaquin River						
Millerton Lake	Apr-Jul	980	77	1200	765	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	320	89	420	230	360*
Merced Falls, blo	Apr-Jul	520	81	750	400	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	540	91	680	430	596*
La Grange, nr	Apr-Jul	1080	88	1390	870	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	285	89	380	210	320*
Stanislaus River						
New Melones Dam	Apr-Jul	610	88	820	480	695
North Fork Mokelumne River						
West Point	Apr-Jul	360	87	480	260	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	400	87	520	310	460
Cosumnes River						
Michigan Bar	Apr-Jul	90	73	160	40	123

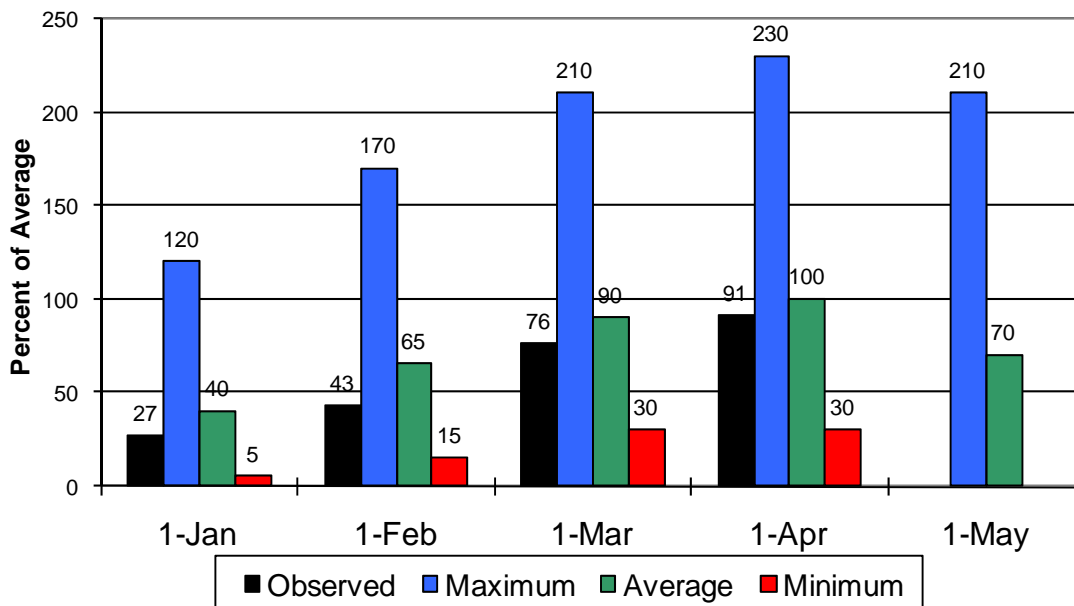
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San Joaquin Basin

Seasonal Basin Precipitation October 1 to Date

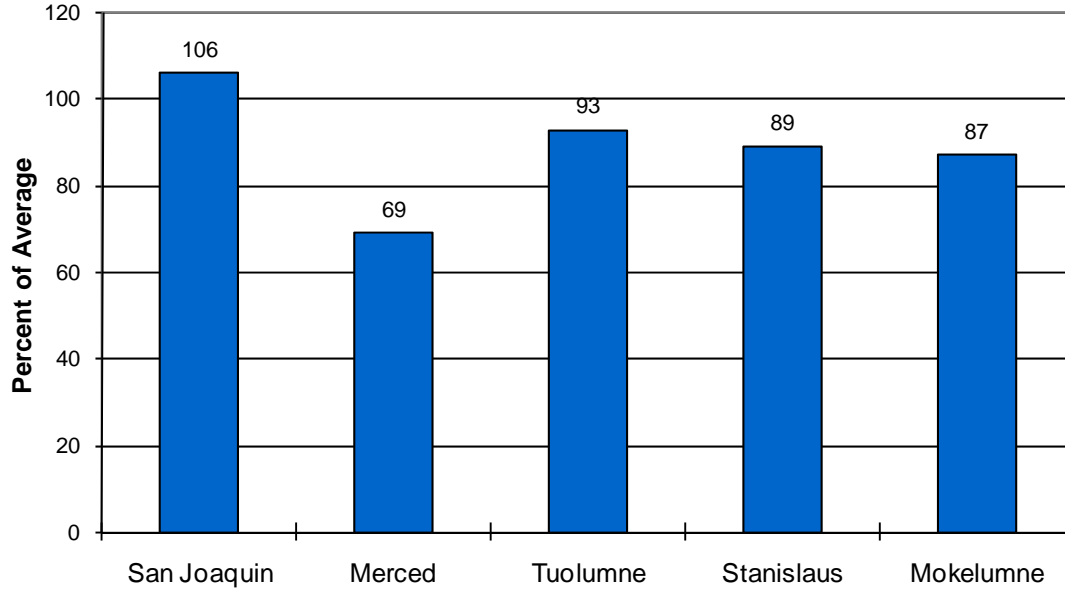


Seasonal Basin Snowpack Water Content in % of April 1 Average

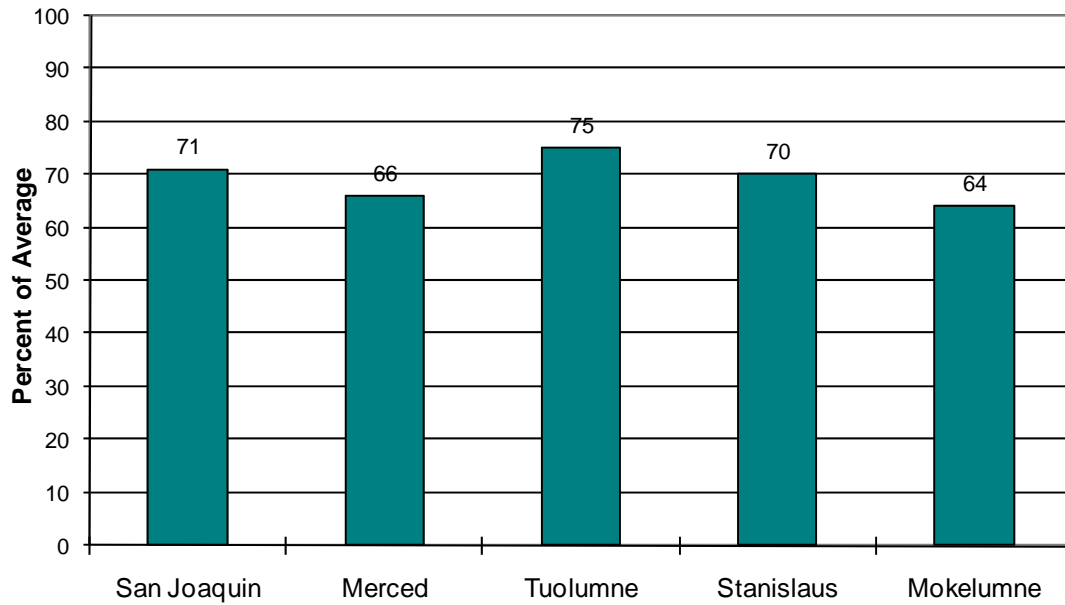


San Joaquin Basin

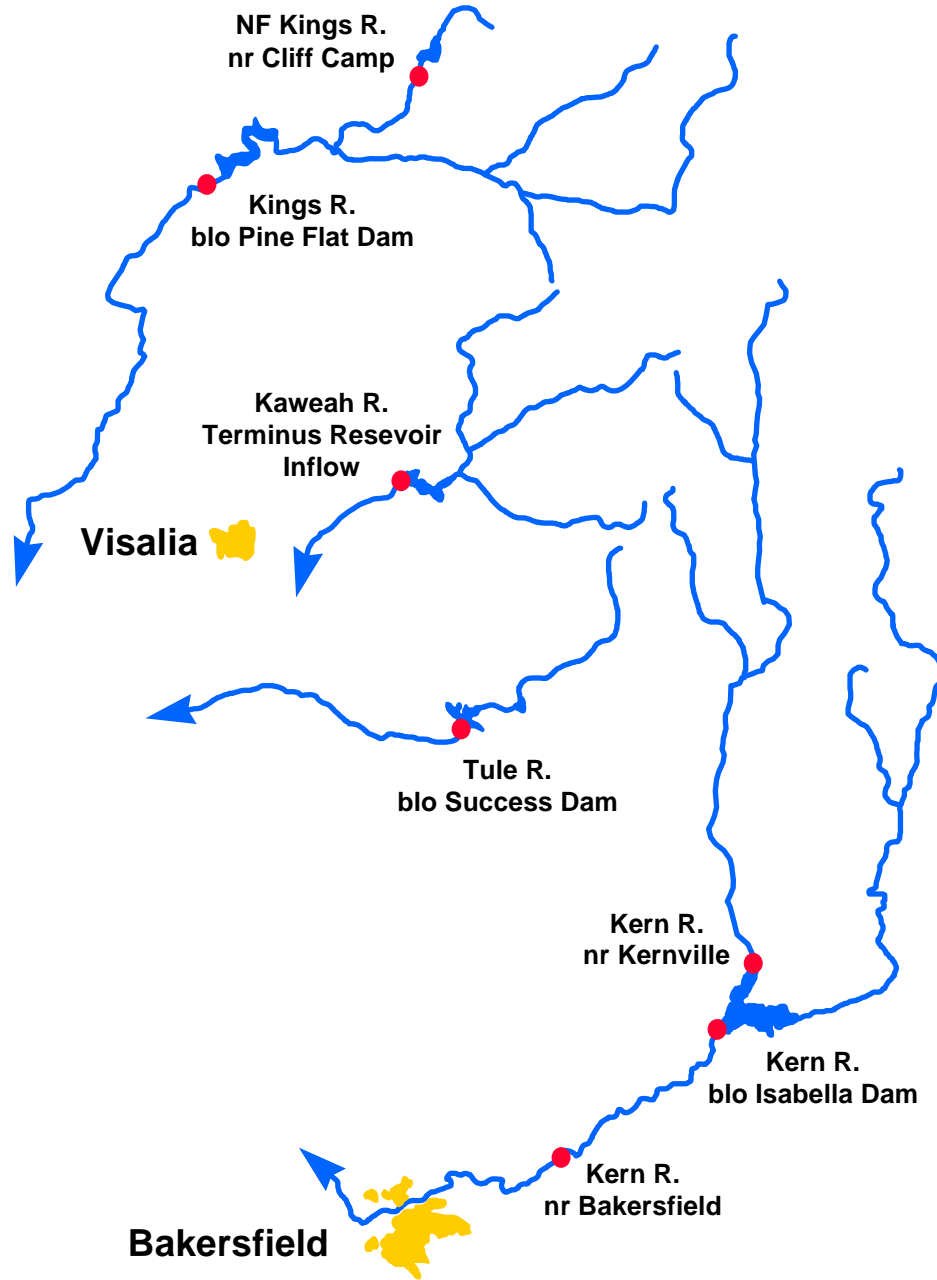
Basin Reservoir Storage Contents of Major Reservoirs in % of Average



Season Basin Runoff October 1 to Date



Tulare Basin



Water Supply Forecasts

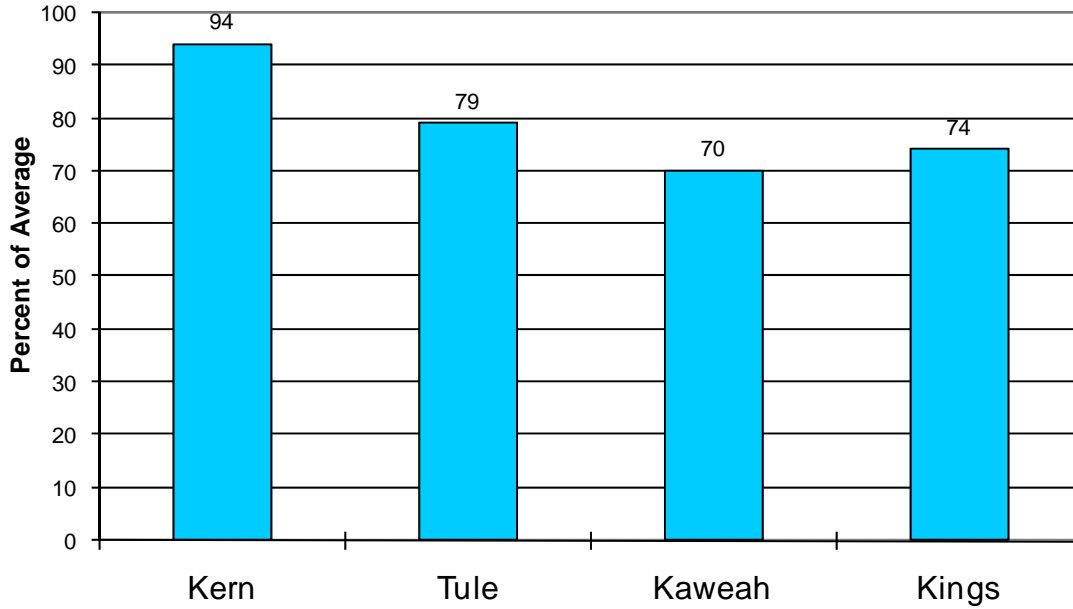
TULARE LAKE BASIN

		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	255	64	330	160	398*
Isabella Dam, blo	Apr-Jul	290	60	390	190	480
Bakersfield, nr	Apr-Jul	300	61	400	200	490
Tule River						
Success Dam	Apr-Jul	26	39	50	10.0	66
Kaweah River						
Terminus Dam	Apr-Jul	210	72	300	140	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	190	79	235	143	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	930	74	1140	720	1250

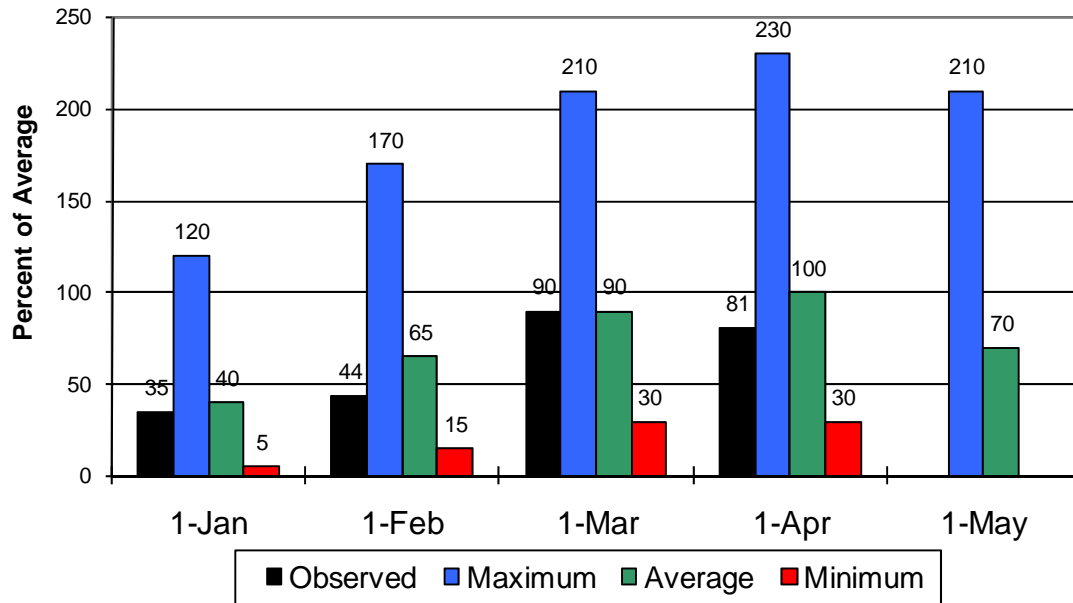
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Tulare Lake Basin

Seasonal Precipitation October 1 to Date



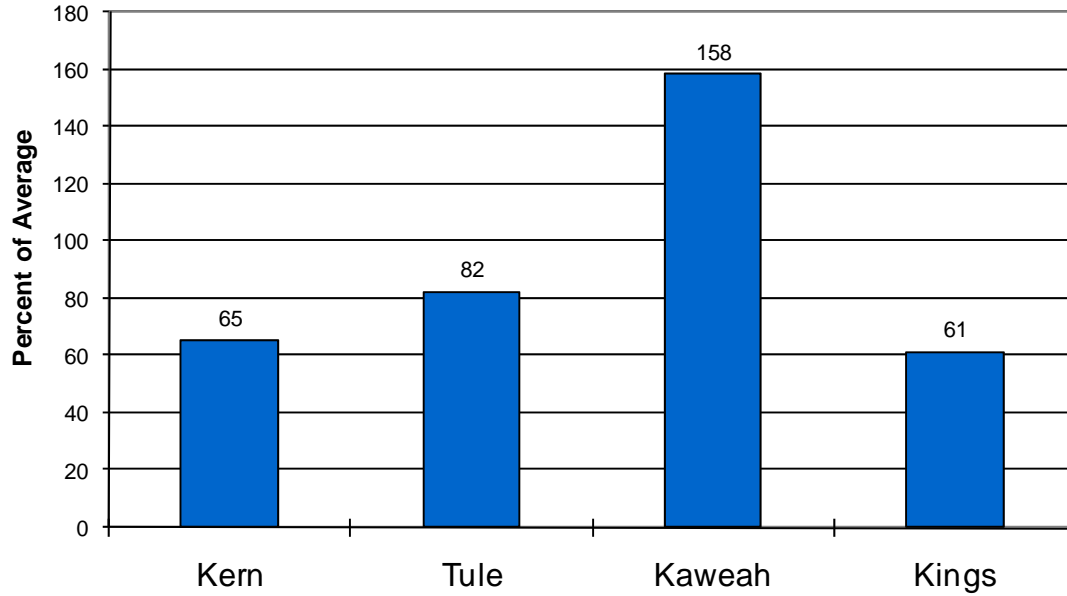
Seasonal Basin Snowpack Water Content in % of April 1 Average



Tulare Lake Basin

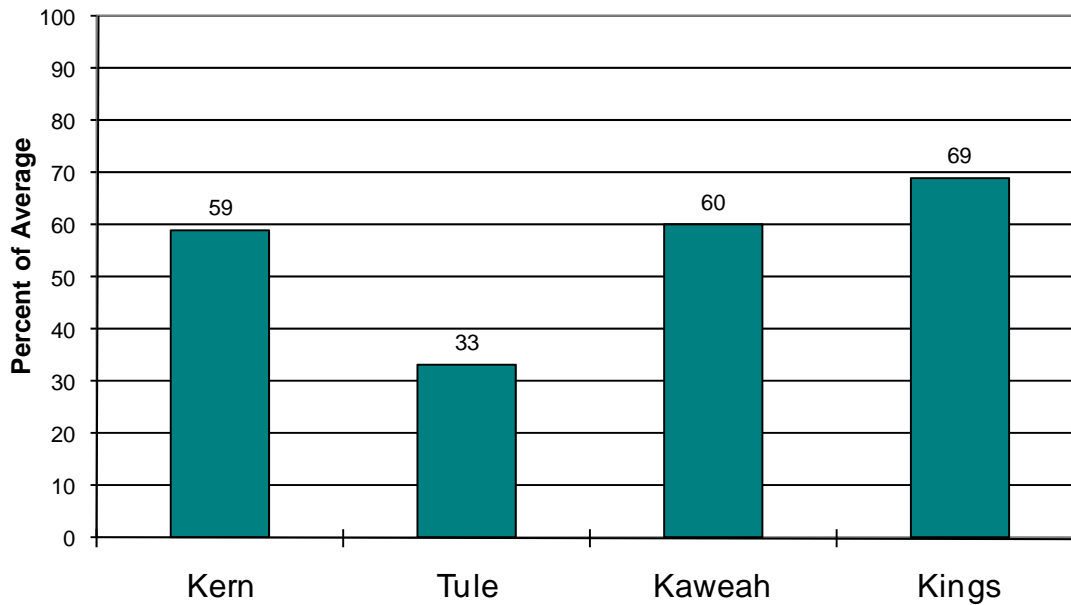
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

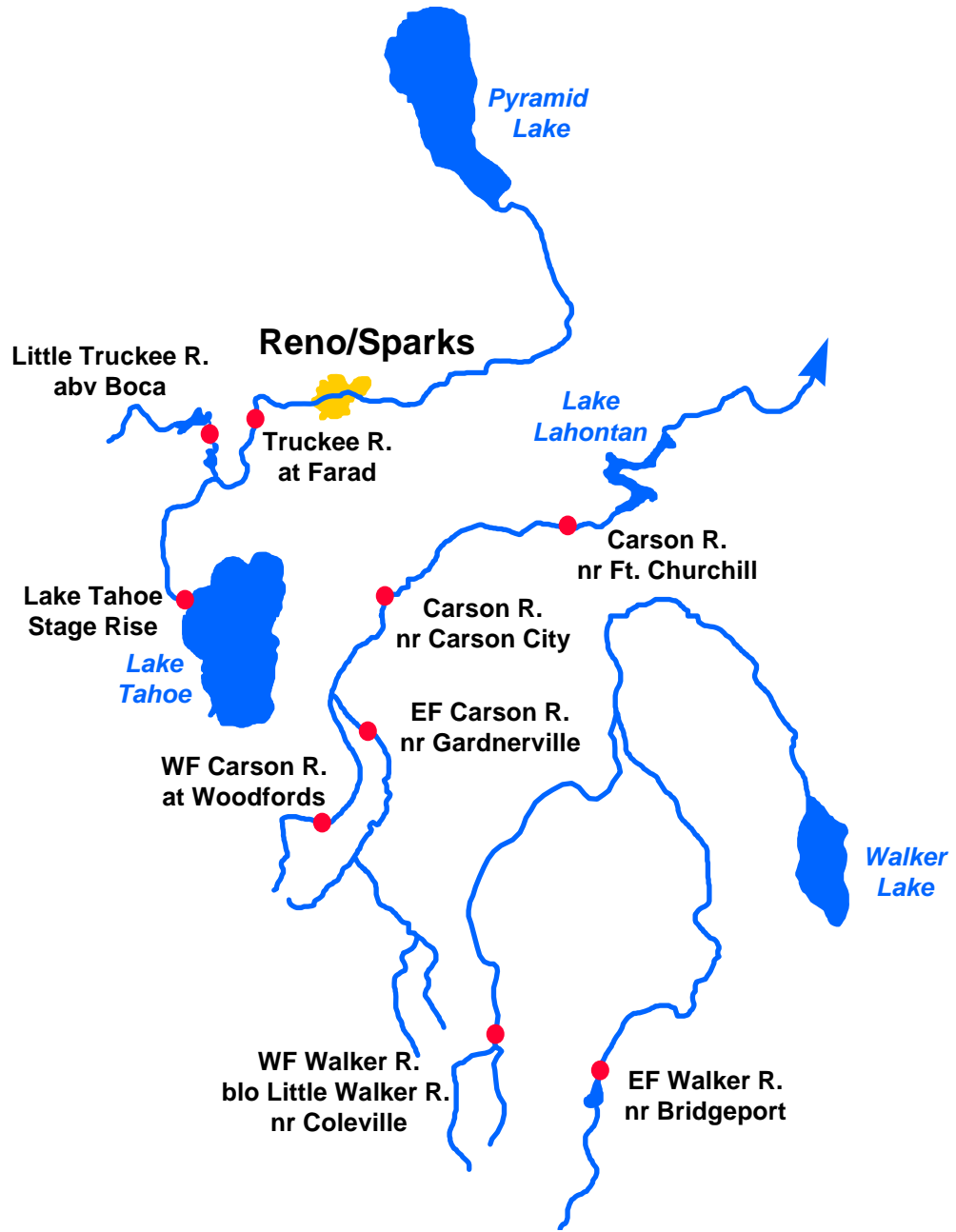


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



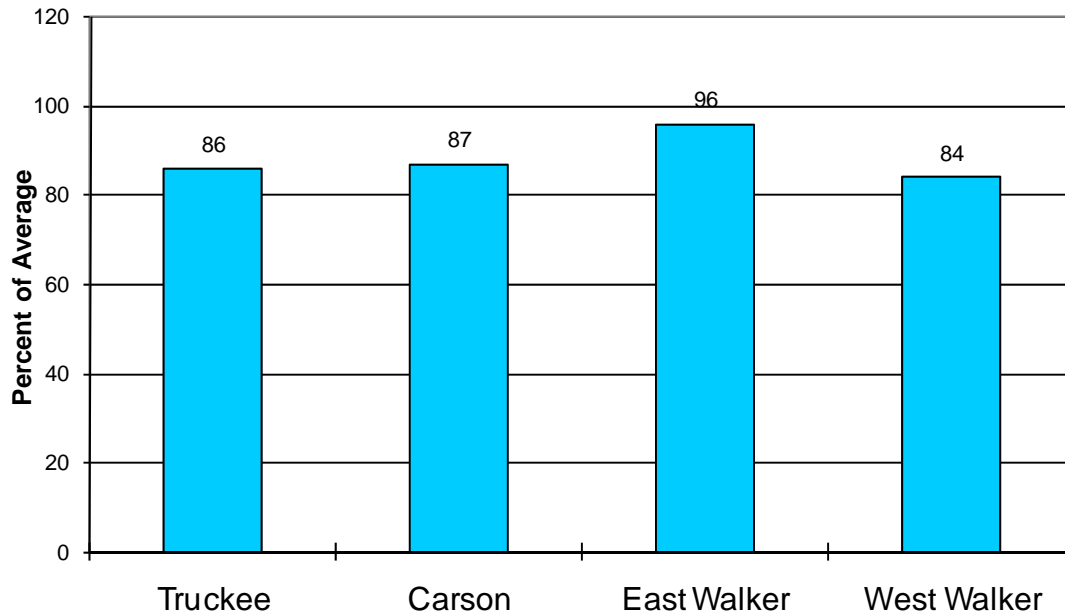
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

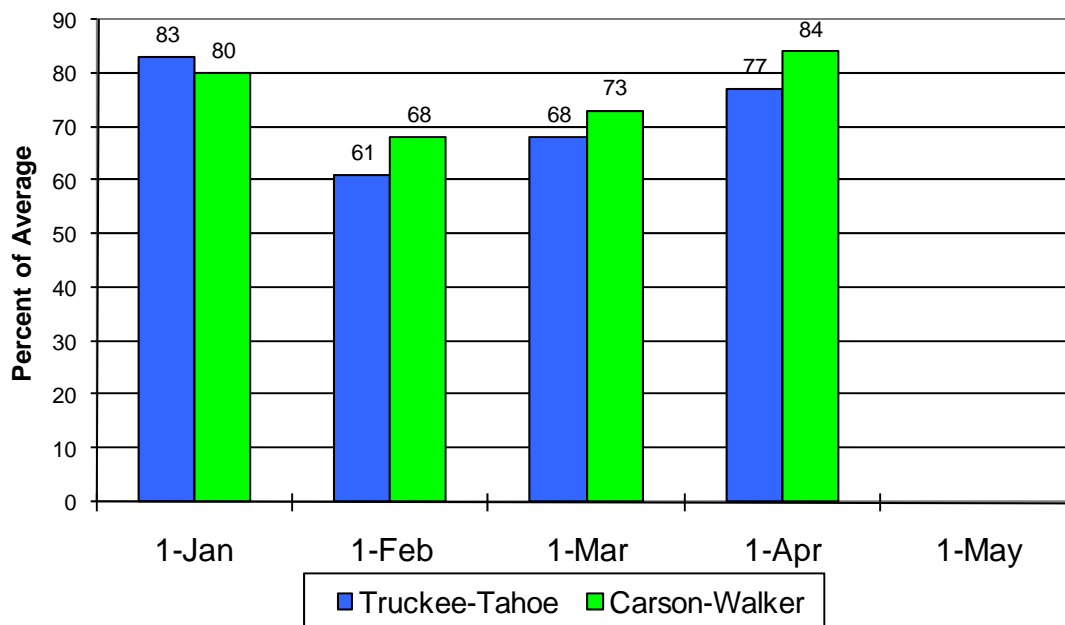
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
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Truckee River						
Truckee River Lake Tahoe Stage Rise	Apr-High	0.95	69	1.53	0.37	1.38
Little Truckee River Stampede Dam	Apr-Jul	55	69	72	42	80
Truckee River Farad	Apr-Jul	175	67	240	109	260
Carson River						
East Fork Carson River Gardnerville, nr	Apr-Jul	135	71	172	98	189
West Fork Carson River Woodfords	Apr-Jul	38	68	49	27	56
Carson River Carson City, nr	Apr-Jul	105	56	137	77	188
Fort Churchill, nr	Apr-Jul	95	53	134	55	178
Walker River						
East Walker River Bridgeport, nr	Apr-Aug	45	67	68	23	67
West Walker River Ltl Walker, blo, Coleville, nr	Apr-Jul	110	71	142	78	156

East Side Sierra Nevada Basins

Seasonal Basin Precipitation October 1 to Date

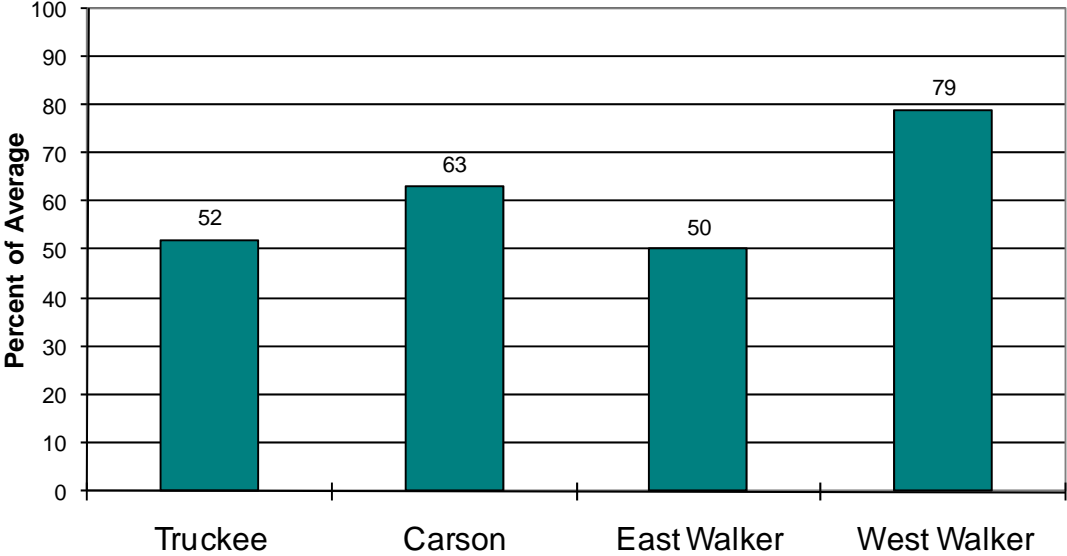


Basin Snowpack % of Average SWE to Date

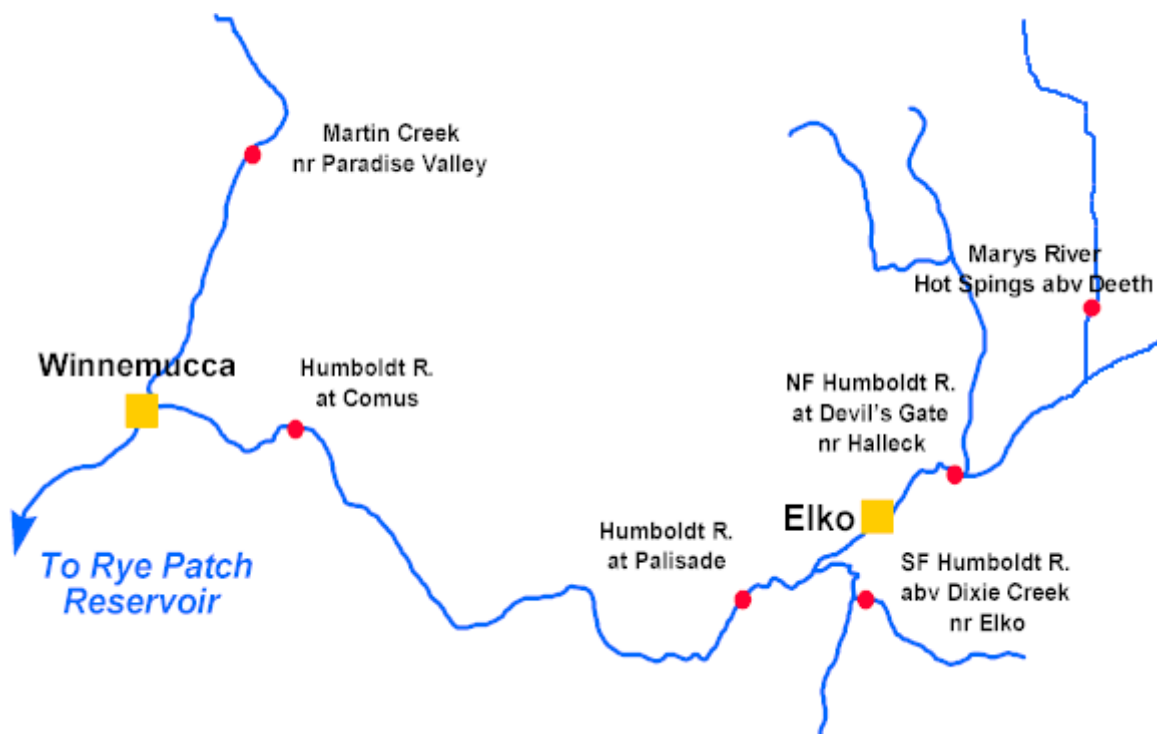


East Side Sierra Nevada Basins

Seasonal Basin Runoff October 1 to Date



Humboldt River Basin



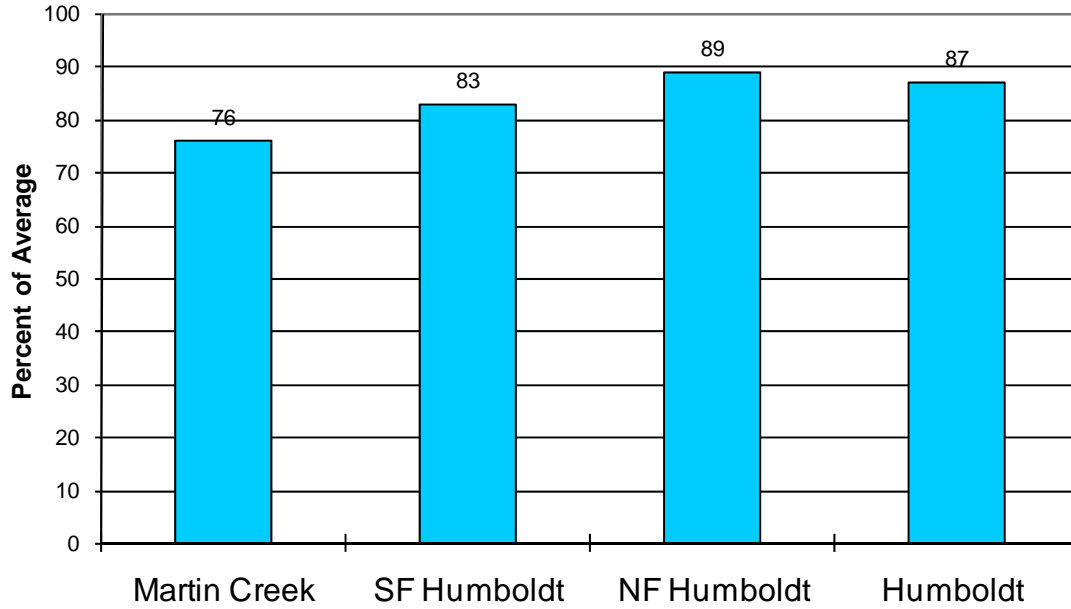
Water Supply Forecasts

		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	26	76	39	13.0	34*
South Fork Humboldt River						
Dixie Ck, abv, Elko, nr	Apr-Jul	50	66	85	15.0	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	31	79	45	17.0	39
Humboldt River						
Elko, nr	Apr-Jul	110	71	180	40	154
Palisade	Apr-Jul	170	68	270	70	250
Comus	Apr-Jul	145	64	260	30	225
Imlay, nr	Apr-Jul	110	59	220	15.0	188
Martin Ck						
Paradise Vly, nr	Apr-Jul	9.0	48	17.0	3.0	18.7

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Humboldt River Basin

Seasonal Basin Precipitation October 1 to Date



Basin Snowpack % of Average SWE to Date

