Water Supply Outlook

California and Northern Nevada

January 2011

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

January 1, 2011

Water year 2011 began with much of the Sierra Nevada receiving in excess of 200 percent of an October average precipitation. Snow began to accumulate during late November with the central and southern Sierra Nevada recording above average precipitation for the month. Finally, intense and cold storms arrived during December producing a robust early-season snowpack, especially in the Upper San Joaquin River and Tulare Lake basins. Soils are now quite saturated and many reservoirs are near or at flood control reservation levels. There is reason to be optimistic for excellent runoff this spring if near normal weather conditions prevail during the remainder of the wet season.

December precipitation was much above average for the entire region, ranging from 149 percent in the Trinity to 530 percent in the Kern River basin. Most of the northern and central Sierra received in excess of 200 percent of the December average while the upper San Joaquin and the Tulare basin recorded 300 to 500 percent of the monthly average. Seasonal precipitation (October 1st to December 31st) range from 138 percent for the lower Klamath River basin to approximately 335 percent for the Kern. Seasonal averages range from near to above 200 percent in the Upper Klamath, east side Sierra and Humboldt watersheds.

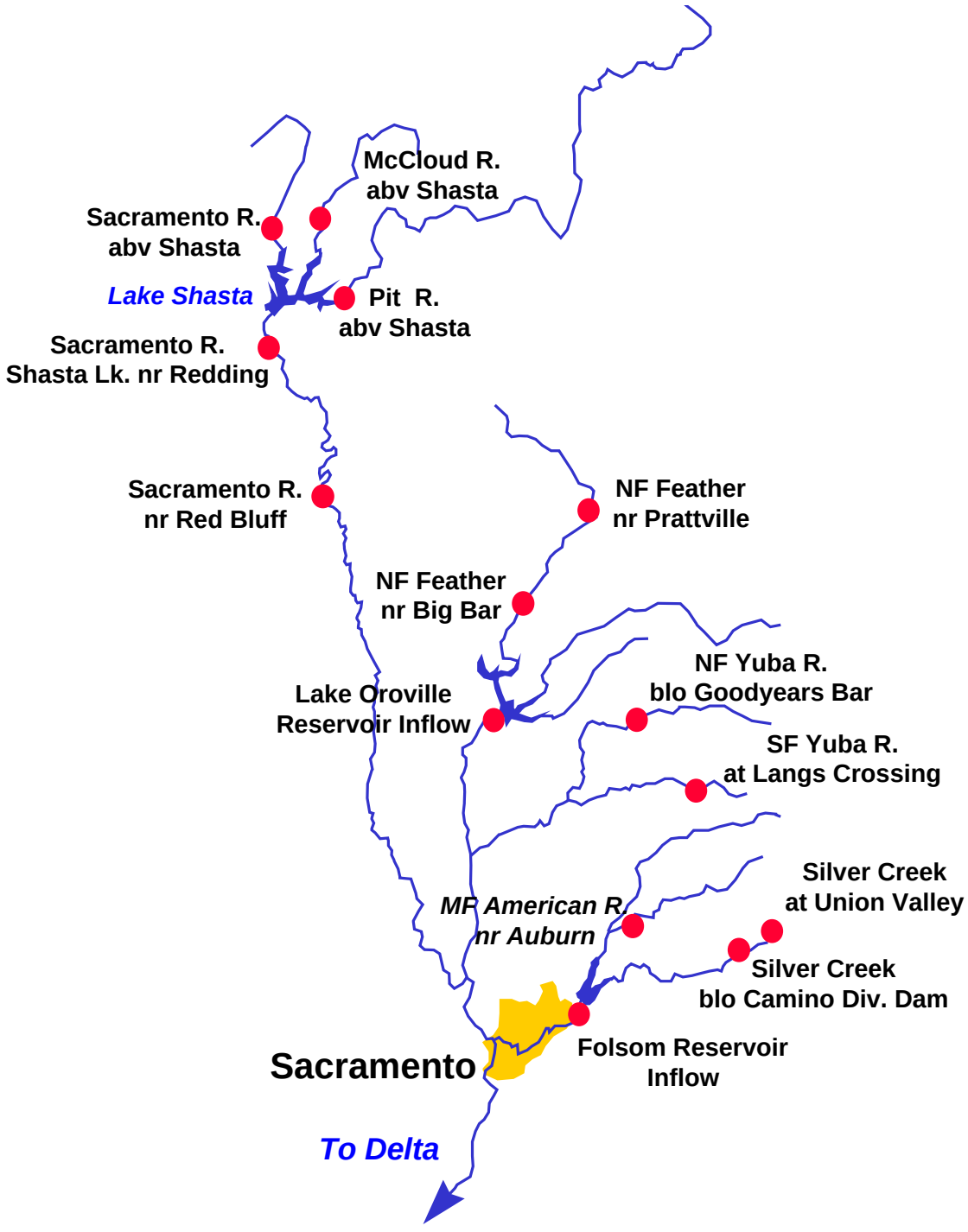
Electronic snow sensor readings as of January 1st, 2011 show that California's snow pack is above average everywhere at this time of the year. The excess is particularly evident in the southern Sierra Nevada. January 1st averages stand at approximately 181 percent for the northern Sierra, 200 percent for the central and 278 percent for the southern Sierra. Snow packs in the Tahoe-Truckee are about 212 percent of the percent of the average-to-date, the Carson-Walker at 216 percent and the Humboldt basin at 193 percent. The pack stands at about 148 percent of the average-to-date for the Upper Klamath Lake basin.

Runoff was much above average for the region during December ranging from 205 percent for the Trinity-Sacramento, 395 percent for the San Joaquin drainage, and 465 percent for the Tulare Lake watershed. East side Sierra basins received 141 percent of a December average while the Humboldt River at Palisade recorded about 162 percent. The Upper Klamath Lake inflow recorded 96 percent of a December average.

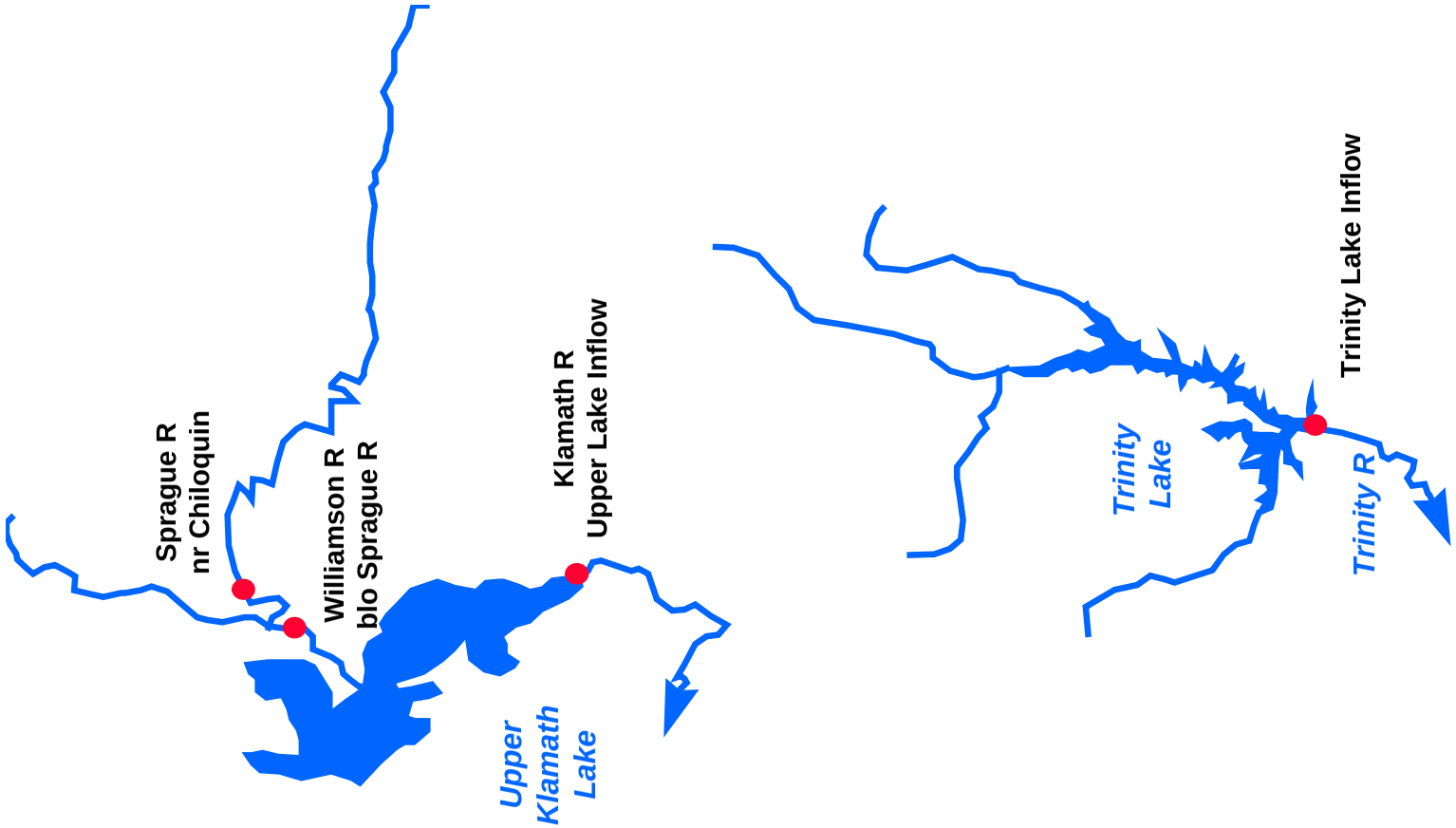
Most of California's major reservoirs are near to above average storage levels as of the end of December. Excellent inroads have been made to storage for the two key reservoirs in northern California with Shasta Lake at 125 percent of average and Lake Oroville at 95 percent. Stored water in the Sacramento region as of December 31st was at 112 percent of average for the date (as opposed to 69 percent for the date last year), the San Joaquin at 128 percent (92 percent last year), and the Tulare Lake watershed at about 160 percent (80 percent last year). East-side Sierra reservoirs were at 120 percent of average. The lake level at Lake Tahoe stood at 6224.54 feet (or 1.54 feet above its natural rim altitude of 6223.0 feet) as of December 31st. Usable storage was 187,100 acre-feet or 53 percent of average. It was 0 acre-feet (0 percent of average) at this time last year. Storage at Lahontan Reservoir in Nevada stands at 63 percent of average as of December 31st while Rye Patch Reservoir is at 17 percent. Storage at Upper Klamath Lake is about 100 percent of average.

April through July runoff forecasts varies from 93 percent for the Pit River basin to about 198 percent of average for the Kern. Projections are greatest in the Tulare Lake basin, ranging from 168 to 198 percent from the Kings River basin to the Kern. Forecasts range from 130 to 174 percent of average for the east side Sierra Nevada basins and 149 to 160 percent for forecast points on the main stem Humboldt River. The April through September forecast for the Upper Klamath Lake inflow is 116 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	450	117	585	315	385
Sprague River						
Chiloquin, nr	Apr-Sep	270	117	380	155	230
Upper Klamath Falls River						
Inflow	Apr-Sep	595	116	835	355	515
Lost River						
Gerber Reservoir Inflow	Feb-Jul	60	128	98	22	47
Clear Lake Reservoir Inflow	Feb-Jul	130	124	215	45	105
Scott River						
Fort Jones, nr	Apr-Jul	210	116	335	140	181
Trinity River						
Trinity Lake Inflow	Apr-Jul	710	112	1100	475	635

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	1000	93	1290	705	1070
Mccloud River						
Shasta Lake, abv	Apr-Jul	430	116	565	295	370
Sacramento River						
Delta	Apr-Jul	340	117	520	182	290
Shasta Dam	Apr-Jul	1920	107	2640	1260	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	2700	111	3740	1660	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	390	117	580	199	333*
Big Bar	Apr-Jul	1200	125	1750	650	962*
Feather River						
Oroville Dam	Apr-Jul	2200	125	3200	1200	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	370	136	530	230	273*
South Yuba River						
Langs Crossing	Apr-Jul	300	133	430	172	225*
Yuba River						
Englebright Reservoir	Apr-Jul	1300	131	1910	645	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
Middle Fork American River						
Auburn, nr	Apr-Jul	645	132	1010	360	490*
Silver Creek						
Union Valley	Apr-Jul	129	132	200	76	98*
Camino Dam, blo	Apr-Jul	215	136	335	111	158*
American River						
Folsom Reservoir	Apr-Jul	1600	130	2580	900	1230

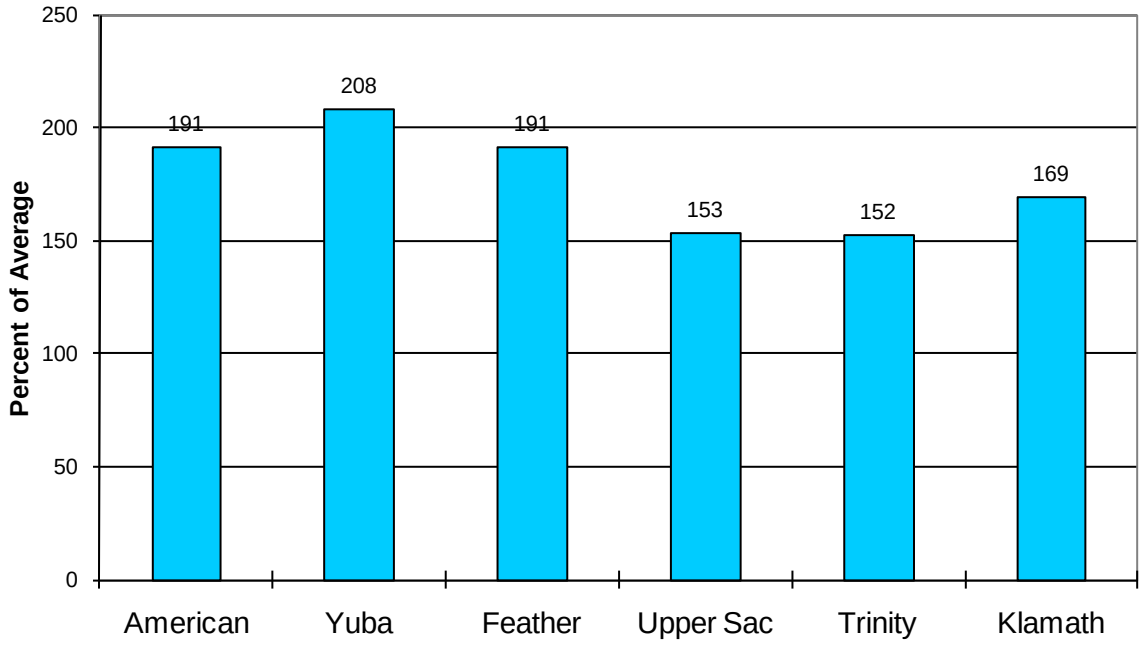
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

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

Sacramento/Trinity/Klamath River Basins

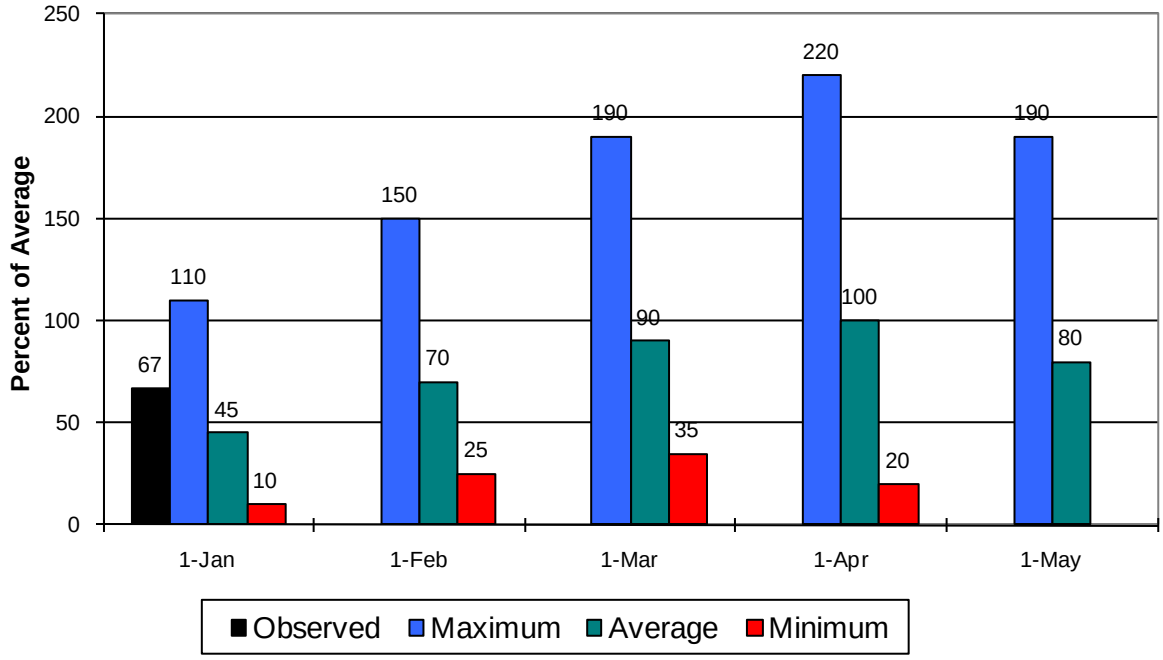
Seasonal Basin Precipitation

October 1 to Date



Seasonal Basin Snowpack

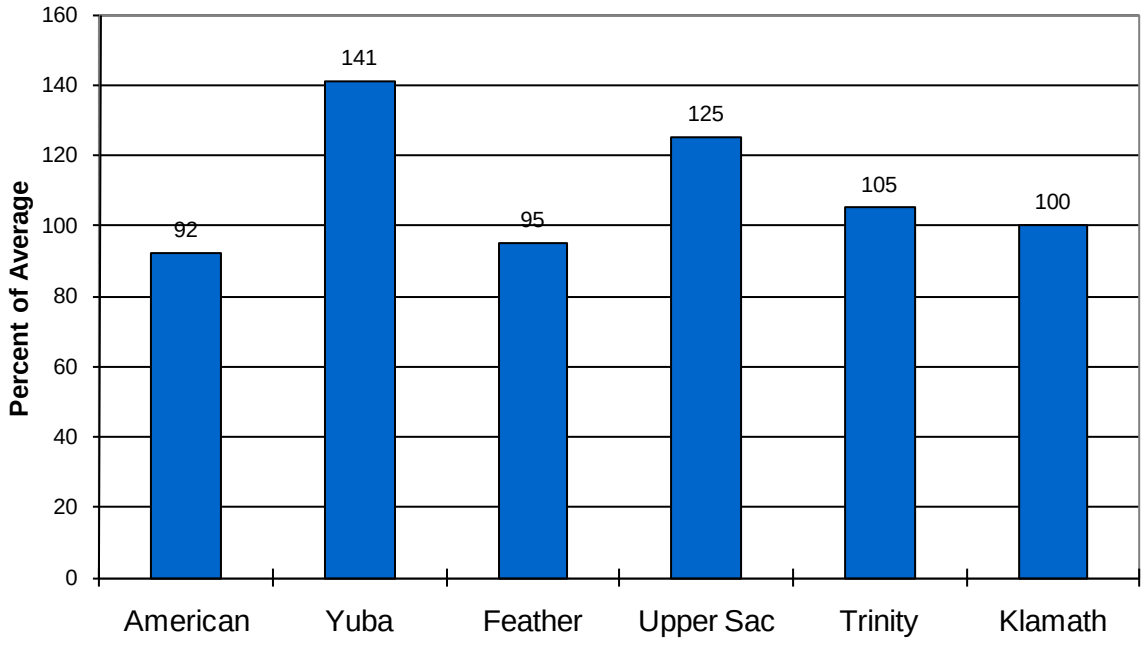
Water Content in % of April 1 Average



Sacramento/Trinity/Klamath River Basins

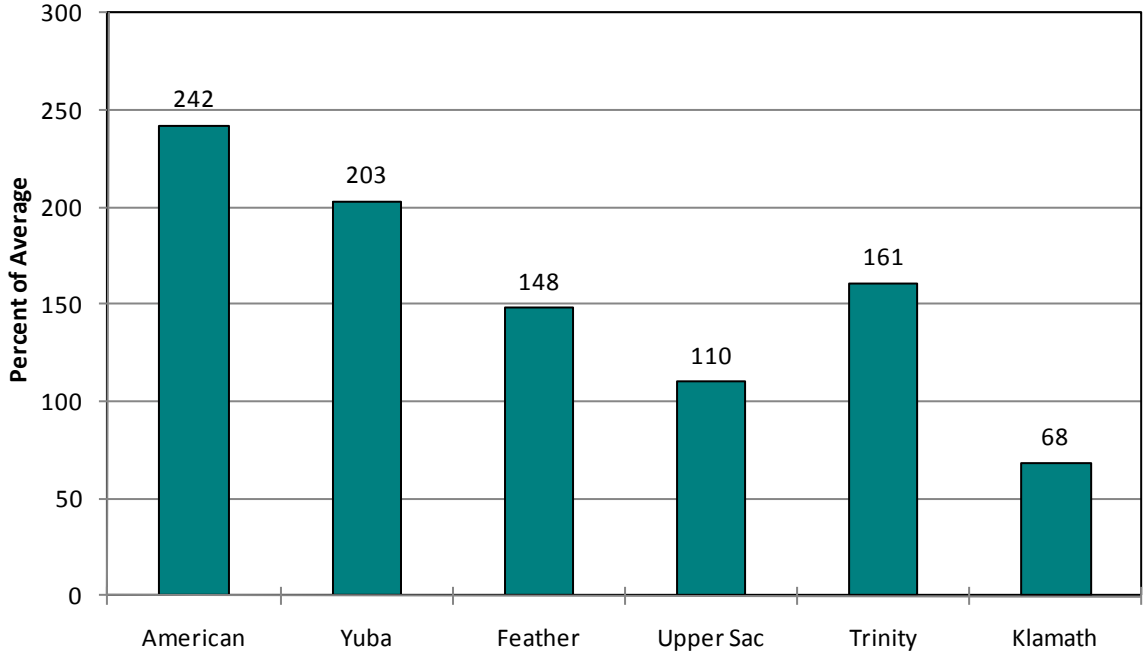
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

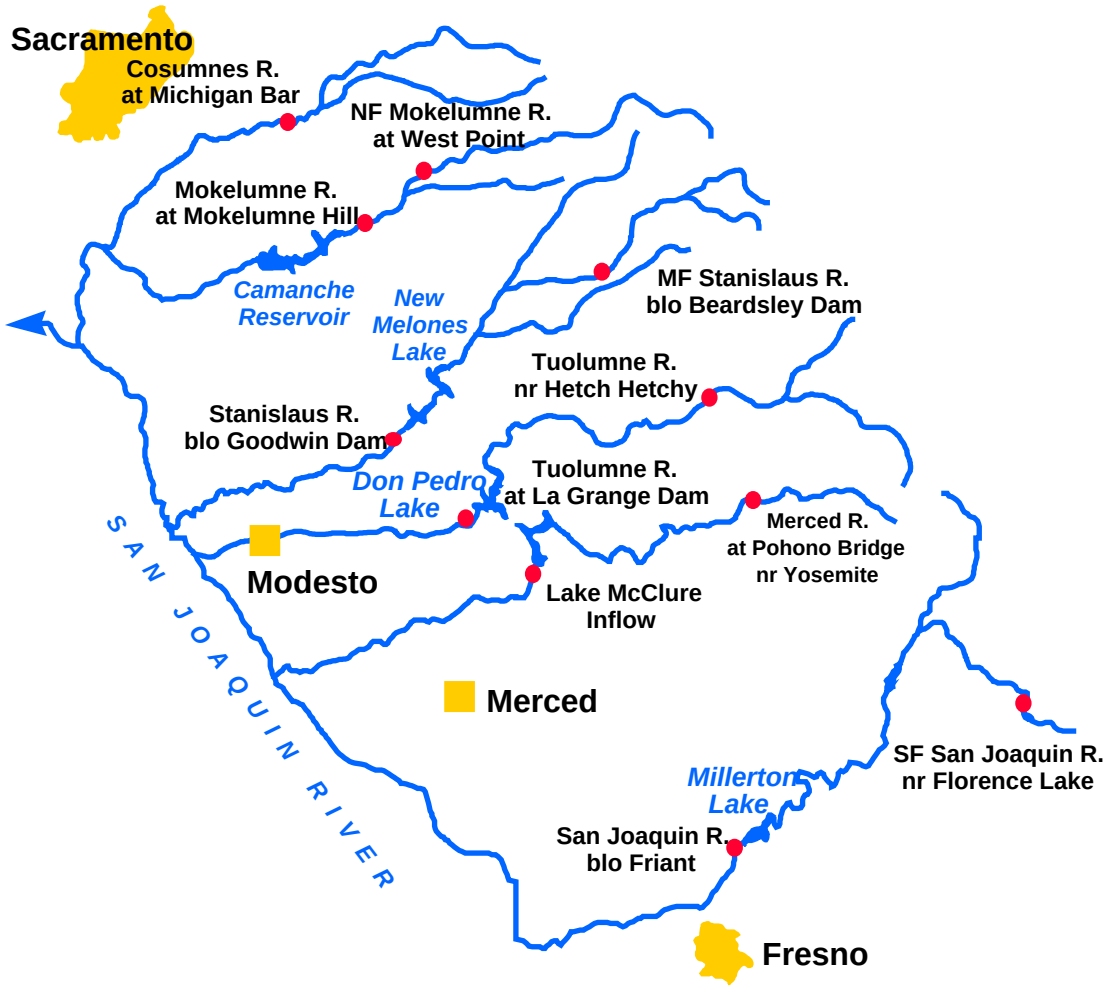


Seasonal Basin Runoff

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, nr	Apr-Jul	300	156	425	174	192*
San Joaquin River						
Millerton Lake	Apr-Jul	1930	152	2830	1020	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	550	153	790	310	360*
Merced Falls, blo	Apr-Jul	925	143	1400	450	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	825	138	1150	500	596*
La Grange, nr	Apr-Jul	1630	133	2380	870	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	400	125	605	194	320*
Stanislaus River						
New Melones Dam	Apr-Jul	850	122	1310	390	695
North Fork Mokelumne River						
West Point	Apr-Jul	500	120	770	270	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	575	125	875	315	460
Cosumnes River						
Michigan Bar	Apr-Jul	160	130	295	86	123

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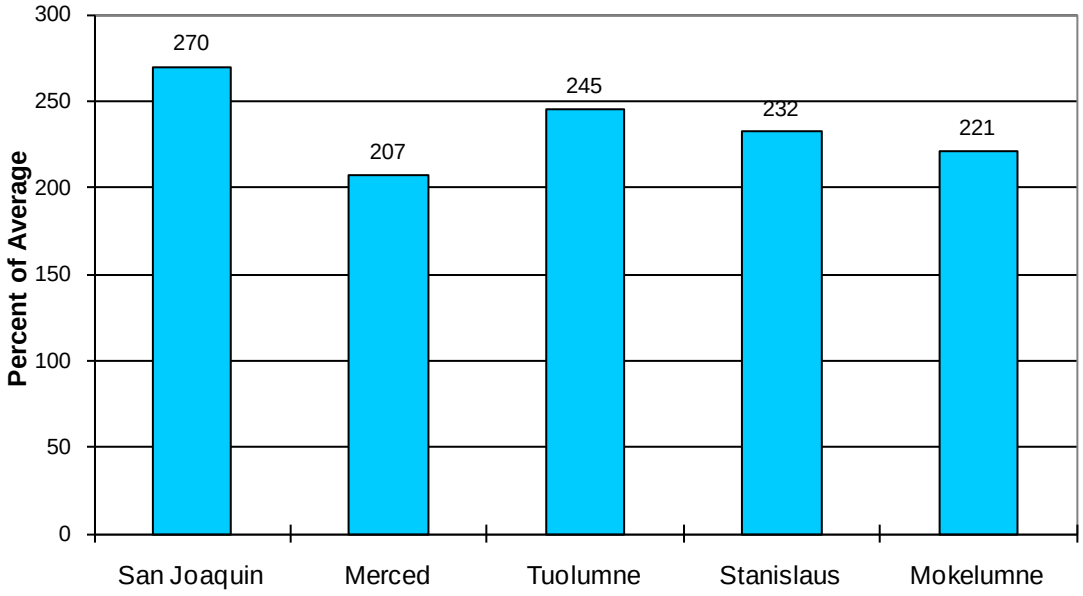
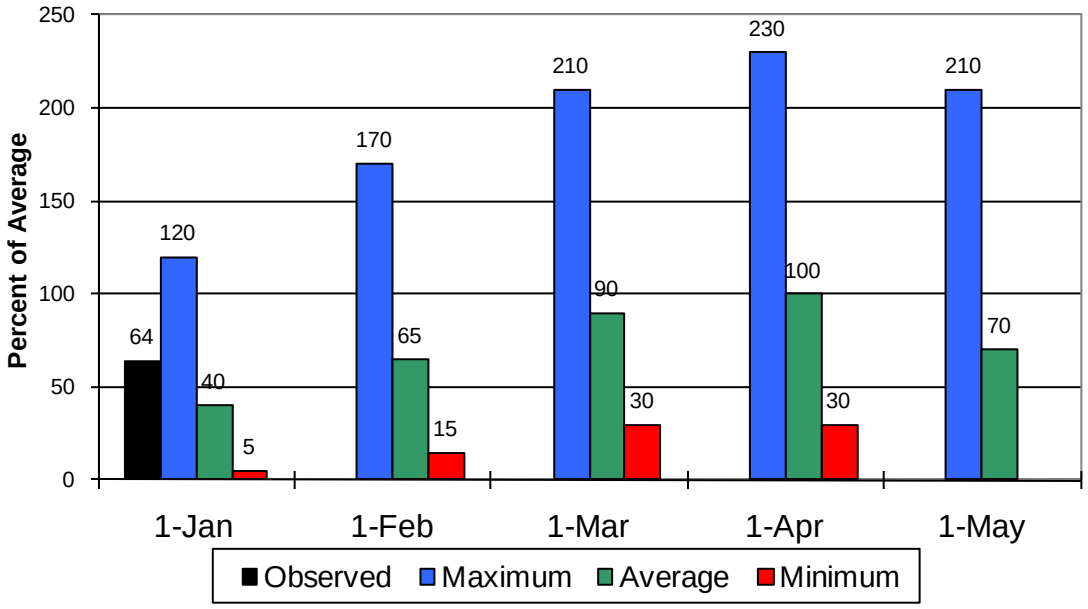
San Joaquin Basin

Seasonal Basin Precipitation
October 1 to Date

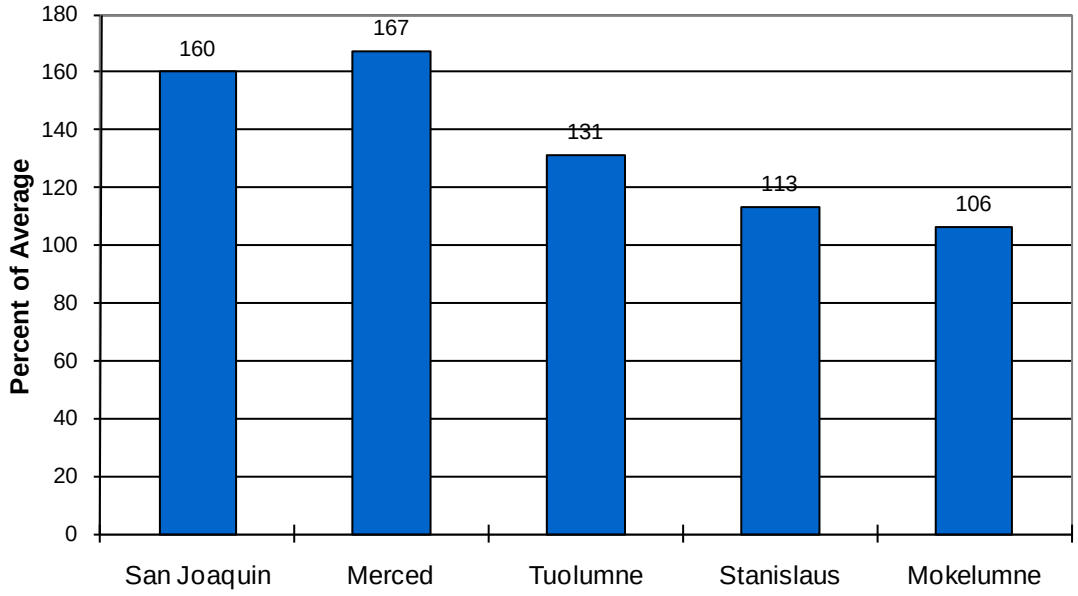


Seasonal Basin Snowpack
Water Content in % of April 1 Average

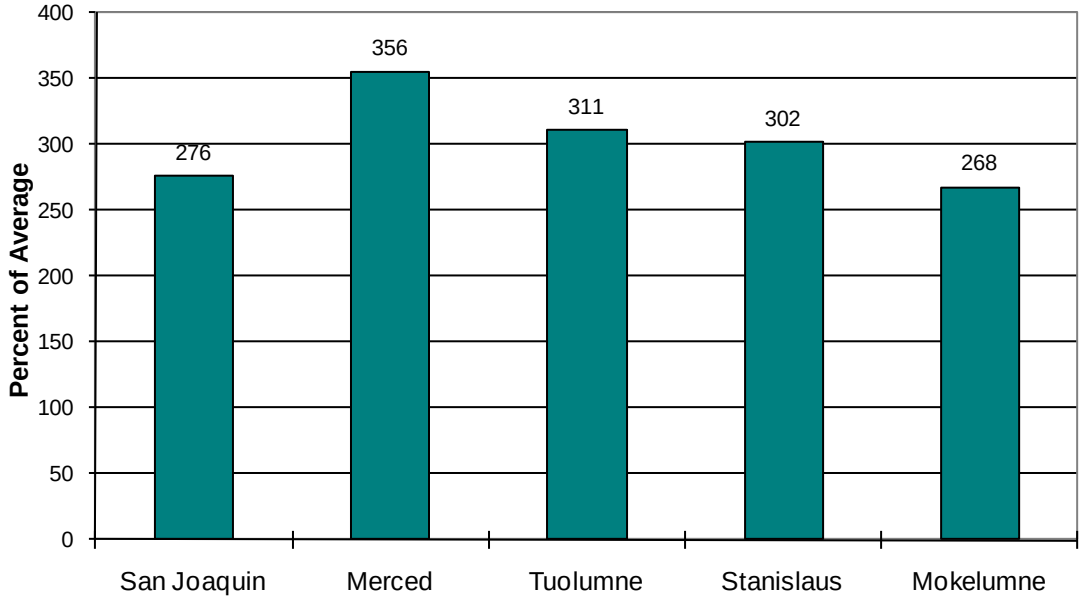


San Joaquin Basin

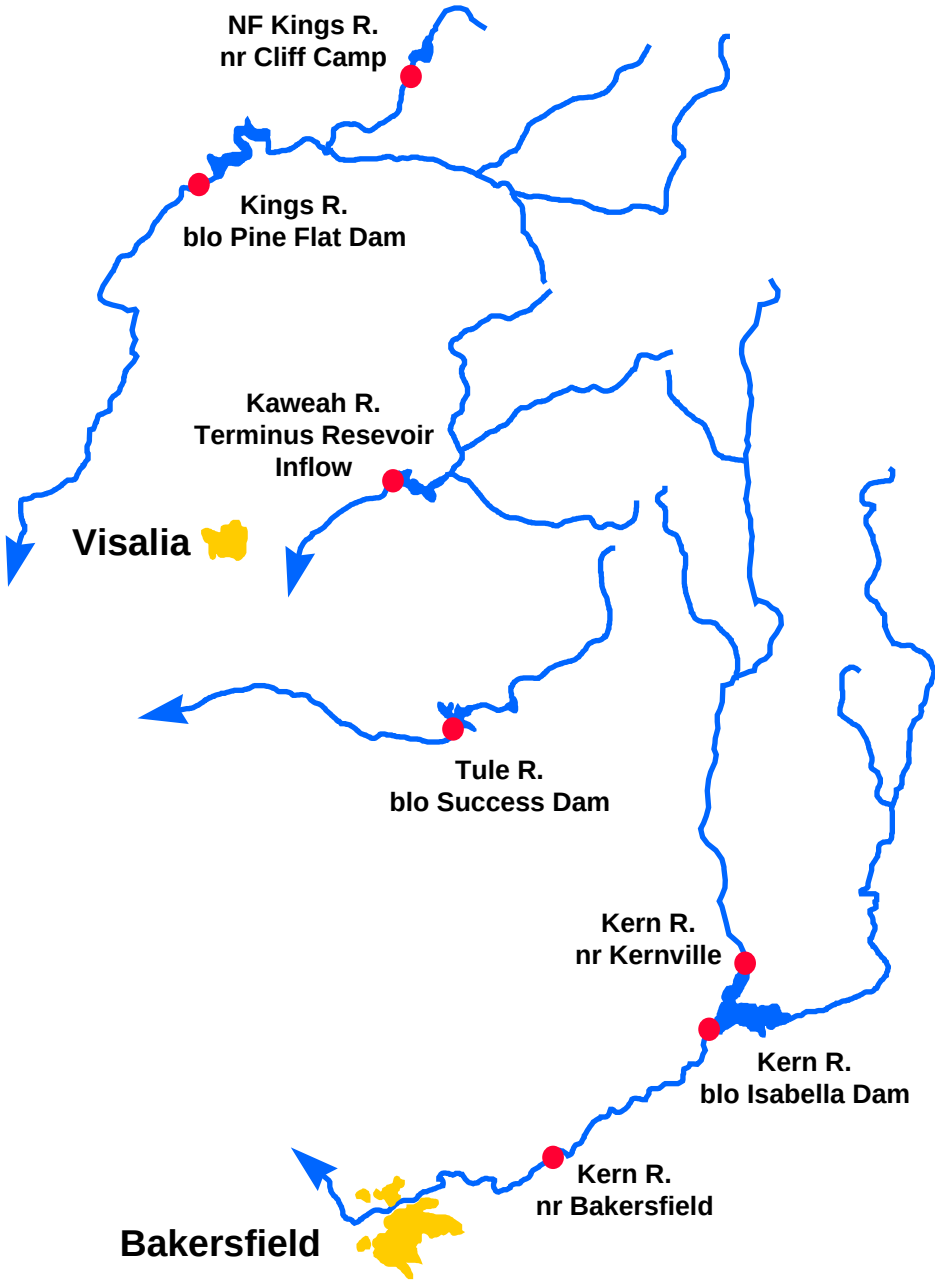
Basin Reservoir Storage
Contents of Major Reservoirs in % of Average



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	775	195	1150	405	398*
Isabella Dam, blo	Apr-Jul	950	198	1460	445	480
Bakersfield, nr	Apr-Jul	975	199	1500	445	490
Tule River						
Success Dam	Apr-Jul	125	189	200	50	66
Kaweah River						
Terminus Dam	Apr-Jul	500	172	745	255	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	400	167	575	225	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	2100	168	3030	1170	1250

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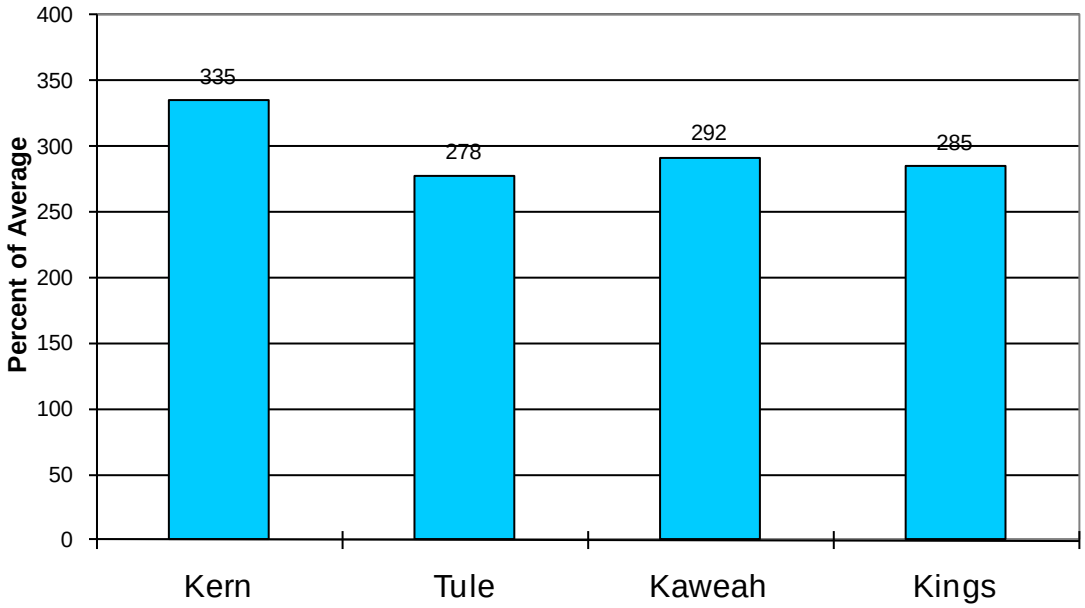
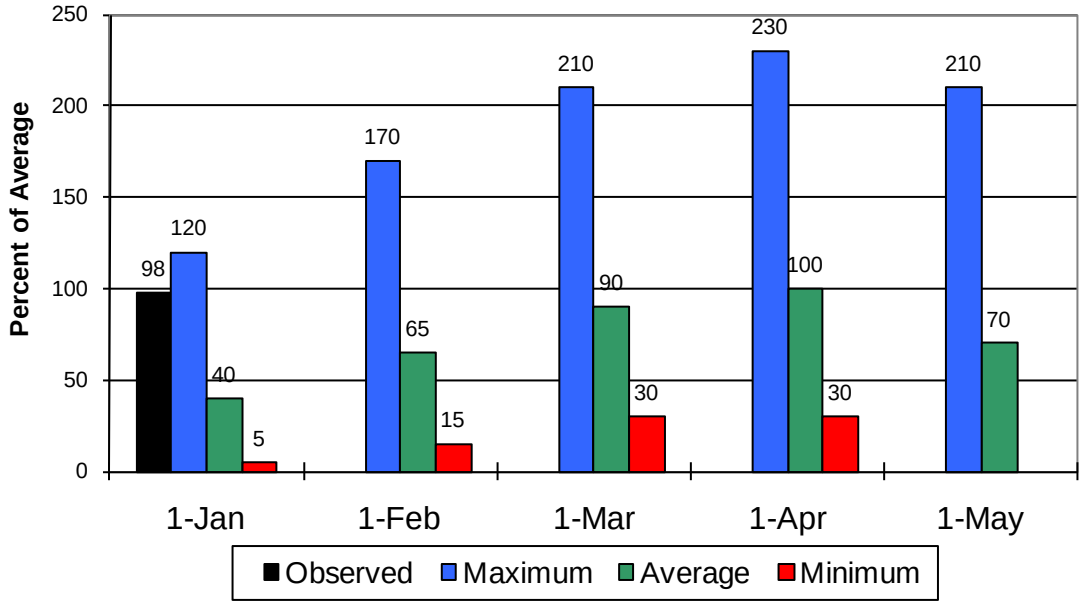
Tulare Lake Basin

Seasonal Precipitation
October 1 to Date



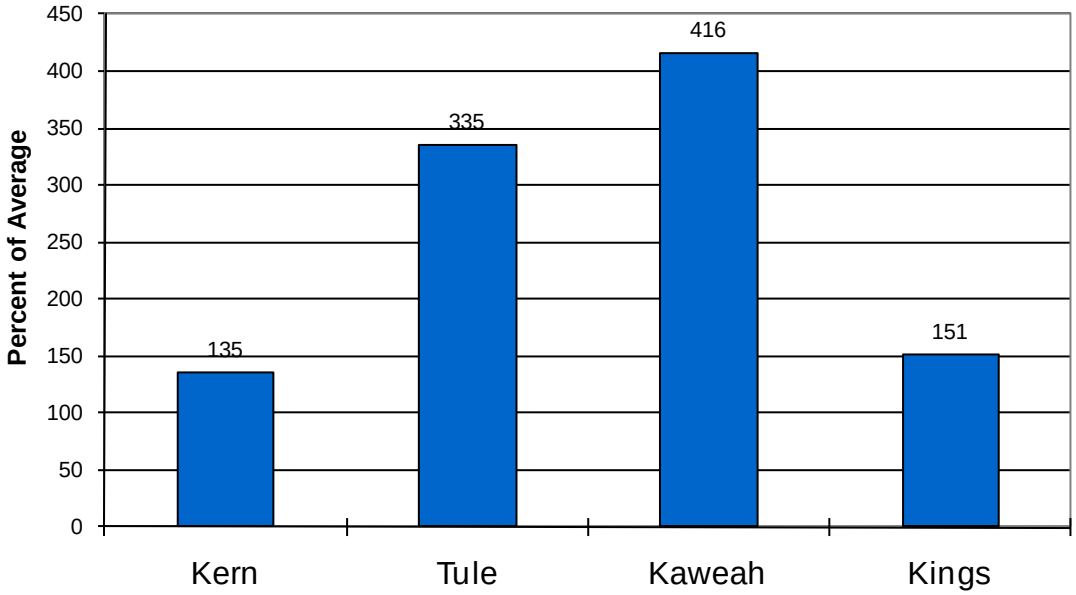
Seasonal Basin Snowpack
Water Content in % of April 1 Average



Tulare Lake Basin

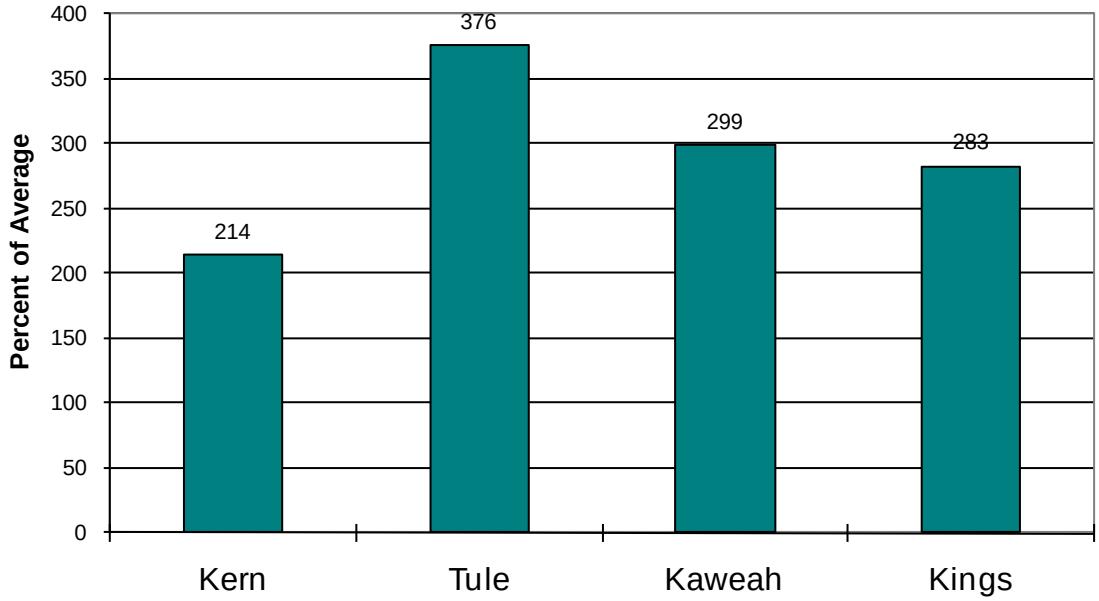
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

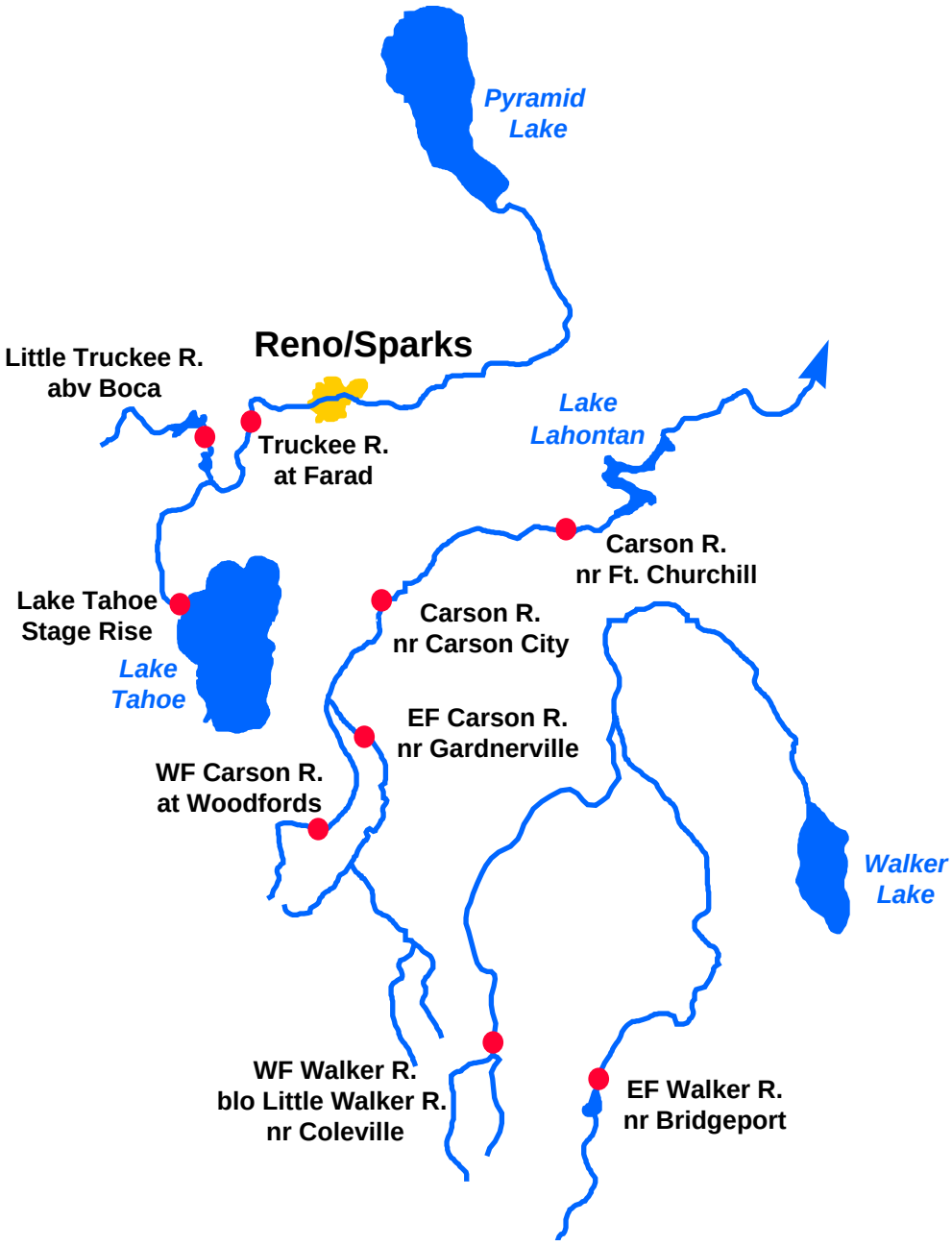


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



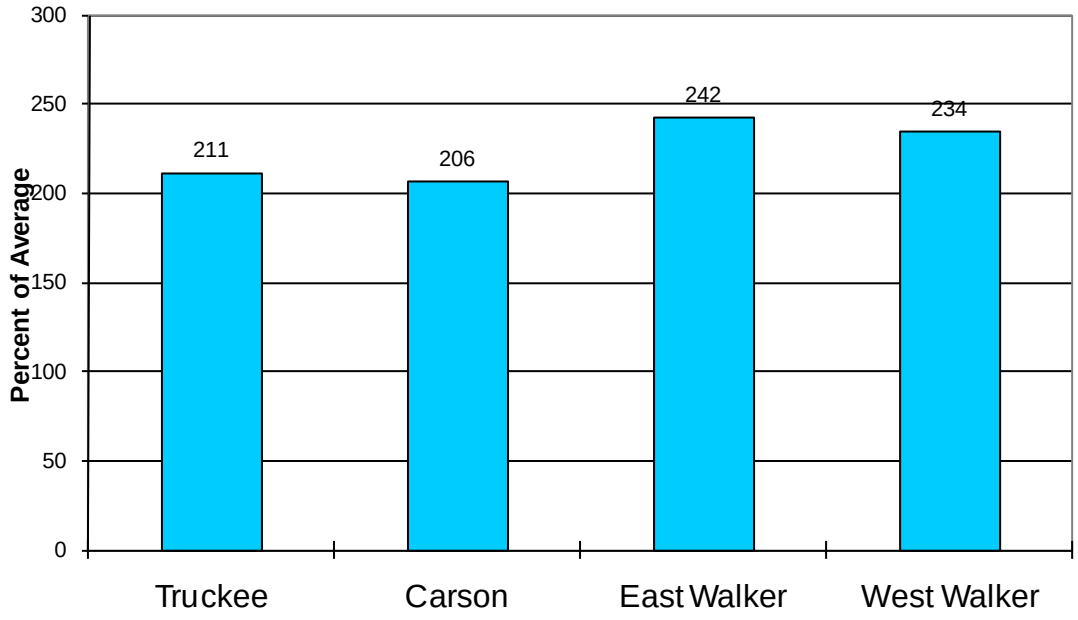
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

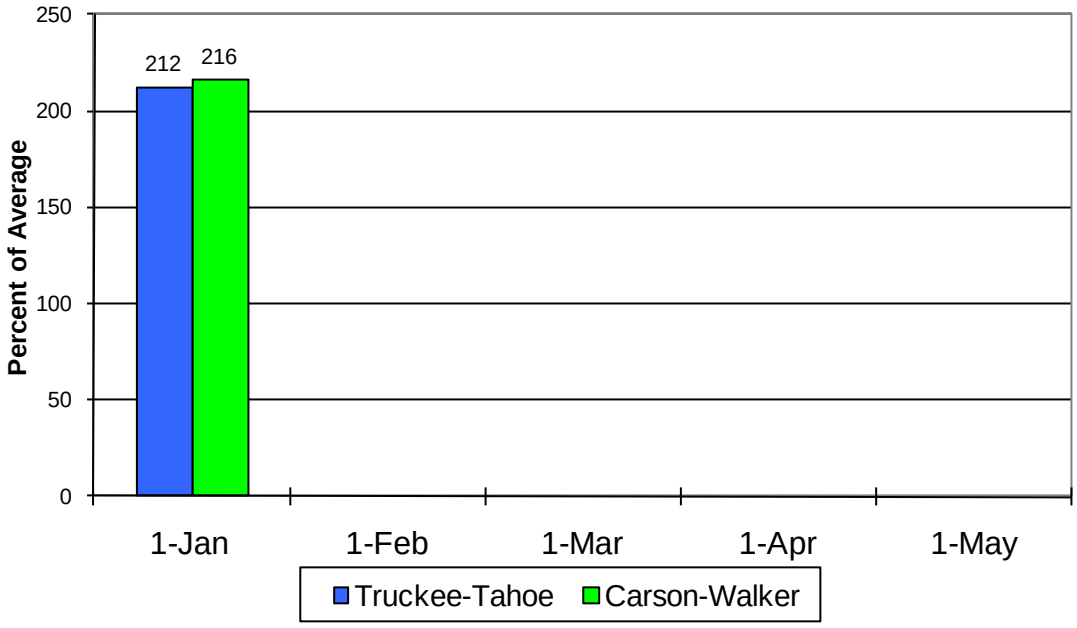
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Truckee River						
Truckee River						
Lake Tahoe Stage Rise	Apr-High	1.80	130	2.9	0.66	1.38
Little Truckee River						
Stampede Dam	Apr-Jul	110	138	192	28	80
Truckee River						
Farad	Apr-Jul	360	138	625	97	260
Carson River						
East Fork Carson River						
Gardnerville, nr	Apr-Jul	280	148	400	160	189
West Fork Carson River						
Woodfords	Apr-Jul	80	143	121	39	56
Carson River						
Carson City, nr	Apr-Jul	300	160	460	138	188
Fort Churchill, nr	Apr-Jul	310	174	665	111	178
Walker River						
East Walker River						
Bridgeport, nr	Apr-Aug	100	149	152	48	67
West Walker River						
Ltl Walker, blo, Coleville, nr	Apr-Jul	240	154	345	136	156

East Side Sierra Nevada Basins

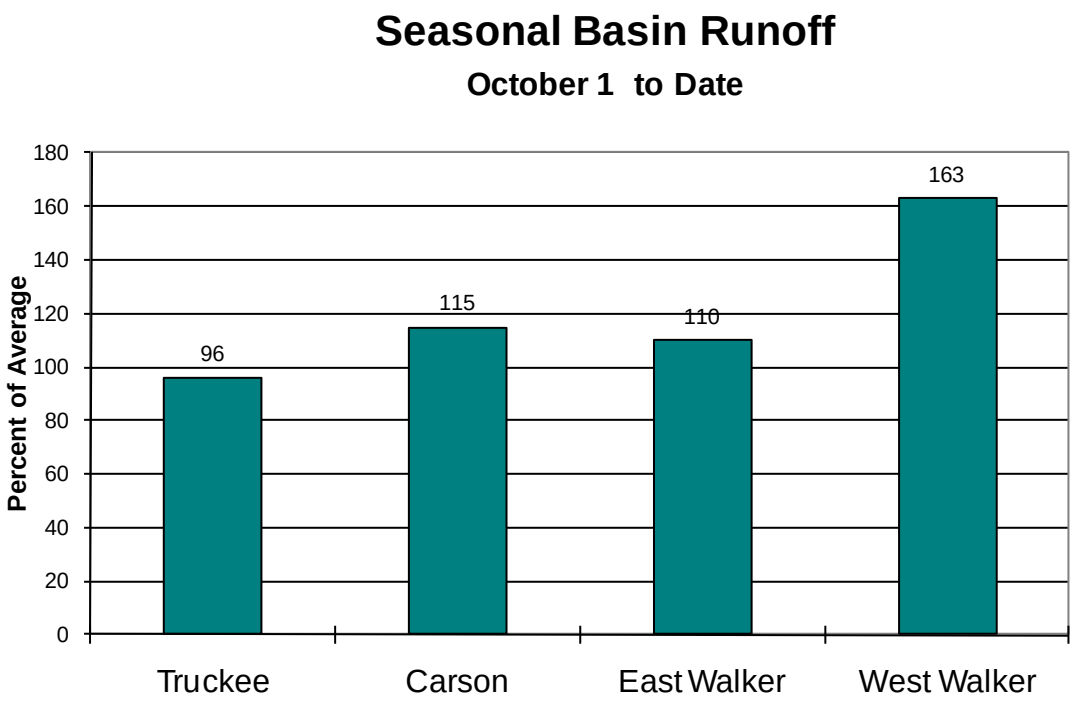
Seasonal Basin Precipitation
October 1 to Date



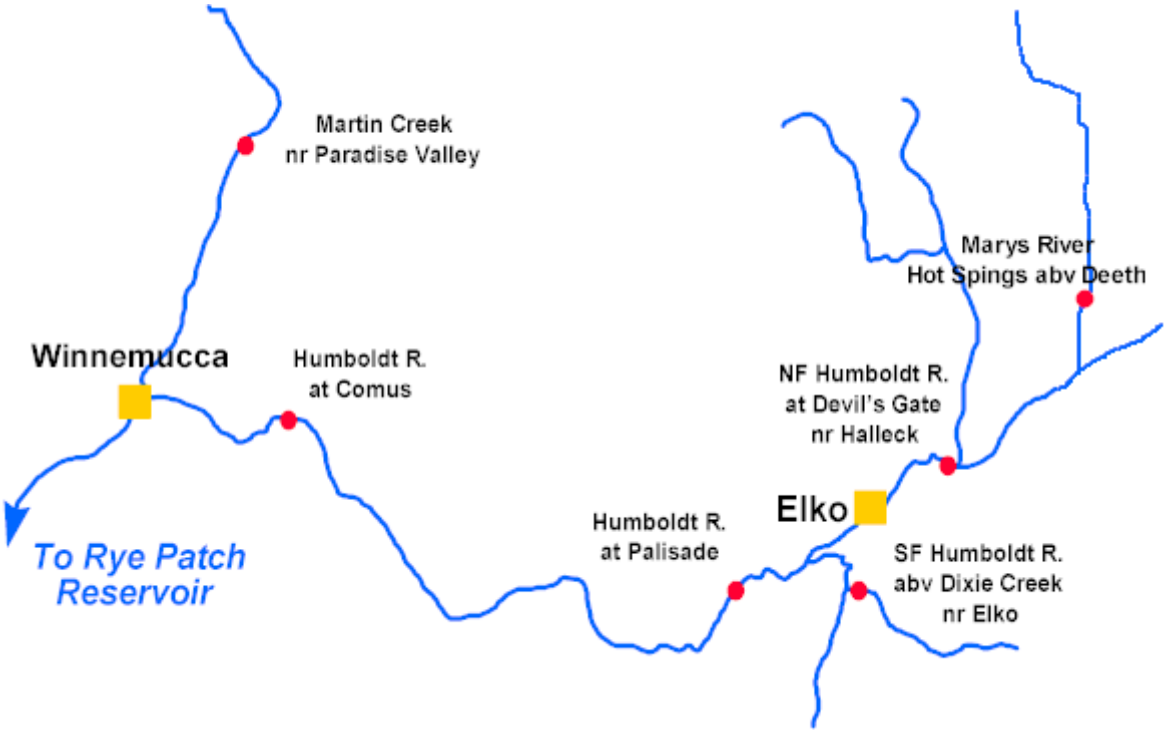
Basin Snowpack
% of Average SWE to Date



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	50	147	78	22	34*
South Fork Humboldt River						
Dixie Ck, abv, Elko, nr	Apr-Jul	120	158	191	49	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	60	154	83	37	39
Humboldt River						
Elko, nr	Apr-Jul	230	149	320	139	154
Palisade	Apr-Jul	380	152	485	275	250
Comus	Apr-Jul	340	151	465	215	225
Imlay, nr	Apr-Jul	300	160	445	155	188
Martin Creek						
Paradise Valley, nr	Apr-Jul	28	150	45	11.3	18.7

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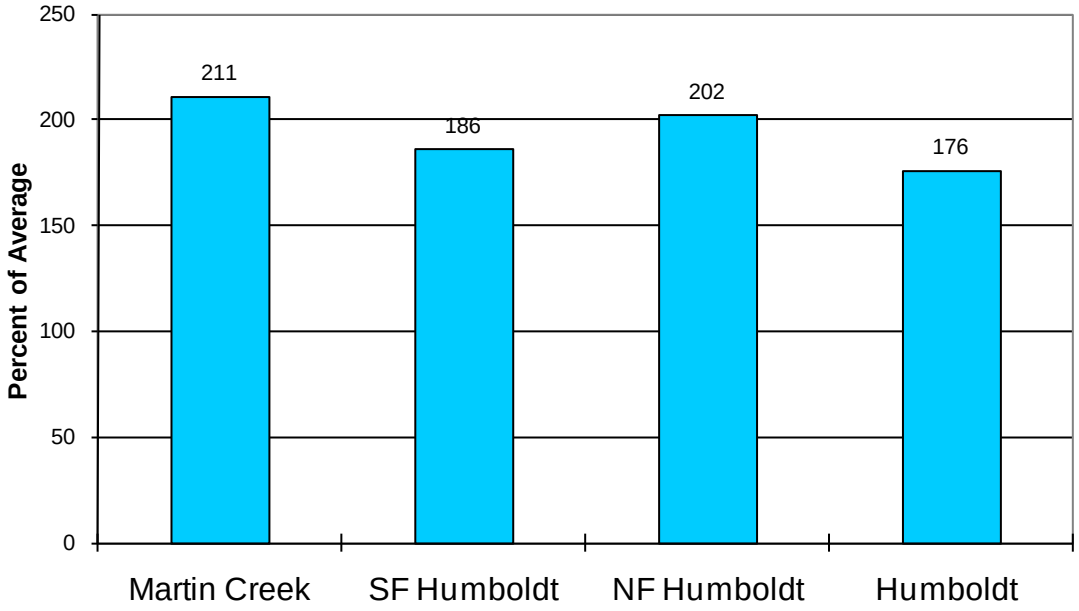
Humboldt River Basin

Seasonal Basin Precipitation
October 1 to Date



Basin Snowpack
% of Average SWE to Date