Water Supply Outlook

California and Northern Nevada

May 2010

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

May 1, 2010

Cool and moist weather systems returned to California during April, increasing the state's water supplies. Although there were some episodes of snowmelt during the month, there was significant accumulation to the mountain snow pack. Cool temperatures and storm activities delayed the onset of sustained melt, especially at the higher elevations. Spring runoff forecasts have improved from April 1st for basins draining into California's Central Valley and the increase of the state's high-altitude snow pack is a step in the right direction to mitigate the effects of three consecutive years of below average spring runoff.

Near average snow packs and above average April precipitation has not brought sufficient relief to the Upper Klamath Lake watershed as seasonal precipitation thus far is below average and storage in the area's major reservoirs remains much below average. Watersheds in Northern and Eastern Nevada continue to struggle from effects due to three consecutive years of drought. This is evidenced by much below average storage conditions at Rye Patch Reservoir and much below average runoff on the mainstem Humboldt River so far this season.

April precipitation was much above average for basins draining into California's Central Valley with most basins receiving in excess of 200 percent of the monthly average. Monthly precipitation was in the 170 to 200 percent range in the East side Sierra Nevada region. It was about 140 percent in the Upper Klamath basin. Seasonal precipitation (October 1, 2009 to April 30, 2010) ranges from 90 percent for the American River basin to 127 percent for the Tule. It is about 75 percent for the Upper Klamath Lake watershed, 85 for the lower Humboldt River basin and 93 percent for the upper Humboldt River basin.

Measurements made by the California Cooperative Snow Surveys show that the May 1st average snow pack stands at approximately 137 percent for the Shasta-northern Sierra Nevada region, 141 percent for the San Joaquin and 153 percent for the Tulare Lake region. Snow packs in the Tahoe-Truckee are about 122 percent of the average-to-date, the Carson-Walker at 119 percent and the Humboldt River basin at 87 percent. The pack stands at about 104 percent of the average-to-date for the Upper Klamath Lake basin.

Most of the water supply basins in California's Central Valley recorded near average runoff during April. It was 101 percent for the Trinity-Sacramento basin, 96 percent for the Tulare Lake region and 93 percent for watersheds in the San Joaquin. East side Sierra basins received 76 percent of an April average while the Humboldt River at Palisade recorded only 38 percent. The Upper Klamath Lake inflow was 51 percent of an April average.

Although end-of-April tabulations are showing a marked improvement of stored water conditions as opposed to this time last year, storage in a few key reservoirs still remain below average. Lake Oroville is at 71 percent of average (69 percent at this time last year) and Trinity Lake at 75 percent (64 percent last year). Storage at Shasta Lake now stands at 114 percent of average as opposed to 78 percent at this time last year. Stored water in the Sacramento region as of April 30 stands at 98 percent of average for the date (85 percent for the date last year), the San Joaquin at 102 percent (88 percent last year), and the Tulare Lake watershed at 102 percent (84 percent last year). East-side Sierra reservoirs are at 77 percent of average. The lake level at Lake Tahoe stood at 6223.66

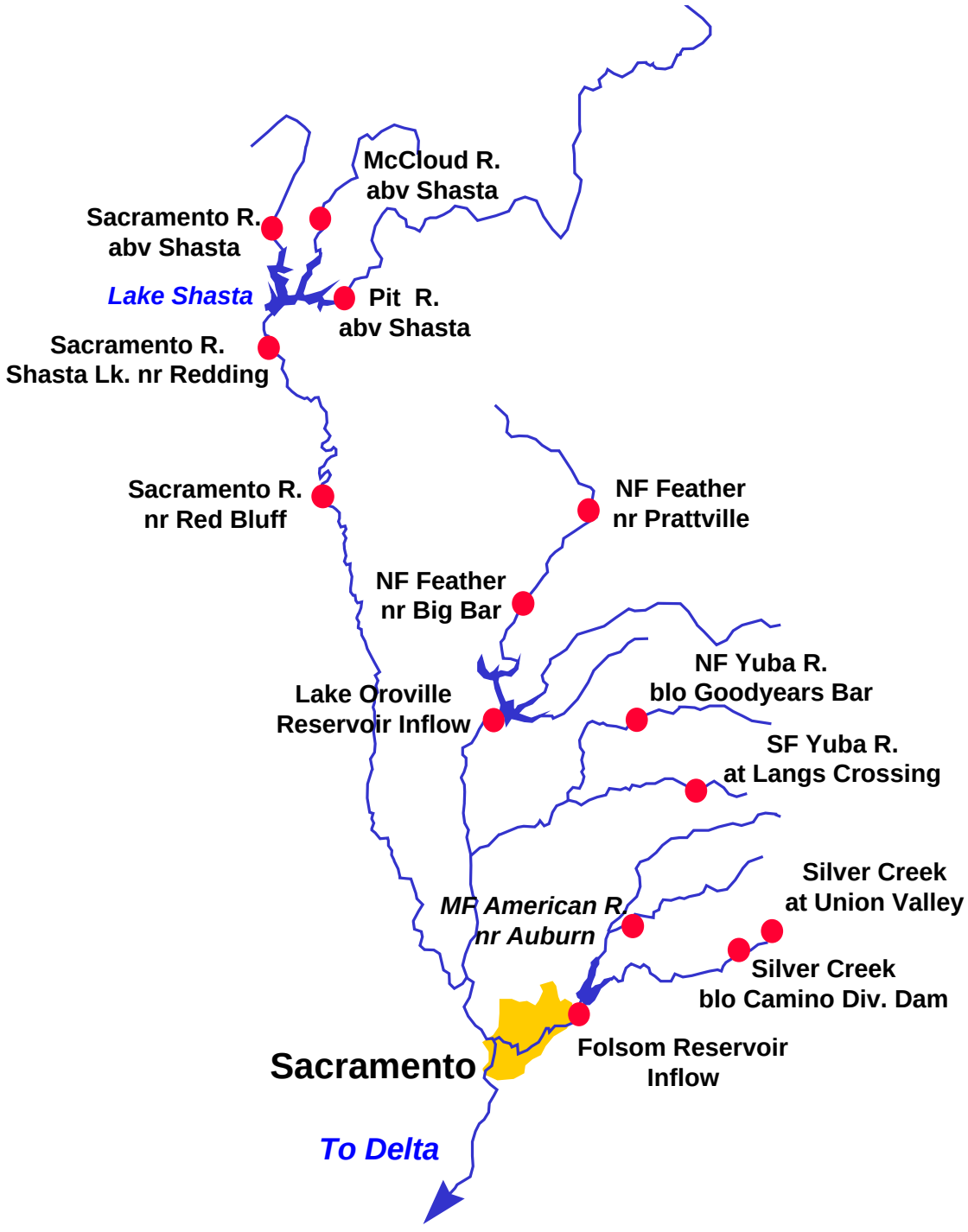
feet or 20 percent of average as of the end of April with usable storage of 80,120 acre-feet. Usable storage was 89,840 acre-feet at this time last year. Storage at Lahontan Reservoir in Nevada stands at 51 percent of average as of April 30 while Rye Patch Reservoir is at 27 percent. Storage at Upper Klamath Lake is about 68 percent of average; it was 92 percent at this time last year.

Spring runoff forecasts increased 7 to 27 percent from last month in California's Central Valley region and are expected to range from near to above average. Forecasts are highest for the Trinity Lake Inflow and the Upper Sacramento at Delta (143 and 141 percent, respectively) and from the Upper San Joaquin River basin to the Kern (ranging from 121 to 138 percent). Projections are lowest for the Pit River basin (91 percent) and the Mokelumne River (101 percent). Forecasts range from 84 to 104 percent of average for the east side Sierra Nevada basins and 30 to 55 percent for forecast points on the main stem Humboldt River. The May through September forecast for the Upper Klamath Lake inflow is 60 percent.

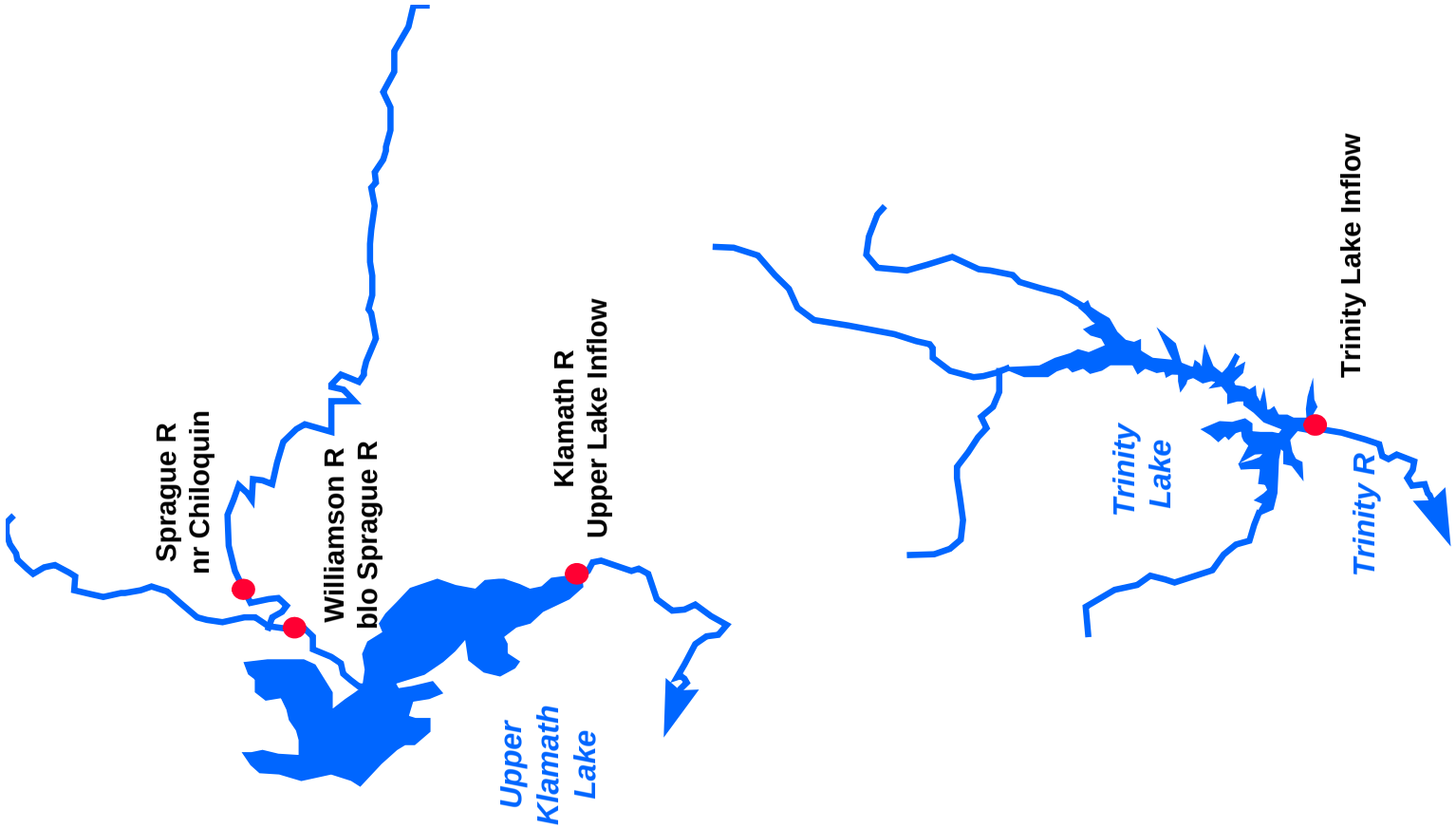
Mid-month updates are scheduled for selected east side Sierra Nevada forecast points and the Upper Klamath Lake Inflow. These will be posted on the CNRFC web page. This will be the last Water Supply Outlook for Water Year 2010.

[Page left blank]

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	175	66	225	123	267
Sprague River						
Chiloquin, nr	May-Sep	90	58	138	42	155
Upper Klamath Falls River						
Inflow	May-Sep	205	60	300	112	340
Lost River						
Gerber Reservoir Inflow	May-Jul	2.0	31	12.1	0.50	6.4
Clear Lake Reservoir Inflow	May-Jul	7.0	36	15.8	1.10	19.3
Scott River						
Fort Jones, nr	Apr-Jul	185	102	220	170	181
Trinity River						
Trinity Lake Inflow	Apr-Jul	910	143	1050	790	635

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

Probability	Oct-Apr	May	Jun	Jul	Aug	Sep	Apr-Jul	Water Yr
90%	751	309	210	50	12	8	790	1340
50%	751	375	249	65	17	12	910	1469
10%	751	449	300	80	30	20	1050	1630

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	855	91	970	750	940**
Mccloud River						
Shasta Lake, abv	Apr-Jul	440	119	490	400	370
Sacramento River						
Delta	Apr-Jul	410	141	490	320	290
Shasta Dam	Apr-Jul	1900	106	2270	1630	1790
Bend Bridge, abv, Red Bluff, nr	Apr-Jul	2580	106	2900	2250	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	330	99	400	260	333*
Big Bar	Apr-Jul	1000	104	1240	760	962*
Feather River						
Oroville Dam	Apr-Jul	1900	108	2200	1640	1760
YUBA RIVER ABOVE SMARTVILLE						
North Yuba River						
Goodyears Bar, blo	Apr-Jul	310	114	355	265	273*
South Yuba River						
Langs Crossing	Apr-Jul	260	116	330	200	225*
Yuba River						
Englebright Reservoir	Apr-Jul	1100	111	1320	920	995
AMERICAN RIVER ABOVE FOLSOM RESERVOIR						
Middle Fork American River						
Auburn, nr	Apr-Jul	550	112	705	395	490*
Silver Creek						
Union Valley	Apr-Jul	105	107	127	83	98*
Camino Dam, blo	Apr-Jul	175	111	210	142	158*
American River						
Folsom Reservoir	Apr-Jul	1400	114	1670	1130	1230

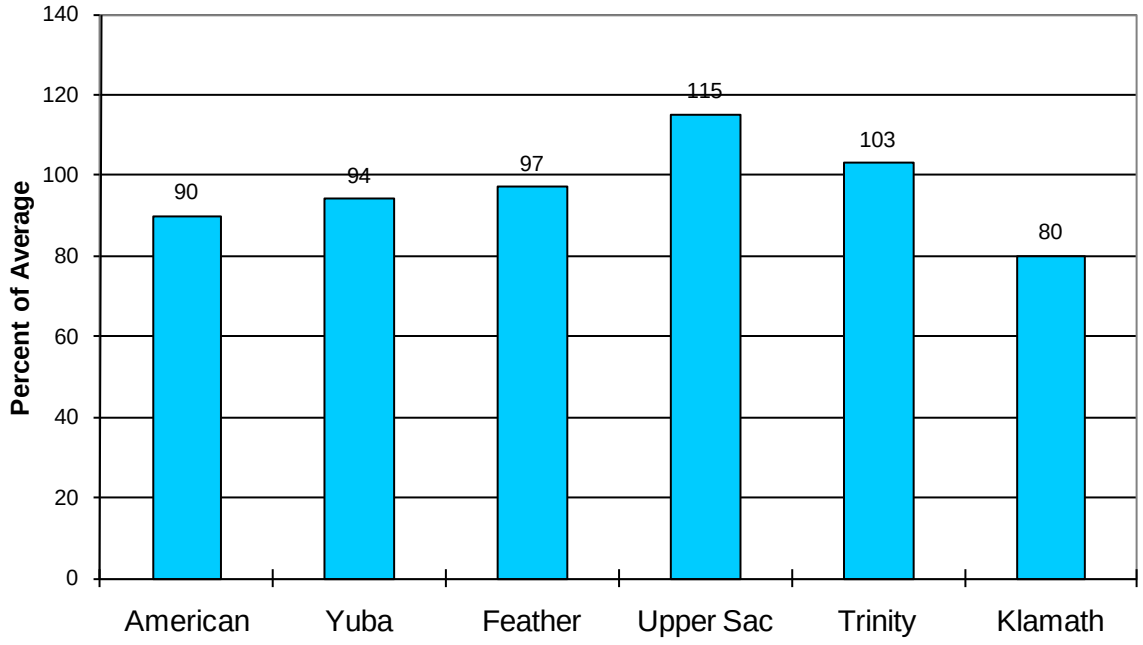
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

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

Sacramento/Trinity/Klamath River Basins

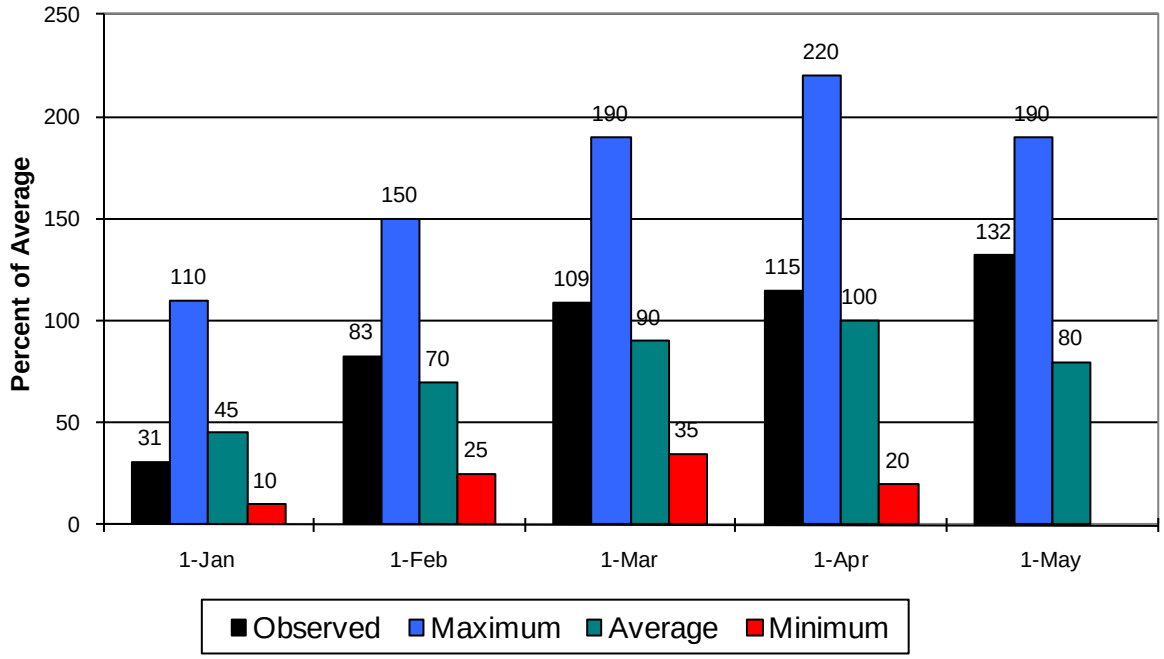
Seasonal Basin Precipitation

October 1 to Date



Seasonal Basin Snowpack

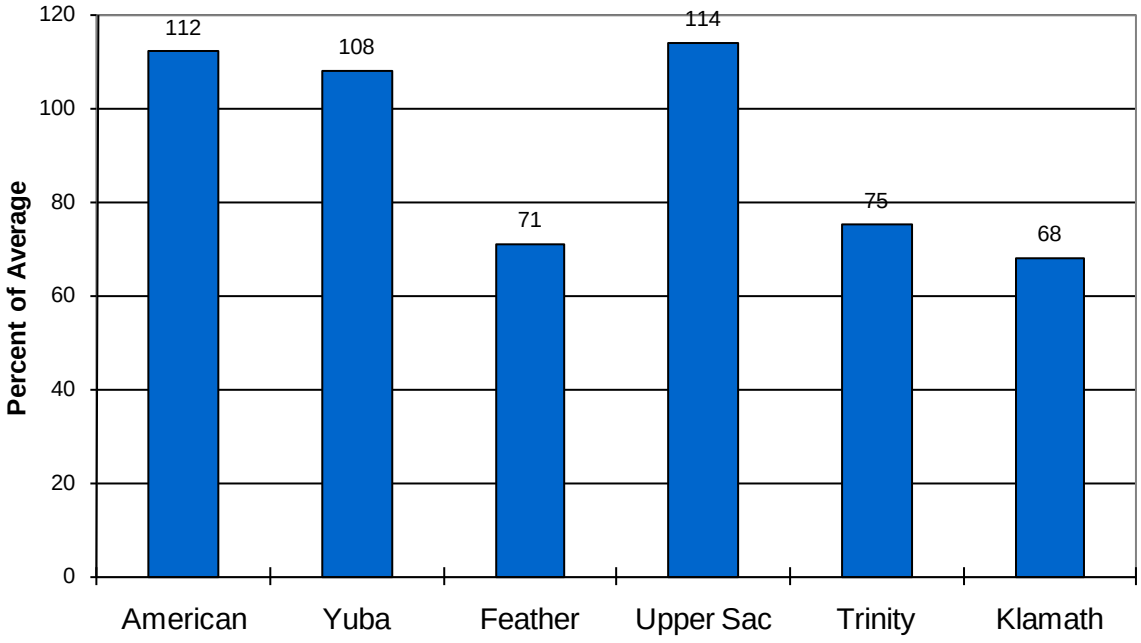
Water Content in % of April 1 Average



Sacramento/Trinity/Klamath River Basins

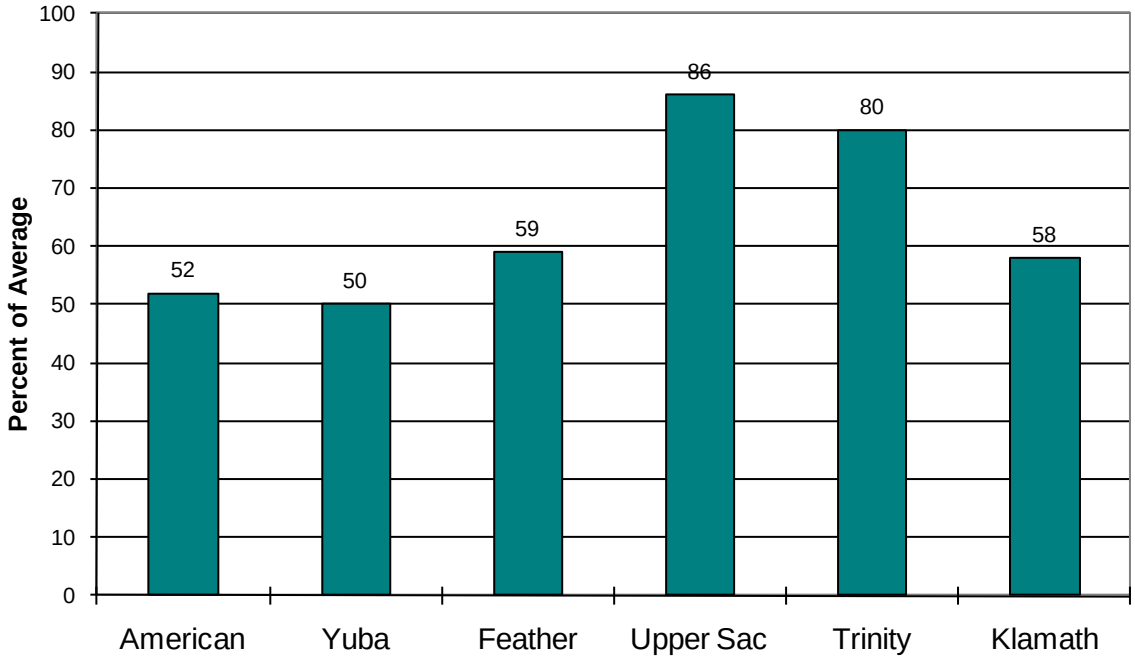
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average



Seasonal Basin Runoff

October 1 to Date



San Joaquin Basin

Water Supply Forecasts

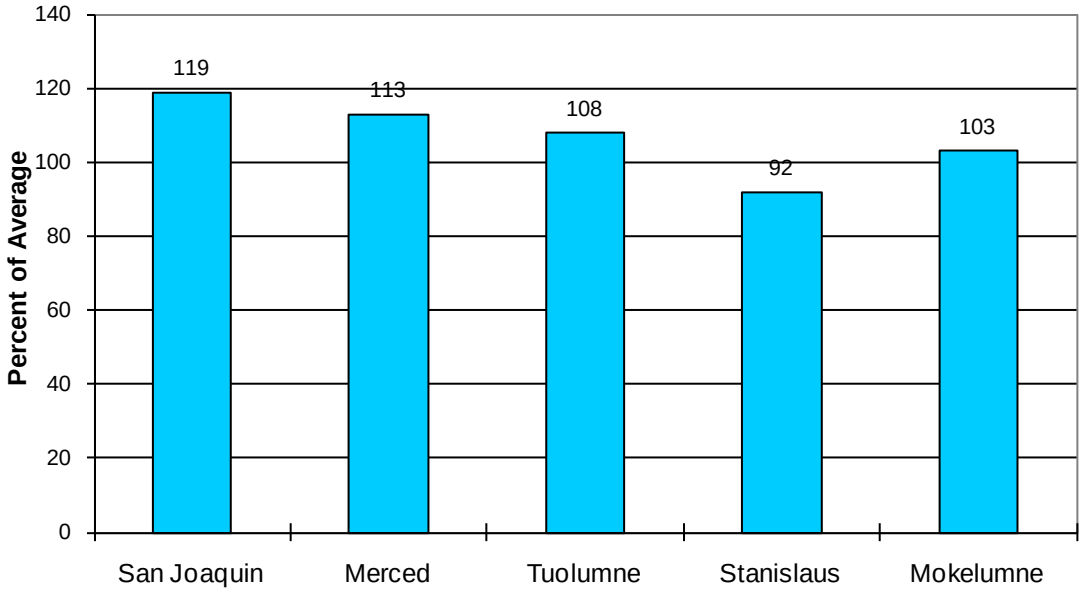
SAN JOAQUIN BASIN

		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	245	128	325	175	192*
San Joaquin River						
Millerton Lake	Apr-Jul	1600	126	1780	1430	1270
Merced River						
Pohono Bridge, at, Yosemite, nr	Apr-Jul	450	125	500	400	360*
Merced Falls, blo	Apr-Jul	750	116	850	650	645
Tuolumne River						
Hetch Hetchy, nr	Apr-Jul	700	117	750	625	596*
La Grange, nr	Apr-Jul	1430	116	1530	1330	1230
Middle Fork Stanislaus River						
Beardsley Dam, blo	Apr-Jul	360	112	425	300	320*
Stanislaus River						
New Melones Dam	Apr-Jul	775	112	875	675	695
North Fork Mokelumne River						
West Point	Apr-Jul	410	99	470	350	416*
Mokelumne River						
Pardee Reservoir	Apr-Jul	465	101	535	415	460
Cosumnes River						
Michigan Bar	Apr-Jul	140	114	199	81	123

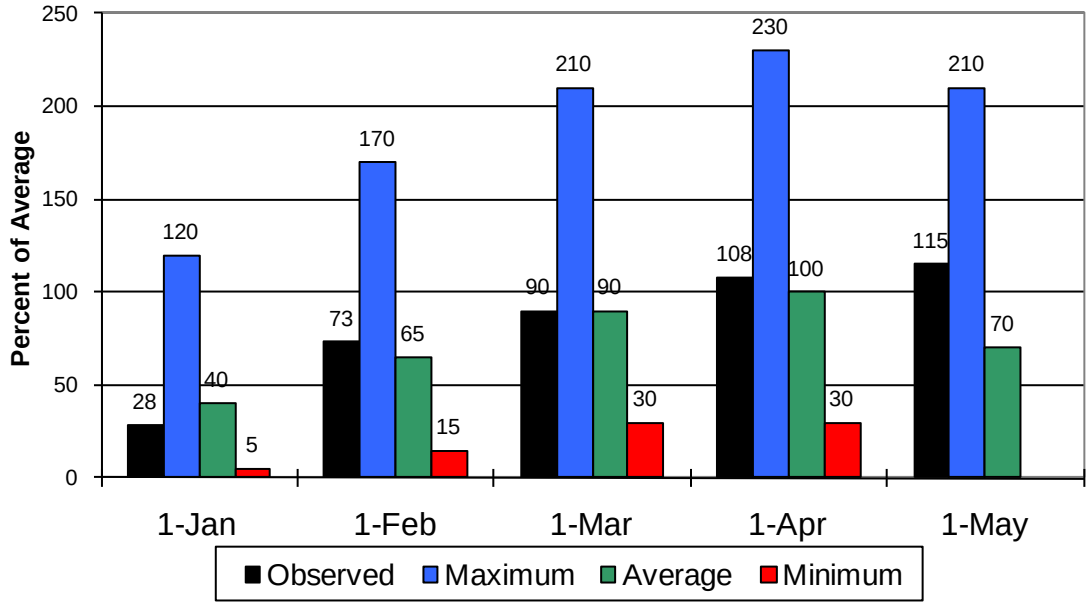
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

San Joaquin Basin

Seasonal Basin Precipitation
October 1 to Date

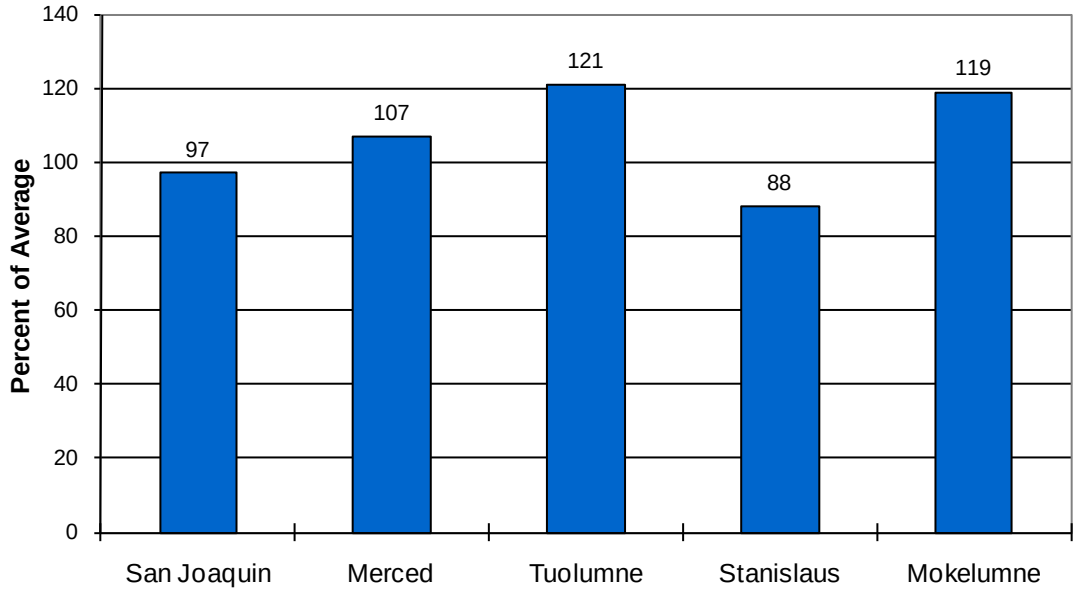


Seasonal Basin Snowpack
Water Content in % of April 1 Average

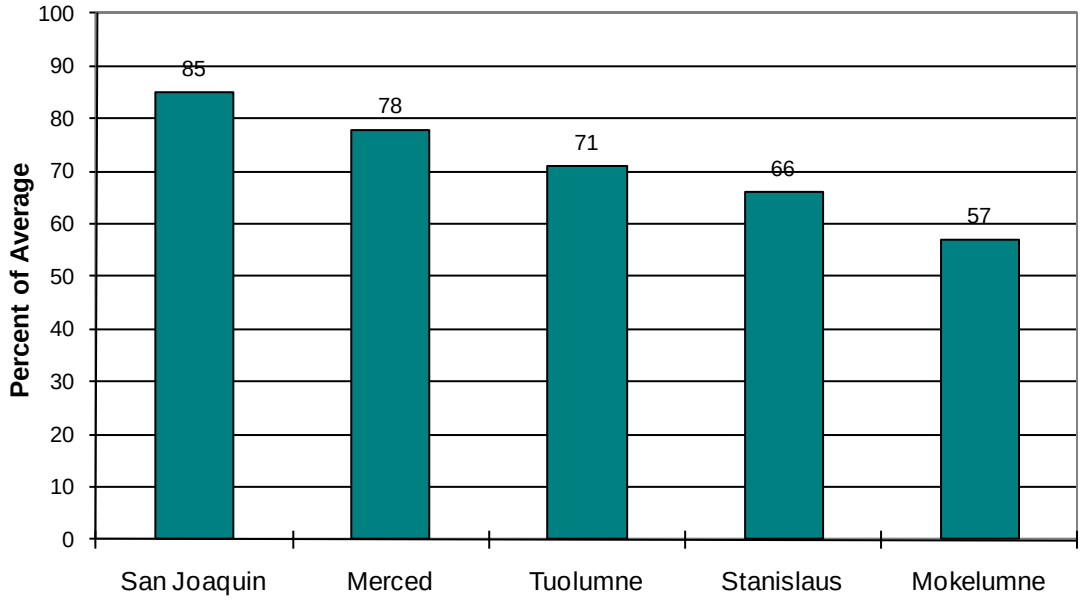


San Joaquin Basin

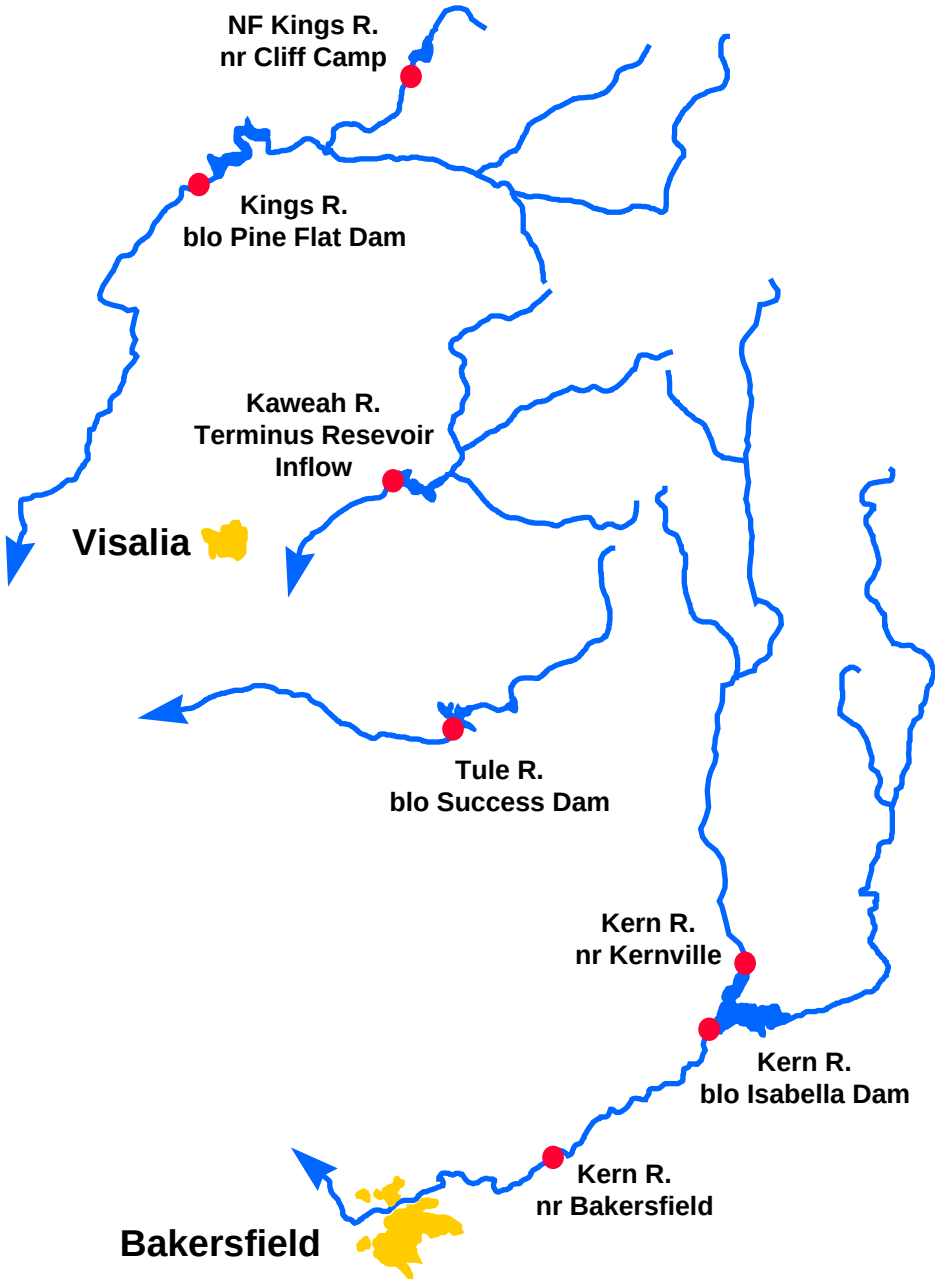
Basin Reservoir Storage
Contents of Major Reservoirs in % of Average



Season Basin Runoff
October 1 to Date



Tulare Basin



Water Supply Forecasts

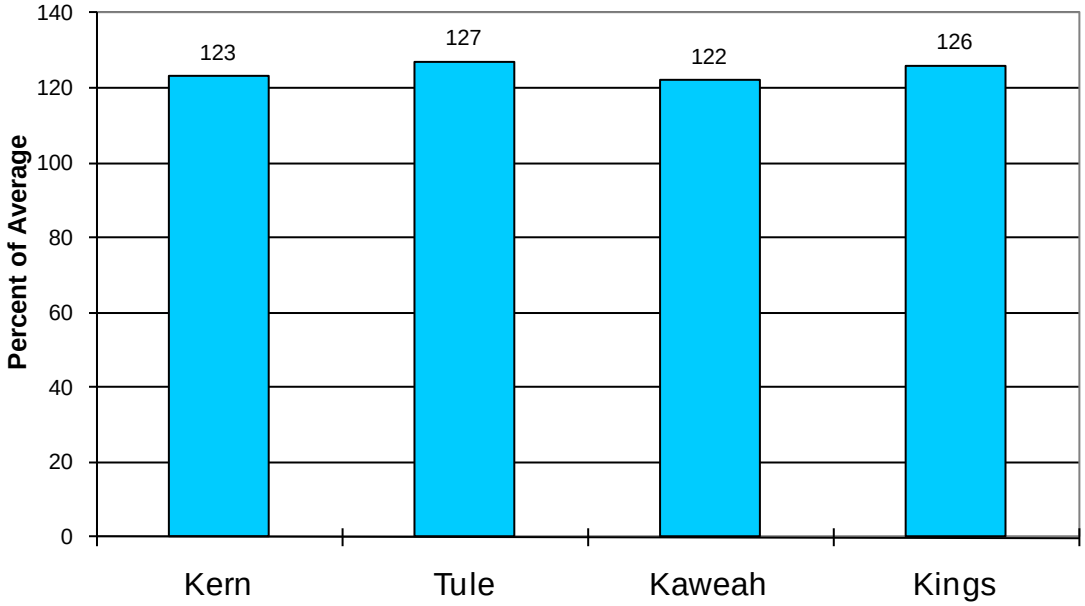
TULARE LAKE BASIN

		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	480	121	555	405	398*
Isabella Dam, blo	Apr-Jul	600	125	750	450	480
Bakersfield, nr	Apr-Jul	615	126	775	475	490
Tule River						
Success Dam	Apr-Jul	90	136	130	75	66
Kaweah River						
Terminus Dam	Apr-Jul	400	138	450	350	290
North Fork Kings River						
Cliff Camp, nr	Apr-Jul	295	123	350	250	240*
Kings River						
Pine Flat Dam, blo	Apr-Jul	1530	122	1650	1400	1250

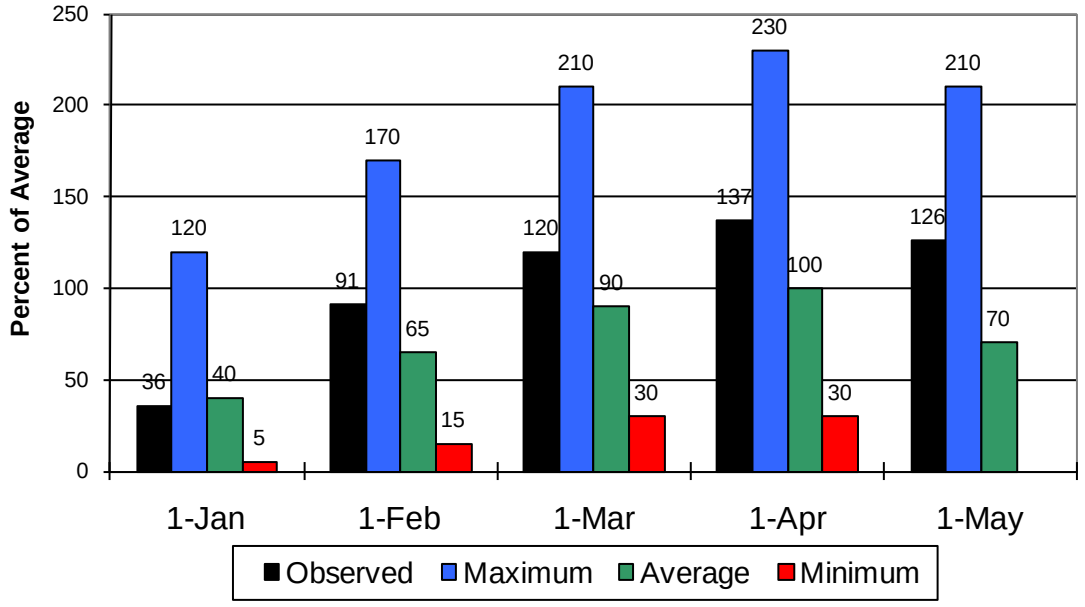
***30 Year Averages for 1971-2000 are incomplete. Those forecast points with an asterisk have incomplete averages, so 1961-1990 averages are listed. The new averages will be incorporated into this report when the complete data sets become available.**

Tulare Lake Basin

Seasonal Precipitation
October 1 to Date



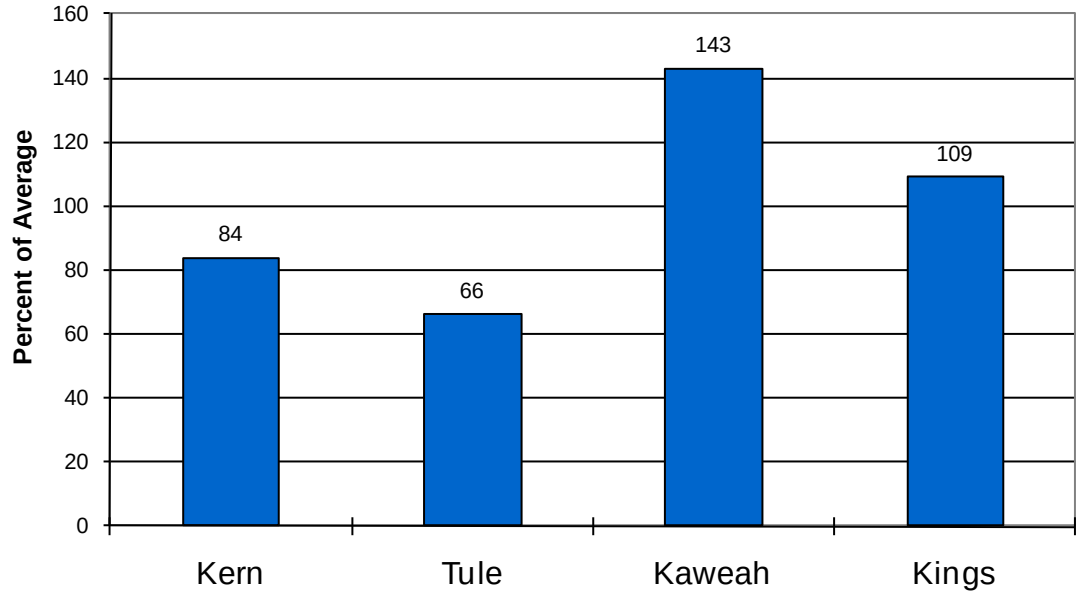
Seasonal Basin Snowpack
Water Content in % of April 1 Average



Tulare Lake Basin

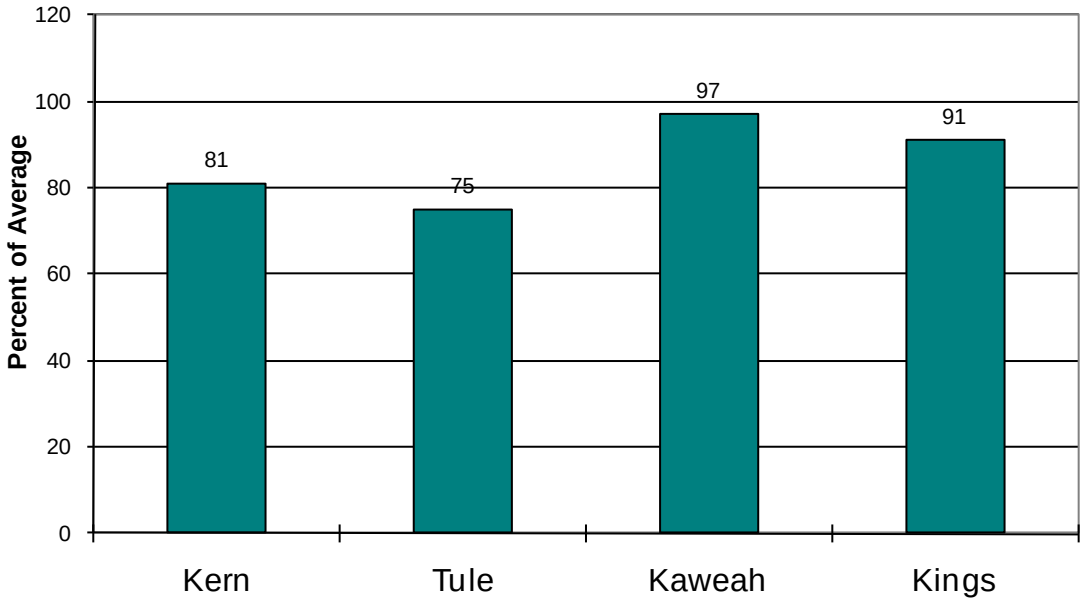
Basin Reservoir Storage

Contents of Major Reservoirs in % of Average

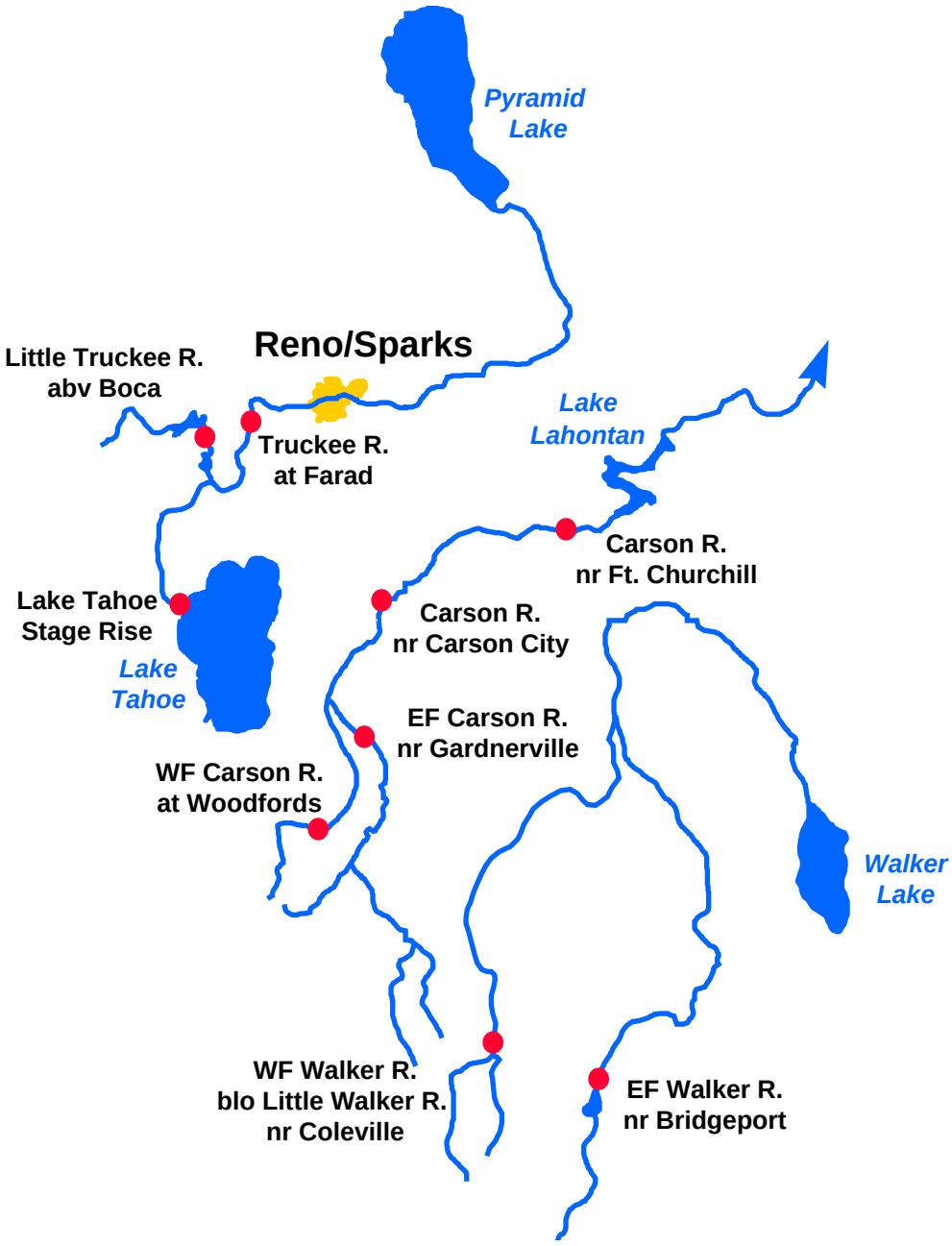


Seasonal Basin Runoff

October 1 to Date



East Side Sierra Nevada Basins



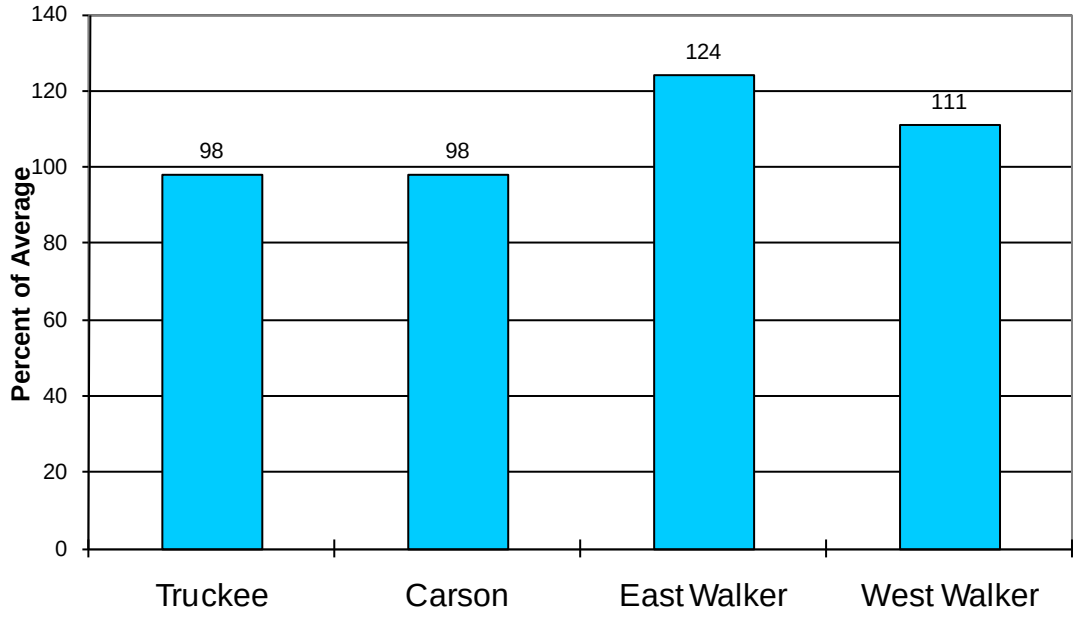
Water Supply Forecasts

EAST SIDE SIERRA NEVADA BASINS

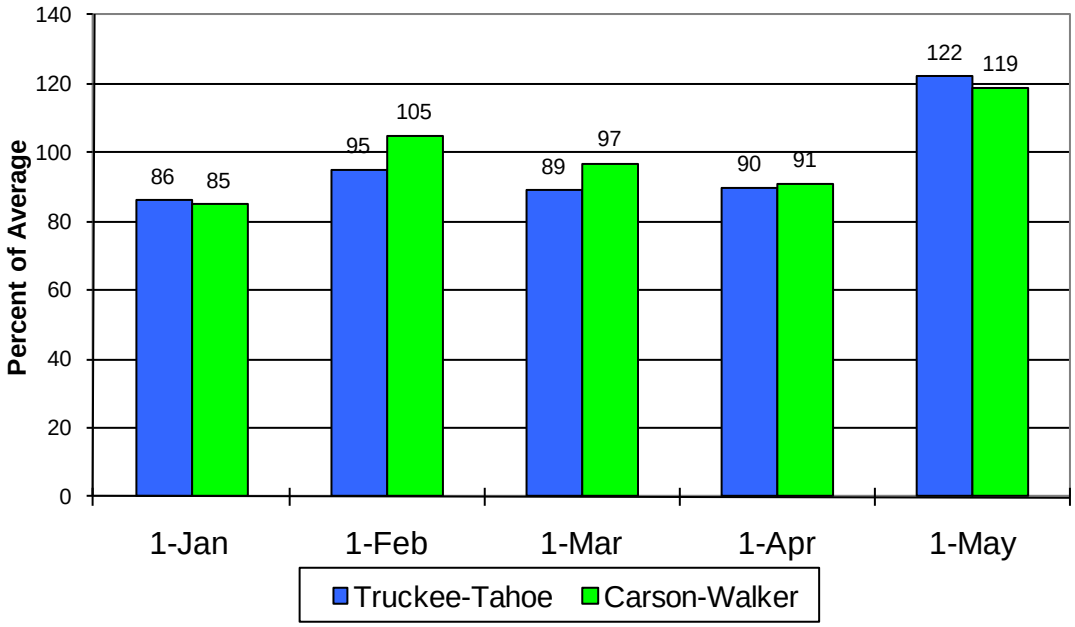
		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
Truckee River						
Truckee River						
Lake Tahoe Stage Rise	Apr-High	1.30	94	1.61	0.99	1.38
Little Truckee River						
Stampede Dam	Apr-Jul	75	94	94	60	80
Truckee River						
Farad	Apr-Jul	250	96	285	213	260
Carson River						
East Fork Carson River						
Gardnerville, nr	Apr-Jul	185	98	210	162	189
West Fork Carson River						
Woodfords	Apr-Jul	51	91	58	44	56
Carson River						
Carson City, nr	Apr-Jul	160	85	191	132	188
Fort Churchill, nr	Apr-Jul	150	84	178	122	178
Walker River						
East Walker River						
Bridgeport, nr	Apr-Aug	70	104	87	53	67
West Walker River						
Coleville, nr	Apr-Jul	160	103	192	128	156

East Side Sierra Nevada Basins

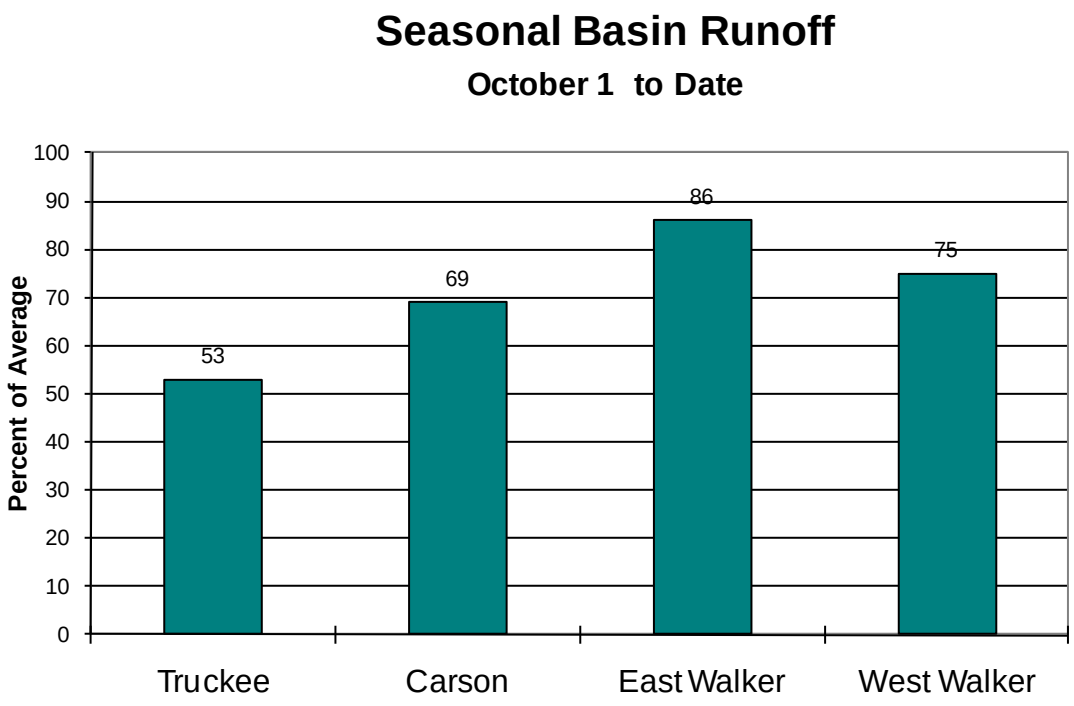
Seasonal Basin Precipitation
October 1 to Date



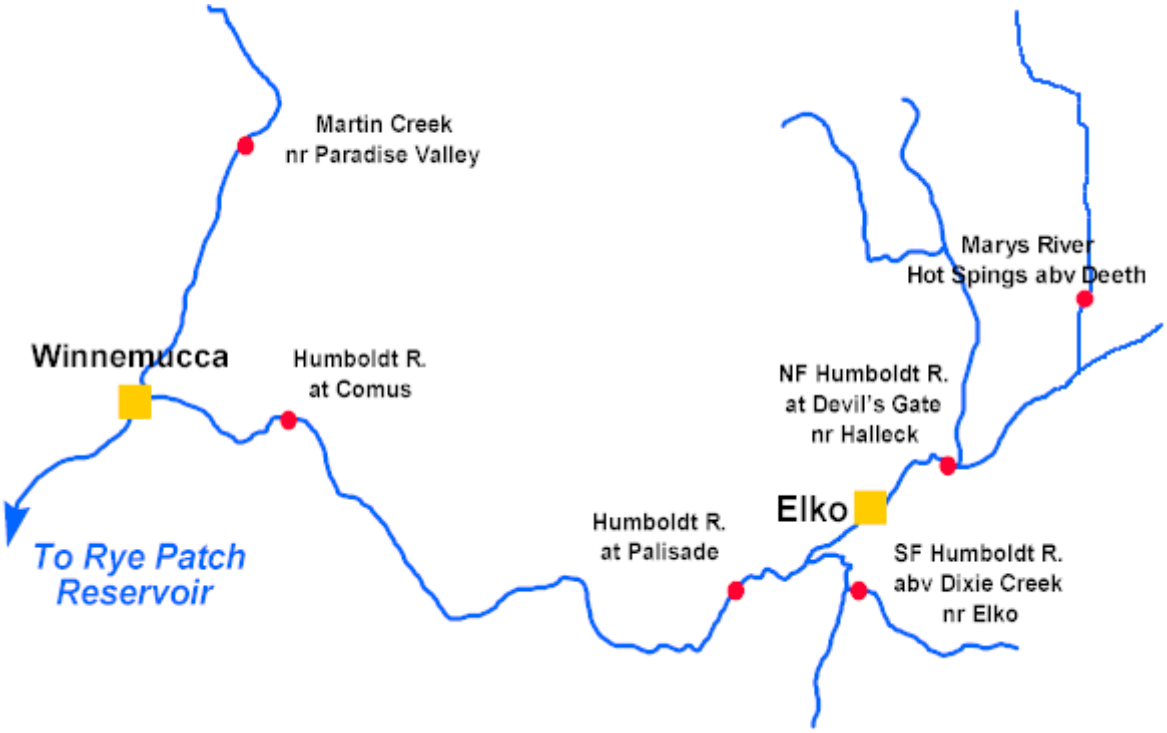
Basin Snowpack
% of Average SWE to Date



East Side Sierra Nevada Basins



Humboldt River Basin



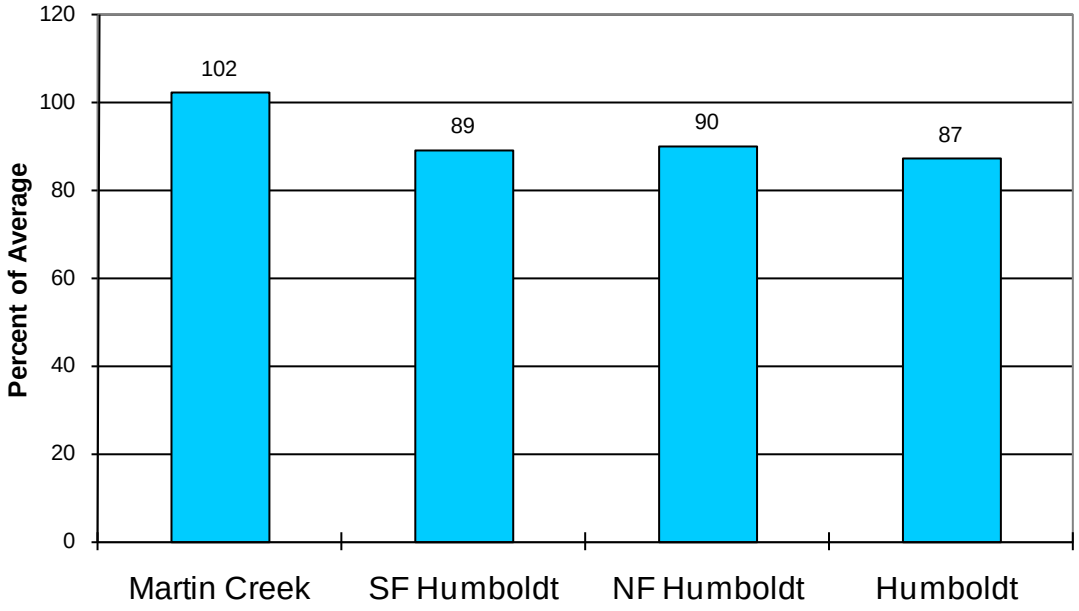
Water Supply Forecasts

		Most Prob Vol KAF	Most Prob Vol %Norm	Reas Max Vol KAF	Reas Min Vol KAF	30 Year Avg KAF
NF Humboldt River						
Devils Gate, at, Halleck, nr	Apr-Jul	22	65	32	12.1	34*
SF Humboldt River						
Dixie Ck, abv, Elko, nr	Apr-Jul	62	82	115	28	76
Marys River						
Hot Springs, abv, Deeth, nr	Apr-Jul	24	62	35	13.0	39
Humboldt River						
Elko, nr	Apr-Jul	85	55	137	33	154
Palisade	Apr-Jul	135	54	225	47	250
Comus	Apr-Jul	98	44	186	37	225
Imlay, nr	Apr-Jul	57	30	144	20	188
Martin Ck						
Paradise Vly, nr	Apr-Jul	9.0	48	15.6	4.0	18.7

***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.**

Humboldt River Basin

Seasonal Basin Precipitation
October 1 to Date



Basin Snowpack
% of Average SWE to Date