# Water Supply Outlook

## California and Northern Nevada

## January 2005

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, 2005

Water year 2005 started off with a wet October and impressive snow accumulation in most Sierra Nevada water supply basins, atypical for this time of year. November was generally dry except in Nevada. However, significant rain and snow fell again in December and another major event was in progress as this publication was being written. Although this has raised expectations for a good water supply year for most basins, it is too early to tell with much of the snow accumulation season still ahead of us.

December rainfall amounts were 130 percent in the Sacramento basin, 155 percent in the San Joaquin, and 120 percent in the Tulare Lake basin. The Truckee basin received 130 percent, the Carson 120 percent and the Walker 140 percent. About 80 percent of the December average fell in the Humboldt basin and 110 percent in the upper Klamath basin.

Although significant snow fell during October, the water equivalent accumulated was only a small percentage of the April 1st average. However, the December storms brought back good accumulation to the Sierra snow pack and a substantial increase of the April 1st average. The monthly averages are 145 percent in the northern Sierra basin, 150 percent for the central Sierra, and 185 percent in the southern Sierra. The April 1st average stands at 55 percent in the northern Sierra, 55 percent for the central Sierra and 60 percent in the southern Sierra. Snow packs in the Carson-Walker are at 175 percent of the average-to-date, the Tahoe-Truckee at 155 percent, and the Humboldt at 120 percent. The upper Klamath basin is only at 60 percent.

Runoff amounts were generally low during the month due to the cold conditions. It was 108 percent of the December average for the Merced inflow to Exchequer, followed by 101 percent for the San Joaquin inflow to Millerton Lake and 89 percent for the Kings at Pine Flat. Amounts then generally taper downward to a low of 50 percent for the Yuba at Smartville. December amounts were mostly in the 50 to 80 percent range in the Sierra Nevada watershed. It was only 64 percent of the monthly average for the Humboldt River at Palisade while the upper Klamath basin received 79 percent.

December 31st storage conditions for the major reservoirs in California's central valley were generally in the 80 to 100 percent range. Two locations were much below average--Pine Flat Reservoir at 49 percent and Lake Isabella at 54 percent. Reservoir storage in the Sacramento basin was at 91 percent of average, the San Joaquin at 98 percent, and the Tulare Lake basin at 57 percent. East side Sierra reservoirs are at 67 percent of average. Storage is about 0.25 feet below the natural rim elevation of 6223.0 at Lake Tahoe as of December 31st. Storage at Lahontan Reservoir stands at 69 percent of the average-to-date while Rye Patch Reservoir in Nevada is at only 17 percent. Storage in the Upper Klamath Lake is about 78 percent of average.

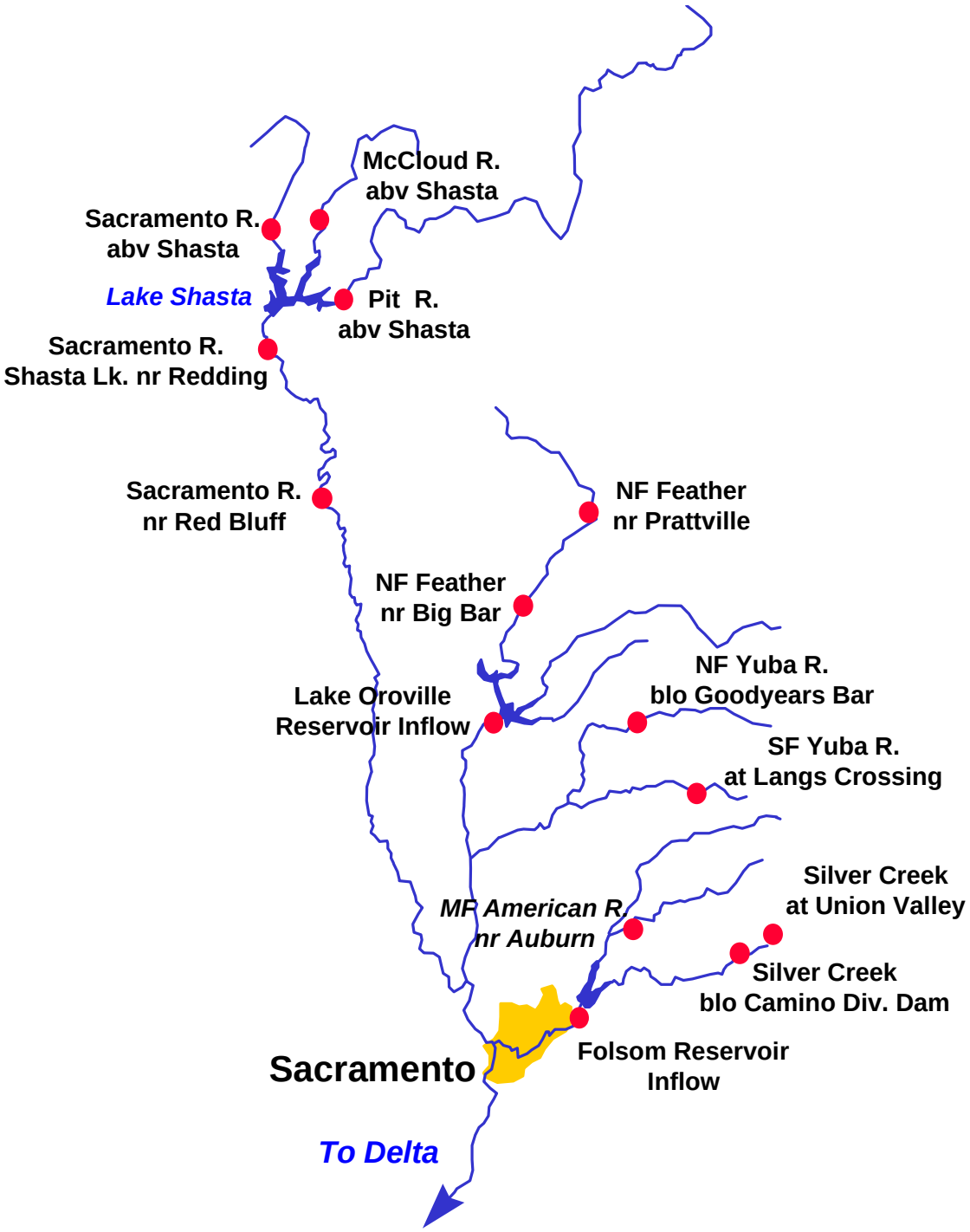
Although blessed with a series of early season storms this water year, many watersheds are coming off a dry water year 2004. Some of them have experienced several consecutive years of below average spring runoff up to now, the upper Klamath, Tulare, Truckee, Carson and Humboldt basins in particular. These dry antecedent conditions are reflected in the January 1st forecasts. The April through July runoff forecasts range from 86 percent for the Pit basin to 104 percent for the Upper San Joaquin. Forecasts vary from 96 to 115 percent for the east-side Sierra basins, and 86 to 100 percent for the Humboldt basin of northern Nevada. The March through September forecast for the upper Klamath basin is 79 percent.

Mid-month updates are scheduled for selected east side Sierra forecast points and the upper Klamath inflow. These will be posted on the CNRFC web page.

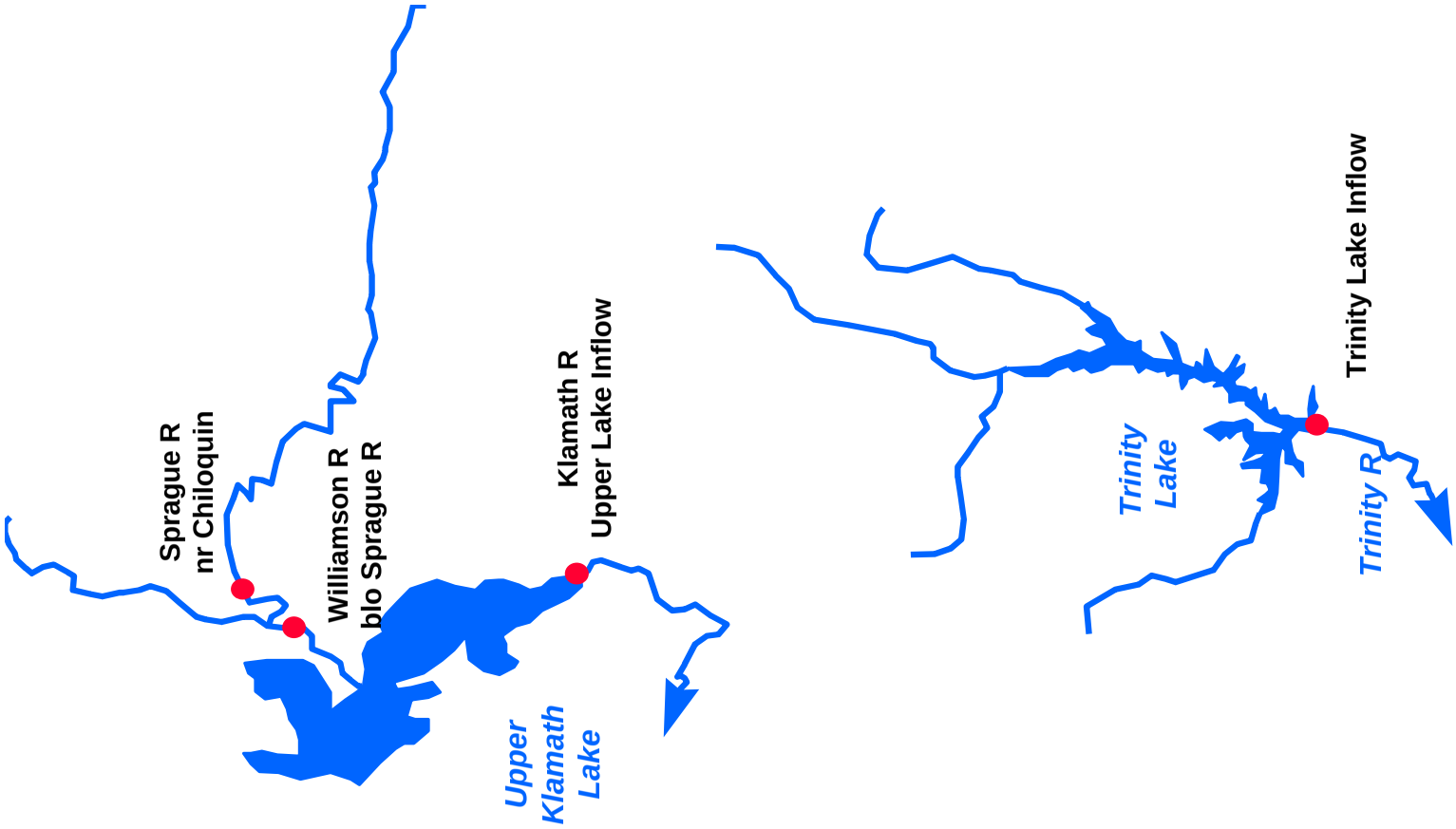
**The Water Supply Outlook is available in pdf format on the World Wide Web at:**

**http://www.wrh.noaa.gov/cnrfc**

# Sacramento River Basin



# Upper Klamath and Trinity River Basins



# Water Supply Forecasts

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **COASTAL BASINS** | | | | | | |
| Williamson River | | | | | | |
| Sprague, blo | Mar-Sep | 400 | 79 | 540 | 260 | 505 |
| Sprague River | | | | | | |
| Chiloquin, nr | Mar-Sep | 230 | 75 | 340 | 121 | 305 |
| Upper Klamath Falls River | | | | | | |
| Inflow | Mar-Sep | 565 | 79 | 765 | 365 | 715 |
| Lost River | | | | | | |
| Gerber Reservoir Inflow | Feb-Jul | 30 | 64 | 50 | 10.0 | 47 |
| Clear Lake Reservoir Inflow | Feb-Jul | 88 | 84 | 158 | 19.0 | 105 |
| Scott River | | | | | | |
| Fort Jones, nr | Apr-Jul | 170 | 94 | 280 | 60 | 181 |
| Trinity River | | | | | | |
| Clair Engle Lake Inflow | Apr-Jul | 570 | 90 | 845 | 300 | 635 |

Trinity River – Inflow at Lewiston Lake Distribution (kAF)

| Exceedence Probability | Oct-Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Apr-Jul | Water Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50% | 132 | 90 | 160 | 180 | 235 | 210 | 90 | 35 | 10 | 5 | 570 | 1147 |
| 90% | 132 | 40 | 75 | 90 | 115 | 125 | 40 | 20 | 15 | 10 | 300 | 662 |
| 10% | 132 | 215 | 335 | 350 | 300 | 315 | 175 | 55 | 20 | 15 | 845 | 1912 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **SACRAMENTO RIVER BASIN** | | | | | | |
| **SACRAMENTO RIVER ABOVE BEND BRIDGE** | | | | | | |
| Pit River | | | | | | |
| Montgomery Ck, nr | Apr-Jul | 920 | 86 | 1210 | 625 | 1070 |
| Mccloud River | | | | | | |
| Shasta Lk, abv | Apr-Jul | 350 | 95 | 485 | 215 | 370 |
| Sacramento River | | | | | | |
| Delta | Apr-Jul | 270 | 93 | 415 | 125 | 290 |
| Shasta Lake, Redding, nr | Apr-Jul | 1600 | 89 | 2110 | 1070 | 1790 |
| Bend Bridge, abv, Red Bluff, nr | Apr-Jul | 2120 | 87 | 3050 | 1200 | 2440 |
| **FEATHER RIVER ABOVE OROVILLE RESERVOIR** | | | | | | |
| NF Feather River | | | | | | |
| Prattville, nr | Apr-Jul | 300 | 90 | 400 | 200 | 333* |
| Big Bar | Apr-Jul | 920 | 96 | 1390 | 450 | 962* |
| Feather River | | | | | | |
| Oroville Reservoir Inflow | Apr-Jul | 1660 | 94 | 2600 | 700 | 1760 |

# Water Supply Forecasts

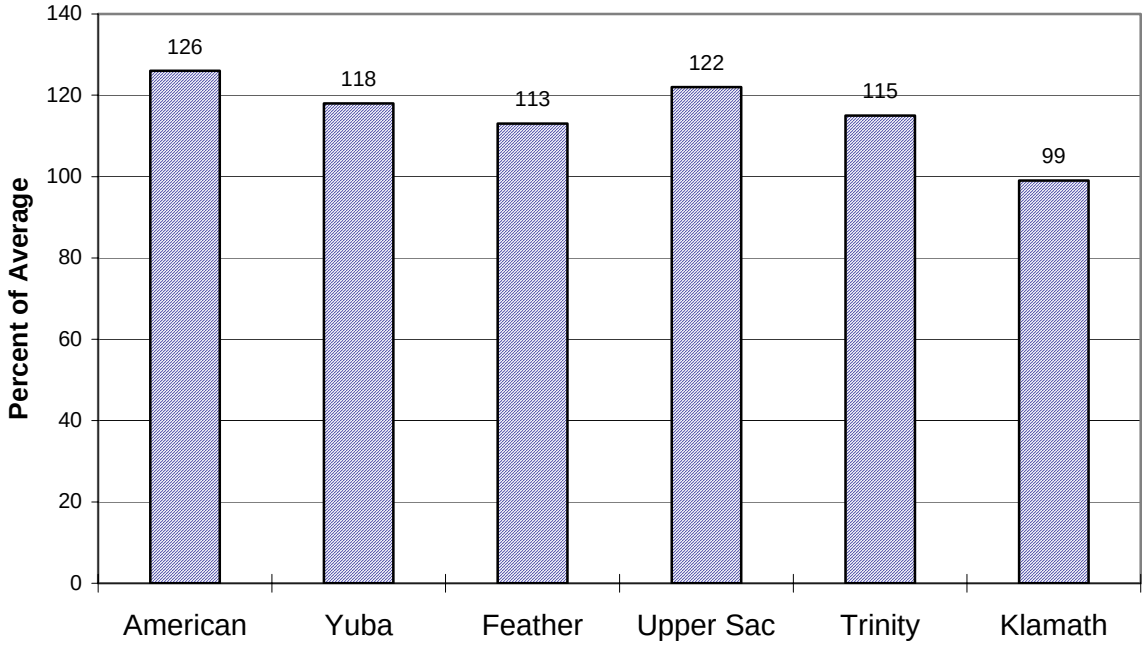
| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **YUBA RIVER ABOVE SMARTVILLE** | | | | | | |
| North Yuba River | | | | | | |
| Goodyears Bar, blo | Apr-Jul | 270 | 99 | 420 | 118 | 273* |
| South Yuba River | | | | | | |
| Langs Crossing | Apr-Jul | 220 | 98 | 350 | 92 | 225* |
| Yuba River | | | | | | |
| Smartville, nr | Apr-Jul | 970 | 97 | 1530 | 415 | 995 |
| **AMERICAN RIVER ABOVE FOLSOM RESERVOIR** | | | | | | |
| MF American River | | | | | | |
| Auburn, nr | Apr-Jul | 500 | 102 | 800 | 198 | 490* |
| Silver Ck | | | | | | |
| Union Valley | Apr-Jul | 100 | 102 | 153 | 47 | 98* |
| Camino Dam, blo | Apr-Jul | 160 | 101 | 260 | 58 | 158* |
| American River | | | | | | |
| Folsom Reservoir Inflow | Apr-Jul | 1250 | 102 | 2000 | 505 | 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.**

# Sacramento/Trinity/Klamath River Basins

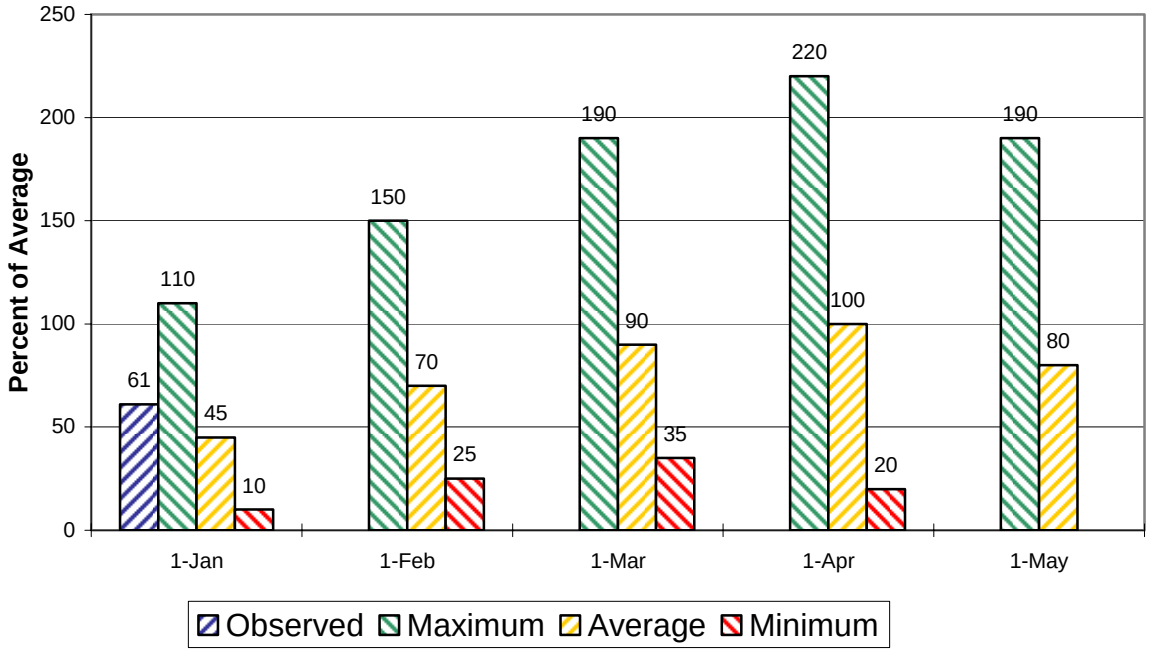
## Seasonal Basin Precipitation

### October 1 to Date




## Seasonal Basin Snowpack

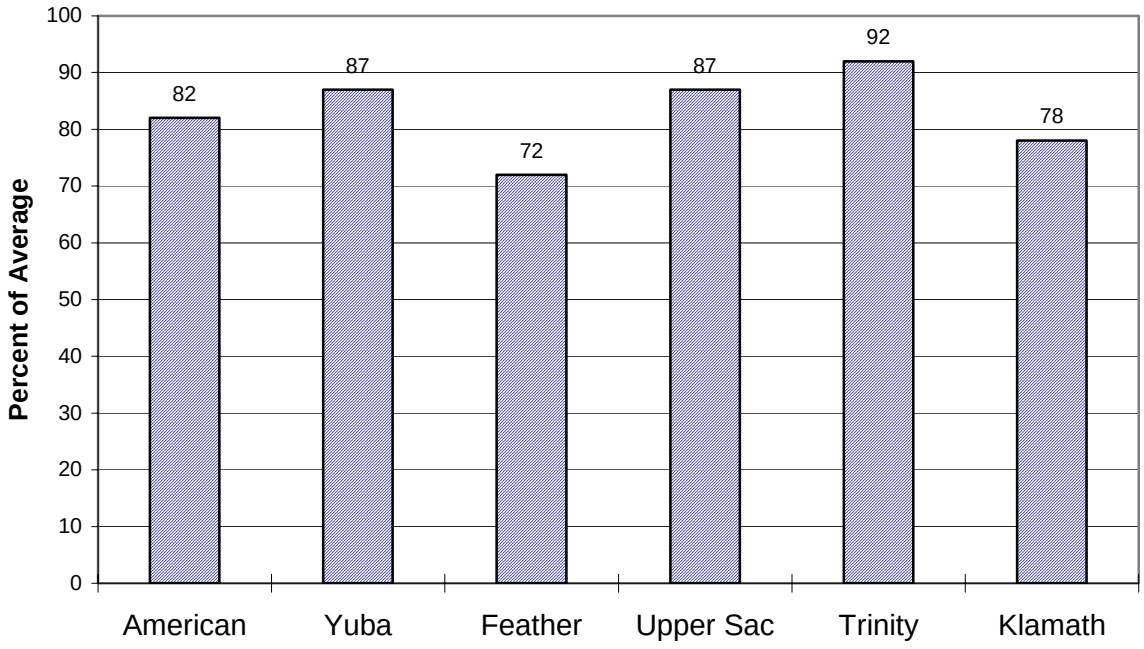
### Water Content in % of April 1 Average



# Sacramento/Trinity/Klamath River Basins

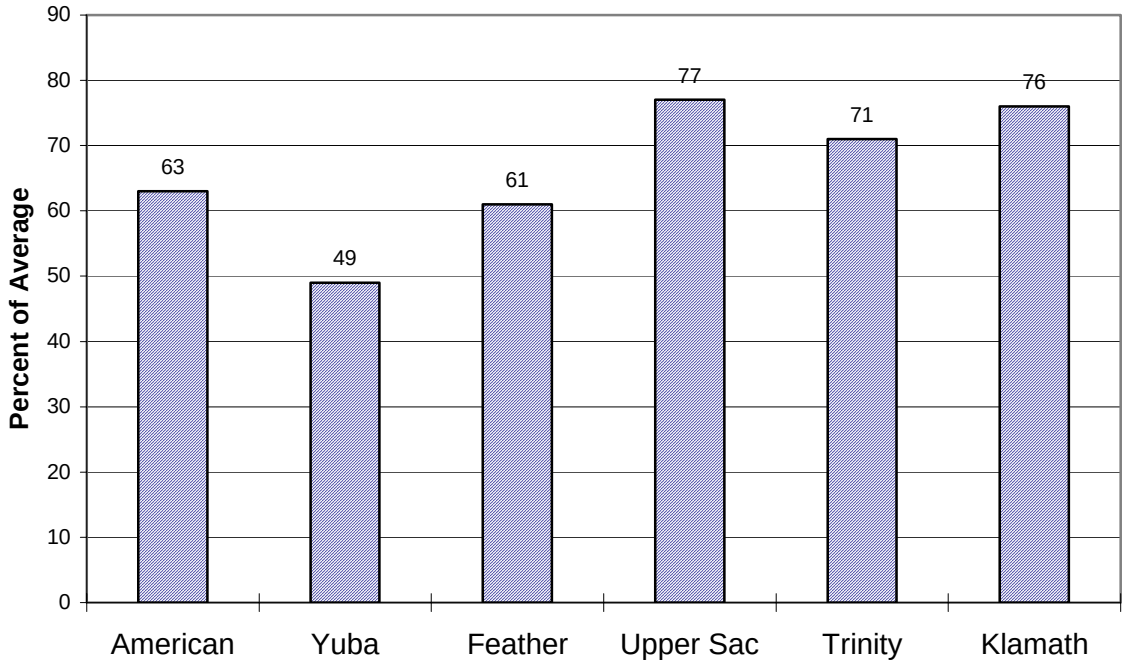
## Basin Reservoir Storage

### Contents of Major Reservoirs in % of Average




## Seasonal Basin Runoff

### October 1 to Date



# San Joaquin Basin

# Water Supply Forecasts

| | | Most Prob Vol KAF | Most Prob Vol %Norm | Reas Max Vol KAF | Reas Min Vol KAF | 30 Year Avg KAF |
|---|---|---|---|---|---|---|
| **SF San Joaquin River** | | | | | | |
| Hooper Ck, blo, Florence Lk, nr | Apr-Jul | 200 | 104 | 325 | 74 | 192* |
| **San Joaquin River** | | | | | | |
| Millerton Lk | Apr-Jul | 1300 | 102 | 2210 | 395 | 1270 |
| **Merced River** | | | | | | |
| Pohono Bridge, at, Yosemite, nr | Apr-Jul | 360 | 100 | 600 | 120 | 360* |
| Merced Falls, blo | Apr-Jul | 620 | 96 | 1100 | 140 | 645 |
| **Tuolumne River** | | | | | | |
| Hetch Hetchy, nr | Apr-Jul | 600 | 101 | 925 | 275 | 596* |
| La Grange, nr | Apr-Jul | 1200 | 98 | 2000 | 450 | 1230 |
| **MF Stanislaus River** | | | | | | |
| Beardsley Dam, blo | Apr-Jul | 310 | 97 | 515 | 104 | 320* |
| **Stanislaus River** | | | | | | |
| Goodwin Dam, blo, Knights Ferry | Apr-Jul | 660 | 95 | 1120 | 200 | 695 |
| **NF Mokelumne River** | | | | | | |
| West Point | Apr-Jul | 440 | 106 | 760 | 150 | 416* |
| **Mokelumne River** | | | | | | |
| Mokelumne Hill | Apr-Jul | 460 | 100 | 745 | 175 | 460 |
| **Cosumnes River** | | | | | | |
| Michigan Bar | Apr-Jul | 120 | 98 | 220 | 30 | 123 |

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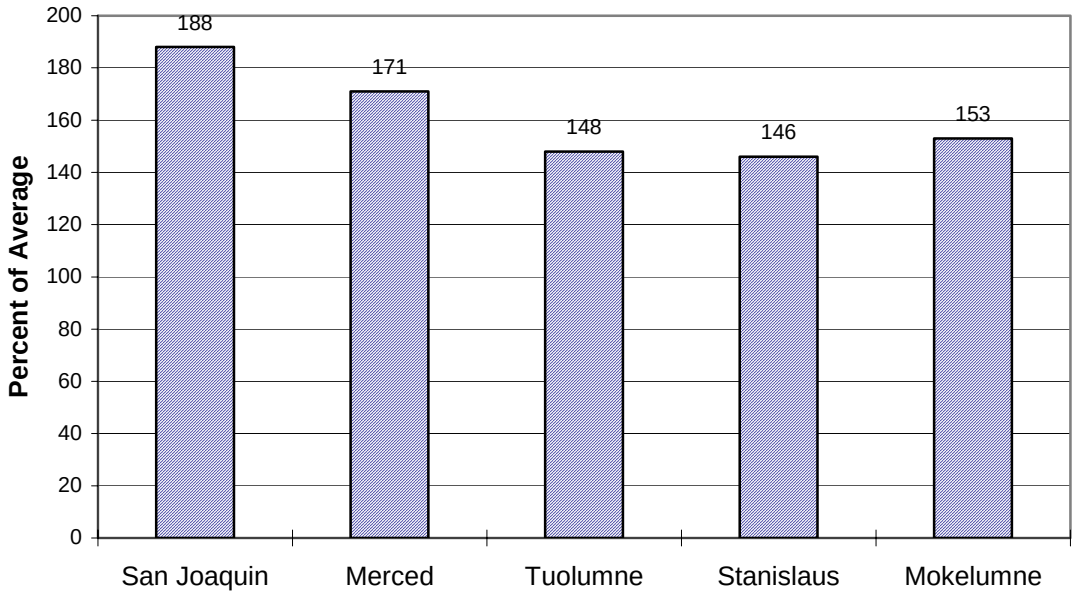
# San Joaquin Basin

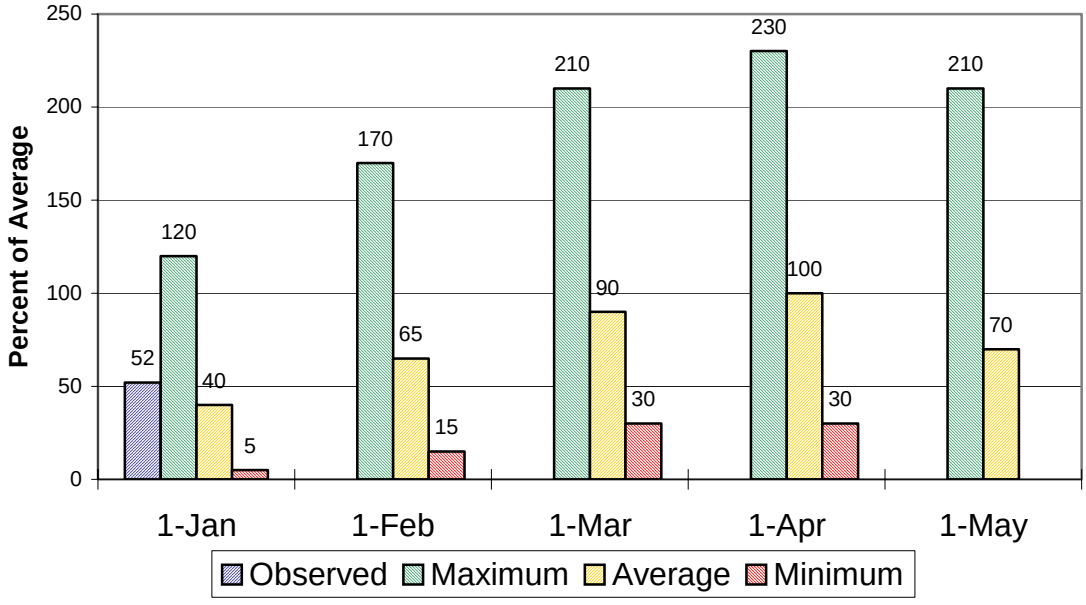
## Seasonal Basin Precipitation

**October 1 to Date**




## Seasonal Basin Snowpack

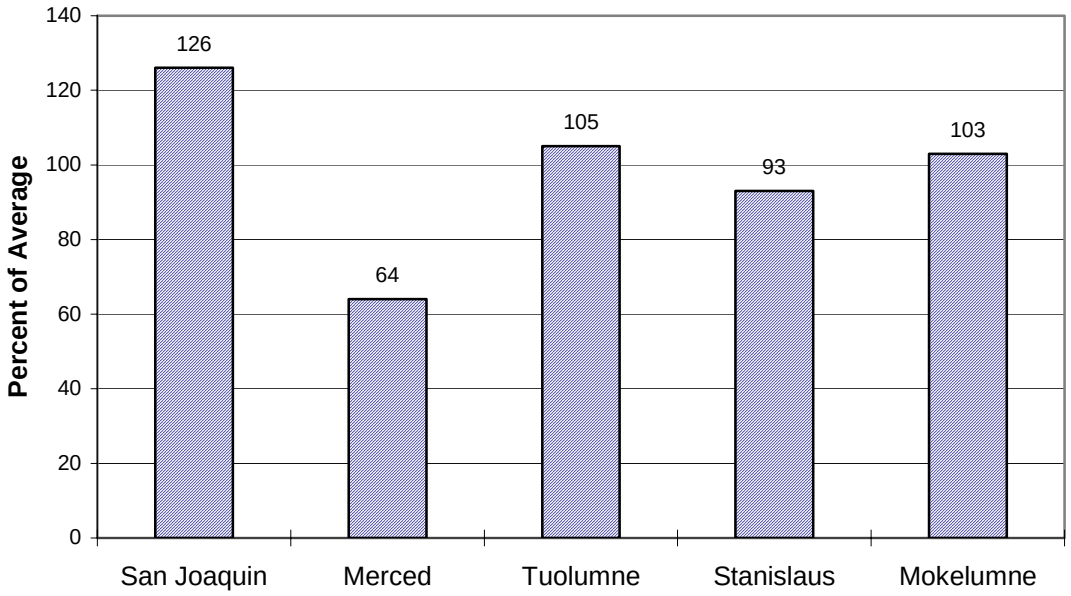
**Water Content in % of April 1 Average**



# San Joaquin Basin

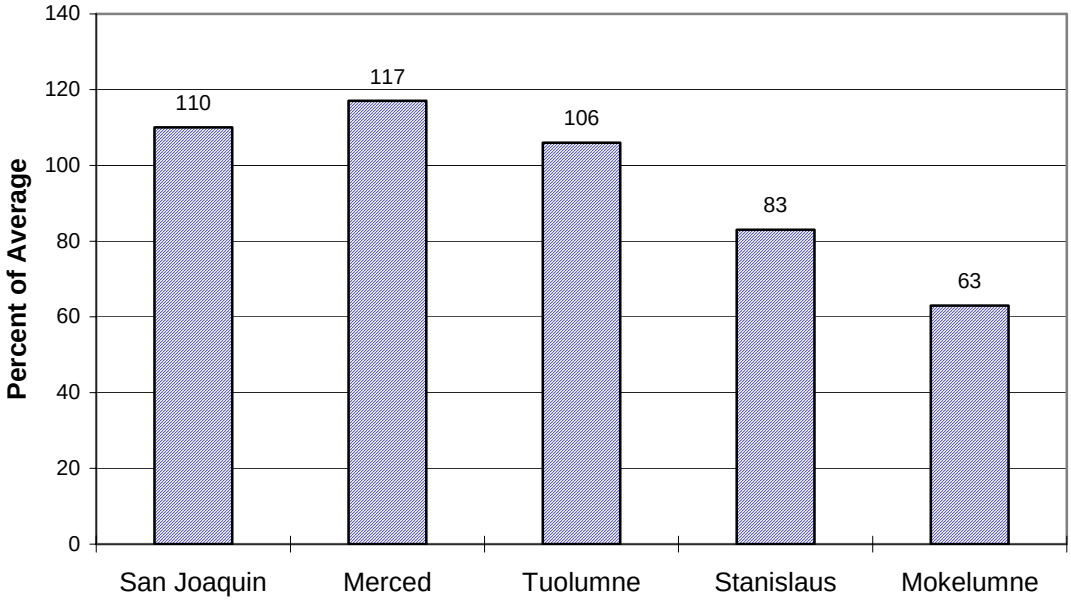
## Basin Reservoir Storage

**Contents of Major Reservoirs in % of Average**

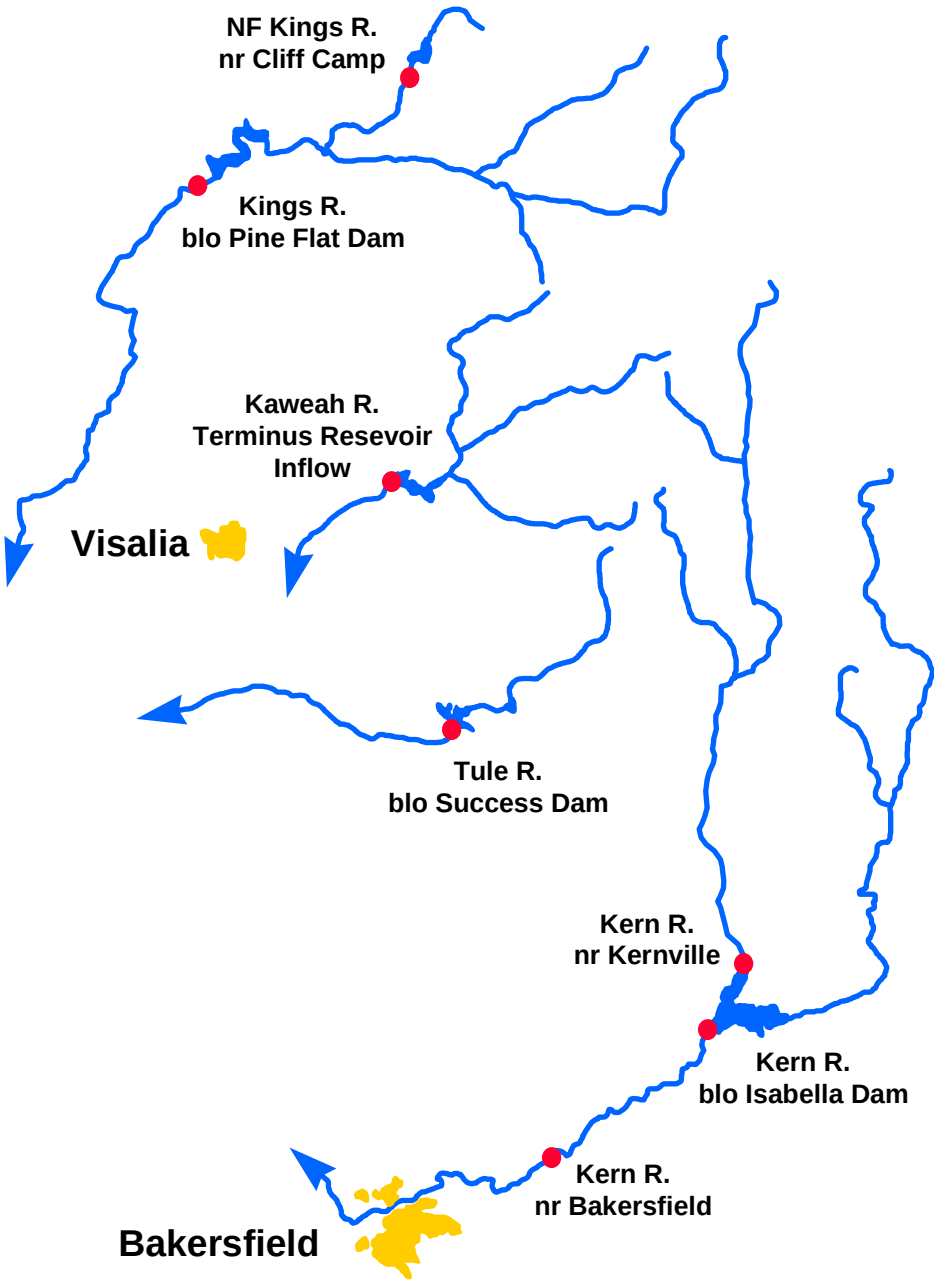



## Season Basin Runoff

**October 1 to Date**



# Tulare Basin



# Water Supply Forecasts

| | | 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 | 340 | 85 | 600 | 120 | 398* |
| Isabella Dam, blo | Apr-Jul | 410 | 85 | 750 | 130 | 480 |
| Bakersfield, nr | Apr-Jul | 425 | 87 | 820 | 150 | 490 |
| **Tule River** | | | | | | |
| Success Dam | Apr-Jul | 60 | 91 | 135 | 15.0 | 66 |
| **Kaweah River** | | | | | | |
| Terminus Dam | Apr-Jul | 280 | 97 | 525 | 80 | 290 |
| **NF Kings River** | | | | | | |
| Cliff Camp, nr | Apr-Jul | 235 | 98 | 410 | 75 | 240* |
| **Kings River** | | | | | | |
| Pine Flat Dam, blo | Apr-Jul | 1200 | 96 | 2130 | 400 | 1250 |

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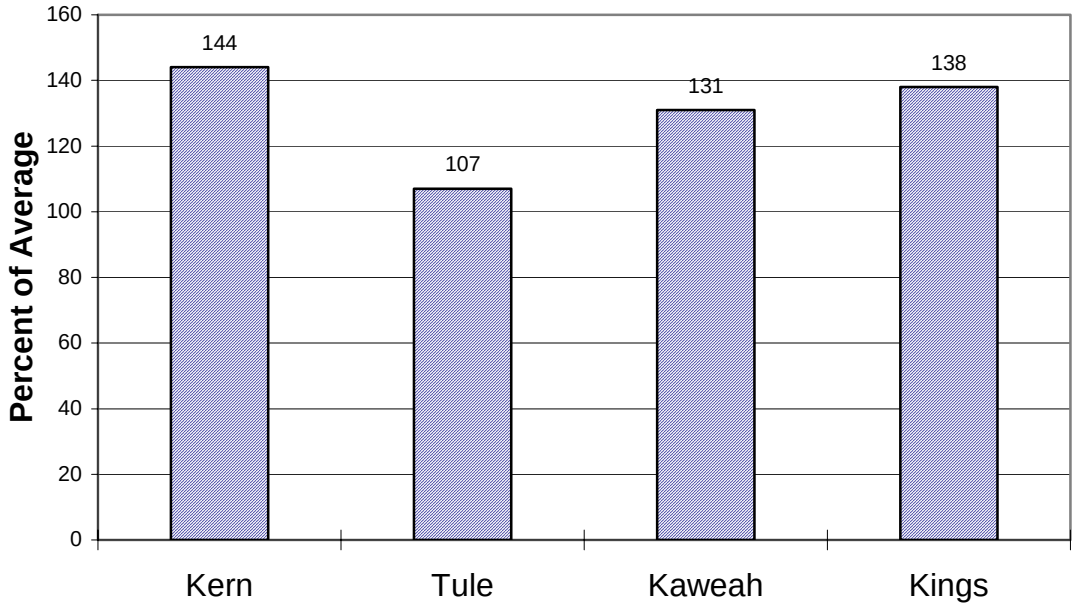
# Tulare Lake Basin

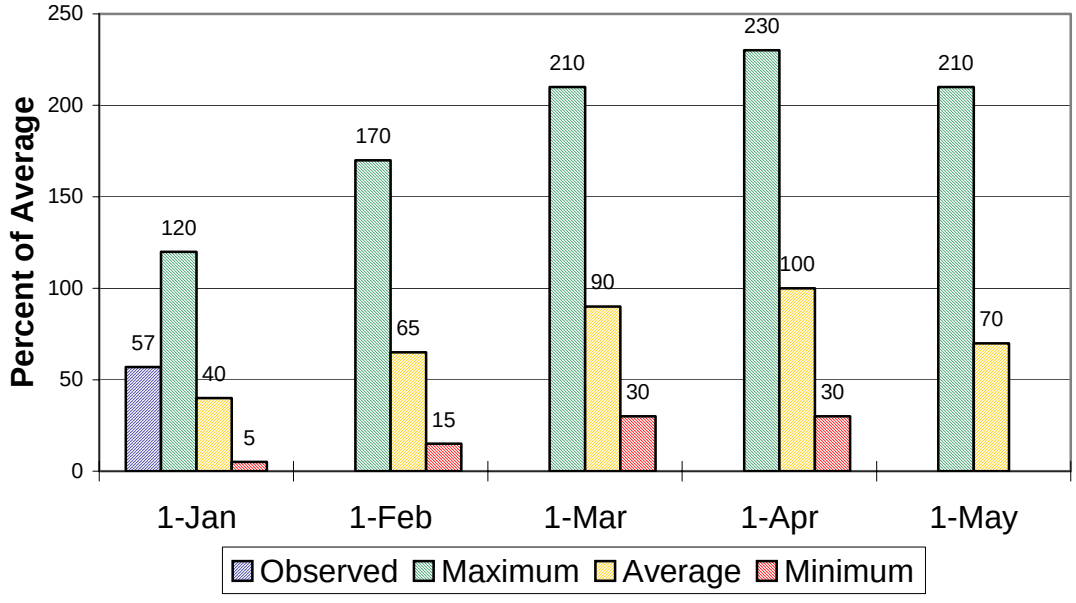
## Seasonal Precipitation

**October 1 to Date**




## Seasonal Basin Snowpack

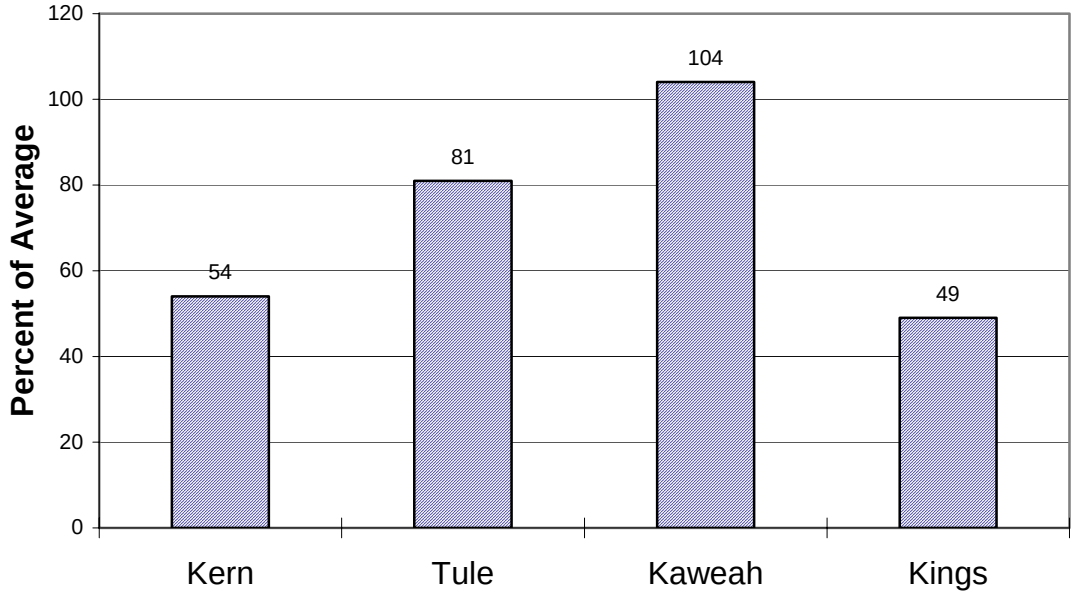
**Water Content in % of April 1 Average**



# Tulare Lake Basin

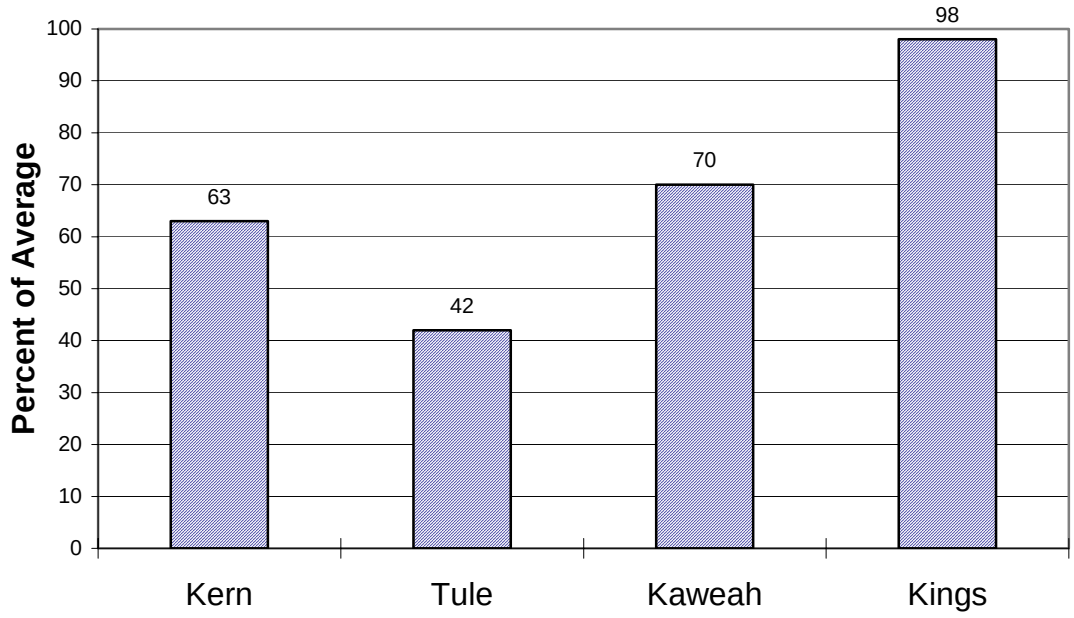
## Basin Reservoir Storage

**Contents of Major Reservoirs in % of Average**

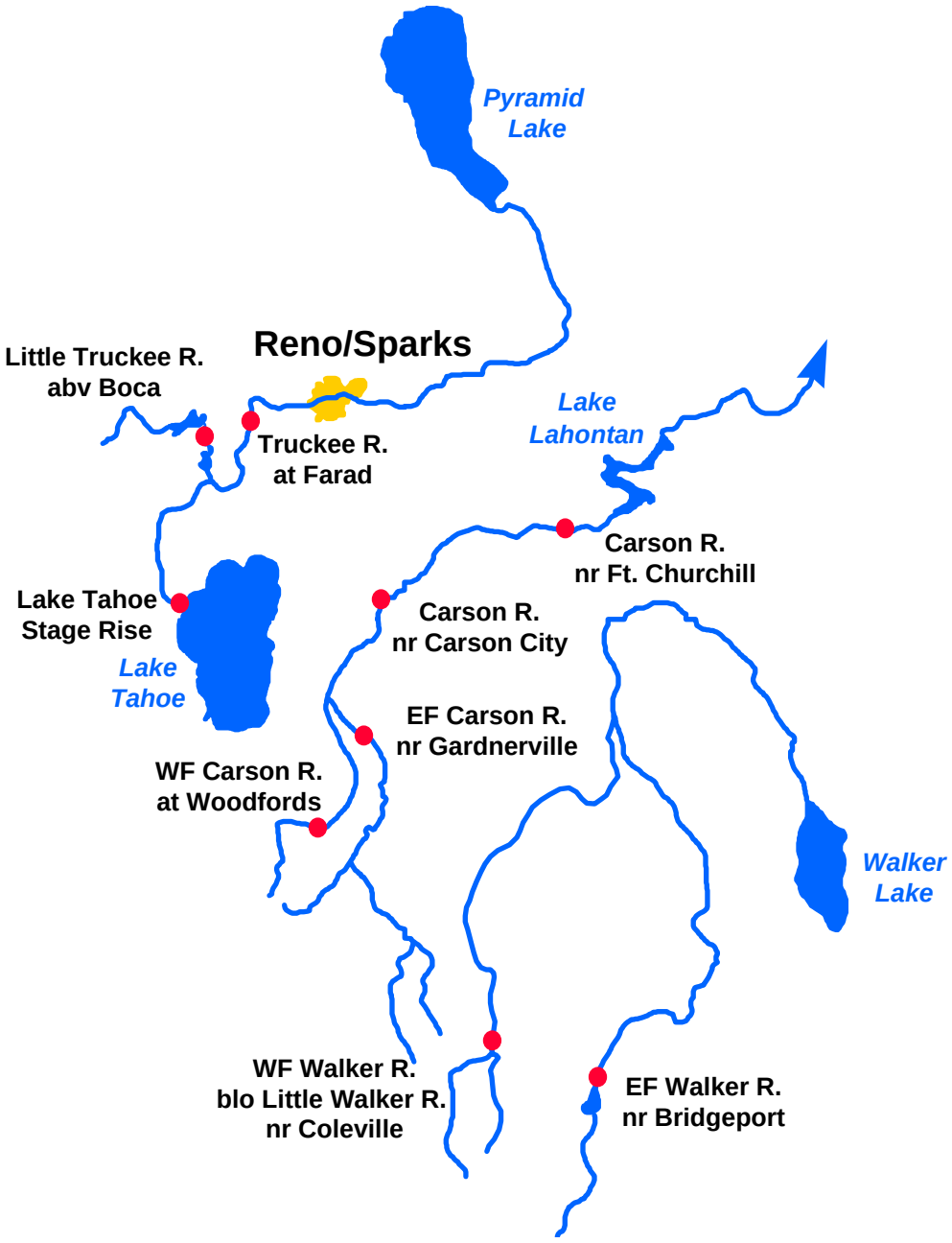



## Seasonal Basin Runoff

**October 1 to Date**



# East Side Sierra Nevada Basins



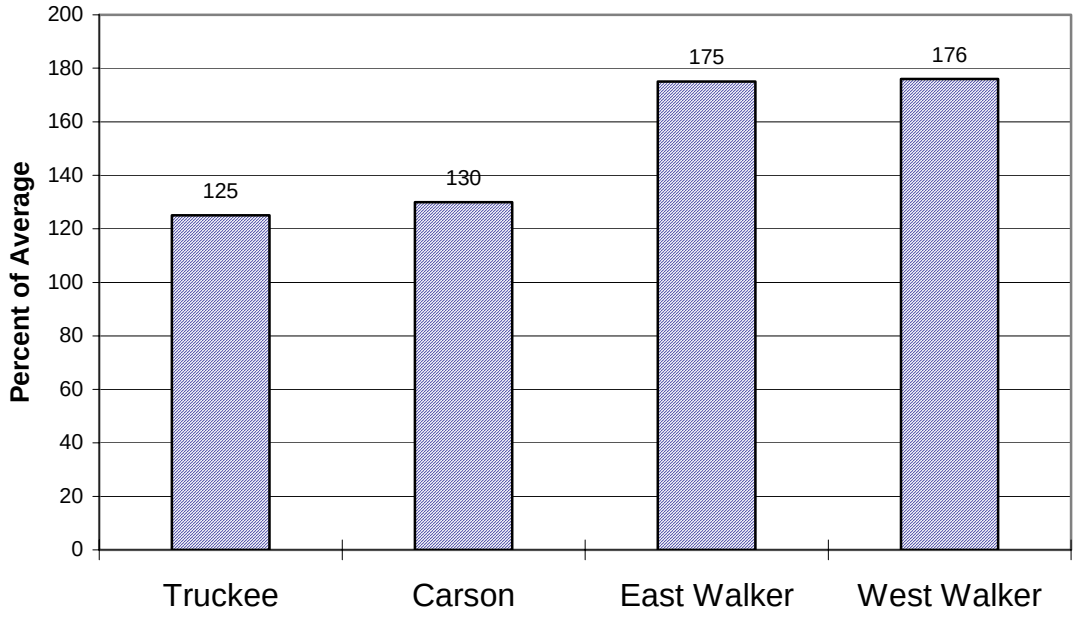
# Water Supply Forecasts

| | | 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 | 1.40 | 101 | 2.3 | 0.51 | 1.38 |
| Ltl Truckee River | | | | | | |
| Boca Res, abv, Truckee, nr | Apr-Jul | 85 | 106 | 134 | 35 | 80 |
| Truckee River | | | | | | |
| Farad | Apr-Jul | 275 | 106 | 450 | 99 | 260 |
| **Carson River** | | | | | | |
| EF Carson River | | | | | | |
| Gardnerville, nr | Apr-Jul | 205 | 108 | 315 | 97 | 189 |
| WF Carson River | | | | | | |
| Woodfords | Apr-Jul | 60 | 107 | 89 | 31 | 56 |
| Carson River | | | | | | |
| Carson City, nr | Apr-Jul | 190 | 101 | 325 | 53 | 188 |
| Fort Churchill, nr | Apr-Jul | 170 | 96 | 300 | 42 | 178 |
| **Walker River** | | | | | | |
| East Walker River | | | | | | |
| Bridgeport, nr | Apr-Aug | 70 | 104 | 119 | 20 | 67 |
| West Walker River | | | | | | |
| Ltl Walker, blo, Coleville, nr | Apr-Jul | 180 | 115 | 270 | 87 | 156 |

# East Side Sierra Nevada Basins

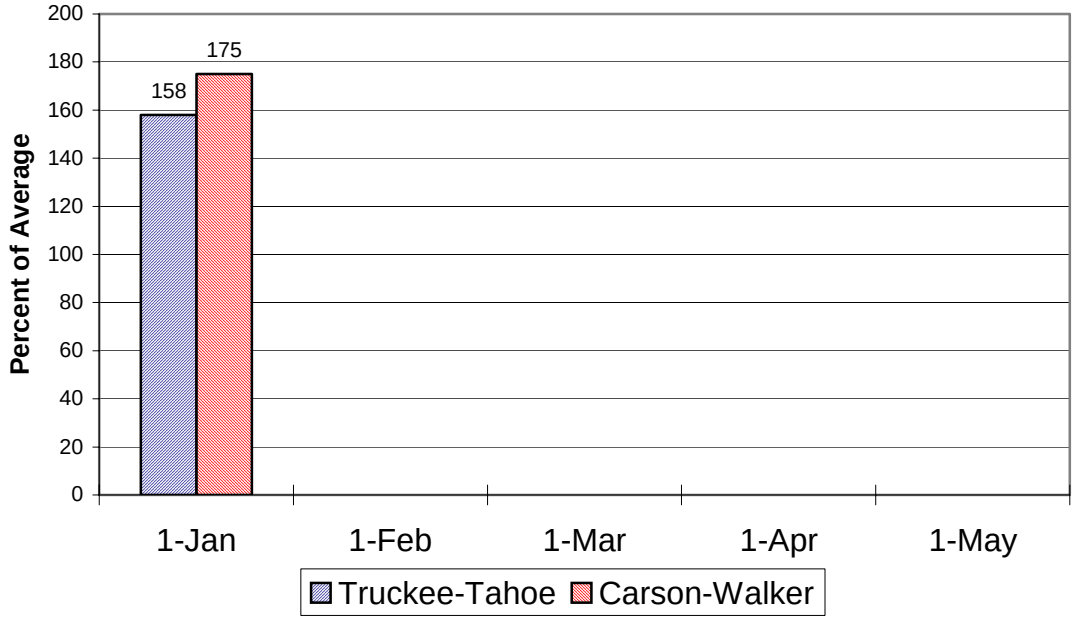
## Seasonal Basin Precipitation

**October 1 to Date**




## Basin Snowpack

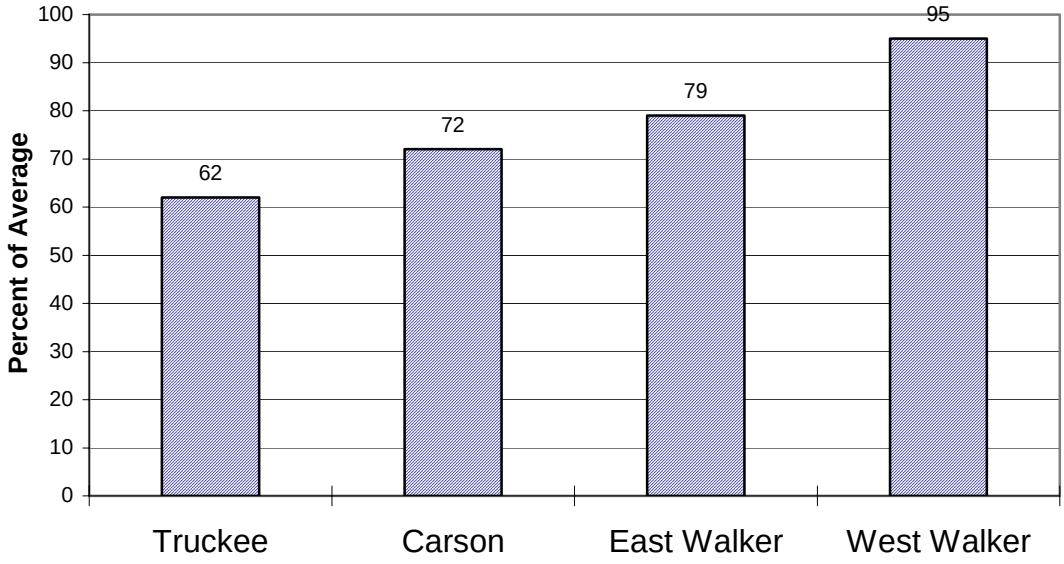
**% of Average SWE to Date**



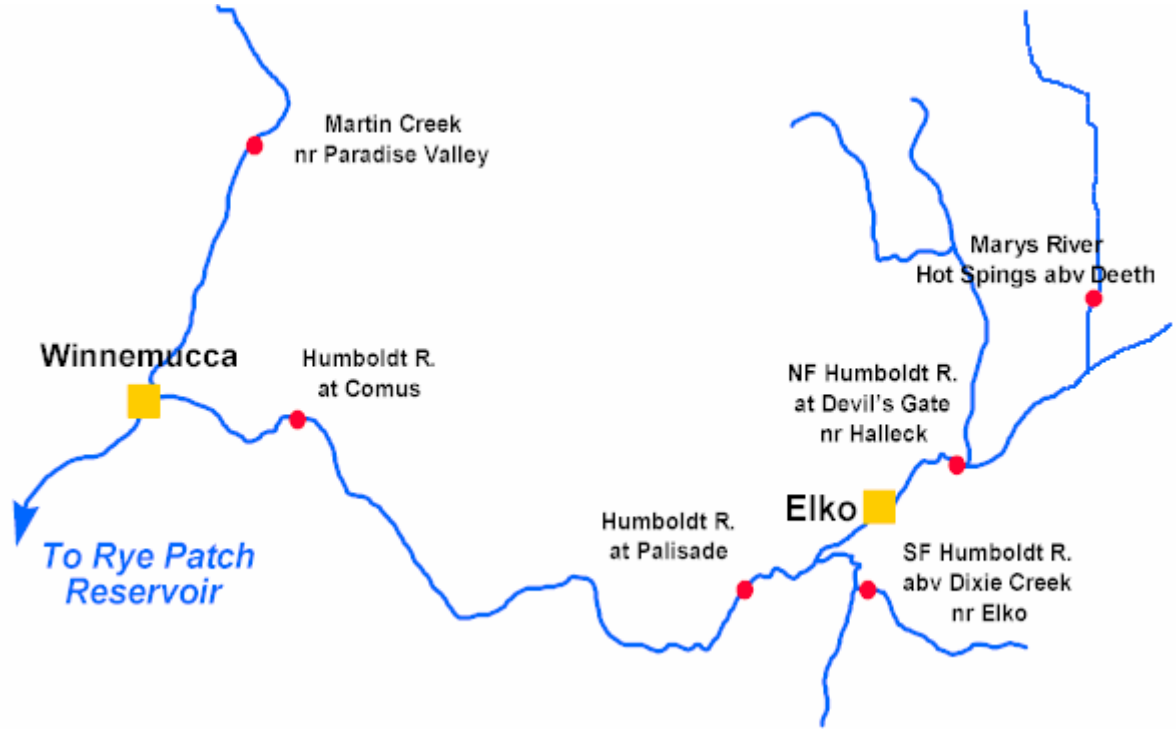
# East Side Sierra Nevada Basins

## 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** | | | | | | |
| Devils Gate, at, Halleck, nr | Apr-Jul | 34 | 100 | 57 | 11.0 | 34* |
| **SF Humboldt River** | | | | | | |
| Dixie Ck, abv, Elko, nr | Apr-Jul | 70 | 92 | 112 | 28 | 76 |
| **Marys River** | | | | | | |
| Hot Springs, abv, Deeth, nr | Apr-Jul | 38 | 97 | 60 | 16.0 | 39 |
| **Humboldt River** | | | | | | |
| Palisade | Apr-Jul | 220 | 88 | 390 | 50 | 250 |
| Comus | Apr-Jul | 195 | 87 | 375 | 85 | 225 |
| **Martin Ck** | | | | | | |
| Paradise Vly, nr | Apr-Jul | 16.0 | 86 | 26 | 6.0 | 18.7 |

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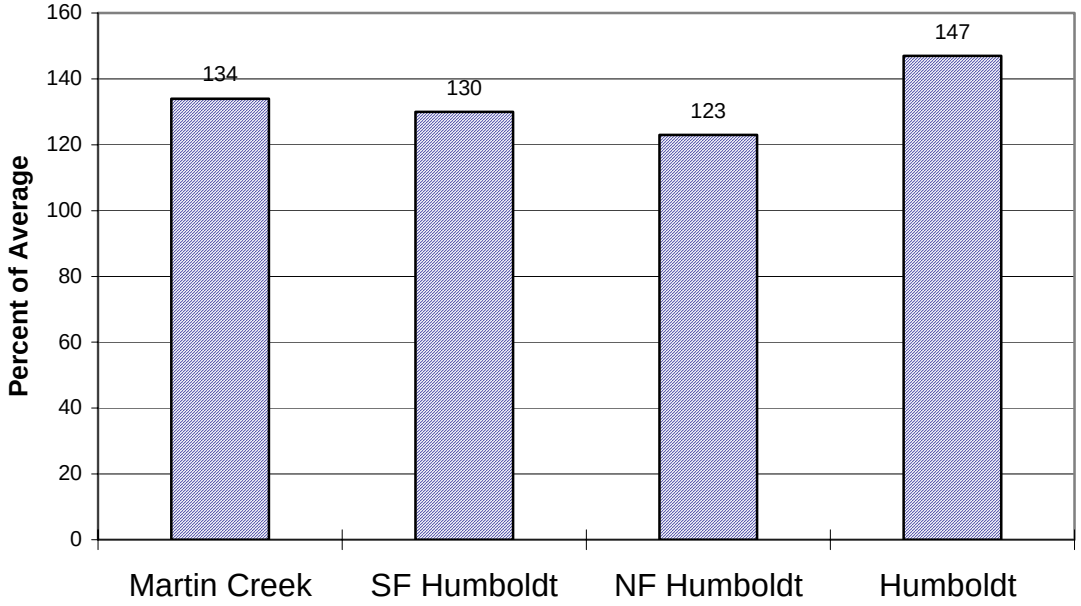
# Humboldt River Basin

## Seasonal Basin Precipitation

**October 1 to Date**




## Basin Snowpack

**% of Average SWE to Date**