



California Cooperative  
Snow Surveys  
Bulletin 120-1-99

State of California  
The Resources Agency

Department of  
Water Resources

# Water Conditions in California

Report 1 February 1, 1999



**Gray Davis**  
Governor  
State of California

**Mary D. Nichols**  
Secretary for Resources  
The Resources Agency

**STATE OF CALIFORNIA**

Gray Davis, Governor

**THE RESOURCES AGENCY**

Mary D. Nichols, Secretary for Resources

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**COOPERATING AGENCIES**

**Public Agencies**

- Buena Vista Water Storage District
- East Bay Municipal Utility District
- Friant Water Users Association
- Kaweah Delta Water Conservation District
- Kern Delta Water District
- Kings River Conservation District
- Lower Tule River Irrigation District
- Merced Irrigation District
- Modesto Irrigation District
- Nevada Irrigation District
- North Kern Water Storage District
- Northern California Power Agency
- Oakdale Irrigation District
- Omochumne-Hartnell Water District
- Oroville-Wyandotte Irrigation District
- Placer County Water Agency
- San Joaquin Exchange Contractors Water Association
- South San Joaquin Irrigation District
- Tri-Dam Project
- Tulare Lake Basin Water Storage District
- Turlock Irrigation District
- Yuba County Water Agency
- Private Organizations**
- J.G. Boswell Company
- Kaweah and St. Johns River Association
- Kings River Water Association
- Tule River Association
- State Water Contractors

**Municipalities**

- City of Bakersfield Water Department
- City of Los Angeles Department of Water and Power
- City and County of San Francisco Hetch Hetchy Water and Power

**State Agencies**

- University of California
- Central Sierra Snow Laboratory
- Scripps Institution of Oceanography
- California Department of Forestry & Fire Protection
- California Department of Water Resources

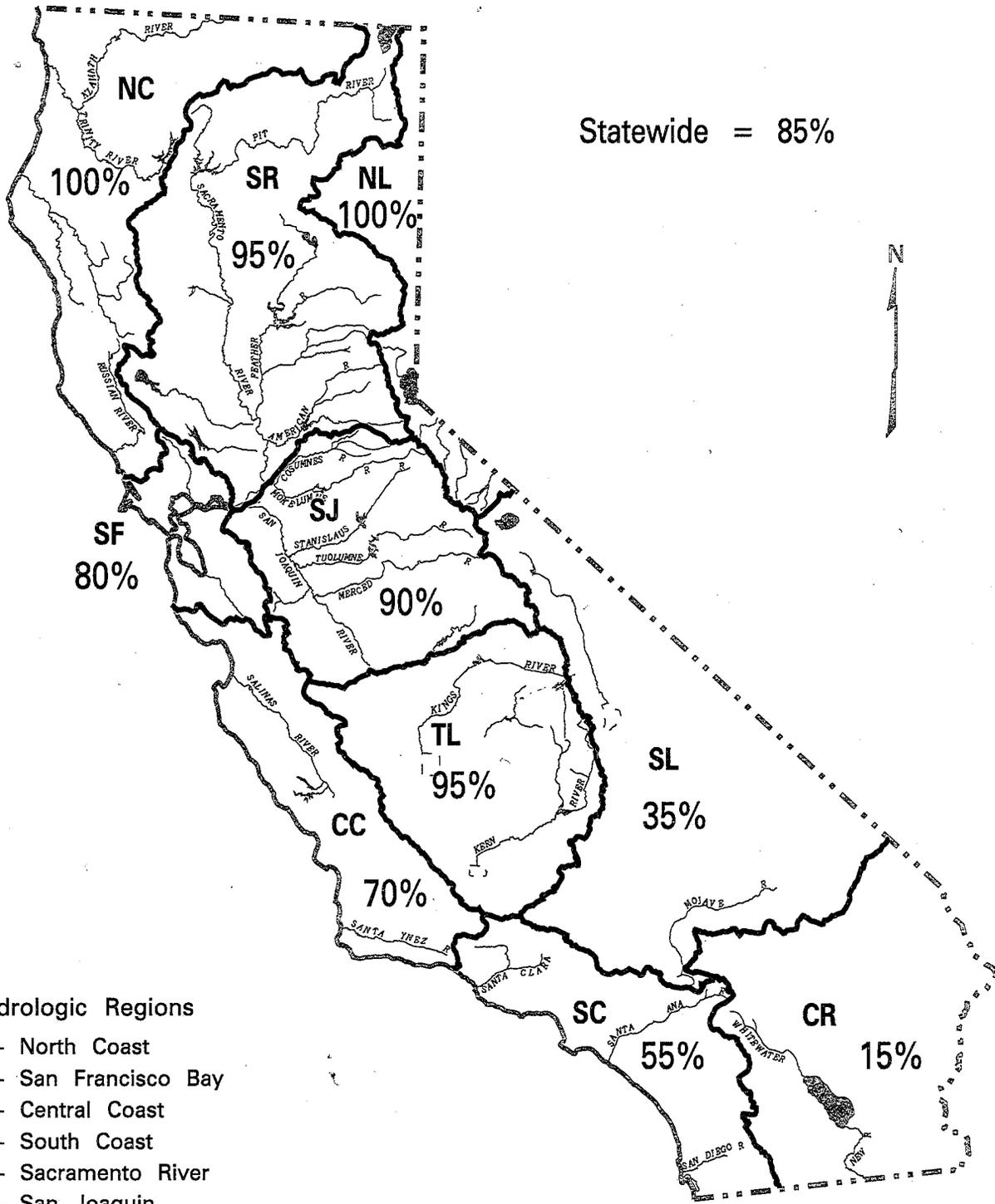
**Federal Agencies**

- U.S. Department of Agriculture
- Forest Service(14 National Forests)
- Natural Resource Conservation Service
- U.S. Department of Commerce
- National Weather Service
- U.S. Department of Interior
- Bureau of Reclamation
- Geological Survey, Water Resources
- National Park Service(3 National Parks)
- U.S. Department of Army
- Corps of Engineers

**Other Cooperative Programs**

- Nevada Cooperative Snow Surveys
- Oregon Cooperative Snow Surveys

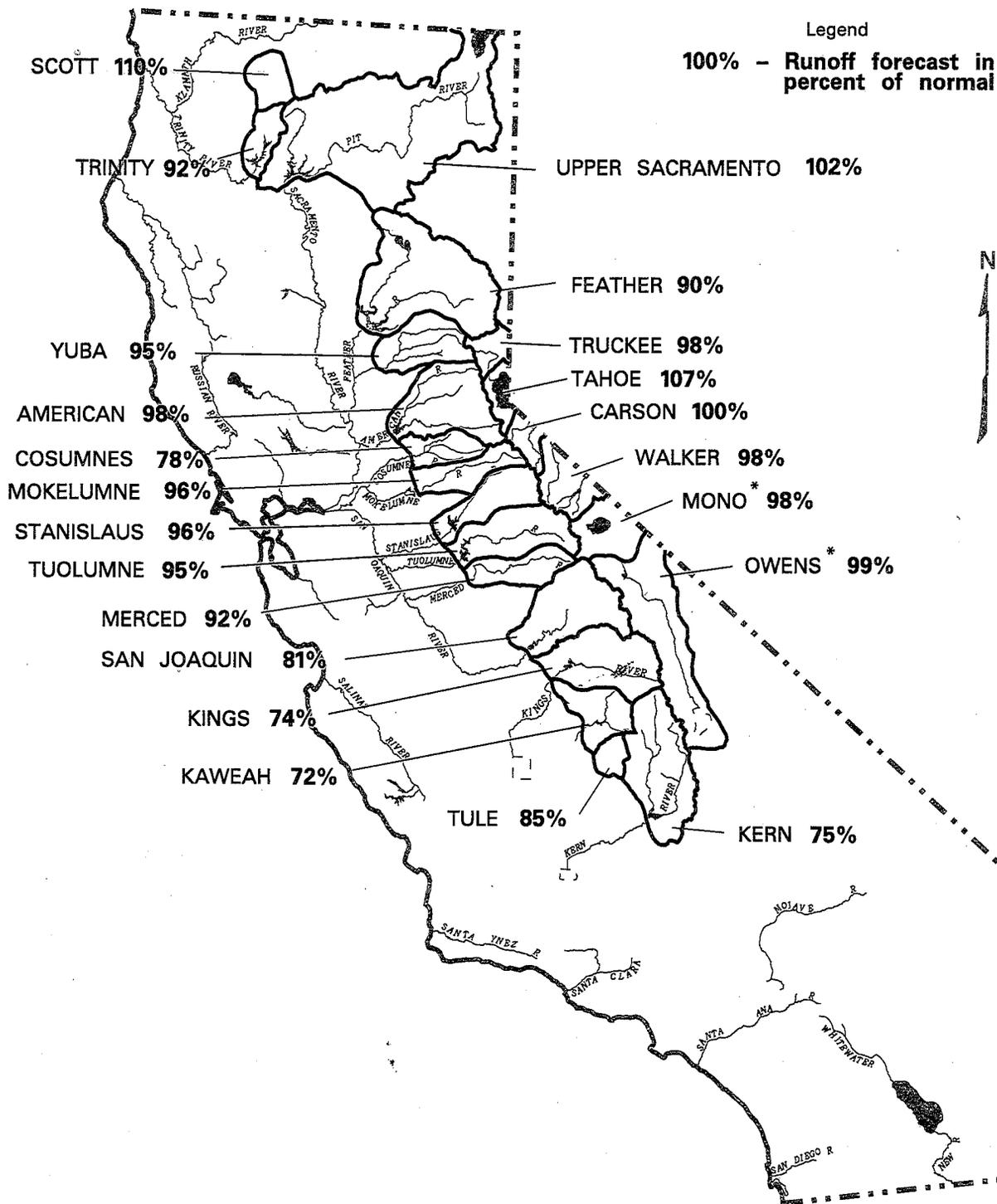
**SEASONAL PRECIPITATION**  
 IN PERCENT OF AVERAGE TO DATE  
 October 1, 1998 through January 31, 1999



- Hydrologic Regions**
- NC - North Coast
  - SF - San Francisco Bay
  - CC - Central Coast
  - SC - South Coast
  - SR - Sacramento River
  - SJ - San Joaquin
  - TL - Tulare Lake
  - NL - North Lahontan
  - SL - South Lahontan
  - CR - Colorado River-Desert

WATER YEAR IS OCTOBER 1 THROUGH SEPTEMBER 30

**FORECAST OF APRIL - JULY  
UNIMPAIRED SNOWMELT RUNOFF**  
February 1, 1999



\* FORECAST BY DEPARTMENT OF WATER AND POWER, CITY OF LOS ANGELES

## SUMMARY OF WATER CONDITIONS FEBRUARY 1, 1999

Storms during the latter half of January made up for the preceding early winter extended dry spell. As a result, prospects are good for near normal water supplies in most areas of the State. The usual wetter north and drier south pattern characteristic of California's climate is amplified this year with lower percentage figures in the southern part of the State. About 40 percent of the rainy season is left; weather during the next three months can still substantially change the runoff outlook.

**Forecasts** of April through July runoff are slightly under average at 90 percent overall. The drop-off in the southern Sierra is due to significantly less snowpack in that region. Water year runoff forecast percentages are nearly the same as those for snowmelt runoff due to generally less than average precipitation thus far.

**Snowpack** water content is 100 percent of average for this date statewide compared to 115 percent last year. The pack is about 65 percent of the April 1 average, which is the date of normal maximum accumulation.

**Precipitation** during January was estimated to be 95 percent of average for the month. The seasonal accumulation since October 1 is about 85 percent of average compared to 125 percent last year.

**Runoff** so far this season is about 90 percent of average compared to 125 percent last year. January runoff overall was 80 percent of average. Estimated runoff of the eight major rivers of the Sacramento and San Joaquin River regions during January was 2.6 million acre-feet.

**Reservoir storage** continues to be excellent at nearly 125 percent of average overall for this date. That is more than the 115 percent reported last year at this time. Many of the larger Central Valley reservoirs are near their flood control limits for this time of year.

## SUMMARY OF WATER CONDITIONS IN PERCENT OF AVERAGE

HYDROLOGIC REGION	PRECIPITATION OCTOBER 1 TO DATE	FEBRUARY 1 SNOW WATER CONTENT	FEBRUARY 1 RESERVOIR STORAGE	RUNOFF OCTOBER 1 TO DATE	APR-JULY RUNOFF FORECAST	WATER YEAR RUNOFF FORECAST
NORTH COAST	100	100	110	80	95	90
SAN FRANCISCO BAY	80	—	115	65	—	—
CENTRAL COAST	70	—	140	35	—	—
SOUTH COAST	55	—	130	60	—	—
SACRAMENTO RIVER	95	110	115	105	95	100
SAN JOAQUIN RIVER	90	100	135	90	90	90
TULARE LAKE	95	75	140	95	75	75
NORTH LAHONTAN	100	100	155	100	100	95
SOUTH LAHONTAN	35	75	95	115	100	95
COLORADO RIVER- DESERT	15	—	—	—	—	—
<b>STATEWIDE</b>	85	100	125	90	90	95

**FEBRUARY 1, 1999 FORECASTS  
APRIL-JULY UNIMPAIRED RUNOFF**

HYDROLOGIC REGION and Watershed	Unimpaired Runoff in 1,000 Acre-Feet (1)					
	HISTORICAL			FORECAST		
	50 Yr Avg (2)	Max of Record	Min of Record	Apr-Jul Forecasts	Pct of Avg	80 % Probability Range (1)
<b>SACRAMENTO RIVER</b>						
<b>Upper Sacramento River</b>						
Sacramento River at Shasta Lake (3)	297	702	39	270	91%	
McCloud River at Shasta Lake	392	850	185	400	102%	
Pit River at Shasta Lake	1,056	2,203	480	1,230	116%	
Total Inflow to Shasta Lake	1,801	3,525	726	<b>2,000</b>	111%	1,460 - 2,860
<b>Sacramento River above Bend Bridge, near Red Bluff</b>	2,451	5,075	943	<b>2,500</b>	102%	1,800 - 3,760
<b>Feather River</b>						
Feather River at Lake Almanor near Prattville (3)	333	675	120	290	87%	
North Fork at Pulga (3)	1,028	2,416	243	900	88%	
Middle Fork near Clio (4)	86	518	4	75	87%	
South Fork at Ponderosa Dam (3)	110	267	13	95	86%	
Total Inflow to Oroville Reservoir	1,831	4,676	392	<b>1,640</b>	90%	1,040 - 2,740
<b>Yuba River</b>						
North Yuba below Goodyears Bar (3)	286	647	51	260	91%	
Inflow to Jackson Mdws and Bowman Reservoirs (3)	112	236	25	105	94%	
South Yuba at Langs Crossing (3)	233	481	57	210	90%	
Yuba River at Smartville	1,029	2,424	200	<b>980</b>	95%	650 - 1,640
<b>American River</b>						
North Fork at North Fork Dam (3)	262	716	43	240	92%	
Middle Fork near Auburn (3)	522	1,406	100	510	98%	
Silver Creek Below Camino Diversion Dam (3)	173	386	37	170	98%	
Total Inflow to Folsom Reservoir	1,261	3,074	229	<b>1,240</b>	98%	800 - 2,080
<b>SAN JOAQUIN RIVER</b>						
<b>Cosumnes River at Michigan Bar</b>	128	363	8	<b>100</b>	78%	40 - 230
<b>Mokelumne River</b>						
North Fork near West Point (5)	437	829	104	400	92%	
Total Inflow to Pardee Reservoir	459	1,065	102	<b>440</b>	96%	300 - 710
<b>Stanislaus River</b>						
Middle Fork below Beardsley Dam (3)	334	702	64	310	93%	
North Fork Inflow to McKays Point Dam (3)	224	503	34	210	94%	
Total Inflow to New Melones Reservoir	699	1,710	116	<b>670</b>	96%	440 - 1,080
<b>Tuolumne River</b>						
Cherry Creek & Eleanor Creek near Hetch Hetchy (3)	322	727	97	280	87%	
Tuolumne River near Hetch Hetchy (3)	606	1,392	153	570	94%	
Total Inflow to Don Pedro Reservoir	1,184	2,682	301	<b>1,120</b>	95%	770 - 1,720
<b>Merced River</b>						
Merced River at Pohono Bridge (3)	362	888	80	330	91%	
Total Inflow to Lake McClure	611	1,587	123	<b>560</b>	92%	360 - 910
<b>San Joaquin River</b>						
San Joaquin River at Mammoth Pool (6)	1,014	2,279	235	800	79%	
Big Creek below Huntington Lake (6)	95	264	11	70	74%	
South Fork near Florence Lake (6)	202	511	58	160	79%	
Total Inflow to Millerton Lake	1,212	3,355	262	<b>980</b>	81%	580 - 1,650
<b>TULARE LAKE</b>						
<b>Kings River</b>						
North Fork Kings River near Cliff Camp (3)	239	565	50	170	71%	
Total Inflow to Pine Flat Reservoir	1,183	3,114	273	<b>880</b>	74%	480 - 1,520
<b>Kaweah River at Terminus Reservoir</b>	276	814	61	<b>200</b>	72%	90 - 390
<b>Tule River at Success Reservoir</b>	59	259	2	<b>50</b>	85%	25 - 110
<b>Kern River</b>						
Kern River near Kernville (3)	373	1,203	83	280	75%	
Total Inflow to Isabella Reservoir	442	1,657	84	<b>330</b>	75%	150 - 680

(1) See inside back cover for definition

(2) All 50 year averages are based on years 1946-1995 unless otherwise noted

(3) 50 year average based on years 1941-90

(4) 44 year average based on years 1936-79

(5) 36 year average based on years 1936-72

(6) 45 year average based on years 1936-81

**FEBRUARY 1, 1999 FORECASTS  
WATER YEAR UNIMPAIRED RUNOFF**

HISTORICAL			Unimpaired Runoff in 1,000 Acre-Feet (1)								FORECAST		
50 Yr Avg (2)	Max of Record	Min of Record	Oct Thru Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug & Sep	Water Year Forecasts	Pct of Avg	80 % Probability Range (1)
856	1,964	165											
1,184	2,353	577											
3,078	5,647	1,484											
5,896	10,796	2,479	2,315	860	870	800	580	360	260	455	<b>6,500</b>	110%	5,300 - 8,300
8,518	17,180	3,294	3,030	1,300	1,310	1,000	720	460	320	560	<b>8,700</b>	102%	6,900 - 11,560
780	1,269	366											
2,417	4,400	666											
219	637	24											
291	562	32											
4,526	9,492	994	1,450	590	630	670	550	280	140	190	<b>4,500</b>	99%	3,380 - 6,600
564	1,056	102											
181	292	30											
379	565	98											
2,337	4,926	369	695	325	300	370	410	160	40	40	<b>2,340</b>	100%	1,720 - 3,460
616	1,234	66											
1,070	2,575	144											
318	705	59											
2,674	6,381	349	620	345	380	450	510	230	50	25	<b>2,610</b>	98%	1,840 - 4,060
378	1,253	20	83	60	55	50	35	12	3	2	<b>300</b>	79%	165 - 585
626	1,009	197											
736	1,800	129	115	60	80	125	200	100	15	5	<b>700</b>	95%	510 - 1,060
471	929	88											
1,131	2,952	155	185	100	120	200	270	160	40	15	<b>1,090</b>	96%	780 - 1,650
461	1,147	123											
770	1,661	258											
1,857	4,430	383	270	145	170	270	450	330	70	25	<b>1,730</b>	93%	1,270 - 2,540
461	1,020	92											
952	2,859	150	110	60	90	150	240	140	30	10	<b>830</b>	87%	570 - 1,300
1,337	2,964	308											
112	298	14											
248	653	71											
1,753	4,642	362	195	85	120	210	370	290	110	50	<b>1,430</b>	82%	920 - 2,300
284	607	58											
1,647	4,294	383	155	60	90	180	350	260	90	45	<b>1,230</b>	75%	740 - 2,040
431	1,402	92	50	20	35	55	80	50	15	5	<b>310</b>	72%	160 - 560
135	615	16	36	15	17	20	20	8	2	2	<b>120</b>	89%	75 - 225
558	1,577	163											
694	2,309	175	130	35	45	80	110	100	40	30	<b>570</b>	82%	340 - 1,040

\* Indicates observed runoff

**FEBRUARY 1, 1999 FORECASTS  
APRIL-JULY UNIMPAIRED RUNOFF**

HYDROLOGIC REGION and Watershed	Unimpaired Runoff in 1,000 Acre-Feet (1)				
	HISTORICAL			FORECAST	
	50 Yr Avg (2)	Max of Record	Min of Record	Apr-Jul Forecasts	Pct of Avg
<b>NORTH COAST</b>					
<b>Trinity River</b> Total Inflow to Lewiston Lake	642	1,593	80	<b>590</b>	92%
<b>Scott River</b> Near Fort Jones	200	n/a	n/a	<b>220</b>	110%
<b>Klamath River</b> Total inflow to Upper Klamath Lake (3)	509	758	280	<b>660</b>	130%
<hr/>					
<b>NORTH LAHONTAN</b>					
<b>Truckee River</b> Lake Tahoe to Farad accretions	264	713	58	<b>260</b>	98%
Lake Tahoe Rise (assuming gates closed, in feet)	1.4	3.6	0.2	<b>1.5</b>	107%
<b>Carson River</b> West Fork at Woodfords	54	135	12	<b>55</b>	102%
East Fork near Gardnerville	183	407	43	<b>180</b>	98%
<b>Walker River</b> West Fork near Coleville	143	330	35	<b>140</b>	98%
East Fork near Bridgeport	61	209	7	<b>60</b>	98%
<hr/>					
<b>SOUTH LAHONTAN</b>					
<b>Owens River</b> Total tributary flow to Owens River (4)	226	579	96	<b>224</b>	99%

(1) See inside back cover for definition

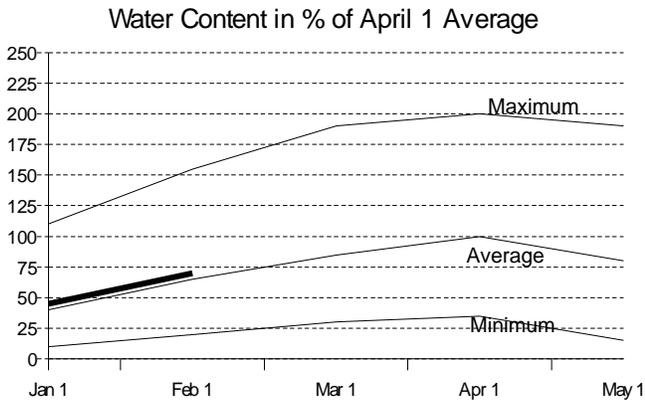
(2) All 50 year averages are based on years 1946-1995 unless otherwise noted

(3) Forecast by U.S. Natural Resources Conservation Service, Portland Oregon, 30 year average based on years 1961-1990.  
April through September forecast.

(4) Forecast by Department of Water and Power, City of Los Angeles

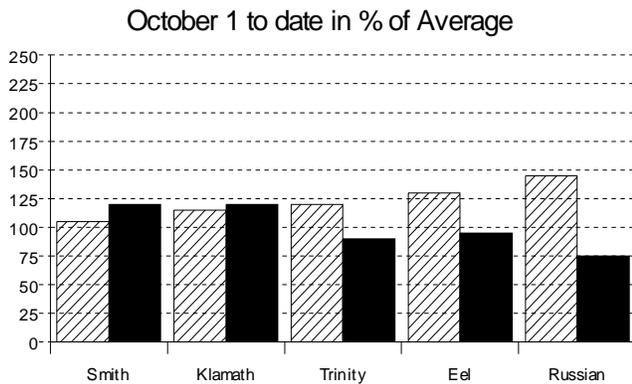
## NORTH COAST REGION

### Snowpack Accumulation



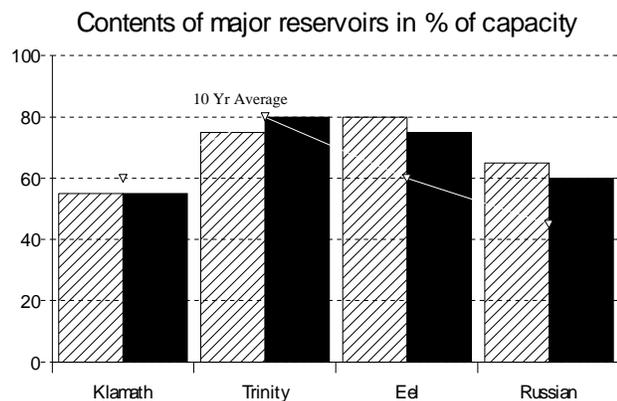
**SNOWPACK**– First of the month measurements made at 11 snow courses indicate an area wide snow water equivalent of 20.6 inches. This is 70 percent of the April 1 average and 100 percent of the February 1 average. Last year at this time the pack was holding 26.9 inches of water.

### Precipitation



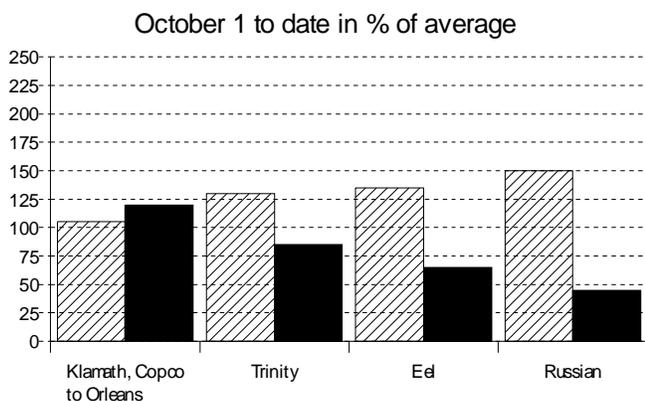
**PRECIPITATION** – Seasonal precipitation (October 1 through the end of last month) on this area was 100 percent of normal. Precipitation last month was about 80 percent of the monthly average. Seasonal precipitation at this time last year stood at 125 percent of normal.

### Reservoir Storage



**RESERVOIR STORAGE**– First of the month storage in 7 reservoirs was 2.4 million acre–feet which is 110 percent of average. About 75 percent of available capacity was being used. Storage in these reservoirs at this time last year was 105 percent of average.

### Runoff

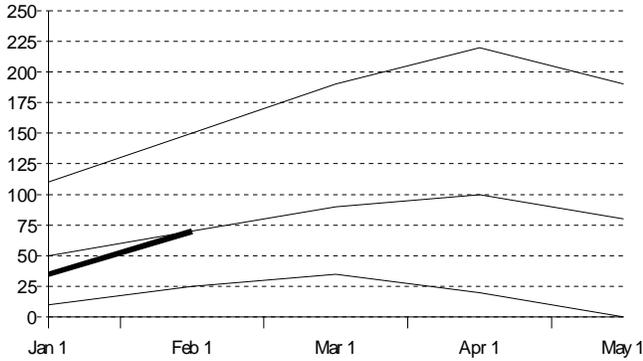


**RUNOFF** – Seasonal runoff of streams draining the are totaled 4.3 million acre–feet which is 80 percent of average for this period. Last year, runoff for the same period was 125 percent of average.

## SACRAMENTO RIVER REGION

### Snowpack Accumulation

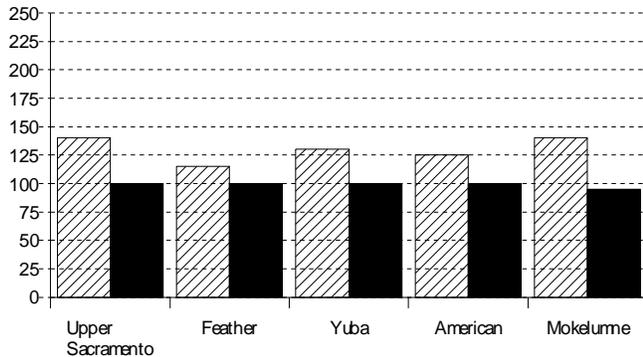
Water Content in % of April 1 Average



**SNOWPACK**– First of the month measurements made at 70 snow courses indicate an area wide snow water equivalent of 21.3 inches. This is 70 percent of the April 1 average and 110 percent of the February 1 average. Last year at this time the pack was holding 24.4 inches of water.

### Precipitation

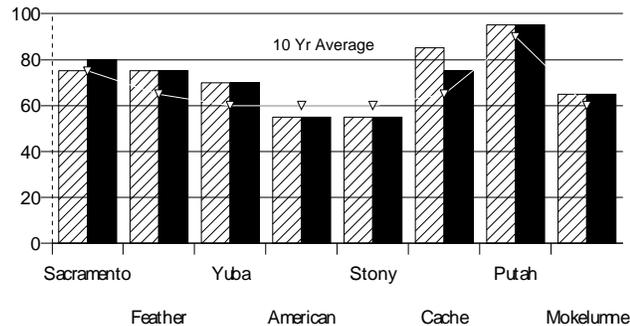
October 1 to date in % of Average



**PRECIPITATION** – Seasonal precipitation (October 1 through the end of last month) on this area was 95 percent of normal. Precipitation last month was about 90 percent of the monthly average. Seasonal precipitation at this time last year stood at 135 percent of normal.

### Reservoir Storage

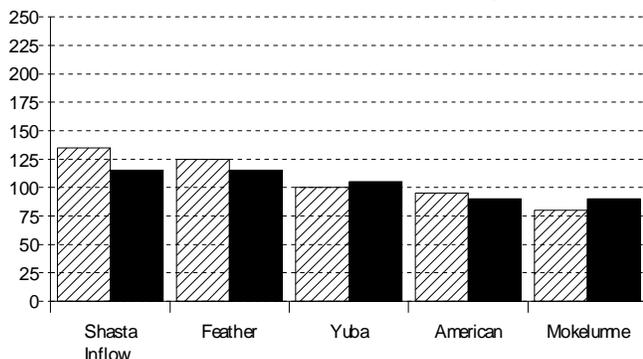
Contents of major reservoirs in % of capacity



**RESERVOIR STORAGE**– First of the month storage in 43 reservoirs was 12.1 million acre–feet which is 115 percent of average. About 75 percent of available capacity was being used. Storage in these reservoirs at this time last year was 110 percent of average.

### Runoff

October 1 to date in % of average



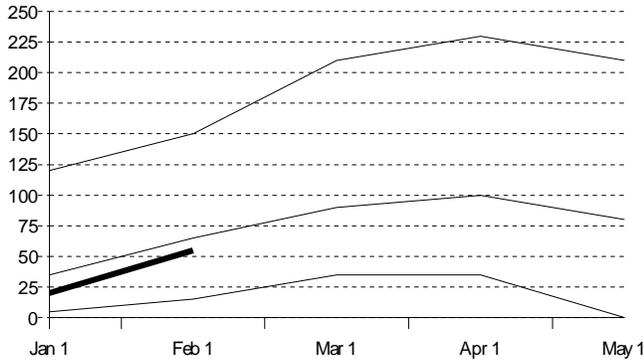
**RUNOFF** – Seasonal runoff of streams draining the are totaled 5.6 million acre–feet which is 105 percent of average for this period. Last year, runoff for the same period was 125 percent of average.

The **Sacramento Region 40–30–30 Water Supply Index** is forecast to be 8.8 assuming median meteorological conditions for the remainder of the year. This classifies the year as "above normal" in the Sacramento Valley according to the State Water Resources Control Board.

# SAN JOAQUIN RIVER AND TULARE LAKE REGIONS

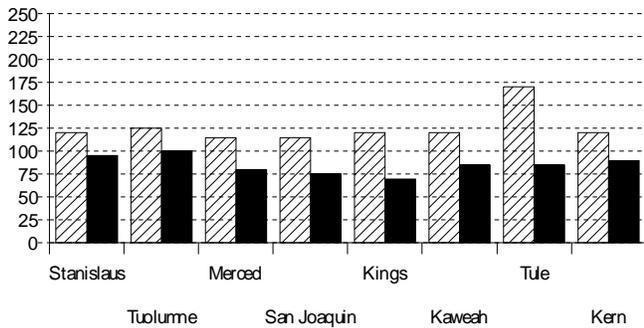
## Snowpack Accumulation

Water Content in % of April 1 Average



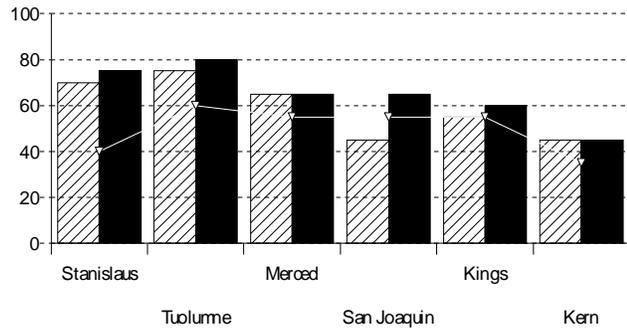
## Precipitation

October 1 to date in % of Average



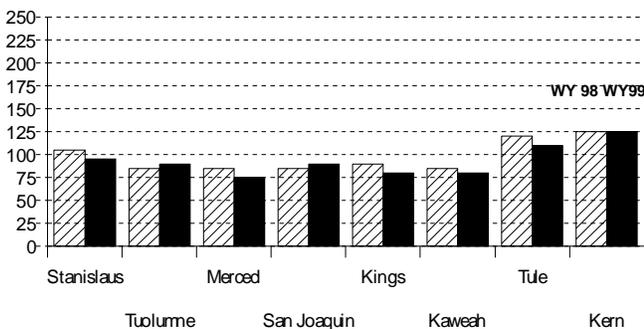
## Reservoir Storage

Contents of major reservoirs in % of capacity



## Runoff

October 1 to date in % of average



**SNOWPACK** – First of the month measurements made at 58 **San Joaquin Region** snow courses indicate an area wide snow water equivalent of 19.2 inches. This is 100 percent of the February 1 average and 60 percent of the seasonal (April 1) average. Last year at this time the pack was holding 22.1 inches of water. At the same time 41 **Tulare Lake Region** snow courses indicated a basin-wide snow water equivalent of 10.2 inches which is 75 percent of the average for February 1 and 45 percent of the seasonal average. Last year at this time the basin was holding 17.1 inches of water.

**PRECIPITATION** – Seasonal precipitation (October 1 through the end of last month) on the **San Joaquin Region** was 90 percent of normal. Precipitation last month was about 125 percent of the monthly average. Seasonal precipitation at this time last year stood at 135 percent of normal. Seasonal precipitation on the **Tulare Lake Region** was 95 percent of normal. Precipitation last month was about 155 percent of the monthly average. Seasonal precipitation at this time last year stood at 135 percent of normal.

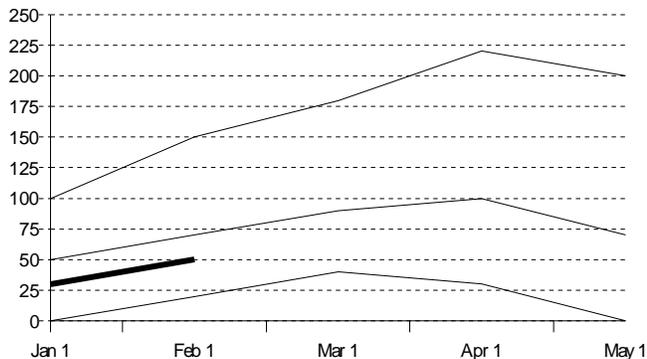
**RESERVOIR STORAGE**– First of the month storage in 33 **San Joaquin Region** reservoirs was 8.7 million acre-feet which is 135 percent of average. About 75 percent of available capacity was being used. Storage in these reservoirs at this time last year was 125 percent of average. First of the month storage in 6 **Tulare Lake Region** reservoirs was 1.0 million acre-feet which is 140 percent of average and about 50 percent of available capacity. Storage in these reservoirs at this time last year was 125 percent of average.

**RUNOFF** – Seasonal runoff of streams draining the **San Joaquin Region** totaled 959 thousand acre-feet which is 90 percent of average for this period. Last year, runoff for the same period was 90 percent of average. Seasonal runoff of streams draining the **Tulare Lake Basin** totaled 380 thousand acre-feet which is 95 percent of average for this period. Last year, runoff for this same period was 95 percent of average.

The **San Joaquin Region 60–20–20 Water Supply Index** is forecast to be 3.2 assuming median meteorological conditions for the remainder of the year. This classifies the year as "above normal" in the San Joaquin Region according to the State Water Resources Control Board.

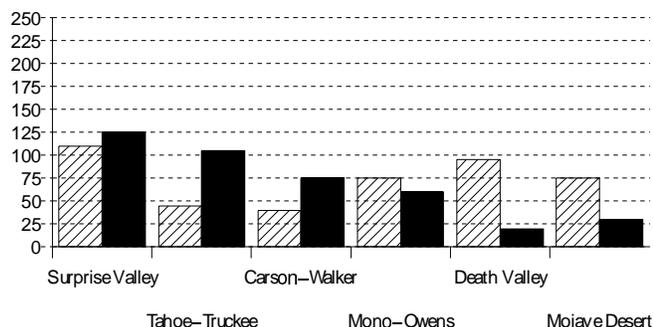
## Snowpack Accumulation

Water Content in % of April 1 Average



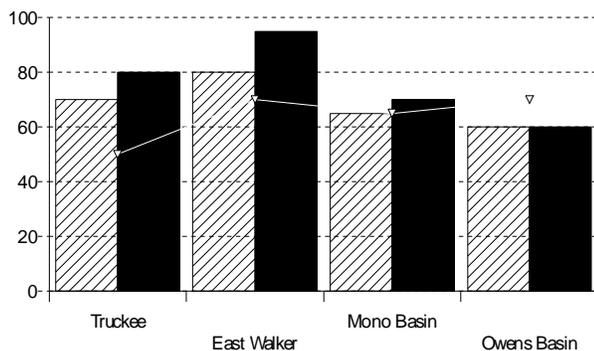
## Precipitation

October 1 to date in % of Average



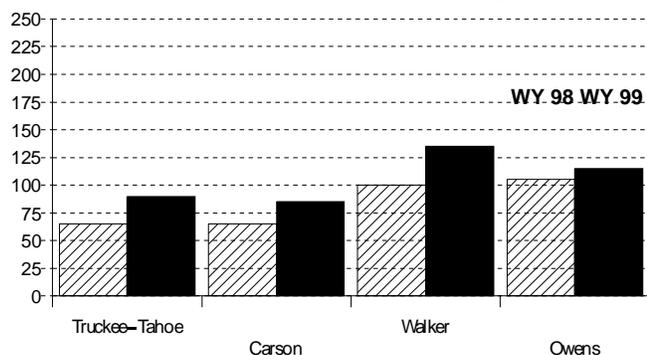
## Reservoir Storage

Contents of major reservoirs in % of capacity



## Runoff

October 1 to date in % of average



## NORTH AND SOUTH LAHONTAN REGIONS

**SNOWPACK** – First of the month measurements made at 14 **North Lahontan** snow courses indicate an area wide snow water equivalent of 15.9 inches. This is 100 percent of the February 1 average and 65 percent of the seasonal (April 1) average. Last year at this time the pack was holding 17.1 inches of water. At the same time 21 **South Lahontan** snow courses indicated a basin-wide snow water equivalent of 10.4 inches which is 75 percent of the average for February 1 and 45 percent of the seasonal average. Last year at this time the basin was holding 10.7 inches of water.

**PRECIPITATION** – Seasonal precipitation (October 1 through the end of last month) on the **North Lahontan** was 100 percent of normal. Precipitation last month was about 125 percent of the monthly average. Seasonal precipitation at this time last year stood at 90 percent of normal. Seasonal precipitation on the **South Lahontan** was 35 percent of normal. Precipitation last month was about 65 percent of the monthly average. Seasonal precipitation at this time last year stood at 75 percent of normal.

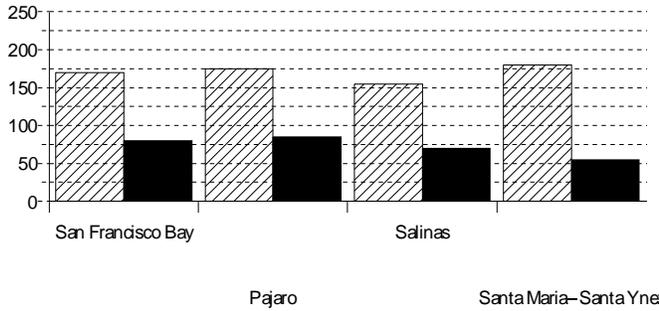
**RESERVOIR STORAGE**– First of the month storage in 5 **North Lahontan** reservoirs was 885 thousand acre-feet which is 155 percent of average. About 85 percent of available capacity was being used. Storage in these reservoirs at this time last year was 140 percent of average. Lake Tahoe was 4.9 feet above its natural rim on February 1. First of the month storage in 8 **South Lahontan** reservoirs was 272 thousand acre-feet which is 95 percent of average and about 65 percent of available capacity. Storage in these reservoirs at this time last year was 65 percent of average.

**RUNOFF** – Seasonal runoff of streams draining the **North Lahontan Region** totaled 147 thousand acre-feet which is 100 percent of average for this period. Last year, runoff for the same period was 75 percent of average. Seasonal runoff of the Owens River in the **South Lahontan Region** totaled 51 thousand acre-feet which is 115 percent of average for this period. Last year, runoff for this same period was 105 percent of average.

# SAN FRANCISCO BAY AND CENTRAL COAST REGIONS

## Precipitation

October 1 to date in % of Average

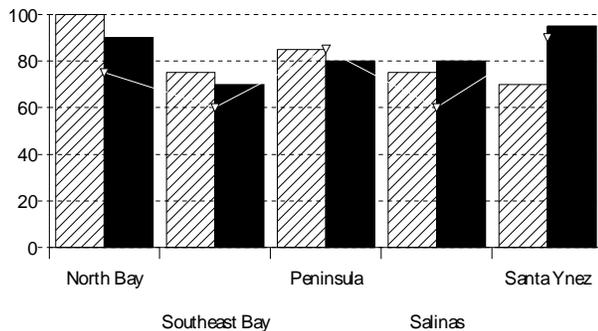


**PRECIPITATION** – Seasonal precipitation (October 1 through the end of last month) on the **San Francisco Bay** region was 80 percent of normal. Precipitation last month was about 80 percent of the monthly average. Seasonal precipitation at this time last year stood at 155 percent of normal.

Seasonal precipitation on the **Central Coast Region** was 70 percent of normal. Precipitation last month was about 90 percent of the monthly average. Seasonal precipitation at this time last year stood at 170 percent of normal.

## Reservoir Storage

Contents of major reservoirs in % of capacity



**RESERVOIR STORAGE**– First of the month storage in 18 major **San Francisco Region** reservoirs was 509 thousand acre–feet which is 115 percent of average. About 75 percent of available capacity was being used. Storage in these reservoirs at this time last year was 125 percent of average. First of the month storage in 6 major **Central Coast Region** reservoirs was 800 thousand acre–feet which is 140 percent of average. About 80 percent of available capacity was being used. Storage in these reservoirs at this time last year was 125 percent of average.

## Runoff

October 1 to date in % of average



**RUNOFF** – Seasonal runoff of the Napa River in the **San Francisco Region** totaled 21 thousand acre–feet which is 65 percent of average for this period. Last year, runoff for the same period was 135 percent of average. Seasonal runoff of selected **Central Coast** streams totaled 43 thousand acre–feet which is 35 percent of average for this period. Last year, runoff for the same period was 120 percent of average.

## **SOUTH COAST AND COLORADO RIVER AREAS**

**PRECIPITATION** – October through January (seasonal) precipitation on the South Coast area was 55 percent of normal. January precipitation was 60 percent of the monthly average. Seasonal precipitation at this time last year was 115 percent of normal. Seasonal precipitation on the Colorado Desert area was 15 percent of normal. Precipitation in January was 5 percent of average. Seasonal precipitation at this time last year stood at 65 percent of average.

**RESERVOIR STORAGE** – February 1 storage in 29 major South Coast area reservoirs was 1.6 million acre–feet or 130 percent of average. About 80 percent of available capacity was being used. Storage in these reservoirs at this time last year was 115 percent of average. On February 1 combined storage in Lakes Powell, Mead, Mohave and Havasu was about 48 million acre–feet or about 125 percent of average. About 90 percent of available capacity was in use. Last year at this time, these reservoirs were storing 125 percent of average.

**RUNOFF** – Seasonal runoff from selected South Coast streams totaled 12 thousand acre–feet which is 60 percent of average. Seasonal runoff from these streams last year was 60 percent of average.

**COLORADO RIVER** – The April through July inflow to Lake Powell is forecast to be 11 million acre–feet, which is 142 percent of average.

### **CENTRAL VALLEY PROJECT**

Based on February 1 conditions, Bureau of Reclamation water year forecasts for unimpaired runoff to CVP reservoirs are: Trinity—109% of average, Shasta—122% of average, American—99% of average, Stanislaus—95% of average, San Joaquin above Friant—80% of average. As of January 31, 1999 CVP storage was 8.9 million acre feet which is an increase of 0.4 million acre feet compared to one year ago, and is approximately 129% of normal for that date.

The Bureau of Reclamation announced preliminary water allocations for the CVP contractors on January 22, 1999. Based on conservative water supply forecasts prepared from information available January 1, 1999 CVP water allocations were: Agricultural contractors North and South of Delta–50%; Urban contractors–75%; Sacramento River water rights and San Joaquin Exchange Contractors– 100%; Wildlife Refuges–100%. Stanislaus Contractors – 43 kaf. Friant Contractors– Class I –75%; Class II, 0%. Updated allocations will be announced February 12, 1999.

### **STATE WATER PROJECT**

State Water Project deliveries have been approved at about 2.24 million acre feet which meets at least 55 percent of most contractors' entitlement. This approval considered several factors, including the existing storage in SWP reservoirs, a conservative projection of hydrology and water supply expected to develop during the remainder of the 1999–00 water year, SWP operational constraints, and 1999 contractor demands. Approvals will be reevaluated with each new round of water supply forecasts.

**MAJOR WATER DISTRIBUTION PROJECTS**

**RESERVOIR STORAGE**

(AVERAGES BASED ON PERIOD RECORD)

RESERVOIR	CAPACITY 1,000 AF	AVERAGE STORAGE 1,000 AF	STORAGE AT END OF JANUARY			
			1998 1,000 AF	1999 1,000 AF	PERCENT AVERAGE	PERCENT CAPACITY
<i>STATE WATER PROJECT</i>						
Lake Oroville	3,538	2,427	2,655	2,768	114%	78%
San Luis Reservoir (SWP)	1,062	833	1,068	1,104	133%	104%
Lake Del Valle	77	30	37	26	88%	34%
Lake Silverwood	73	64	70	63	98%	86%
Pyramid Lake	171	162	169	165	102%	97%
Castaic Lake	324	248	287	248	100%	77%
Perris Lake	132	110	108	124	113%	95%
<i>CENTRAL VALLEY PROJECT</i>						
Clair Engle Lake	2,448	1,815	1,800	1,939	107%	79%
Lake Shasta	4,552	3,181	3,390	3,588	113%	79%
Whiskeytown Lake	241	208	206	205	98%	85%
Folsom Lake	977	534	542	533	100%	55%
New Melones Reservoir	2,420	1,401	1,925	1,976	141%	82%
Millerton Lake	520	305	320	458	150%	88%
San Luis Reservoir (CVP)	971	734	791	825	113%	85%
<i>COLORADO RIVER PROJECT</i>						
Lake Mead	26,159	19,864	25,068	24,836	125%	95%
Lake Powell	25,002	16,600	21,103	21,344	129%	85%
Lake Mohave	1,810	1,595	1,682	1,647	103%	91%
Lake Havasu	619	539	548	534	99%	86%
<i>EAST BAY MUNICIPAL UTILITY DISTRICT</i>						
Pardee Reservoir	198	176	166	173	98%	87%
Camanche Reservoir	417	241	321	318	132%	76%
East Bay (4 reservoirs)	151	122	143	124	102%	82%
<i>CITY AND COUNTY OF SAN FRANCISCO</i>						
Hetch-Hetchy Reservoir	360	144	196	294	204%	82%
Cherry Lake	268	103	168	243	235%	91%
Lake Eleanor	26	9	11	23	262%	87%
South Bay/Peninsula (4 reservoirs)	225	157	191	182	116%	81%
<i>CITY OF LOS ANGELES (D.W.P.)</i>						
Lake Crowley	183	129	115	122	95%	67%
Grant Lake	48	28	42	42	149%	87%
Other Aqueduct Storage (6 res)	83	71	58	57	80%	69%

# TELEMETERED SNOW WATER EQUIVALENTS

FEBRUARY 1, 1999

(AVERAGES BASED ON PERIOD RECORD)

BASIN NAME STATION NAME	ELEV	APRIL 1 AVERAGE	INCHES OF WATER EQUIVALENT			
			FEB 1	PERCENT OF AVERAGE	24 HRS PREVIOUS	1 WEEK PREVIOUS
<b>TRINITY RIVER</b>						
Peterson Flat	7150'	29.2	25.4	87%	25.4	25.0
Red Rock Mountain	6700'	39.6	28.1	71%	28.1	27.4
Bonanza King	6450'	40.5	19.8	49%	19.8	19.7
Shimmy Lake	6200'	40.3	28.2	70%	27.6	27.6
Middle Boulder 3	6200'	28.3	15.7	55%	15.7	16.3
Highland Lakes	6030'	29.9	17.9	60%	17.9	17.9
Scott Mountain	5900'	16.0	—	—	—	13.7
Mumbo Basin	5700'	22.4	16.9	76%	16.8	16.6
Big Flat	5100'	15.8	10.9	69%	10.3	9.9
<b>SACRAMENTO RIVER</b>						
Cedar Pass	7100'	18.1	16.1	89%	16.1	15.8
Blacks Mountain	7100'	12.7	10.1	79%	10.1	9.6
Sand Flat	6750'	42.4	24.0	57%	24.0	23.5
Medicine Lake	6700'	32.6	28.6	88%	28.6	26.8
Adin Mountain	6350'	13.6	10.1	74%	10.5	11.4
Snow Mountain	5950'	27.0	23.3	86%	23.3	22.6
Slate Creek	5600'	29.0	13.1	45%	12.7	12.5
Stouts Meadow	5400'	36.0	17.8	49%	17.8	17.2
<b>FEATHER RIVER</b>						
Kettle Rock	7300'	25.5	24.6	96%	24.6	24.6
Grizzly Ridge	6900'	29.7	21.5	72%	21.4	20.5
Pilot Peak (DWR)	6800'	52.6	26.0	50%	25.8	26.2
Gold Lake	6750'	36.5	33.2	91%	32.9	31.9
Humbug	6500'	28.0	27.2	97%	27.0	26.5
Rattlesnake	6100'	14.0	14.2	101%	14.0	14.0
Bucks Lake	5750'	44.7	22.9	51%	22.2	21.6
Four Trees	5150'	20.0	3.8	19%	3.2	2.4
<b>EEL RIVER</b>						
Noel Spring	5100'	—	1.5	—	0.7	0.7
Plaskett Meadows	6000'	—	—	—	—	—
<b>YUBA &amp; AMERICAN RIVERS</b>						
Lake Lois	8800'	39.5	42.5	108%	42.5	42.5
Schneiders	8750'	34.5	30.0	87%	29.4	29.0
Caples Lake (DWR)	7800'	30.9	23.0	75%	22.8	22.2
Alpha (Smud)	7600'	35.9	26.0	72%	25.8	25.4
Beta	7600'	35.9	26.6	74%	26.5	26.2
Meadow Lake	7200'	55.5	40.5	73%	40.5	39.2
Silver Lake (DWR)	7100'	22.7	16.9	75%	16.7	14.0
Central Sierra Snow Lab	6950'	33.6	28.8	86%	28.8	28.2
Huysink	6600'	42.6	22.9	54%	22.6	21.6
Van Vleck	6700'	35.9	30.5	85%	30.2	29.2
Robbs Saddle	5900'	21.4	15.0	70%	14.9	14.5
Greek Store	5600'	21.0	13.7	65%	13.1	12.6
Blue Canyon	5280'	9.0	2.3	25%	1.9	1.6
Robbs Powerhouse	5150'	5.2	14.5	279%	14.5	14.5
<b>MOKELUMNE &amp; STANISLAUS RIVERS</b>						
Deadman Creek	9250'	37.2	17.2	46%	17.2	16.9
Highland Meadow	8800'	47.9	34.8	73%	34.8	34.0
Gianelli Meadow	8350'	55.5	28.2	51%	27.5	26.3
Lower Relief Valley	8100'	41.2	26.6	64%	25.3	24.6
Blue Lakes	8000'	33.1	18.4	56%	18.4	17.6
Mud Lake	7900'	44.9	36.7	82%	36.7	36.7
Stanislaus Meadow	7750'	47.5	28.0	59%	27.4	27.4
Bloods Creek	7200'	35.5	20.8	58%	20.3	19.9
Black Springs	6500'	32.0	15.7	49%	15.0	14.5
<b>TUOLUMNE &amp; MERCED RIVERS</b>						
Dana Meadows	9800'	27.7	18.3	66%	18.3	18.3
Slide Canyon	9200'	41.1	25.5	62%	24.9	24.2
Snow Flat	8700'	44.1	—	—	—	—
Tuolumne Meadows	8600'	22.6	12.4	55%	12.4	12.4
Horse Meadow	8400'	48.6	27.5	57%	26.2	26.2
Ostrander Lake	8200'	34.8	21.9	63%	21.9	21.9
Paradise Meadow	7650'	41.3	26.6	64%	25.9	24.6
Gin Flat	7050'	34.2	16.7	49%	15.8	14.0
Lower Kibbie Ridge	6600'	27.4	14.9	54%	14.3	13.6

# TELEMETERED SNOW WATER EQUIVALENTS

FEBRUARY 1, 1999

(AVERAGES BASED ON PERIOD RECORD)

BASIN NAME STATION NAME	ELEV	APRIL 1 AVERAGE	INCHES OF WATER EQUIVALENT			
			FEB 1	PERCENT OF AVERAGE	24 HRS PREVIOUS	1 WEEK PREVIOUS
<b>SAN JOAQUIN RIVER</b>						
Volcanic Knob	10100'	30.1	13.7	46%	13.1	12.4
Agnew Pass	9450'	32.3	18.0	56%	17.6	17.6
Kaiser Point	9200'	37.8	14.2	37%	13.4	12.4
Green Mountain	7900'	30.8	13.7	44%	13.4	12.6
Tamarack Summit	7600'	30.5	14.2	46%	13.2	12.2
Chilkoot Meadow	7150'	38.0	19.4	51%	18.8	17.9
Huntington Lake (USBR)	7000'	20.1	12.7	63%	12.1	11.0
Graveyard Meadow	6900'	18.8	11.0	59%	10.2	8.3
Poison Ridge	6900'	28.9	11.2	39%	10.1	8.8
<b>KINGS RIVER</b>						
Bishop Pass	11200'	34.0	11.5	34%	10.9	10.9
Charlotte Lake	10400'	27.5	10.8	39%	10.4	10.4
State Lakes	10400'	29.0	12.2	42%	11.5	10.8
Mitchell Meadow	10375'	32.9	16.1	49%	15.3	13.6
Blackcap Basin	10300'	34.3	14.4	42%	13.7	13.1
Upper Burnt Corral	9700'	34.6	17.6	51%	17.0	16.3
West Woodchuck Meadow	9100'	32.8	—	—	—	—
Big Meadows (DWR)	7600'	25.9	11.6	45%	11.6	10.7
<b>KAWEAH &amp; TULE RIVERS</b>						
Quaking Aspen	7200'	21.0	12.4	59%	11.5	9.6
Giant Forest (Corps)	6400'	10.0	5.0	50%	4.0	2.4
<b>KERN RIVER</b>						
Upper Tyndall Creek	11500'	27.7	7.6	27%	7.5	6.5
Crabtree Meadow	10700'	19.8	4.6	23%	4.6	4.0
Chagoopa Plateau	10300'	21.8	9.6	44%	8.9	8.3
Pascoes	9150'	24.9	14.0	56%	13.3	9.0
Tunnel Guard Station	8950'	15.6	4.2	27%	4.2	3.6
Wet Meadows	8900'	30.3	10.5	35%	10.2	8.4
Casa Vieja Meadows	8400'	20.9	9.1	44%	8.5	7.2
Beach Meadows	7650'	11.0	5.0	46%	4.9	3.7
<b>SURPRISE VALLEY AREA</b>						
Dismal Swamp	7050'	29.2	23.7	81%	23.5	23.4
<b>TRUCKEE RIVER</b>						
Mount Rose Ski Area	8850'	38.5	29.6	77%	29.4	29.3
Independence Lake (NRCS)	8450'	41.4	32.5	79%	32.4	31.7
Big Meadows (NRCS)	8700'	25.7	15.5	60%	15.4	14.6
Independence Camp	7000'	21.8	13.1	60%	13.1	13.3
Independence Creek	6500'	12.7	9.1	72%	9.1	9.3
<b>LAKE TAHOE BASIN</b>						
Heavenly Valley	8800'	28.1	—	—	—	18.0
Hagans Meadow	8000'	16.5	12.8	78%	12.8	12.8
Marlette Lake	8000'	21.1	18.2	86%	18.2	17.9
Echo Peak 5	7800'	39.5	29.1	74%	28.7	28.0
Rubicon Peak 2	7500'	29.1	24.0	82%	23.9	22.9
Ward Creek 3	6750'	39.4	26.0	66%	26.0	25.3
Fallen Leaf Lake	6300'	7.0	4.9	70%	4.9	5.5
<b>CARSON RIVER</b>						
Ebbetts Pass	8700'	38.8	24.4	63%	24.4	23.6
Poison Flat	7900'	16.2	12.8	79%	12.7	12.3
<b>WALKER RIVER</b>						
Virginia Lakes	9200'	20.3	9.2	45%	9.2	9.1
Lobdell Lake	9200'	17.3	9.0	52%	9.0	8.7
Sonora Pass Bridge	8750'	26.0	15.6	60%	15.5	14.4
Leavitt Meadows	7200'	8.0	7.5	94%	7.6	7.3
<b>OWENS RIVER/MONO LAKE</b>						
Gem Pass	10750'	31.7	17.6	56%	17.0	16.3
Sawmill	10300'	19.4	9.8	51%	9.8	8.5
Cottonwood Lakes	10200'	11.6	8.0	69%	7.9	5.8
Big Pine Creek	9800'	17.9	5.2	29%	5.2	3.9
South Lake	9600'	16.0	6.6	41%	6.6	5.6
Mammoth Pass (USBR)	9500'	42.4	21.5	51%	20.4	19.2
Rock Creek Lakes	10000'	14.0	4.7	34%	4.7	3.9

NORMAL SNOWPACK ACCUMULATION EXPRESSED AS A PERCENT OF APRIL 1ST AVERAGE

AREA	JANUARY	FEBRUARY	MARCH	APRIL	MAY
Central Valley North	45%	70%	90%	100%	75%
Central Valley South	45%	65%	85%	100%	80%
North Coast	40%	60%	85%	100%	80%

## SNOWLINES

**THE 1998 WESTERN SNOW CONFERENCE** annual meeting will be held April 19–22 at South Lake Tahoe, CA. Expect further information in the mail. If you have not been receiving information regarding the Western Snow Conference contact Frank Gehrke at 916–574–2635 or [gridley@water.ca.gov](mailto:gridley@water.ca.gov)

**DEPICTED** on this months cover is the Tyndall Creek cabin shortly after being "dug out" by DWR snow gaugers Jim King and Walt Hoffman in March, 1998. Photo by Jim King.

**BULLETIN 120** in pdf format is now available on the web. See <http://snow.water.ca.gov>.

**SNOWPACK** - Snow data is a major index of spring and summer runoff from Sierra Nevada watersheds. April 1 data historically reflects the magnitude of the snowpack at or near the maximum seasonal accumulation. Averages are based on April 1 data for the period 1946-1995 (50 years, except for data sites established after 1946).

**PRECIPITATION** - Averages are based on April 1 data for the period 1946-1995 (50 years, except for data sites established after 1946).

**RUNOFF AND FORECASTS** - Runoff data and runoff forecasts are shown as unimpaired values. Unimpaired runoff represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds. Forecast of runoff assumes median conditions subsequent to the date of forecast.

Runoff probability ranges are statistically derived from historical data. The 80 percent probability range is comprised of the 90 percent exceedence level value and the 10 percent exceedence level value. This means that actual runoff should fall within the stated limits eight times out of ten.

Runoff averages for most streams are based on the period 1946-1995. For more details contact California Cooperative Snow Surveys, P.O. Box 942836, Sacramento, CA 94236-0001, (916) 574-2635 or [gridley@water.ca.gov](mailto:gridley@water.ca.gov).

#### INDICES OF WATER AVAILABILITY

The Sacramento River Hydrologic Region 40-30-30 Water Supply Index. The 40-30-30 represent the percentage weight given to the three variables in the formula for the index. The first variable is the forecasted unimpaired runoff from April through July (40 Percent). The second variable is the forecasted unimpaired runoff from October through March (30 Percent). The third variable is the previous year's index with a cap to account for required flood control releases during wet years. The basins used in this computation are those used in the Sacramento River water year unimpaired runoff.

The Sacramento River water year unimpaired runoff is the sum of: Sacramento River above Bend Bridge, Feather River Inflow to Lake Oroville, Yuba River near Smartville and American River Inflow to Folsom Lake.

The San Joaquin River Hydrologic Region 60-20-20 Water Supply Index. In a similar manner, the 60-20-20 represents the percentage weights on April through July runoff, October through March runoff and previous year's index. The San Joaquin River unimpaired runoff is the sum of: Stanislaus River Inflow to New Melones Lake, Tuolumne River Inflow to New Don Pedro Reservoir, Merced River Inflow to Lake McClure and San Joaquin River Inflow to Millerton Lake.

Prior month unimpaired runoff is the sum of the runoff in the eight major rivers used in the two above indices.

State of California – The Resources Agency  
DEPARTMENT OF WATER RESOURCES  
P.O. Box 942836  
Sacramento, CA 94236-0001

# First Class

