



**California Cooperative
Snow Surveys
Bulletin 120-87**

State of California
The Resources Agency

Department of
Water Resources

Water Conditions in California

Report 3 April 1, 1987



Gordon K. Van Vleck
Secretary for Resources
The Resources Agency

George Deukmejian
Governor
State of California

David N. Kennedy
Director
Department of Water Resources

State of California
GEORGE DEUKMEJIAN, Governor

The Resources Agency
GORDON K. VAN VLECK, Secretary for Resources

Department of Water Resources
DAVID N. KENNEDY, Director

JOHN P. CAFFREY
Deputy Director

ROBERT E. WHITING
Deputy Director

ROBERT G. POTTER
Acting Deputy Director

SALLE S. JANTZ
Assistant Director

ROBERT W. JAMES
Chief Counsel

Division of Flood Management

G. Donald Meixner Chief
Maurice Roos Chief, Flood Hydrology and Water Supply Branch

Prepared by

Jack G. Pardee Senior Engineer, W.R.
Ming Q. Ong Associate Engineer, W.R.
James Spence Associate Engineer, W.R.
Gary Hester Associate Engineer, W.R.
Robert R. Newton Associate Engineer, W.R.
David M. Hart Water Resources Engineering Associate
Armando L. Raimundo Water Resources - Technician II
Kirk Freeman Water Resources - Technician I
Maureen Reed Senior Stenographer
Patrick M. Armstrong Lead Snow Gauger
David D. Sharp Lead Snow Gauger
Murton A. Stewart Lead Snow Gauger
Susan A. Burak Snow Gauger
Mead Hargis Snow Gauger
Nick Hartzell Snow Gauger
K. Jay Jensen Snow Gauger

COOPERATING AGENCIES

Public Agencies

Buena Vista Water Storage District
Central California Irrigation District
East Bay Municipal Utility District
Friant Water Users Association
Kaweah Delta Water Conservation District
Kaweah River Association
Kern Delta Water District
Kings River Conservation District
Kings River Water Association
Los Angeles Flood Control District
Lower Tule River Irrigation District
Merced Irrigation District
Modesto Irrigation District
Nevada Irrigation District
North Kern Water Storage District
Oakdale Irrigation District
Omochumne-Hartnell Water District
Oroville-Wyandotte Irrigation District
Placer County Water Agency
Sacramento Municipal Utility District
South San Joaquin Irrigation District
St. Johns River Association
Tulare Lake Basin Water Storage District

Public Agencies (continued)

Tri-Dam Project
Tule River Association
Turlock Irrigation District
Yuba County Water Agency

Private Companies

J. G. Boswell Company

Public Utilities

Pacific Gas and Electric Company
Sierra Pacific Power Company
Southern California Edison Company

MUNICIPALITIES

City of Bakersfield
Water Department
City of Los Angeles
Department of Water and Power
City and County of San Francisco
Public Utilities Commission

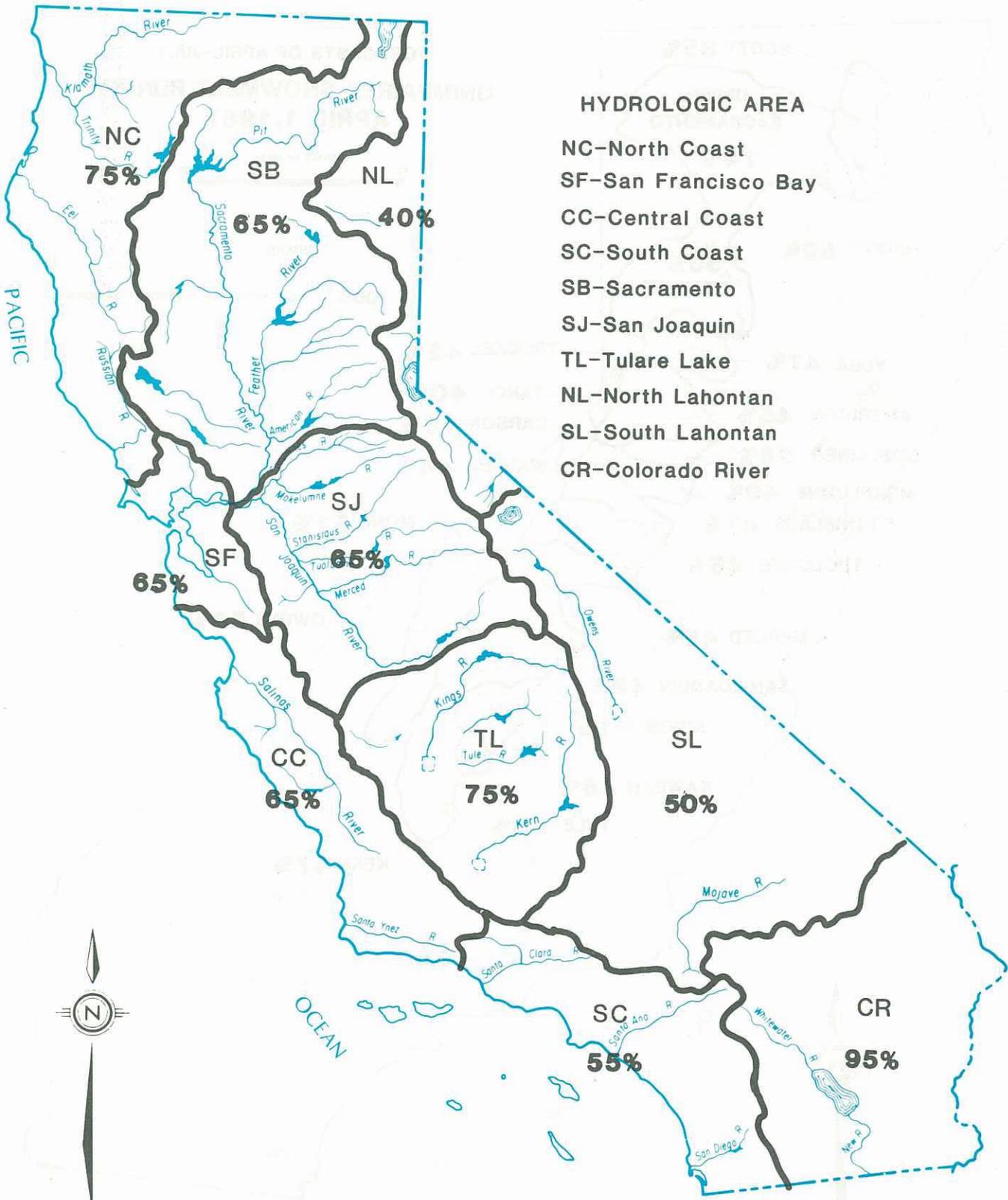
State and Federal Agencies

California Department of Forestry
California Department of Water Resources
California Department of Parks and Recreation
U.S. Department of Agriculture
Forest Service (14 National Forests)
Pacific Southwest Forest and Range Experiment Station
Soil Conservation Service
U.S. Department of Commerce
National Weather Service
U.S. Department of the Interior
Bureau of Reclamation
Geological Survey, Water Resources Division
National Park Service (3 National Parks)
U.S. Department of the Army
Corps of Engineers

Other Cooperative Programs

Nevada Cooperative Snow Surveys
Oregon Cooperative Snow Surveys

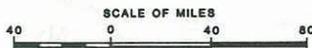
**SEASONAL PRECIPITATION IN PERCENT OF AVERAGE TO DATE
OCT. 1, 1986 - MAR. 31, 1987**



- HYDROLOGIC AREA**
- NC-North Coast
 - SF-San Francisco Bay
 - CC-Central Coast
 - SC-South Coast
 - SB-Sacramento
 - SJ-San Joaquin
 - TL-Tulare Lake
 - NL-North Lahontan
 - SL-South Lahontan
 - CR-Colorado River

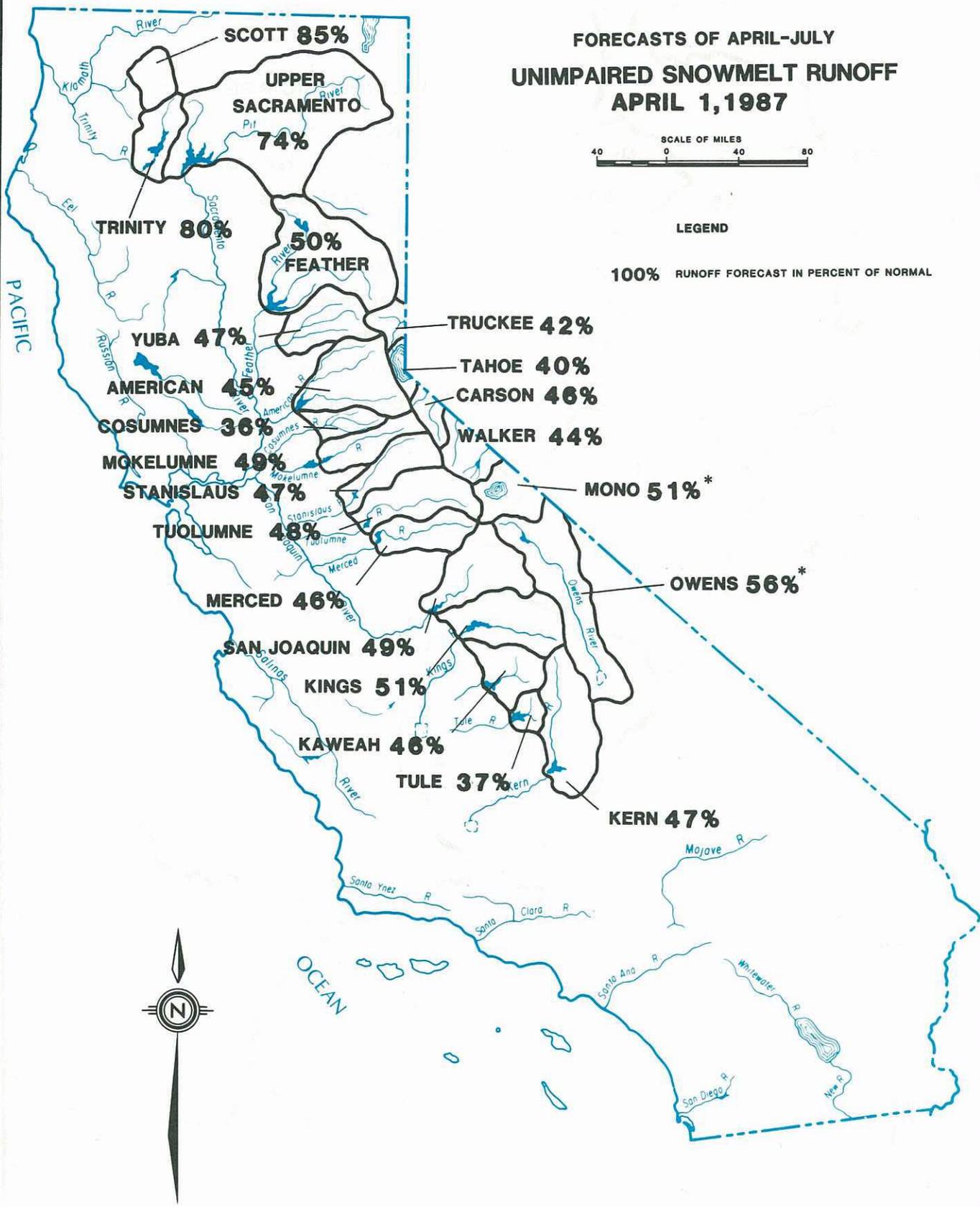


FORECASTS OF APRIL-JULY
UNIMPAIRED SNOWMELT RUNOFF
APRIL 1, 1987



LEGEND

100% RUNOFF FORECAST IN PERCENT OF NORMAL



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

SUMMARY OF WATER CONDITIONS

April 1, 1987

ABOVE AVERAGE MARCH PRECIPITATION IN MOST AREAS FAILED TO OVERCOME THE SEASONAL DEFICIT LEFT BY THE PREVIOUS DRY WEATHER. WITH MOST OF THE RAINY SEASON BEHIND US WE ARE NOW PREDICTING AN APRIL THROUGH JULY RUNOFF OF JUST A LITTLE MORE THAN HALF NORMAL. GOOD RESERVOIR STORAGE IS LESSENING THE IMPACT OF BELOW NORMAL WATER SUPPLY.

FORECASTS OF APRIL THROUGH JULY RUNOFF FOR MOST STREAMS WERE RAISED FROM LAST MONTH. FORECASTS FOR NORTH COAST STREAMS AND THE UPPER SACRAMENTO DRAINAGE WERE INCREASED THE MOST. MOST OTHER STREAMS ONLY WENT UP A FEW PERCENTAGE POINTS AND SOME STREAMS IN THE LAHONTAN AREA WERE DROPPED A FEW POINTS. THE STATE AS A WHOLE IS NOW EXPECTED TO HAVE SLIGHTLY MORE THAN ONE HALF OF ITS USUAL APRIL THROUGH JULY RUNOFF.

PRECIPITATION IN MOST AREAS WAS ABOVE NORMAL FOR MARCH. ONLY THE SOUTH COAST, COLORADO DESERT AND LAHONTAN AREAS EXPERIENCED BELOW NORMAL MARCH PRECIPITATION. SEASONAL PRECIPITATION, HOWEVER, REMAINS BELOW NORMAL THROUGHOUT THE STATE.

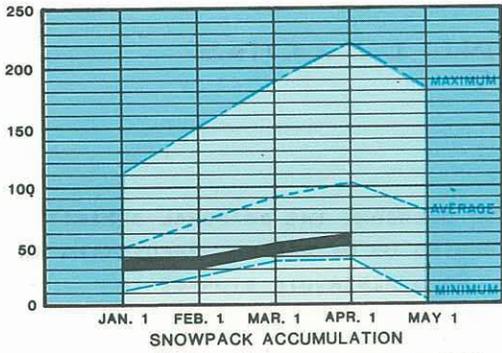
SNOWPACK CONDITIONS IMPROVED ONLY SLIGHTLY DURING MARCH. THE NORTH COAST HAS THE GREATEST SNOWPACK, ABOUT 90 PERCENT OF AVERAGE. MAXIMUM SNOW ACCUMULATION GENERALLY OCCURS ABOUT APRIL 1, SO THE SITUATION IS NOT LIKELY TO IMPROVE. CALIFORNIA'S SNOW ZONES AS A WHOLE ARE HOLDING A LITTLE MORE THAN HALF THEIR USUAL AMOUNTS FOR THIS DATE.

RUNOFF PICKED UP DURING MARCH, BUT FEW STREAMS EXPERIENCED AVERAGE FLOWS. SEASONAL FLOWS REMAIN BELOW NORMAL ON ALL STREAMS EXCEPT THE OWENS RIVER WHICH HAS ABOUT 120 PERCENT OF AVERAGE TO DATE. FLOWS RANGE FROM A HIGH OF 75 PERCENT IN THE LAHONTAN AREA TO A LOW OF 20 PERCENT IN THE SAN FRANCISCO BAY AND CENTRAL COAST AREAS.

RESERVOIR STORAGE CONTINUES TO BE THE BRIGHT SPOT IN THE WATER SUPPLY OUTLOOK. RESERVOIRS IN ALL AREAS EXCEPT THE SAN FRANCISCO BAY ARE HOLDING NORMAL OR ABOVE AMOUNTS. THE STATE AS A WHOLE IS STORING ABOUT 100 PERCENT OF ITS USUAL AMOUNT FOR THIS TIME.

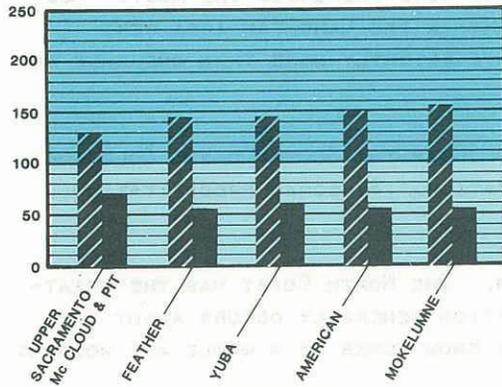
SUMMARY OF WATER CONDITIONS IN PERCENT OF AVERAGE						
HYDROGRAPHIC AREA	PRECIPITATION OCTOBER 1 TO DATE	SNOW WATER CONTENT	RESERVOIR STORAGE	RUNOFF		
				OCTOBER 1 TO DATE	APR-JULY FORECAST	WATER YEAR FORECAST
NORTH COAST	75	90	100	60	80	70
SAN FRANCISCO BAY	65	--	80	20	--	20
CENTRAL COAST	65	--	100	20	--	25
SOUTH COAST	55	--	105	35	--	35
CENTRAL VALLEY, NORTH	65	55	105	50	55	55
CENTRAL VALLEY, SOUTH	70	50	95	35	50	45
LAHONTAN	45	50	110	75	45	55
COLORADO RIVER	95	--	--	--	--	--
STATEWIDE	65	55	100	55	55	55

CENTRAL VALLEY - NORTH HALF



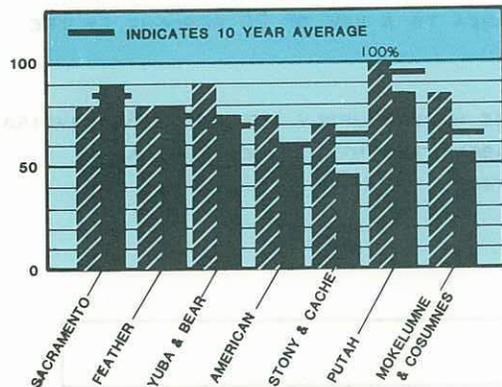
WATER CONTENT IN PERCENT OF APRIL 1 AVERAGE

SNOWPACK - MEASUREMENTS OF THE SNOWPACK OBTAINED AT 96 SNOW COURSES AND 21 SENSORS ON OR ABOUT APRIL 1, SHOW A BASIN WIDE SNOW WATER EQUIVALENT OF 18.7 INCHES. THIS IS 57 PERCENT OF THE APRIL 1 (SEASONAL) AVERAGE. ONE YEAR AGO THE SNOWPACK CONTAINED 29.6 INCHES OF WATER OR 81 PERCENT OF THE APRIL 1 AVERAGE FOR THOSE COURSES WHICH REPORTED.



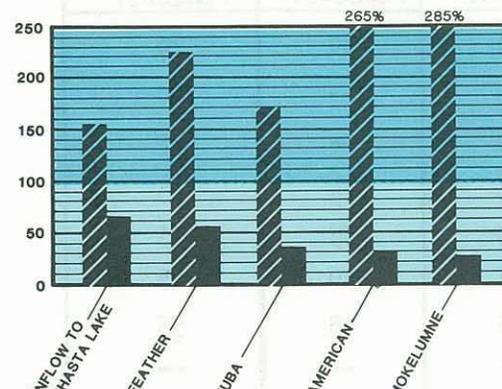
OCTOBER 1 TO DATE IN PERCENT OF AVERAGE

PRECIPITATION - OCTOBER THROUGH MARCH PRECIPITATION OVER THE NORTH HALF OF THE CENTRAL VALLEY AVERAGED 63 PERCENT OF NORMAL. MARCH PRECIPITATION OVER THIS AREA WAS ABOUT 132 PERCENT OF THE MONTHLY AVERAGE.



CONTENTS OF MAJOR RESERVOIRS IN PERCENT OF CAPACITY

RESERVOIR STORAGE - APRIL 1 STORAGE IN 44 RESERVOIRS WAS 12.8 MILLION ACRE-Feet WHICH IS 103 PERCENT OF AVERAGE. ABOUT 79 PERCENT OF AVAILABLE CAPACITY WAS BEING USED. STORAGE IN THESE RESERVOIRS ONE YEAR AGO WAS ABOUT 110 PERCENT OF AVERAGE.



OCTOBER 1 TO DATE IN PERCENT OF AVERAGE

RUNOFF - MARCH RUNOFF FROM STREAMS DRAINING THE NORTH HALF OF THE CENTRAL VALLEY AMOUNTED TO 2.3 MILLION ACRE-Feet WHICH IS 82 PERCENT OF AVERAGE MARCH FLOWS. FOR THE PERIOD OCTOBER THROUGH MARCH FLOWS HAVE TOTALED 5.9 MILLION ACRE-Feet WHICH IS 51 PERCENT OF AVERAGE. LAST YEAR RUNOFF FOR THIS SAME PERIOD WAS 20.9 MILLION ACRE-Feet OR 197 PERCENT OF AVERAGE.

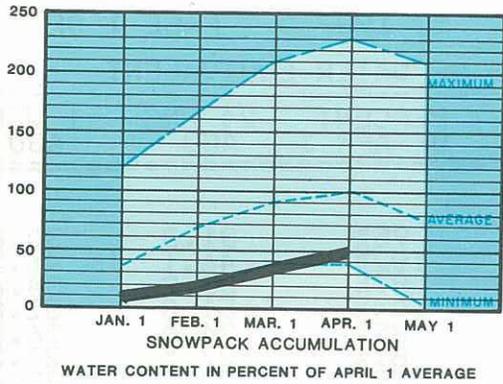
River

THE SACRAMENTO VALLEY FOUR BASIN INDEX FOR THIS WATER YEAR IS FORECAST AT 10.4 MILLION ACRE-Feet ASSUMING MEDIAN CONDITIONS FOR THE REMAINDER OF THE YEAR. THIS CLASSIFIES THE YEAR AS "DRY" IN THE SACRAMENTO-SAN JOAQUIN DELTA ACCORDING TO THE STATE WATER RESOURCES CONTROL BOARD'S DECISION 1485.

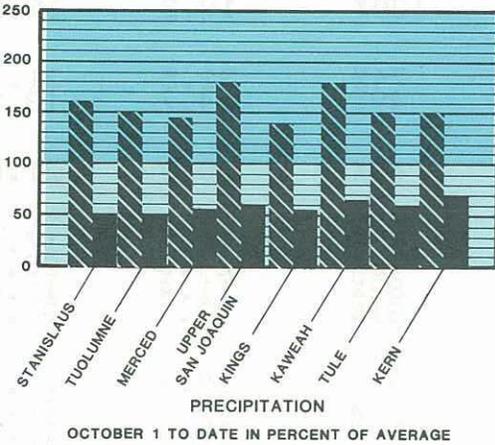
LAST YEAR THIS YEAR

CENTRAL VALLEY - SOUTH HALF

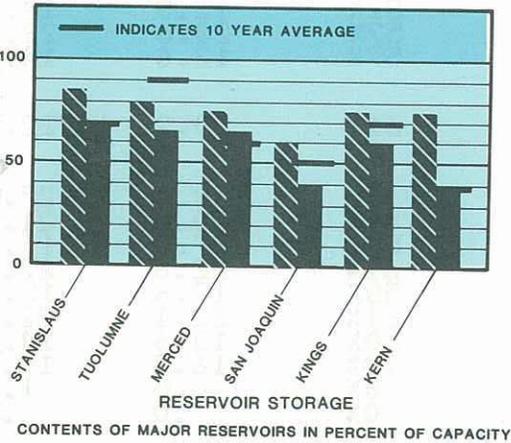
SNOWPACK - MEASUREMENTS OF THE SNOWPACK OBTAINED AT 109 SNOW COURSES, AND 22 SENSORS ON OR ABOUT APRIL 1 SHOW A BASIN WIDE AVERAGE SNOW WATER EQUIVALENT OF 14.0 INCHES. THIS IS 48 PERCENT OF THE APRIL 1 (SEASONAL) AVERAGE. ONE YEAR AGO THE SNOWPACK CONTAINED 40.4 INCHES OF WATER OR 142 PERCENT OF THE APRIL 1 AVERAGE FOR THOSE COURSES WHICH REPORTED.



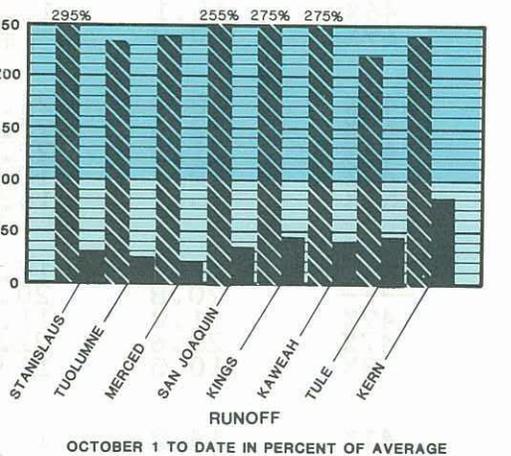
PRECIPITATION - OCTOBER THROUGH MARCH PRECIPITATION OVER THE SOUTH HALF OF THE CENTRAL VALLEY AVERAGED 70 PERCENT OF NORMAL. THE SAN JOAQUIN RIVER BASIN RECEIVED LESS PRECIPITATION THAN DID THE TULARE LAKE BASIN (64 vs 75). MARCH PRECIPITATION AVERAGED ABOUT 120 PERCENT OF NORMAL. THE TULARE LAKE BASIN WAS DRIER THAN THE SAN JOAQUIN (112 vs 128).



RESERVOIR STORAGE - APRIL 1 STORAGE IN 28 MAJOR RESERVOIRS WAS 7.6 MILLION ACRE-Feet WHICH IS 95 PERCENT OF AVERAGE FOR THIS DATE. ABOUT 70 PERCENT OF AVAILABLE CAPACITY WAS BEING USED. STORAGE IN THESE RESERVOIRS ONE YEAR AGO WAS 9.6 MILLION ACRE-Feet



RUNOFF - MARCH RUNOFF FROM STREAMS DRAINING THE SOUTH HALF OF THE CENTRAL VALLEY AMOUNTED TO 374 THOUSAND ACRE-Feet WHICH IS 45 PERCENT OF AVERAGE MARCH FLOWS. FOR THE PERIOD OCTOBER THROUGH MARCH FLOWS HAVE TOTALED 1.0 MILLION ACRE-Feet WHICH IS 36 PERCENT OF AVERAGE.



INCHES OF WATER EQUIVALENT

BASIN NAME STATION NAME	AGENCY	ELEV FEET	APR 1 AVG	TODAY	PERCENT OF APR 1	24 HRS AGO	1 WEEK AGO
TRINITY RIVER							
PETERSON FLAT	USBR	6700	33.0	31.3	95%	31.3	30.8
RED ROCK MOUNTAIN	USBR	6700	44.0	44.7	102%	46.1	46.5
BONANZA KING	USBR	6450	40.5	35.2	87%	35.2	34.6
SHIMMY LAKE	USBR	6200	49.9	51.9	104%	51.8	52.8
MIDDLE BOULDER #3	USBR	6200	27.1	23.1	85%	24.0	26.7
HIGHLAND LAKES	USBR	6000	34.0	27.4	81%	27.5	27.5
SCOTTS MOUNTAIN	USBR	5900	27.0	21.2	79%	22.2	22.6
MUMBO BASIN	USBR	5700	25.8	20.2	78%	20.8	22.4
BIG FLAT	USBR	5100	15.8	19.0	120%	19.2	19.8
UPPER SACTO. RIVER							
SAND FLAT	USBR	6750	42.4	31.3	74%	31.5	31.1
SLATE CREEK	USBR	5600	30.0	14.8	49%	14.7	13.9
MCCLLOUD RIVER							
STOUTS MEADOW	DWR	5250	42.5	20.4	48%	20.8	21.8
FIT RIVER							
CEDAR PASS	SCS	7100	18.1	16.6	92%	16.9	17.5
MEDICINE LAKE	USBR	6700	32.7	24.0	73%	24.0	23.9
ADIN MOUNTAIN	SCS	6350	13.6	11.2	82%	11.4	11.4
SNOW MOUNTAIN	USBR	5950	27.0	21.9	81%	22.0	21.7
FEATHER RIVER							
PILOT PEAK	DWR	7457	52.6	18.3	35%	19.4	20.8
KETTLEROCK	DWR	7300	25.5	16.1	63%	16.4	16.7
GRIZZLY	DWR	6900	29.7	15.4	52%	15.5	15.5
GOLD LAKE	DWR	6750	36.5	22.2	61%	22.6	23.1
HUMBURG	DWR	6500	28.0	23.9	85%	25.1	25.7
RATTLESNAKE	DWR	6100	14.0	11.5	82%	12.5	14.3
BUCKS LAKE	DWR	5750	44.7	23.1	52%	23.6	23.8
FOUR TREES	DWR	5150	20.0	11.4	57%	12.6	14.6
YUBA RIVER							
CENT SIERRA SNOW LAB	USFS	6900	33.6	20.5	61%	20.9	22.0
AMERICAN RIVER							
LAKE LOIS	DWR	8800	-----	28.4	-----	28.4	27.7
SCHNEIDERS	SMUD	8750	34.5	20.4	59%	20.5	21.7
CAPLES LAKE COURSE	USBR	8000	30.9	16.8	54%	17.0	17.0
ALPHA	SMUD	7600	35.9	21.9	61%	22.6	22.7
SILVER LAKE	USBR	7100	22.7	13.1	58%	13.6	15.7
VAN VLECK	SMUD	6700	35.9	22.1	61%	22.1	22.4
ROBBS SADDLE	SMUD	5900	21.4	12.9	60%	13.6	14.7
GREEK STORE	USBR	5600	21.0	15.4	73%	16.9	17.3
BLUE CANYON	USBR	5300	9.0	.0	0%	.0	1.0
ROBBS POWERHOUSE	SMUD	5150	5.2	.0	0%	.0	.0
MOKELUMNE RIVER							
BLUE LAKES	SCS	8000	33.1	15.1	46%	15.1	15.2
MUD LAKE	SMUD	7900	44.9	30.8	69%	30.8	-----
STANISLAUS RIVER							
GIANELLI MEADOW	USBR	8350	55.5	25.4	45%	25.4	24.4
LOWER RELIEF VALLEY	DWR	8100	41.2	21.8	53%	22.6	23.0
STANISLAUS MEADOW	DWR	7750	48.3	21.4	44%	21.6	22.3
BLOODS CREEK	USBR	7200	37.8	18.3	48%	18.7	18.7
BLACK SPRINGS	USBR	6500	27.1	15.2	56%	15.2	14.2
TUOLUMNE RIVER							
DANA MEADOWS	DWR	9800	27.7	17.0	61%	17.4	17.0
SLIDE CANYON	DWR	9200	-----	20.3	-----	20.8	20.4
TUOLUMNE MEADOWS	DWR	8600	22.6	11.0	49%	11.0	11.7
HORSE MEADOW	DWR	8400	48.6	23.0	47%	22.6	22.0
LOWER KIBBIE	DWR	6600	27.4	10.5	38%	10.5	12.7
MERCED RIVER							
GIN FLAT	DWR	7050	34.2	14.0	41%	14.2	14.0

DEPARTMENT OF WATER RESOURCES - CALIFORNIA DATA EXCHANGE CENTER

TELEMETERED SNOW WATER EQUIVALENTS -

APRIL 1, 1987

PAGE 2 OF 2

INCHES OF WATER EQUIVALENT

BASIN NAME STATION NAME	AGENCY	ELEV FEET	APR 1 AVG	TODAY	PERCENT OF APR 1	24 HRS AGO	1 WEEK AGO
=====							
SAN JOAQUIN RIVER							
KAISER POINT	USBR	9300	31.4	17.2	55%	17.2	17.0
GREEN MOUNTAIN	USBR	7900	30.8	15.7	51%	16.3	16.5
TAMARACK SUMMIT	USBR	7600	26.0	16.7	64%	16.9	17.9
CHILKOOT MEADOW	USBR	7150	36.6	17.7	48%	18.7	19.0
GRAVEYARD MEADOW	USBR	6900	23.8	3.4	14%	3.9	5.7
POISON RIDGE	USBR	6900	28.9	9.1	31%	9.3	10.0
KINGS RIVER							
CHARLOTTE LAKE	DWR	10400	----	13.0	----	13.0	12.8
STATE LAKES	USCE	10300	29.0	15.3	53%	15.0	14.7
MITCHELL MEADOW	USCE	9900	32.9	17.6	53%	17.6	18.8
UPPER BURNT CORRAL	DWR	9700	34.6	22.2	64%	22.9	22.9
WEST WOODCHUCK MDW	USCE	8800	32.8	18.1	55%	18.5	18.1
BIG MEADOWS	DWR	7600	25.9	13.8	53%	13.8	13.8
KAWEAH RIVER							
GIANT FOREST	USCE	6412	10.0	.5	5%	.8	3.5
TULE RIVER							
QUAKING ASPEN	DWR	7200	----	14.4	----	14.5	16.1
KERN RIVER							
UPPER TYNDALL CREEK	USCE	11450	27.7	14.3	52%	14.3	13.5
CRABTREE	DWR	10700	19.8	----	----	----	----
CHAGOOA PLATEAU	DWR	10500	21.8	14.0	64%	14.0	14.8
PASCOE	USCE	9150	24.9	19.3	78%	19.1	19.2
TUNNEL	DWR	8960	----	8.2	----	8.4	8.6
WET MEADOW	USCE	8950	30.3	----	----	----	----
BEACH MEADOW	DWR	7650	11.0	1.2	11%	1.3	1.9
SURPRISE VALLEY AREA							
DISMAL SWAMP	SCS	7050	29.2	22.1	76%	22.5	22.8
TRUCKEE RIVER							
MOUNT ROSE	SCS	9000	35.9	10.5	29%	10.6	10.3
MOUNT ROSE SKI AREA	SCS	8850	38.5	21.2	55%	21.1	21.1
INDEPENDENCE LAKE	SCS	8450	41.4	20.6	50%	19.9	16.7
BIG MEADOWS	SCS	8300	25.7	10.3	40%	10.3	10.9
SQUAW VALLEY G.C.	SCS	7800	46.5	24.2	52%	24.3	24.7
INDEPENDENCE CAMP	SCS	7000	21.8	6.3	29%	6.6	7.8
INDEPENDENCE CREEK	SCS	6500	12.7	5.9	46%	6.1	7.5
TRUCKEE NO. 2	SCS	6350	14.3	8.0	56%	8.1	8.9
LAKE TAHOE BASIN							
HEAVENLY VALLEY	SCS	8800	28.1	18.8	67%	18.9	19.1
HAGANS MEADOW	SCS	8000	16.5	----	----	----	----
MARLETTE LAKE	SCS	8000	21.1	14.7	70%	14.9	15.4
ECHO PEAK	SCS	7800	39.5	21.3	54%	22.5	22.4
RUBICON NO. 2	SCS	7500	39.7	15.2	38%	15.2	15.2
TAHOE CITY CROSS	SCS	6750	16.0	----	----	----	----
WARD CREEK NO. 3	SCS	6750	39.4	19.2	49%	19.3	19.4
FALLEN LEAF LAKE	SCS	6300	7.0	.0	0%	.0	.0
CARSON RIVER							
EBBETTS PASS	SCS	8700	38.8	17.3	45%	17.3	17.0
WET MEADOWS	SCS	8050	38.8	20.7	53%	20.4	20.2
POISON FLAT	SCS	7900	16.2	.0	0%	.0	.0
SPRATT CREEK	SCS	6150	3.3	.0	0%	.0	.0
WALKER RIVER							
VIRGINIA LAKES RIDGE	SCS	9200	20.3	8.1	40%	8.1	8.5
LOBDELL LAKE	SCS	9200	17.3	9.5	55%	9.6	9.8
SONORA PASS BRIDGE	SCS	8750	26.0	12.0	46%	11.9	13.1
LEAVITT MEADOWS	SCS	7200	4.4	.0	0%	.0	2.1
OWENS RIVER/MONO LK.							
GEM PASS	LADWP	10750	31.7	20.4	64%	20.6	20.6
COTTONWOOD LAKES	LADWP	10200	11.6	5.6	48%	5.6	5.4
SOUTH LAKE	LADWP	9600	16.0	----	----	----	----
MAMMOTH PASS(6 TANK)	USBR	9500	42.4	22.0	53%	22.0	19.9
ROCK CREEK	LADWP	9050	----	6.0	----	6.0	----

CENTRAL SIERRA SNOW LABORATORY = TOTAL SNOW DEPTH 51.5 IN. DENSITY 39.5%
 BLUE CANYON SNOW DEPTH = TOTAL SNOWM DEPTH 0.0 IN.

FORECASTS OF APRIL- JULY AN FOR CENTRAL

APRI

DRAINAGE BASIN AND WATERSHED	April through July Unimpaired Runoff in 1,000 Acre-feet				
	HISTORICAL			FORECASTS	
	50 Year Average (1)	Maximum of Record	Minimum of Record	April-July Forecast	Percent of Average
SACRAMENTO RIVER BASIN					
Upper Sacramento River					
Sacramento River unimpaired flow at Shasta Lake (2)	304	702	39	230	76
McCloud River unimpaired flow at Shasta Lake (2)	430	850	185	320	74
Pit River unimpaired flow at Shasta Lake (2)	1,075	1,796	480	790	73
Total unimpaired flow at Shasta Lake (1)	1,880	3,189	726	1,400	74
Total unimpaired flow at Shasta Lake (1)					1,100 - 1,900
Sacramento River above Bend Bridge, near Red Bluff	2,569	4,674	943	1,860	72
Total unimpaired flow at Shasta Lake (1)					1,400 - 2,600
Feather River					
Unimpaired flow at Lake Almanor near Pratville (2)	345	675	120	210	61
North Fork at Pulga (2)	1,080	2,416	243	570	53
Middle Fork near Clito (3)	86	518	4	25	29
South Fork at Ponderosa Dam (2)	116	267	13	55	47
Total unimpaired flow at Oroville Reservoir	1,971	4,676	392	980	50
Total unimpaired flow at Oroville Reservoir					750 - 1,580
Yuba River					
North Yuba below Goodyears Bar (2)	298	647	51	140	47
Combined unimpaired flow at Jackson Mdw and Bowman Reservoirs (2)	115	236	25	60	52
South Yuba at Langs Crossing (2)	232	481	57	115	50
Yuba River at Smartville	1,107	2,424	200	520	47
Total unimpaired flow at Smartville					370 - 870
American River					
North Fork at North Fork Dam (2)	274	716	43	120	44
Middle Fork near Auburn (2)	548	1,406	100	260	47
Silver Creek below Camino Diversion Dam (2)	178	386	37	90	51
Total unimpaired flow at Folsom Reservoir	1,366	3,074	229	620	45
Total unimpaired flow at Folsom Reservoir					460 - 1,060
Sacramento River at Sacramento					
SAN JOAQUIN RIVER BASIN					
Cosumnes River					
Cosumnes River at Michigan Bar	140	363	8	50	36
Total unimpaired flow at Michigan Bar					28 - 100
Mokelumne River					
North Fork near West Point (4)	437	829	104	230	53
Total unimpaired flow at Pardee Reservoir	490	1,065	102	240	49
Total unimpaired flow at Pardee Reservoir					180 - 370
Stanislaus River					
Middle Fork below Beardsley Dam (2)	352	702	64	180	51
Total unimpaired flow at Melones Reservoir	753	1,710	116	350	47
Total unimpaired flow at Melones Reservoir					270 - 550
Tuolumne River					
Cherry Creek and Eleanor Creek near Hetch Hetchy (2)	322	727	97	165	51
Tuolumne River near Hetch Hetchy (2)	618	1,392	153	320	52
Total unimpaired flow at Don Pedro Reservoir	1,254	2,682	301	600	48
Total unimpaired flow at Don Pedro Reservoir					460 - 900
Merced River					
Merced River at Pohono Bridge (2)	371	888	80	180	49
Total unimpaired flow at Exchequer Reservoir	654	1,587	123	300	46
Total unimpaired flow at Exchequer Reservoir					240 - 450
San Joaquin River					
San Joaquin River at Mammoth Pool (2)	1,014	2,279	235	580	57
Big Creek below Huntington Lake (2)	95	264	11	45	47
South Fork near Florence Lake (2)	202	511	58	120	59
Total unimpaired flow at Millerton Lake	1,296	3,355	262	640	49
Total unimpaired flow at Millerton Lake					470 - 900
San Joaquin River near Vernalis					
TULARE LAKE BASIN					
Kings River					
North Fork near Cliff Camp (2)	243	565	50	125	51
Total unimpaired flow at Pine Flat Reservoir	1,266	3,114	273	650	51
Total unimpaired flow at Pine Flat Reservoir					490 - 900
Kaweah River					
Total unimpaired flow at Terminus Reservoir	303	814	61	140	46
Total unimpaired flow at Terminus Reservoir					110 - 195
Tule River					
Total unimpaired flow at Success Reservoir	70	256	2	26	37
Total unimpaired flow at Success Reservoir					19 - 38
Kern River					
Kern River near Kernville (2)	389	1,203	83	200	51
Total unimpaired flow at Isabella Reservoir	492	1,657	84	230	47
Total unimpaired flow at Isabella Reservoir					180 - 310

(1) All 50-year averages are based on data for water years 1936-1985 except:
(2) 50-year average based on years 1936-80.
(3) 50-year average based on years 1936-1979.

(4) 43-year average based on years 1936-1971.
(5) See inside back cover for definition of unimpaired runoff and 80 percent probability ranges.

WATER YEAR UNIMPAIRED RUNOFF KEY STREAMS

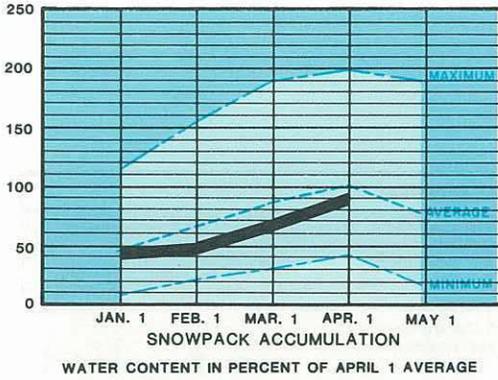
987

Water Year Unimpaired Runoff October through September In 1,000 Acre-feet												
HISTORICAL			*	*	*	DISTRIBUTION					FORECASTS	
30 Year Average	Maximum of Record	Minimum of Record	October through January	February	March	April	May	June	July	August and September	Water Year Forecast	Percent of Average
Values in parentheses indicate the 80 percent probability range for water year forecasts												
859	1.964	165										
1.286	2.353	577										
3.169	5.150	1.484										
6.090	10.796	2.479	1,070	500	900	530	400	265	205	380	4,250 (3,850 - 4,800)	70
8.856	17.180	3.294	1,390	750	1,340	760	500	340	260	460	5,800 (5,200 - 6,700)	65
786	1.269	366										
2.446	4.400	666										
219	637	24										
292	562	32										
4.754	9.492	994	510	330	540	420	310	150	100	140	2,500 (2,150 - 3,100)	53
565	1.056	102										
174	292	30										
357	565	98										
2.460	4.926	369	135	155	190	230	200	70	20	20	1,020 (850 - 1,400)	41
612	1.234	66										
1.066	2.575	144										
314	705	59										
2.837	6.381	349	100	135	210	290	250	70	10	5	1,070 (850 - 1,550)	38
												49
407	1.253	20	9	14	22	30	15	4	1	< 0.5	95 (75 - 160)	23
626	1.009	197										
776	1.800	129	14	20	40	90	120	28	2	1	315 (280 - 440)	41
483	929	88										
1.198	2.952	155	38	30	59	140	150	50	10	3	480 (400 - 680)	40
461	1.147	123										
775	1.661	258										
1.951	4.430	383	36	40	85	190	285	110	15	4	765 (680 - 1,070)	39
460	1.020	92										
1.023	2.559	150	18	18	38	95	140	55	10	1	375 (310 - 520)	37
1.337	2.964	308										
112	298	14										
248	653	71										
1.861	4.642	362	70	40	65	180	265	155	40	25	840 (660 - 1,100)	45
												40
282	607	58										
1.745	4.294	383	85	35	55	170	275	160	45	25	850 (680 - 1,100)	49
468	1.402	92										
			29	14	20	40	65	30	5	2	205 (170 - 260)	44
159	615	16										
			16	8	12	14	10	2	< 0.5	< 0.5	62 (50 - 80)	39
575	1.577	163										
749	2.309	175	93	27	38	65	80	60	25	22	410 (350 - 500)	55

Unimpaired runoff to date. e Estimated.
Monthly distributions of runoff forecasts are estimated based on comparisons with previous historic water years.

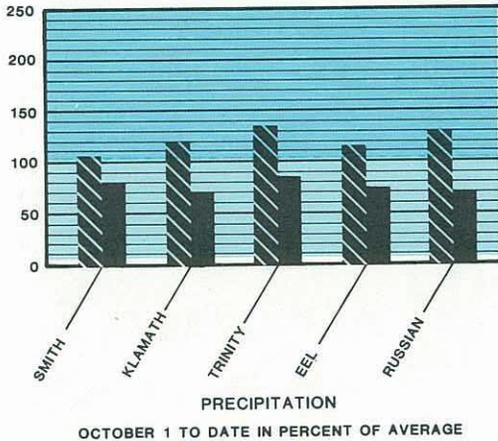
NORTH COAST AREA

87

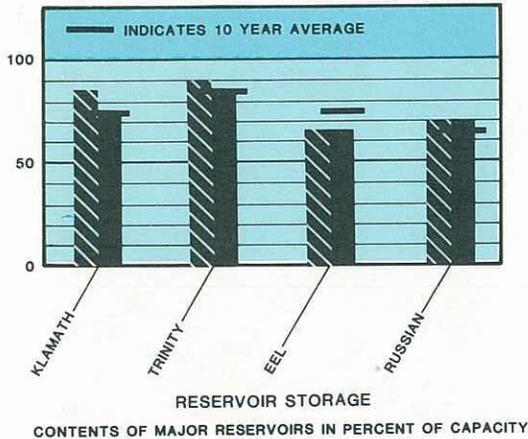


SNOWPACK - MEASUREMENTS OF THE SNOWPACK OBTAINED AT 16 SNOW COURSES AND 1 SENSOR ON OR ABOUT APRIL 1 INDICATE A BASIN WIDE AVERAGE SNOW WATER EQUIVALENT OF 25.8 INCHES. THIS IS 89 PERCENT OF THE APRIL 1 (SEASONAL) AVERAGE. ONE YEAR AGO THE SNOWPACK CONTAINED 30.1 INCHES OF WATER OR 92 PERCENT OF THE APRIL 1 AVERAGE FOR THOSE COURSES WHICH REPORTED.

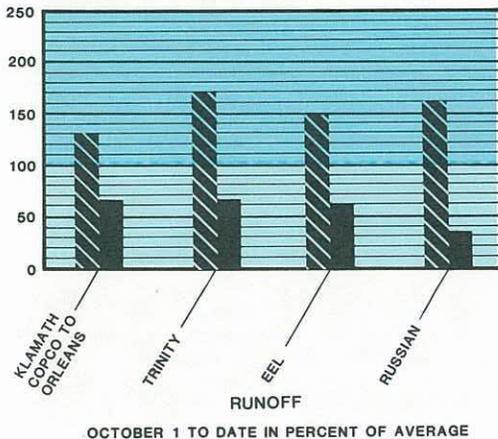
THE OREGON COOPERATIVE SNOW SURVEYS (THROUGH THE U. S. SOIL CONSERVATION SERVICE IN PORTLAND, OREGON) REPORTS THAT THE SNOWPACK WATER EQUIVALENT IN THE UPPER KLAMATH RIVER BASIN WAS 81 PERCENT OF AVERAGE ON APRIL 1. THIS COMPARES TO 93 PERCENT AT THIS TIME LAST YEAR.



PRECIPITATION - OCTOBER THROUGH MARCH PRECIPITATION AVERAGED ABOUT 76 PERCENT OF NORMAL OVER THIS AREA. MARCH PRECIPITATION WAS ABOUT 146 PERCENT OF THE MONTHLY AVERAGE.



RESERVOIR STORAGE - APRIL 1 STORAGE IN 6 MAJOR RESERVOIRS WAS 2.3 MILLION ACRE-FEET WHICH IS 102 PERCENT OF AVERAGE. ABOUT 83 PERCENT OF AVAILABLE CAPACITY WAS BEING USED. STORAGE IN THESE RESERVOIRS ONE YEAR AGO WAS 2.4 MILLION ACRE-FEET.



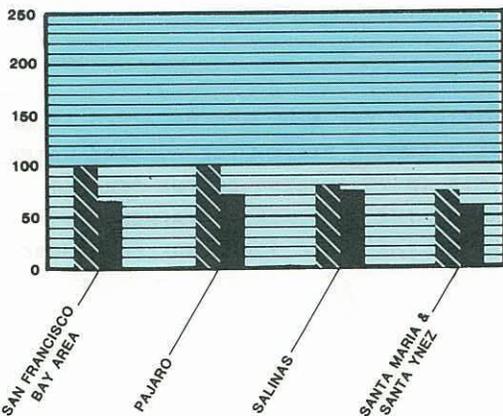
RUNOFF - MARCH RUNOFF FROM NORTH COAST STREAMS AMOUNTED TO 2.5 MILLION ACRE-FEET WHICH IS 115 PERCENT OF THE AVERAGE MARCH FLOW. FOR THE PERIOD OCTOBER THROUGH MARCH FLOWS HAVE TOTALED 10. MILLION ACRE-FEET WHICH IS 60 PERCENT OF AVERAGE. LAST YEAR RUN-OFF FOR THIS PERIOD WAS 15.6 MILLION ACRE-FEET OR 161 PERCENT OF AVERAGE.

LAST YEAR (hatched bar) THIS YEAR (solid black bar)

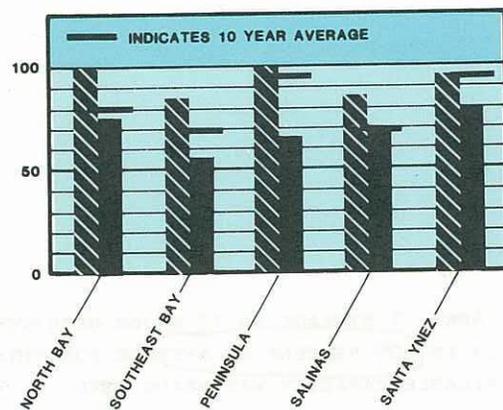
SAN FRANCISCO AND CENTRAL COAST AREAS

87

PRECIPITATION - OCTOBER THROUGH MARCH PRECIPITATION AVERAGED ABOUT 67 PERCENT OF NORMAL. MARCH RAINFALL WAS ABOUT 129 PERCENT OF NORMAL. THE BAY WAS DRIER THAN THE COAST (115 VS 142).



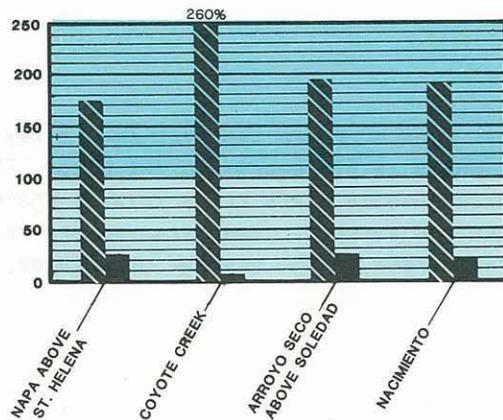
PRECIPITATION
OCTOBER 1 TO DATE IN PERCENT OF AVERAGE



RESERVOIR STORAGE
CONTENTS OF MAJOR RESERVOIRS IN PERCENT OF CAPACITY

RESERVOIR STORAGE - APRIL 1 STORAGE IN 17 MAJOR RESERVOIRS WAS 419 THOUSAND ACRE-FEET WHICH IS 80 PERCENT OF AVERAGE FOR THIS DATE. STORAGE IN THESE RESERVOIRS ONE YEAR AGO WAS 624 THOUSAND ACRE-FEET. STORAGE IN 6 MAJOR CENTRAL COAST AREA RESERVOIRS WAS 728 THOUSAND ACRE-FEET ON APRIL 1 WHICH IS 98 PERCENT OF AVERAGE FOR THIS DATE. ABOUT 74 PERCENT OF AVAILABLE CAPACITY WAS BEING USED.

STORAGE IN THESE RESERVOIRS ONE YEAR AGO WAS 869 THOUSAND ACRE-FEET.



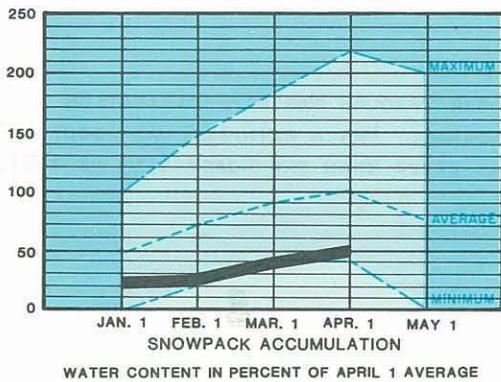
RUNOFF
OCTOBER 1 TO DATE IN PERCENT OF AVERAGE

LAST YEAR [hatched bar] THIS YEAR [solid black bar]

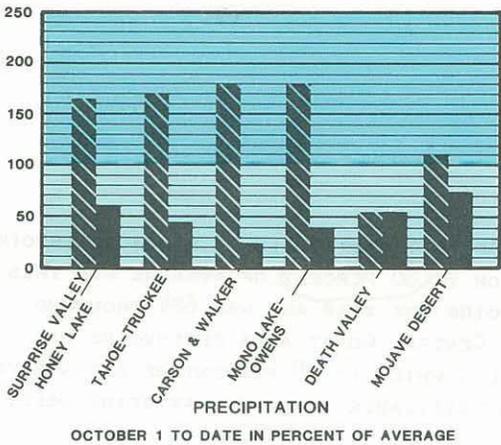
RUNOFF - MARCH RUNOFF FROM SELECTED SAN FRANCISCO BAY AREA STREAMS AMOUNTED TO 8.4 THOUSAND ACRE-FEET WHICH IS 42 PERCENT OF THE MARCH AVERAGE. FOR THE PERIOD OCTOBER THROUGH MARCH FLOWS HAVE TOTALED 17.8 THOUSAND ACRE-FEET WHICH IS 18 PERCENT OF AVERAGE. LAST YEAR RUNOFF FOR THIS PERIOD WAS 236 THOUSAND ACRE-FEET OR 238 PERCENT OF AVERAGE.

SELECTED CENTRAL COAST STREAMS PRODUCED 23.1 THOUSAND ACRE-FEET DURING MARCH. THIS WAS 32 PERCENT OF THE AVERAGE FOR THIS MONTH. SEASONAL (OCTOBER THROUGH MARCH) RUNOFF WAS 62.5 THOUSAND ACRE-FEET OR 21 PERCENT OF AVERAGE. LAST YEAR RUNOFF FOR THIS PERIOD WAS 528 THOUSAND ACRE-FEET OR 193 PERCENT OF AVERAGE.

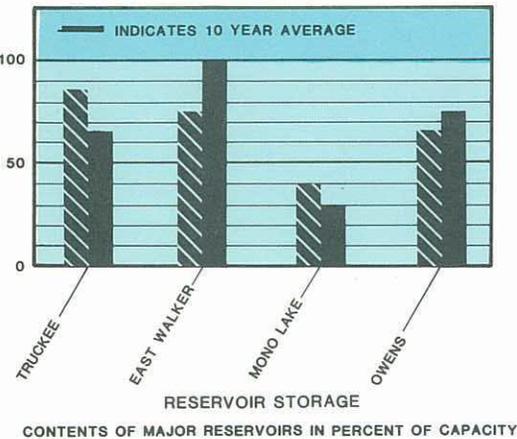
LAHONTAN AREA



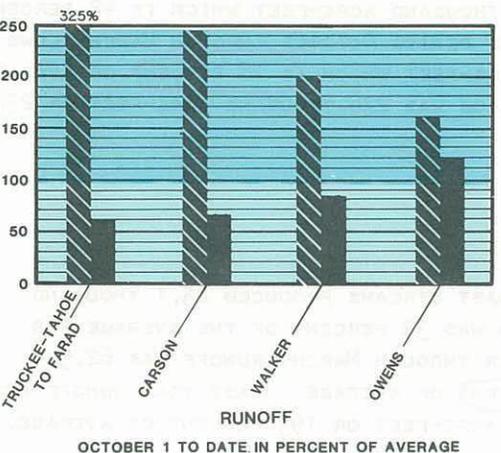
SNOWPACK - MEASUREMENTS OF THE SNOWPACK OBTAINED AT 62 SNOW COURSES ON OR ABOUT APRIL 1 SHOW A BASIN WIDE AVERAGE WATER EQUIVALENT OF 13.1 INCHES. THIS IS 49 PERCENT OF THE APRIL 1 (SEASONAL) AVERAGE. ONE YEAR AGO THE SNOWPACK CONTAINED 37.9 INCHES OF WATER OR 148 PERCENT OF THE APRIL 1 AVERAGE FOR THOSE COURSES WHICH REPORTED.



PRECIPITATION - OCTOBER THROUGH MARCH PRECIPITATION AVERAGED ABOUT 46 PERCENT OF NORMAL. THE SOUTHERN PORTION WAS WETTER THAN THE NORTH (41 VS 51). MARCH PRECIPITATION WAS ABOUT 85 PERCENT OF NORMAL. THE SOUTH WAS WETTER THAN THE NORTH (92 VS 78).



RESERVOIR STORAGE - APRIL 1 STORAGE IN 13 MAJOR RESERVOIR WAS 1.0 MILLION ACRE- FEET WHICH IS 109 PERCENT OF AVERAGE FOR THIS DATE. ABOUT 67 PERCENT OF AVAILABLE CAPACITY WAS BEING USED.



RUNOFF - MARCH RUNOFF FROM SELECTED LAHONTAN AREA STREAMS TOTALLED 54 THOUSAND ACRE-FEET WHICH IS 67 PERCENT OF THE MARCH AVERAGE. FOR THE PERIOD OCTOBER THROUGH MARCH FLOWS TOTALLED 252 THOUSAND ACRE-FEET OR 76 PERCENT OF AVERAGE. LAST YEAR RUNOFF FOR THIS PERIOD WAS 771 THOUSAND ACRE-FEET OR 250 PERCENT OF AVERAGE.

LAST YEAR [hatched bar] THIS YEAR [solid black bar]

**FORECASTS OF APRIL-JULY UNIMPAIRED RUNOFF FOR SELECTED CALIFORNIA STREAMS
APRIL 1, 1987**

DRAINAGE BASIN AND WATERSHED	UNIMPAIRED RUNOFF IN 1000 ACRE-FEET						(3)
	HISTORICAL			FORECASTS			
	50 Year Average	Maximum of Record	Minimum of Record	April - July Forecasts		Percent of Average	
	1000 Acre-Foot	1000 Acre-Foot	1000 Acre-Foot	1000 Acre-Foot			
NORTH COAST AREA							
Trinity River at Lewiston	676	1593	80	540		80	
Scott River at Ft. Jones	200			170		85	
Upper Klamath Lake (1)				370		71	
LAHONTAN AREA							
Truckee River, Lake Tahoe to Farad accretion	285	713	58	120		42	
Lake Tahoe Rise (assuming gates closed)	1.50 Ft.	3.75 Ft.	0.23 Ft.	0.6 Ft.		40	
East Carson River near Gardnerville	195	407	48	50		46	
West Carson River at Woodfords	55	131	12	25		45	
East Walker River near Bridgeport	68	209	7	26		38	
West Walker River near Coleville	154	380	35	75		49	
Owens River at Long Valley Reservoir (2)	90	166	20	50		55	
SURPRISE VALLEY AREA							
Bidwell Creek near Ft. Bidwell	12.00	--	--	6.6		55	
Mill Creek above diversions	4.10	--	--	3.2		78	
Deep Creek above diversions	3.60	--	--	2.3		64	
Eagle Creek at Eagleville	4.30	--	--	3.0		70	
GOOSE LAKE TRIBUTARIES							
New Pine Creek below Schroeders	7.35	--	--	4.4		60	
Cottonwood Creek below Larkin Garden Ditch	2.45	--	--	1.5		61	
Lassen Creek near Willows Ranch	7.54	--	--	5.2		69	
Davis Creek above Diversion No. 4	6.25	--	--	4.4		70	

(1) Forecast by U.S. Soil Conservation Service, Portland, Oregon, for monthly period, April through September.

(2) Forecast by Dept. of Water and Power, City of Los Angeles, for monthly period, April through September.

(3) Inside back cover for definition of unimpaired runoff.

SOUTH COAST AND COLORADO RIVER AREAS

PRECIPITATION - OCTOBER THROUGH MARCH PRECIPITATION OVER THIS PART OF THE STATE AVERAGED ABOUT 75 PERCENT OF NORMAL. THE COAST AREA WAS DRIER THAN THE DESERT. MARCH PRECIPITATION WAS ABOUT 45 PERCENT OF NORMAL. THE COAST WAS WETTER THAN THE DESERT DURING THE MONTH.

RESERVOIR STORAGE - APRIL 1 STORAGE IN 28 MAJOR RESERVOIRS IN THE SOUTH COAST AREA WAS 1.5 MILLION ACRE-FeET OR 106 PERCENT OF AVERAGE. ABOUT 69 PERCENT OF AVAILABLE CAPACITY WAS BEING USED. ONE YEAR AGO STORAGE IN THESE RESERVOIRS WAS 1.6 MILLION ACRE-FeET. ON APRIL 1 COMBINED STORAGE IN LAKES POWELL, MEAD, MOHAVE AND HAVASU WAS 48.3 MILLION ACRE-FeET OR 128 PERCENT OF AVERAGE AND ABOUT 90 PERCENT OF AVAILABLE CAPACITY.

RUNOFF - MARCH RUNOFF FROM SELECTED SOUTH COAST STREAMS WAS 6.1 THOUSAND ACRE-FeET WHICH IS 40 PERCENT OF AVERAGE. SEASONAL (OCTOBER THROUGH MARCH) FLOWS HAVE TOTALED 17.3 THOUSAND ACRE-FeET OR 35 PERCENT OF NORMAL. LAST YEAR RUNOFF FOR THIS PERIOD WAS 55 THOUSAND ACRE-FeET OR 130 PERCENT OF AVERAGE.

COLORADO RIVER - THE APRIL 1 SNOWPACK IN THE UPPER COLORADO RIVER BASIN, ACCORDING TO THE U. S. SOIL CONSERVATION SERVICE, IS 82 PERCENT OF AVERAGE AND RANGES FROM 113 PERCENT OF AVERAGE IN THE SAN JUAN BASIN TO 70 PERCENT OF AVERAGE IN THE GREEN RIVER BASIN ABOVE FLAMING GORGE

THE APRIL THROUGH JULY INFLOW TO LAKE POWELL IS FORECAST TO BE 7.5 MILLION ACRE-FeET WHICH IS 93 PERCENT OF NORMAL.

MAJOR WATER DISTRIBUTION PROJECTS

CENTRAL VALLEY PROJECT - CVP RESERVOIRS WERE ABLE TO STORE ALL EXCESS INFLOW DURING MARCH. ALTHOUGH RUNOFF FORECASTS RANGE FROM 38 TO 85 PERCENT OF AVERAGE, THE CVP WATER SUPPLY IS FULLY ADEQUATE IN THE DELTA AND NORTHERN PORTIONS OF THE STATE. FRIANT WATER SUPPLY HAS BEEN DECLARED TO 80 PERCENT OF CLASS 1 ON THE BASIS OF THE DRY CONDITIONS IN THE UPPER SAN JOAQUIN.

STATE WATER PROJECT - PROJECT STORAGE SOUTH OF THE DELTA IS ESSENTIALLY FULL. OROVILLE STORAGE INCREASED TO ABOUT 3.08 MILLION ACRE-FeET, BUT THE LAKE IS NOT EXPECTED TO FILL IN 1987. FULL ENTITLEMENTS HAVE BEEN RESTORED.

MAJOR WATER DISTRIBUTION PROJECTS

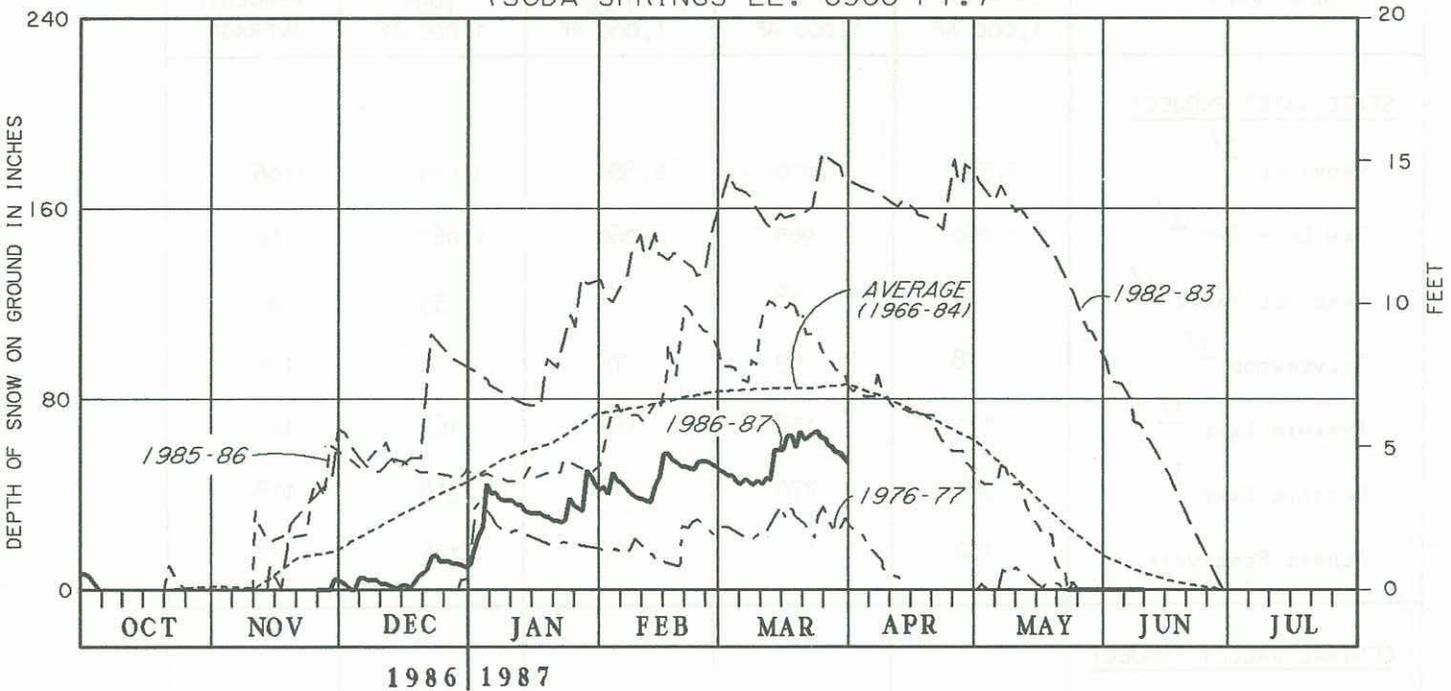
RESERVOIR STORAGE

(AVERAGES BASED ON PERIOD 1966-85)

RESERVOIR	CAPACITY 1,000 AF	AVERAGE STORAGE ^{1/} 1,000 AF	STORAGE AS OF APRIL 1		
			1986 1,000 AF	1987 1,000 AF	PERCENT AVERAGE
<u>STATE WATER PROJECT</u>					
OROVILLE ^{1/}	3,540	2,900	2,880	3,080	106
SAN LUIS SWP ^{1/}	1,060	965	1,060	1,060	110
LAKE DEL VALLE ^{1/}	77	38	41	33	87
SILVERWOOD ^{1/}	78	69	74	72	104
PYRAMID LAKE ^{1/}	171	158	167	163	103
CASTAIC LAKE ^{1/}	324	270	318	318	118
PERRIS RESERVOIR	132	113	126	126	112
<u>CENTRAL VALLEY PROJECT</u>					
CLAIR ENGLE LAKE	2,450	2,020	2,170	2,090	103
SHASTA LAKE	4,550	3,840	3,700	4,180	109
WHISKEYTOWN	241	216	206	207	96
FOLSOM	1,010	675	660	662	98
NEW MELONES	2,400	1,700	2,040	1,850	109
MILLERTON LAKE	521	365	361	206	56
SAN LUIS CVP ^{1/}	980	816	963	964	118
<u>COLORADO RIVER PROJECT</u>					
LAKE MEAD	26,300	19,800	23,300	24,200	122
LAKE POWELL	25,000	15,500	22,000	21,800	141
LAKE MOHAVE	1,810	1,680	1,670	1,760	105
LAKE HAVASU	619	556	559	553	99

^{1/} AVERAGE STORAGE BASED ON 10 YEAR PERIOD 1976 - 1985. EXCLUSIVE PERIOD OF INITIAL FILLING.

SNOW DEPTH AT CENTRAL SIERRA SNOW LAB.
(SODA SPRINGS EL. 6900 FT.)



DATA SOURCE: CENTRAL SIERRA SNOW LAB.

SNOW LINES



PROPOSED COMPUTER LINK - ANDY LEVEN, THE U. S. FOREST SERVICE'S ASSISTANT REGIONAL FORESTER FOR WATERSHEDS, HAS SENT A LETTER TO EACH FOREST REQUESTING THAT THEY CONTRIBUTE \$550 PER YEAR TO FINANCE THE LINK BETWEEN THE FOREST SERVICE'S COMPUTER NETWORK (FLIPS) AND THE CALIFORNIA DATA EXCHANGE CENTER (CDEC) ON A PILOT BASIS STARTING IN FEDERAL FY 1988.



SURPRISE VALLEY AND GOOSE LAKE FORECASTS - DATA NEEDED TO FORECAST STREAMS IN THIS AREA ARE HARD TO OBTAIN. THIS MAKES FORECASTING DIFFICULT AND HAS CAUSED QUESTIONING OF THE VALUE OF FORECASTS. WE ARE PROPOSING TO DROP THESE FORECASTS AT THE END OF THE SEASON UNLESS THERE ARE OBJECTIONS. IF YOU HAVE THOUGHTS ON THIS, DROP US A NOTE OR TELEPHONE JACK PARDEE AT (916) 323-1482



LATE OR MISSING SURVEYS - BAD WEATHER, SICKNESS AND A HOST OF OTHER THINGS CAN DELAY A SNOW SURVEY TRIP. IF YOU FIND YOURSELF IN A BIND ABOUT AN UPCOMING SURVEY, LET DAVE HART KNOW. FREQUENTLY WE CAN DO SOMETHING ABOUT IT. DAVE'S NUMBER IS (916) 323-1490.



COVER PHOTOGRAPHS - LAST MONTH'S SNOW LINES ASKED FOR HELP IN IDENTIFYING THE INDIVIDUALS IN THE MOUNT ROSE PICTURES. THE PEOPLE IN THE FIRST TWO ISSUES HAVE BEEN TENTATIVELY IDENTIFIED AS DR. CHURCH AND HIS WIFE. THE PHOTOGRAPHS WERE PROBABLY TAKEN DURING CONSTRUCTION OF THE MOUNT ROSE STATION DURING 1906 AND 1907.

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 date for the period 1936-1985 (50 years, except for data sites established after 1936).

PRECIPITATION—Averages are based on the period 1931-1980 (50 years).

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. Forecasts of runoff assume 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 50 year period (1936-1985). For more details, contact California Cooperative Snow Surveys, P.O. Box 943836, Sacramento, CA 94236-0001, (916) 445-2196.

State of California—Resources Agency
Department of Water Resources
P.O. Box 942836
Sacramento CA 94236-0001

FIRST CLASS

