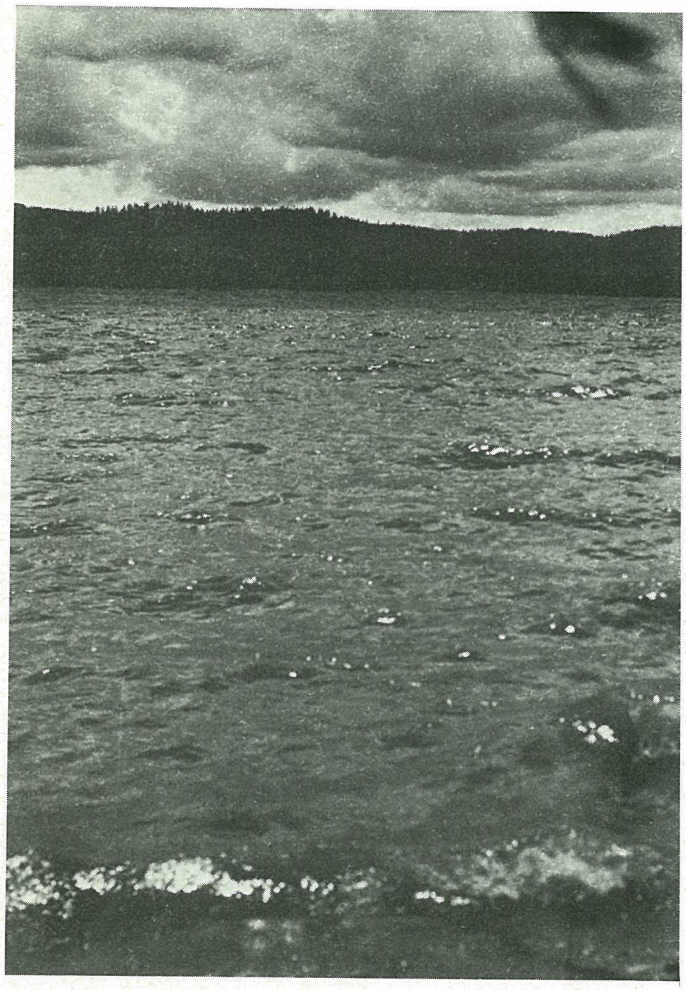
STATE OF CALIFORNIA

The Resources Agency

Department of Water Resources

BULLETIN No. 120-73

SUMMARY OF WATER CONDITIONS IN CALIFORNIA



October 1, 1972 -

September 30, 1973

DECEMBER 1973

NORMAN B. LIVERMORE, JR.
Secretary for Resources
The Resources Agency

RONALD REAGAN
Governor
State of California

JOHN R. TEERINK
Director
Department of Water Resources

For a number of years the Fall Report of Bulletin No. 120 has summarized data on snowpack, precipitation, reservoir storage, and runoff throughout California at the close of each water year. To provide water resources managers a more complete picture of statewide water conditions, commencing with this edition, the content of Bulletin No. 120 is being expanded to include data summaries of ground water and water quality. These additional sections cover such factors as ground water levels, the status of sea-water intrusion, waste-water reclamation, flood flows, and interbasin transfers of water.

All data are provisional and subject to revision. Detailed information will be available in the Department's district offices. (Publication of water conditions summaries each February, March, April, and May as part of the Bulletin No. 120 series will continue unchanged.)

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Ronald Reagan, Governor

THE RESOURCES AGENCY
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PRECIPITATION AND SNOWPACK

Statewide precipitation for the 1972-73 water year averaged about 115 percent of normal. Much above normal amounts occurred in the Central Coastal and the Sacramento-San Joaquin Valleys. The heaviest precipitation occurred in October and November, and in the January through March period. Despite the heavy precipitation during these months, the northern border of the State experienced below normal amounts of precipitation, as did the Mojave-Colorado Desert region. A change to a dry precipitation regime occurred in April which held and dominated the weather pattern through the last half of the water year. Extreme amounts ranged from a high of 109 inches just south of Eureka to a low of just under two inches at Thermal in the Colorado Desert. Seasonal totals from other stations were Shasta Dam 69 inches, Woodland 30 inches, Visalia 19 inches, and Los Angeles City 21 inches.

April 1 snow surveys indicated that all snowmelt streams in California had above normal snowpack accumulations, ranging from 113 percent in Mono Creek Basin to nearly 300 percent in the Tule River Basin.

Central Valley basins in particular reflected the above-normal precipitation amounts for the October through March period, with snowpacks in the Sacramento Valley drainage averaging about 130 percent of normal, while those of the San Joaquin and Tulare Lake drainages averaged about 170 percent of normal. Streams of the Lahontan area, on the eastern Sierra Nevada slopes, averaged about 125 percent of normal.

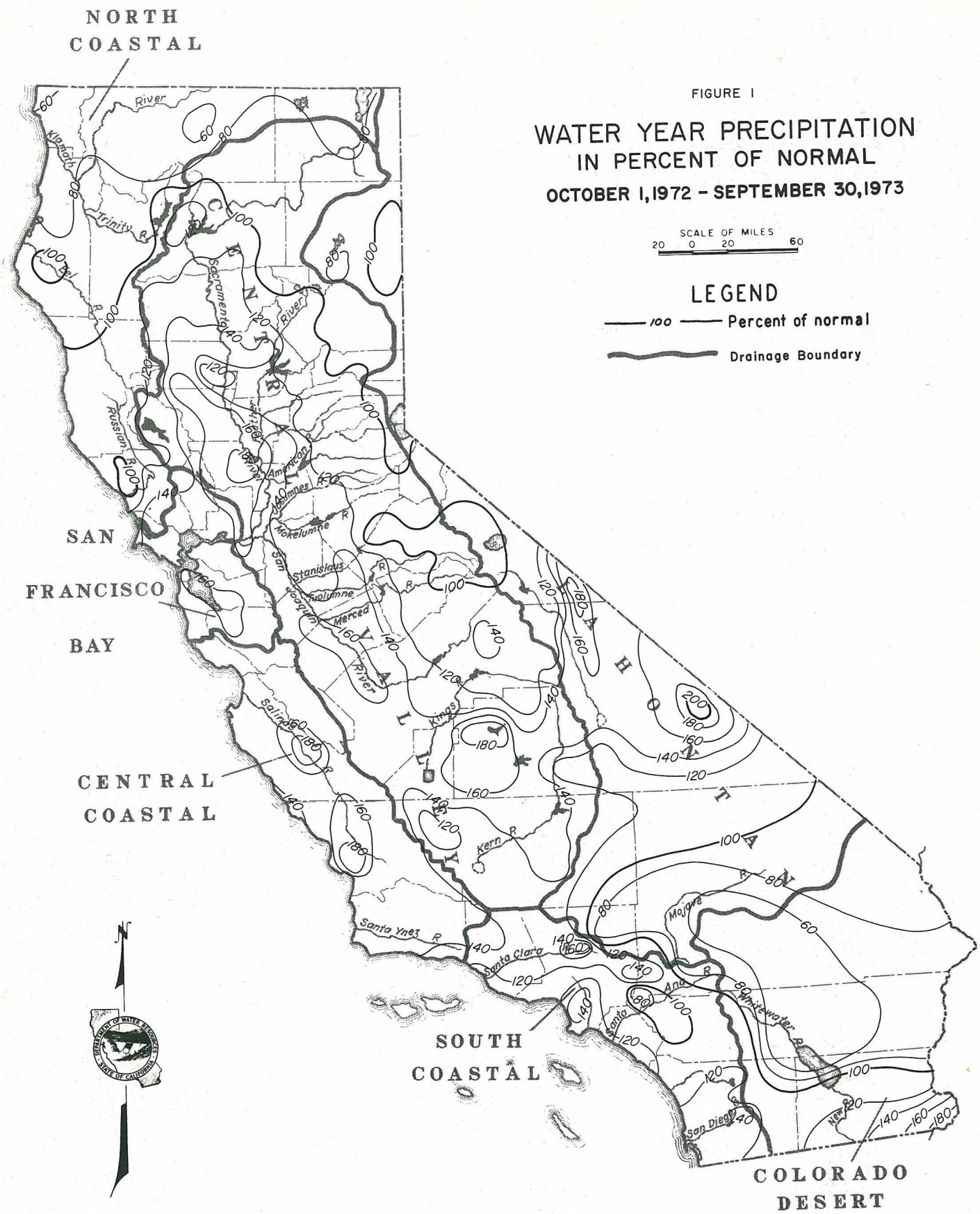


FIGURE I

WATER YEAR PRECIPITATION IN PERCENT OF NORMAL

OCTOBER 1, 1972 - SEPTEMBER 30, 1973

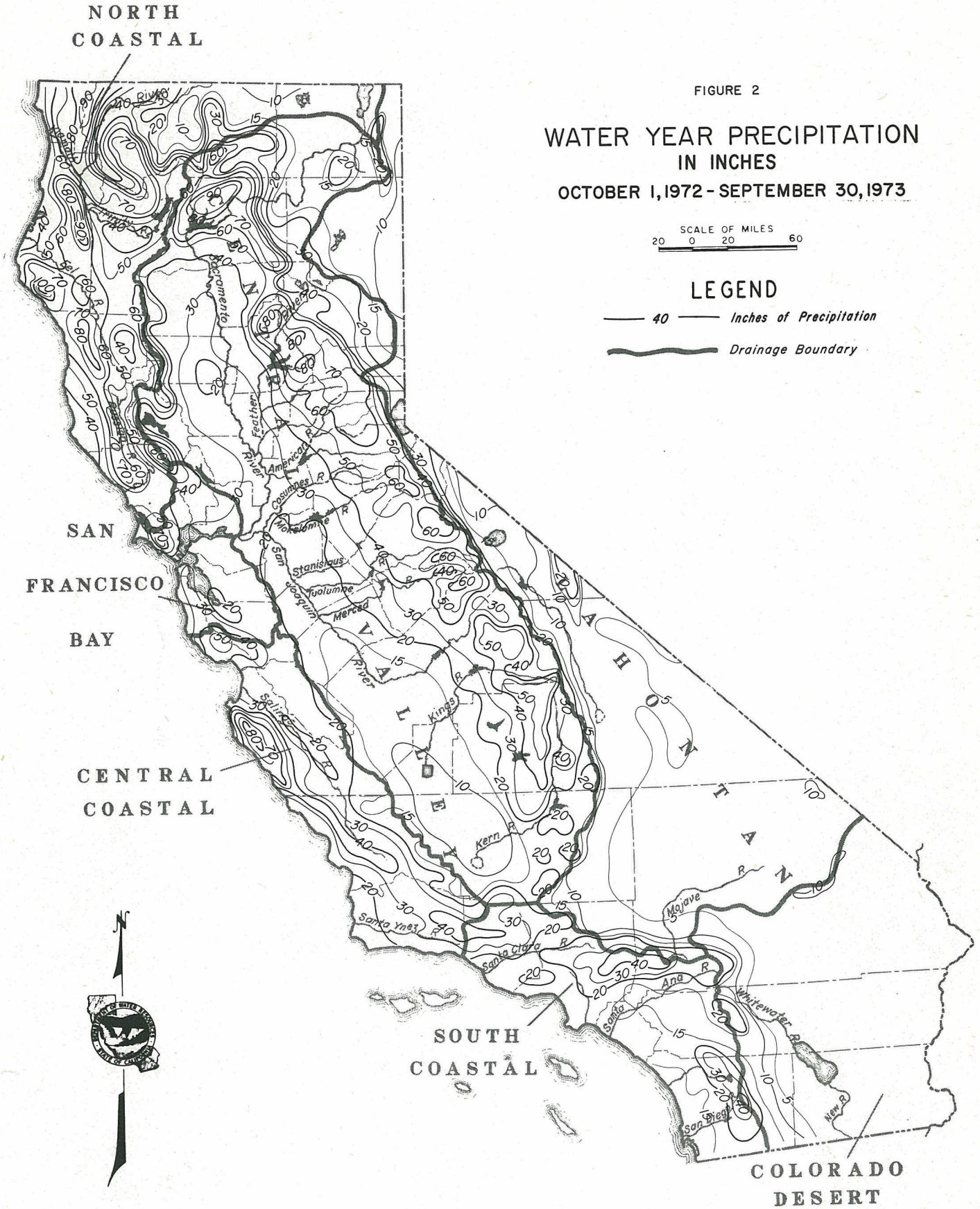


FIGURE 2

WATER YEAR PRECIPITATION
IN INCHES
OCTOBER 1, 1972 - SEPTEMBER 30, 1973

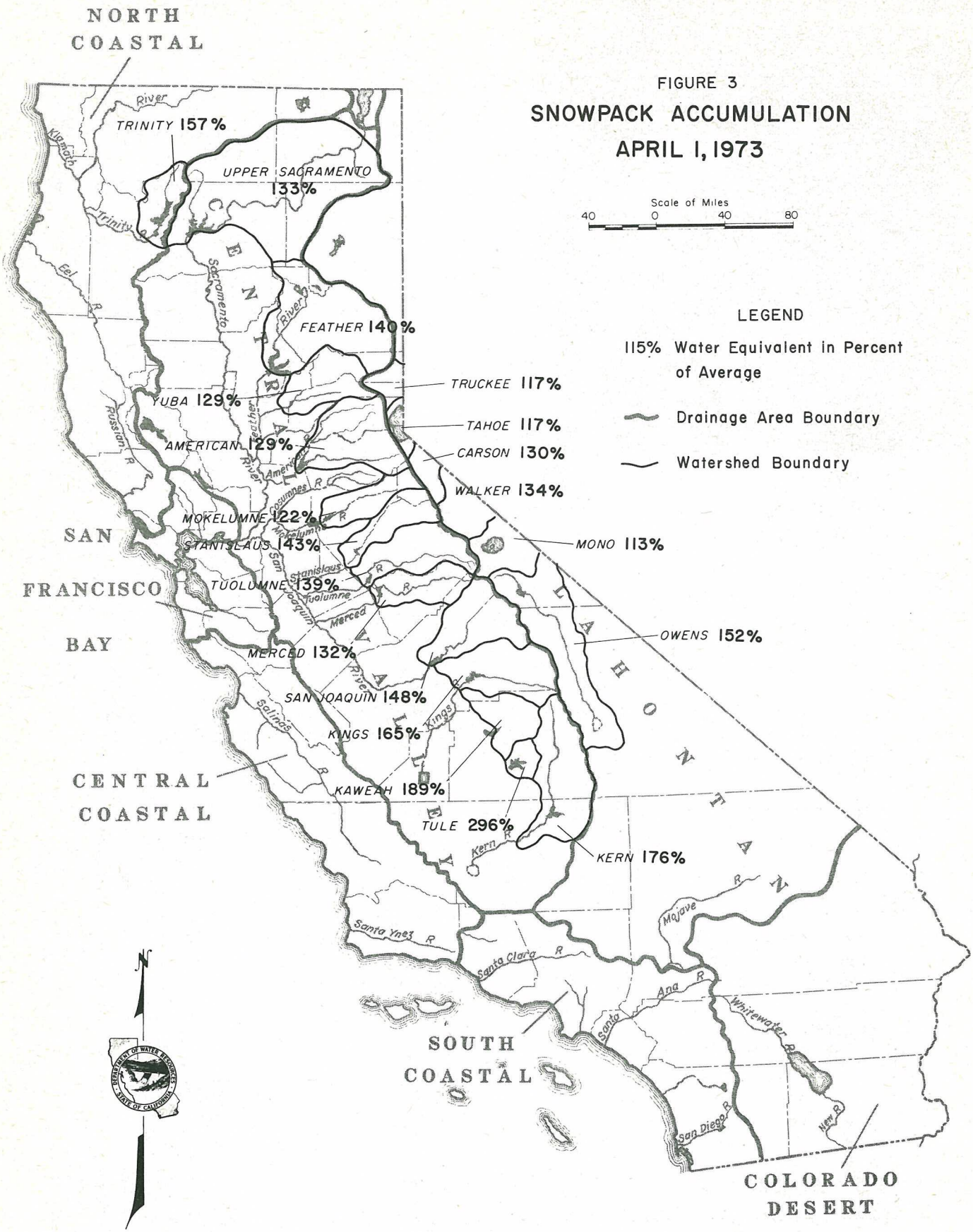
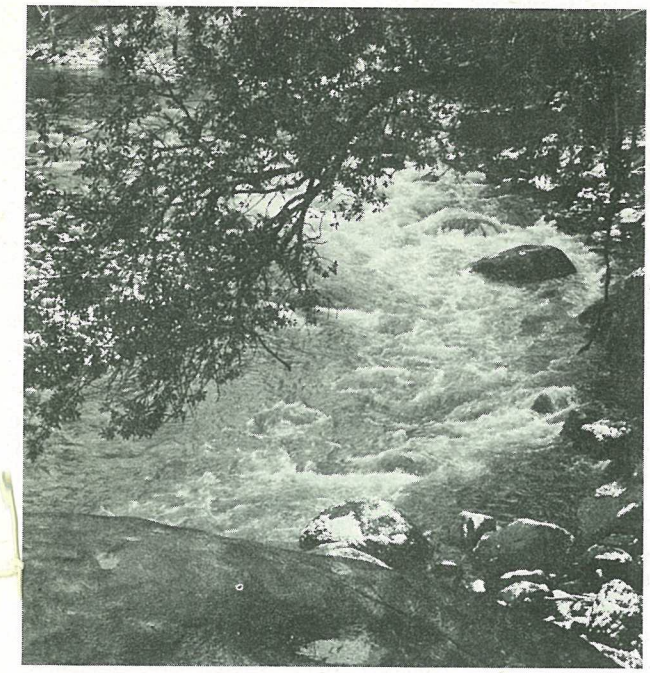


FIGURE 3
SNOWPACK ACCUMULATION
APRIL 1, 1973
Scale of Miles
40 0 40 80
LEGEND
115% Water Equivalent in Percent of Average
Drainage Area Boundary
Watershed Boundary
NORTH COASTAL
TRINITY 157%
UPPER SACRAMENTO 133%
FEATHER 140%
TRUCKEE 117%
YUBA 129%
TAHOE 117%
AMERICAN 129%
CARSON 130%
WALKER 134%
MOKELUMNE 122%
STANISLAUS 143%
MONO 113%
TUOLUMNE 139%
SAN FRANCISCO BAY
OWENS 152%
MERCED 132%
SAN JOAQUIN 148%
KINGS 165%
CENTRAL COASTAL
KAWEAH 189%
TULE 296%
KERN 176%
SOUTH COASTAL
COLORADO DESERT
N

STREAMFLOW



Runoff during the 1972-73 water year was above average in most river basins of California. The runoff distribution over the State was influenced by several major storm periods that concentrated their precipitation over the central and southern areas. As a result, high snowmelt contributions were experienced in central and southern Sierra watersheds from a mountain snowpack that was above average last winter and persisted well into May.

Although spring and summer rainfall was negligible, the above-normal winter precipitation resulted in water year runoff to the San Joaquin Valley that ranged from 110 percent of average on the Stanislaus River to 160 percent on the Tule River. This reversed the pattern of below-normal conditions that had existed during the previous three seasons in the San Joaquin Valley.

In central coast streams, runoff approached or exceeded 200 percent of average for the year, also reflecting the mid-state precipitation patterns.

Elsewhere in the State runoff was generally about 115 percent of average, except for the extreme North Coast where streams were 20 to 30 percent below average this year.

The Colorado River, a major source of imported supplies to Southern California, produced 145 percent of average inflow to Lake Powell during the water year.

HYDROGRAPHIC AREA	WATER YEAR UNIMPAIRED FLOW 1000 AF	PERCENT OF NORMAL
North Coastal	13,153	100
San Francisco Bay	181	155
Central Coastal	601	200
South Coastal	143	105
Central Valley		
Sacramento Basin	21,315	120
San Joaquin and Tulare Lake Basins	10,289	125
Lahontan	1,235	110
ENTIRE STATE	46,917	115

FIGURE 4
UNIMPAIRED RUNOFF
1972-73 WATER YEAR

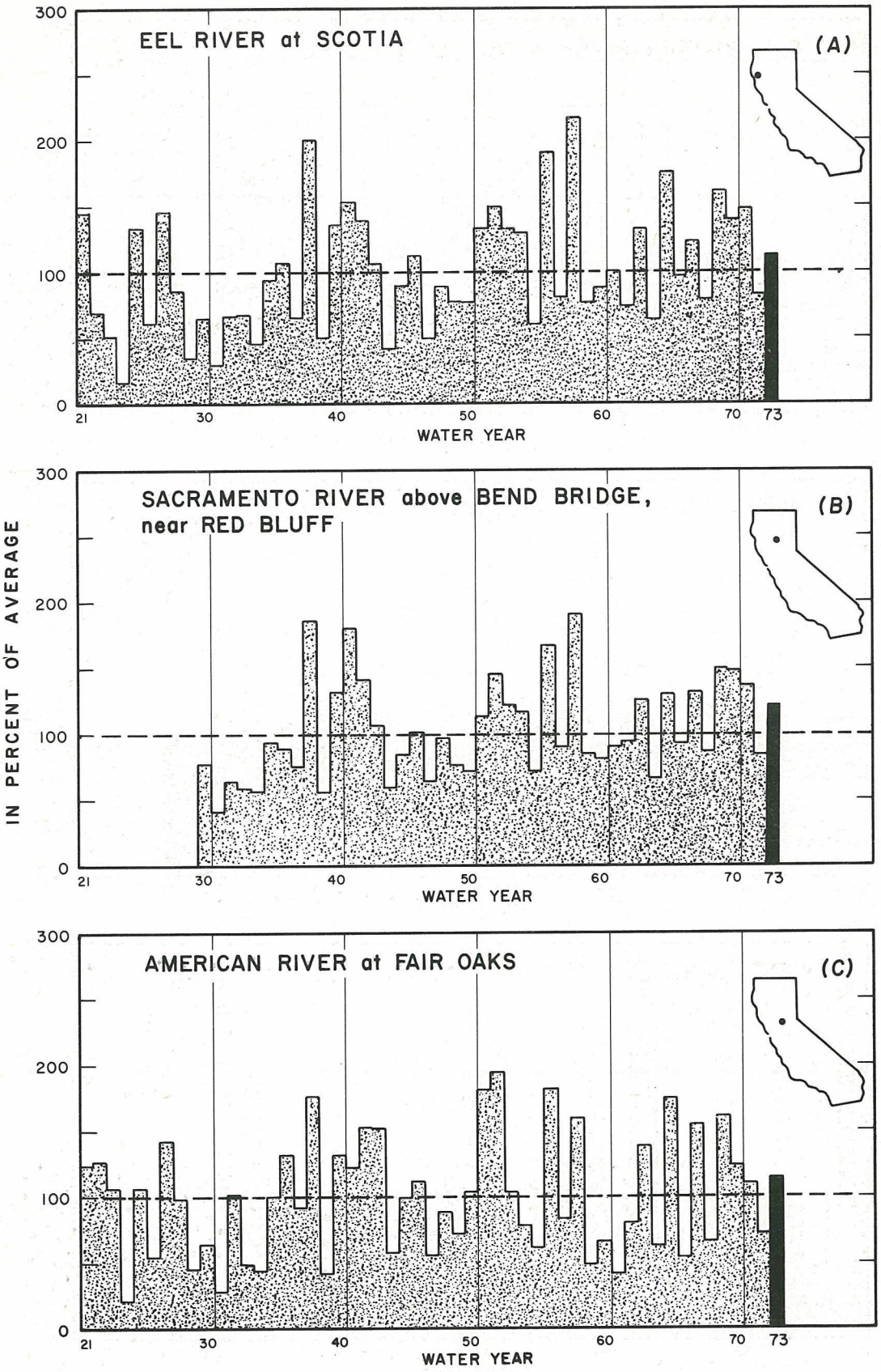
TABLE I

RUNOFF DATA FROM SELECTED STREAMS

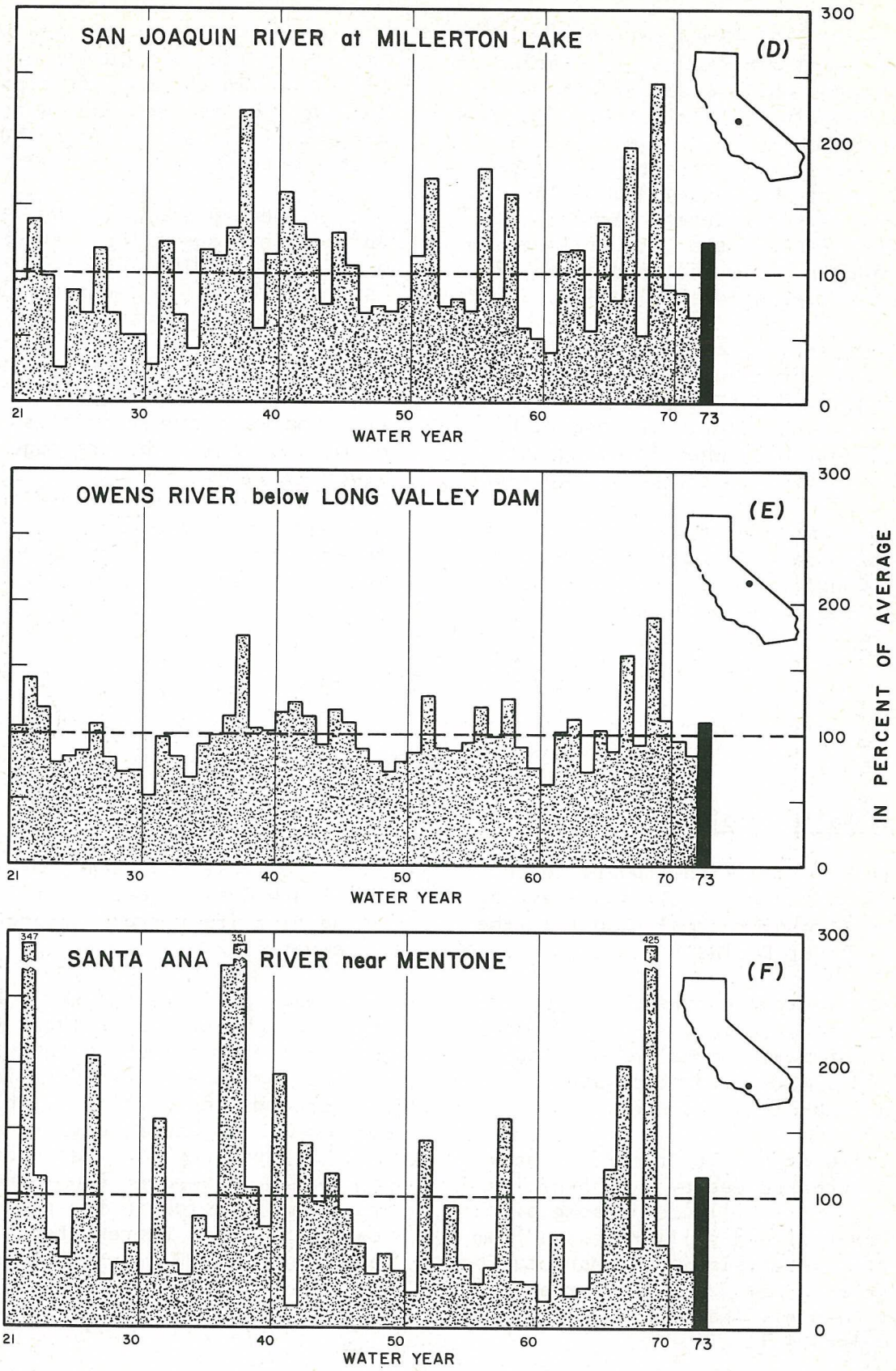
AREA, STREAM, AND STATION (1)	SNOWMELT PERIOD APRIL 1, 1973 - JULY 31, 1973				WATER YEAR OCTOBER 1, 1972 - SEPTEMBER 30, 1973			
	MEASURED FLOW 1000 AF	UNIMPAIRED RUNOFF			MEASURED FLOW 1000 AF	UNIMPAIRED RUNOFF		
		50-YEAR AVE (2) 1000 AF	PERIOD TOTAL 1000 AF	PER-CENT AVE		50-YEAR AVE (2) 1000 AF	ANNUAL TOTAL 1000 AF	PER-CENT AVE
NORTH COASTAL AREA								
KLAMATH, COPCO TO ORLEANS (3)(7)	1202.40	1664.88	1081.60	65	4691.60	4409.68	3588.50	81
SALMON AT SOMESBAR (3)	353.90	523.39	353.90	68	894.70	1246.05	894.70	72
TRINITY AT LEWISTON	38.60	617.25	690.20	112	130.60	1227.37	1383.10	113
EEL AT SCOTIA (3)	557.30	888.21	604.60	68	5870.10	5379.31	6038.80	112
RUSSIAN AT HEALDSBURG (3)	95.90	109.74	50.50	46	1398.90	886.24	1247.80	141
SAN FRANCISCO BAY AREA								
NAPA NEAR ST HELENA (3)	3.70	8.59	3.70	43	97.30	70.58	97.30	138
COYOTE CREEK NEAR MADRONE (3)	12.00	7.38	2.80	38	26.30	45.36	83.60	184
CENTRAL COASTAL AREA								
ARROYO SECO NEAR SOLEDAD (3)	24.30	22.74	24.30	107	233.90	108.46	233.90	216
NACIMIENTO BELOW NACIMIENTO DAM, NEAR BRADLEY (3)	44.00	25.64	1.60	6	166.80	190.68	367.40	193
SOUTH COASTAL AREA								
SESPE CREEK NEAR FILLMORE (3)	16.10(4)	15.17	16.10	106	72.10(4)	76.87	72.10	94
ARROYO SECO NEAR PASADENA (3)	1.70	1.54	1.70	110	8.10	6.67	8.10	121
SANTA ANA NEAR MENTONE (3)	22.30(5)	19.78	27.70	140	53.80(5)	54.96	63.10	115
SACRAMENTO VALLEY AREA								
INFLOW TO SHASTA (8)	1537.60	1764.00	1537.60	87	6166.80	5412.36	6166.80	114
SACRAMENTO ABOVE BEND BRIDGE (9)	2676.10	2421.70	2200.20	91	10442.20	7948.10	9677.70	122
FEATHER, INFLOW TO OROVILLE	734.70(8)	1862.30	1912.60	103	3376.20(8)	4287.07	4786.90	112
YUBA AT SMARTVILLE (6)	365.10	1081.46	1002.20	93	1987.90	2273.68	2665.60	117
AMERICAN, INFLOW TO FOLSOM	728.80(8)	1320.84	1259.50	95	2909.30(8)	2573.14	2938.30	114
COSUMNES AT MICHIGAN BAR	118.00	131.72	117.40	89	447.50	350.89	462.20	132
MOKELUMNE, INFLOW TO PARDEE	351.90	465.66	519.50	112	769.20	704.95	784.80	111
SAN JOAQUIN VALLEY AREA								
STANISLAUS, INFLOW TO MELONES	206.60	717.40	738.30	103	635.70	1085.32	1214.20	112
TUOLUMNE, INFLOW TO DON PEDRO	818.30	1194.53	1414.10	118	1679.80	1791.32	2062.60	115
MERCED, INFLOW TO EXCHEQUER	423.50	607.77	730.00	120	702.80	919.96	1121.70	122
SAN JOAQUIN, INFLOW TO MILLERTON	1111.80(8)	1186.65	1545.80	130	2003.40(8)	1660.11	2046.90	123
KINGS, INFLOW TO PINE FLAT	1507.70	1162.09	1660.50	143	2030.80	1567.62	2082.70	133
KAWEAH, INFLOW TO TERMINUS	450.60	269.75	450.70	167	615.60	402.48	615.30	153
TULE, INFLOW TO SUCCESS	112.10	63.13	111.00	176	225.60	142.24	225.40	158
KERN NEAR BAKERSFIELD	468.30	433.32	723.80	167	744.60	667.58	920.20	138
LAHONTAN AREA								
TRUCKEE, TAHOE TO FARAD (7)	230.30	263.81	285.50	108	491.80	380.76	402.90	106
WEST FORK CARSON AT WOODFORDS	56.40	54.18	56.40	104	77.90	74.38	77.90	105
EAST FORK CARSON NEAR GARDNERVILLE	208.40	179.66	208.40	116	274.40	245.46	274.40	112
WEST WALKER BELOW LITTLE WALKER, NEAR COLEVILLE	168.20	142.71	168.20	118	197.40	177.11	197.40	111
EAST WALKER NEAR BRIDGEPORT	73.50	59.68	87.60	147	107.50	104.53	125.70	120
OWENS BELOW LONG VALLEY DAM	57.20	59.53	72.60	122	201.90	141.76	156.30	110
COLORADO DESERT AREA								
COLORADO, INFLOW TO LAKE POWELL	9404.00	7636.78	11453.00	150	15553.00	11314.24	16139.00	143

(1) RESERVOIR INFLOW DATA ARE BASED ON OBSERVED FLOWS AT STATIONS DOWNSTREAM FROM LISTED FACILITY.
(2) COMPUTED FOR 50 YEAR PERIOD, 1920-21 THROUGH 1969-70.
(3) NON-SNOWMELT STREAM
(4) INCLUDES FILLMORE IRRIGATION COMPANY CANAL.
(5) INCLUDES SOUTHERN CALIFORNIA EDISON COMPANY CANAL.
(6) INCLUDES DEER CREEK.
(7) ACCRETIONS BETWEEN STATIONS.
(8) COMPUTED FROM OPERATING RECORDS-- UNADJUSTED FOR UPSTREAM REGULATION.
(9) UNIMPAIRED FLOWS COMPATIBLE TO THOSE AT DISCONTINUED STATION NEAR RED BLUFF.

Figure 5. ANNUAL UNIMPAIRED



RUNOFF IN PERCENT OF AVERAGE



FLOOD FLOWS

The 1972-73 flood season saw extensive local flooding from a series of heavy storms which overtaxed storm drains and minor streams; but there was no widespread flood damage from the State's major river systems. Colusa, Glenn, Marin, Monterey, Napa, Placer, San Luis Obispo, Sutter, Ventura, and Yuba Counties and the City of South San Francisco were declared areas of emergency due to local flooding.

The first local flooding started in early October in the San Francisco Bay Area, producing the wettest October ever recorded. Storms in January hit Marin County hard when flooding was compounded by exceptionally high tides.

The same January storms and high tides also caused flooding in Napa and Solano Counties, and required extensive flood fight work to prevent inundation of Webb, Bradford, Jersey, Holland, and Bethel Islands in the Sacramento-San Joaquin Delta.

Heavy storms in January and February produced a series of mudflows and slides in the Big Sur area of Monterey County, destroying a major portion of Big Sur Village and closing State Route 1.

A January storm in the San Luis Obispo area caused local streams to overflow, flooding 70 homes, sweeping many cars down flooded streets, and washing out many roads.

Flood damages in the Sacramento Valley counties of Colusa, Glenn, Sutter, and Yuba were caused by flash flooding of minor streams, by drainage canal levee failures, and by rock slides. The towns of Williams and Willows experienced some flooding, but most of the damages were to agricultural lands and crops, and to highway and railroad embankments.

WATER TRANSFERS

Central Valley Project

Trinity Division imports to the Central Valley were well above average because of above-normal runoff in the Trinity River Basin.

Delta exports through the Contra Costa Canal were less than 1972 exports because of above-normal runoff that produced a more favorable supply in the Antioch-Pittsburg area.

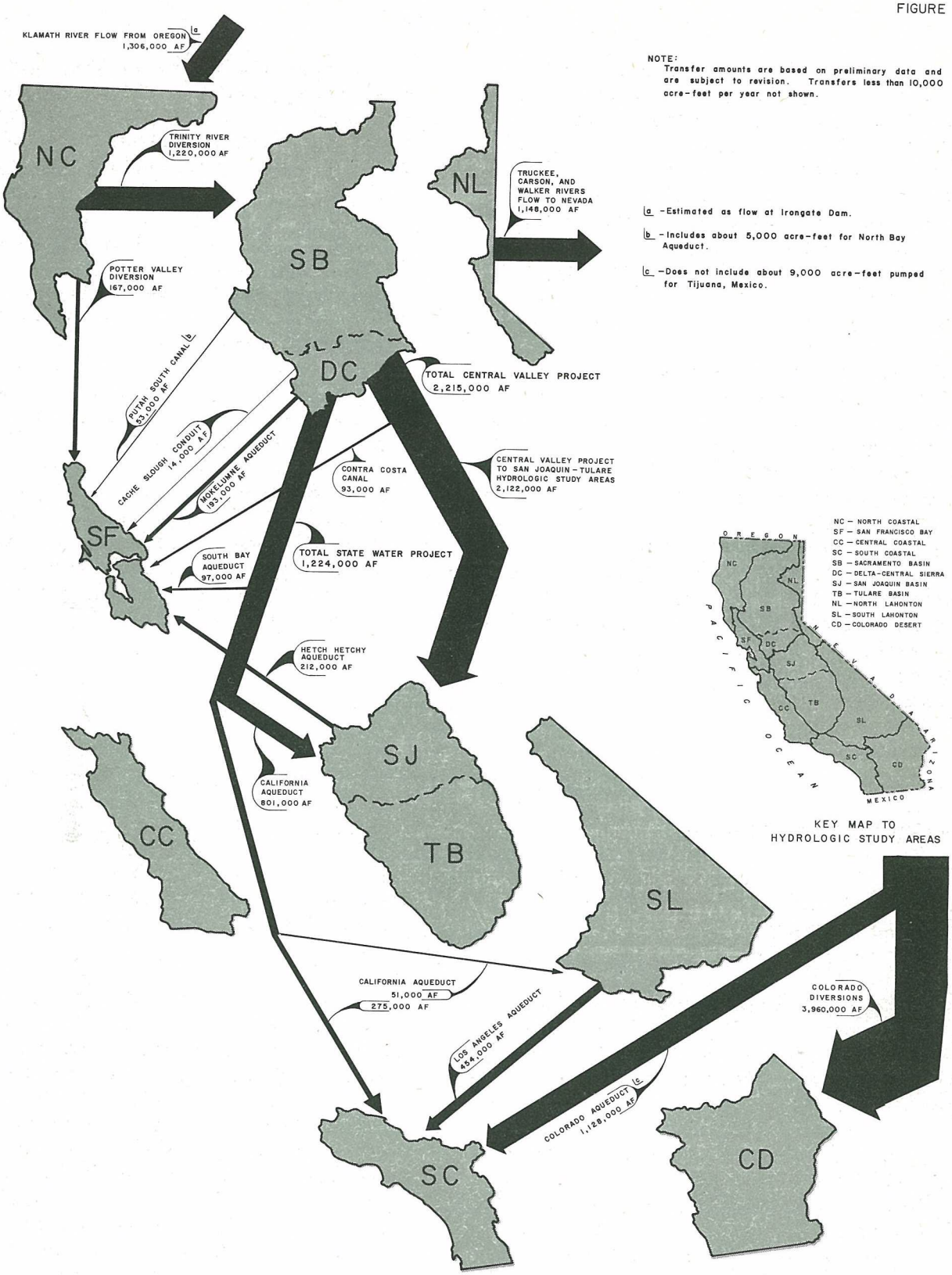
Delta exports to the San Joaquin Valley were reduced by a combination of two events: (1) use of some of the flood control and spill releases from Millerton Reservoir in the Mendota Pool service area and (2) above-normal winter rainfall that raised spring soil moisture levels.

State Water Project

The first deliveries of water to the South Coastal area near San Bernardino (East Branch) began in November 1972.

Water transferred through the Tehachapi Mountains included supplies for filling the four Southern California reservoirs: Pyramid, Castaic, Silverwood, and Perris. Combined storage for these reservoirs at the end of September 1973 was about 186,000 acre-feet, an amount equalling slightly more than one-fourth their combined capacity. This represented an increase of about 107,000 acre-feet over the amount stored in September 1972.

FIGURE 6



MAJOR WATER TRANSFERS
FOR 1972-73 WATER YEAR

WASTE WATER

Annual municipal and industrial waste water production and reclamation in California for the years 1970 through 1972 are summarized below. This summary shows that the greatest production of waste water was in the major metropolitan areas of the State, and that the largest quantities of waste water reclaimed were in the South Coastal and Tulare Basin areas.

Systematic waste water production records for the State have been collected only since 1970. Moreover, records in some areas are not considered to represent total production. Because of the short and incomplete record for the years shown, conclusions concerning trends in waste water production have not been made.

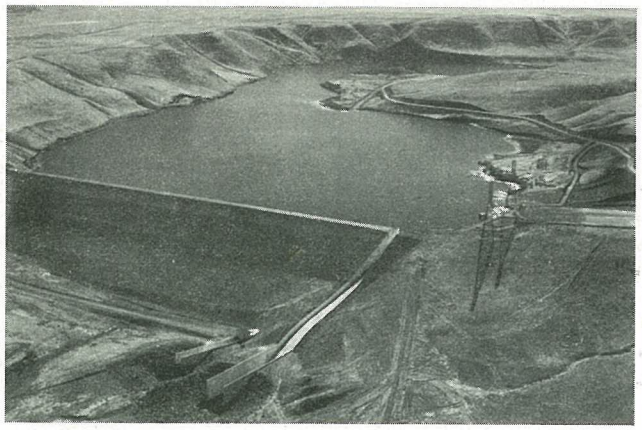
Much of the waste water production in interior California is returned to the usable water supply and reused naturally. Only in the coastal areas, primarily from the major metropolitan centers where waste water is discharged to saline water, does reclamation represent a potential new water supply. However, the quality of the waste water produced must be considered carefully before reuse. Approximately 1.5 million acre-feet of the waste water produced in 1972 is believed to contain less than 1500 milligrams per liter of total dissolved solids and is thus potentially suitable for reclamation. In addition specific mineral constituents may affect this potential.

Agricultural return flows, not included in the table below, are in most cases of good quality and are returned directly to the usable water supply. These flows constitute a significant water supply.

SUMMARY OF ANNUAL
WASTE WATER PRODUCTION AND RECLAMATION PRACTICES
Calendar Years

HYDROLOGIC STUDY AREA	ESTIMATED POPULATION SERVED (1000's)			WASTE WATER PRODUCTION (1000 Acre-Feet)			WASTE WATER RECLAMATION (1000 Acre-Feet)		
	1970	1971	1972	1970	1971	1972	1970	1971	1972
North Coastal	83	85	85	11	71	73	1	1	1
San Francisco Bay	4,347	4,524	4,578	607	582	552	8	4	8
Central Coastal	655	644	718	96	94	114	10	8	5
South Coastal	10,325	10,653	11,021	1,223	1,249	1,282	60	63	56
Sacramento Basin	534	542	618	63	89	106	5	6	12
Delta-Central Sierra	687	792	902	119	126	133	4	1	10
San Joaquin Basin	228	290	356	46	55	65	9	12	29
Tulare Basin	631	716	719	84	121	120	64	83	49
North Lahontan	54	50	56	6	6	11	3	3	6
South Lahontan	172	168	176	20	19	20	6	5	7
Colorado Desert	133	150	162	22	23	22	6	5	6
TOTAL	17,849	18,614	19,389	2,297	2,435	2,498	175	190	189

RESERVOIR STORAGE



Reservoir storage was adequate to meet all firm commitments during the 1972-73 water year. Amounts in storage throughout the State were slightly above average for October 1 and well above the amounts in storage last year on this date.

In the Sacramento Valley, storage in the larger reservoirs was average or above at the end of the water year, with nearly 1 million acre-feet more water in storage than in the previous year.

San Joaquin Valley reservoirs were also storing above average amounts on October 1, and had increased impoundments by over 1.5 million acre-feet during the water year. Most major reservoirs reached maximum storage in June; however, flood control releases were necessary from only one, Millerton Lake. More than 116,000 acre-feet were released from Millerton Lake to the San Joaquin River during the period March 27 through May 1.

Only Lahontan area reservoir storage was slightly below average at water years' end, influenced by Lakes Crowley and Tahoe, which are both storing about 95 percent of average supplies.

Storage on the Colorado River is excellent and Lake Mead, Southern California's source for much of its imported supplies, is storing over 20 million acre-feet or 130 percent of average.

With no major water storage deficiencies anywhere in California at this time, prospects for adequate reservoir supplies during 1974 appear excellent.

RESERVOIR STORAGE BY HYDROGRAPHIC AREA
THOUSANDS OF ACRE-FEET

AREA	NUMBER OF RESERVOIRS	TOTAL CAPACITY	10-YEAR AVERAGE 1963-72	STORAGE OCTOBER 1 1973	PERCENT OF AVERAGE	PERCENT OF CAPACITY
INTRASTATE:						
North Coastal	4	2,714	1,994	2,010	100	75
San Francisco Bay	17	620	347	387	110	60
Central Coastal	6	986	496	667	135	70
South Coastal	26	1,486	472	630	135	40
Sacramento Valley	34	16,005	11,075	11,822	105	75
San Joaquin Valley	27	7,665	2,756	3,719	135	50
Lahontan	7	348	247	232	95	65
Subtotal	121	29,824	17,387	19,467	110	65
INTERSTATE:						
North Coastal	3	1,205	526	451	85	35
Lahontan	3	828	542	502	95	60
Colorado Desert (1)	4	53,533	27,562	39,431	145	75
Subtotal (1)	10	55,566	28,630	40,384	140	75
TOTAL (1)	131	85,390	46,017	59,851	130	70

(1) Includes data for Lake Mead and Lake Powell which regulate flow of the Lower Colorado River, the major source of water for the Colorado Desert and South Coastal areas.

TABLE 2

STORAGE IN MAJOR RESERVOIRS

AREA AND DRAINAGE BASIN	RESERVOIR	OPERATOR	CAPACITY (1) 1000 AF	STORAGE AS OF OCTOBER 1: 10-YR AVE 1963-1972 1000 AF	1972 1000 AF	1973 1000 AF	1973 PER-CENT AVE
NORTH COASTAL AREA							
KLAMATH R	UPPER KLAMATH (2)	USBR	584.000	277.330	335.260	188.330	68
	CLEAR LAKE (2)	USBR	526.800	208.110	297.930	238.640	115
	GERBER (2)	USBR	94.300	40.990	45.930	23.970	58
SHASTA R	DWINNELL	MONTAGUE WCD	50.000	13.850	16.720	6.500	47
TRINITY R	CLAIR ENGLE LAKE	USBR	2447.700	1878.460	1913.000	1904.200	101
SOUTH EEL R	LAKE PILLSBURY	PAC GAS AND ELEC CO	93.700	41.740	39.430	40.710	98
RUSSIAN R	LAKE MENDOCINO	US CORPS OF ENGIN	122.500	60.270	60.270	58.780	98
SAN FRANCISCO BAY AREA							
NORTH BAY							
CONN CR	LAKE HENNESSEY	CITY OF NAPA	31.000	23.910	15.800	24.300	102
NICASIO CR	NICASIO	MARIN MWD	22.500	13.230	3.800	10.440	79
LAGUNITAS CR	KENT	MARIN MWD	16.700	11.960	12.100	12.680	106
	ALPINE	MARIN MWD	8.900	3.830	2.100	4.410	115
SOUTH EAST BAY							
SAN PABLO CR	SAN PABLO (3)	EAST BAY MUD	43.200	23.510	29.780	20.080	85
SAN LEANDRO CR	U SAN LEANDRO (3)	EAST BAY MUD	41.400	26.950	21.780	20.700	77
	CHABOT(3)	EAST BAY MUD	12.600	9.660	9.150	9.240	96
BEAR CR	BRIONES (3)	EAST BAY MUD	60.400	39.500(6)	51.450	53.860	135
SAN ANTONIO CR	SAN ANTONIO	CITY CO SAN FRANCISCO	50.500	29.820(6)	22.320	36.250	121
COYOTE CR	COYOTE	SANTA CLARA CO FCWD	24.500	6.310	3.320	17.350	275
	LEROY ANDERSON	SANTA CLARA CO FCWD	93.100	34.990	22.140	60.130	172
LOS GATOS CR	LEXINGTON	SANTA CLARA CO FCWD	21.400	3.430	1.810	14.060	409
	AUSTRIAN	SAN JOSE WATER WORKS	6.200	1.200	0.300	0.450	37
CALAVERAS CR	CALAVERAS (3)	CITY CO SAN FRANCISCO	100.000	61.740	48.860	47.970	78
PENINSULA							
SAN ANDREAS CR	SAN ANDREAS	CITY CO SAN FRANCISCO	18.500	12.980	3.570	15.950	123
LAGUNA CR	UPPER AND LOWER						
SAN MATEO CR	CRYSTAL SPRINGS(3)	CITY CO SAN FRANCISCO	69.500	44.170	48.470	38.770	88
CENTRAL COASTAL AREA							
SALINAS R	SANTA MARGARITA LK	SAN LUIS OBISPO CITY	26.000	19.370	11.890	20.810	107
	SAN ANTONIO	MONTEREY CO FCWCD	350.000	198.700(6)	99.400	197.700	98
	NACIMIENTO	MONTEREY CO FCWCD	350.000	87.440	24.440	218.000	249
SANTA YNEZ R	GIBRALTAR	SANTA BARBARA CITY	14.800	7.540	3.010	5.780	77
	CACHUMA	USBR	204.900	160.620	121.310	185.590	116
OLD CR	WHALE ROCK	SAN LUIS OBISPO CITY	40.000	21.810	31.660	39.600	182
SOUTH COASTAL AREA							
VENTURA-SANTA CLARA RIVERS							
COYOTE CR	CASITAS	VENTURA R MWD	254.000	125.830	183.370	228.100	181
PIRU CR	LAKE PIRU *	UNITED WCD CONS DIST	101.200	22.010	14.780	21.400	97
MATILIJA CR	MATILIJA	VENTURA CO FCD	3.500	1.060	0.120	1.470	139
SAN GABRIEL-SANTA ANA RIVERS							
SAN GABRIEL R	COGSWELL	LA CO FCD	10.900	2.480	1.060	3.420	138
	SAN GABRIEL	LA CO FCD	43.800	2.380	0.000	0.000	0
BEAR CR	BEAR VALLEY	BEAR V MUT WATER CO	72.200	34.910	52.430	61.700	177
TRIB, CAJALCO CR	LAKE MATHEWS (4)	METROPOLITAN WD	182.000	118.360	101.670	94.340	80
SAN JACINTO R	LAKE HEMET	LAKE HEMET WATER CO	13.400	5.420	5.640	7.530	139
	RAILROAD CANYON (3)	TEMESCAL WATER CO	14.700	4.650	6.980	7.800	168
SANTIAGO CR	SANTIAGO (3)	SERRANO AND CARPENTER ID AND IRVINE CO	25.000	9.410	5.920	8.350	89
	VILLA PARK	ORANGE COUNTY FCD	15.600	0.010	0.000	0.410	4100

TABLE 2

STORAGE IN MAJOR RESERVOIRS (CONTINUED)

AREA AND DRAINAGE BASIN	RESERVOIR	OPERATOR	CAPACITY (1) 1000 AF	STORAGE AS OF OCTOBER 1: 10-YR AVE 1963-1972 1000 AF	1972 1000 AF	1973 1000 AF	1973 PER-CENT AVE
SOUTH COASTAL AREA (CONTINUED)							
SANTA MARGARITA-SAN LUIS REY RIVERS							
TEMECULA CR	VAIL	VAIL COMPANY	49.500	13.890	21.880	23.050	166
SAN LUIS REY R	HENSHAW	VISTA ID	194.300	8.030	2.930	1.980	25
SAN DIEGUITO-SAN DIEGO RIVERS							
SAN DIEGUITO R	LAKE HODGES (3)	CITY OF SAN DIEGO	33.600	2.960	0.390	1.230	41
SAN YSABEL CR	SUTHERLAND	CITY OF SAN DIEGO	29.700	2.530	2.380	3.390	134
SAN VICENTE CR	SAN VICENTE (3)	CITY OF SAN DIEGO	90.200	60.990	60.940	78.800	129
SAN DIEGO R	EL CAPITAN (3)	CITY OF SAN DIEGO	112.800	19.500	10.180	33.020	169
BOULDER CR	CUYAMACA	HELIX ID	11.800	0.480	0.540	0.730	149
QUAIL CANYON CR	LAKE JENNINGS (3)	HELIX ID	9.800	6.330	8.190	8.100	128
CHAPPAREL CANYON	MURRAY (3)	CITY OF SAN DIEGO	5.700	3.590	4.480	4.560	127
SWEETWATER-OTAY RIVERS - COTTONWOOD CR							
SWEETWATER R	LAKE LOVELAND	CALIF WATER AND TEL C	25.400	6.670	14.260	15.690	235
	SWEETWATER MAIN (3)	CALIF WATER AND TEL C	27.700	2.720	3.730	2.840	104
OTAY R	LOWER OTAY (3)	CITY OF SAN DIEGO	56.500	8.190	7.040	11.620	142
COTTONWOOD CR	MORENA	CITY OF SAN DIEGO	50.200	1.820	2.630	3.610	197
	BARRETT	CITY OF SAN DIEGO	44.800	1.740	0.770	0.770	45
SOLEDAD VALLEY							
BIG SURR CR	MIRAMAR (3)	CITY OF SAN DIEGO	7.300	6.000	6.320	6.130	102
CENTRAL VALLEY AREA							
SACRAMENTO R	SHASTA	USBR	4500.000	3200.520	3266.500	3316.600	104
	WHISKEYTOWN	USBR	241.100	224.820(6)	217.100	217.500	96
FEATHER R	LAKE ALMANOR	PAC GAS AND ELEC CO	1035.500	752.800	758.700	983.330	131
	BUTT VALLEY	PAC GAS AND ELEC CO	49.900	37.690	40.250	45.880	122
	BUCKS STORAGE	PAC GAS AND ELEC CO	101.700	57.140	65.580	59.240	104
	FRENCHMAN	DWR - STATE OF CALIF	55.400	40.520	40.200	38.460	95
	LAKE DAVIS	DWR - STATE OF CALIF	84.400	70.790(6)	71.610	71.640	100
	LITTLE GRASS VALLEY	OROVILLE WYANDOTTE ID	93.000	60.100	65.830	68.320	114
	SLY CREEK	OROVILLE WYANDOTTE ID	65.000	40.990	34.200	24.140	59
	LAKE OROVILLE	DWR - STATE OF CALIF	3538.000	2468.320(6)	2611.500	2728.500	110
YUBA R	BULLARDS BAR	YUBA CO WATER AGENCY	930.000	610.360(6)	594.570	615.140	100
	JACKSON MEADOWS	NEVADA ID	68.700	52.000(6)	67.950	48.670	93
	BOWMAN LAKE	NEVADA ID	69.800	37.100	3.060	46.700	126
	SPAULDING SYSTEM	PAC GAS AND ELEC CO	137.400	84.520	74.470	38.080	45
	SCOTT FLAT	NEVADA ID	48.500	23.970	31.090	31.280	130
BEAR R	ROLLINS	NEVADA ID	66.000	54.850(6)	57.910	50.640	91
	CAMP FAR WEST	SO SUTTER WATER DIST	104.400	39.440(6)	25.800	62.100	156
AMERICAN R	FRENCH MEADOWS	PLACER CO WATER AGENC	133.700	95.980(6)	108.160	78.440	81
	HELL HOLE	PLACER CO WATER AGENC	208.400	128.050(6)	87.630	139.340	108
	LOON LAKE	SACRAMENTO MUD	76.500	33.220(6)	36.580	36.480	109
	CAPLES LAKE	PAC GAS AND ELEC CO	21.600	15.200	13.920	15.050	99
	UNION VALLEY	SACRAMENTO MUD	271.000	174.700(6)	161.060	190.830	108
	ICE HOUSE	SACRAMENTO MUD	46.000	29.750	27.580	31.940	107
	FOLSOM	USBR	1010.300	638.390	658.700	742.200	116
STONY CR	EAST PARK	USBR	50.900	11.780	0.280	16.240	138
	STONY GORGE	USBR	50.000	7.540	16.210	5.670	75
	BLACK BUTTE	US CORPS OF ENGIN	160.000	30.820(6)	33.810	31.600	102
CACHE CR	CLEAR LAKE	CLEAR LAKE WATER CO	314.000	83.070	24.000	60.200	72
PUTAH CR	BERRYESSA	USBR	1602.300	1384.880	1148.200	1389.490	100
COSUMNES R	JENKINSON LAKE	USBR	41.000	27.880	22.200	22.480	81

TABLE 2

STORAGE IN MAJOR RESERVOIRS (CONTINUED)

AREA AND DRAINAGE BASIN	RESERVOIR	OPERATOR	CAPACITY (1) 1000 AF	STORAGE AS OF OCTOBER 1: 10-YR AVE 1963-1972 1000 AF	1972 1000 AF	1973 1000 AF	1973 PER-CENT AVE
CENTRAL VALLEY AREA (CONTINUED)							
MOKELUMNE R	LOWER BEAR	PAC GAS AND ELEC CO	48.500	28.290	26.300	26.970	95
	SALT SPRINGS	PAC GAS AND ELEC CO	140.900	84.510	81.150	77.240	91
	PARDEE	EAST BAY MUD	210.000	189.550	194.270	194.460	103
	CAMANCHE	EAST BAY MUD	431.500	255.670(6)	246.170	316.790	123
CALAVERAS R	NEW HOGAN	US CORPS OF ENGIN	325.000	148.170(6)	115.000	143.770	96
STANISLAUS R	RELIEF	PAC GAS AND ELEC CO	15.600	4.260	2.430	3.640	85
	DONNELLS	OAKDALE-SO SAN JOAQ I	64.700	35.470	26.290	23.350	66
	HARTLEY LAKE	OAKDALE-SO SAN JOAQ I	98.300	80.950	72.020	89.180	110
	STRAWBERRY	PAC GAS AND ELEC CO	18.300	10.220	10.150	9.140	89
	MELONES	PAC GAS AND ELEC CO	112.600	20.360	10.940	22.440	110
	TULLOCH	OAKDALE-SO SAN JOAQ I	68.200	35.990	14.870	12.320	34
TUOLUMNE R	HETCH HETCHY	CITY CO SAN FRANCISCO	360.400	251.580	205.050	257.130	102
	CHERRY LAKE	CITY CO SAN FRANCISCO	268.200	130.260	70.350	151.360	116
	LAKE ELEANOR	CITY CO SAN FRANCISCO	26.100	9.780	0.020	2.450	25
	DON PEDRO	TURLOCK AND MODESTO I	2030.000	242.400(6)	362.400	913.180	376
	TURLOCK LAKE	TURLOCK ID	49.000	19.810	11.120	28.560	144
	MODESTO	MODESTO ID	27.000	10.410	4.000	11.000	106
MERCED R	LAKE MCCLURE	MERCED ID	1026.000	505.230(6)	292.700	673.650	132
SAN JOAQUIN R	FLORENCE LAKE	SO CALIF EDISON CO	64.600	23.630	25.450	26.110	110
	THOMAS A EDISON	SO CALIF EDISON CO	125.200	91.570	92.830	92.480	101
	MAMMOTH POOL	SO CALIF EDISON CO	122.700	33.730	34.760	43.390	129
	HUNTINGTON LAKE	SO CALIF EDISON CO	89.800	80.270	86.420	87.030	108
	SHAVER LAKE	SO CALIF EDISON CO	135.400	75.000	54.550	98.100	131
	CRANE VALLEY	PAC GAS AND ELEC CO	45.400	24.840	26.430	29.010	117
	MILLERTON LAKE	USBR	520.600	184.790	146.500	143.500	78
KINGS R	COURTRIGHT	PAC GAS AND ELEC CO	129.900	45.240	50.090	59.950	133
	WISHON	PAC GAS AND ELEC CO	128.600	77.130	81.430	126.630	164
	PINE FLAT	US CORPS OF ENGIN	1013.400	411.220	269.800	425.380	103
KERN R	ISABELLA	US CORPS OF ENGIN	570.000	170.860	50.400	223.440	131
KAWEAH R	TERMINUS	US CORPS OF ENGIN	150.000	17.120	9.040	9.310	54
TULE R	SUCCESS	US CORPS OF ENGIN	80.000	15.170	4.250	13.490	89
LAHONTAN AREA							
TRUCKEE R	LAKE TAHOE(2,7)	TRUCKEE-CARSON ID	744.600	507.080	481.900	485.300	96
	BOCA (2)	WASHOE CO WCD	41.200	17.650	28.100	4.320	24
EAST WALKER R	BRIDGEPORT (2)	WALKER RIVER ID	42.500	17.040	5.800	12.000	70
MONO LAKE BASIN	SADDLEBAG LAKE	SO CALIF EDISON CO	11.100	6.870	7.420	6.970	101
	GEM LAKE	SO CALIF EDISON CO	17.600	11.070	10.610	16.220	146
	GRANT LAKE	CITY OF LOS ANGELES	47.500	35.590	15.330	28.020	79
OWENS R	SOUTH LAKE	SO CALIF EDISON CO	13.400	9.870	8.400	11.640	118
	LAKE CROWLEY	CITY OF LOS ANGELES	183.500	139.140	60.300	134.540	97
	TINEMAHA	CITY OF LOS ANGELES	16.600	5.350	6.250	0.890	17
	HAIWEE (SOUTH)	CITY OF LOS ANGELES	58.500	38.750	42.290	34.030	88
COLORADO DESERT AREA							
COLORADO R	LAKE POWELL (2,7)	USBR	25002.000	10075.130(6)	12488.000	17284.000	171
	LAKE MEAD (2,7)	USBR	26102.000	15533.600	17451.000	20176.000	130
	LAKE MOJAVE (2,7)	USBR	1810.000	1396.810	1403.900	1412.200	101
	LAKE HAVASU (2,7)	USBR	619.000	555.990	560.200	559.000	101

(1) TOTAL CAPACITY TO THE NEAREST HUNDRED ACRE FEET.
(2) INTERSTATE RESERVOIR USED JOINTLY BY CALIFORNIA AND ADJACENT STATES.
(3) INCLUDES FOREIGN WATER.
(4) STORES ONLY IMPORTED COLORADO RIVER WATER.
(5) NEW RESERVOIR--AVERAGE CONSIDERED EQUAL TO CURRENT STORAGE.
(6) LESS THAN 10-YEAR AVERAGE.
(7) DATA BASED ON ACTIVE OR USABLE CAPACITY TABLES.

GROUND WATER

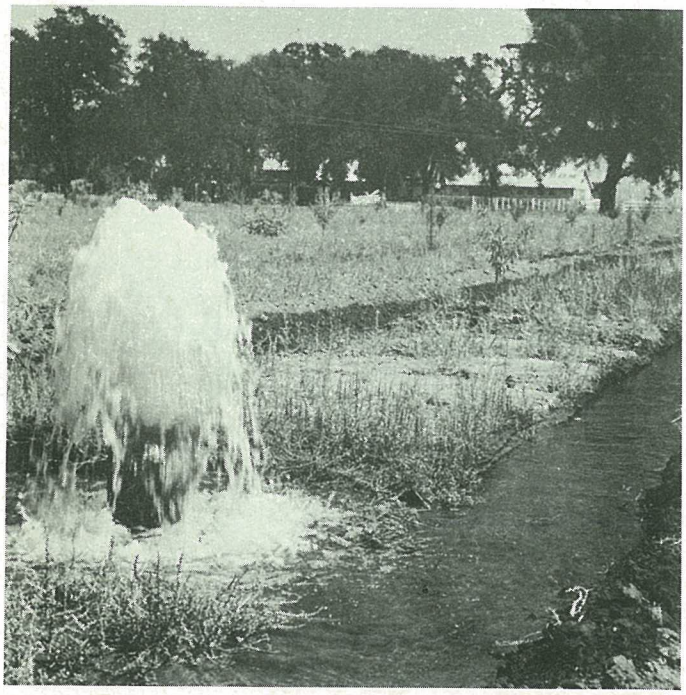
Measurements of wells in numerous ground water basins in California indicate that in general there were no significant ground water level changes in Northern California basins; however, water levels declined in some basins in Central California and in some basins in Southern California. Ground water levels did not respond quickly to the wetness of the current water year. This is because the percolation process is, in general, very slow.

Northern California

In the Sacramento Valley, spring 1973 ground water levels were generally normal after recovering from a decline that followed below-normal precipitation in 1972. No significant ground water level changes occurred in the northern ground water basins. Lower-than-usual pumping levels were reported occasionally near the end of the season in a few local areas of heavy demand.

Central California

Water delivered by the State Water Project since 1962 has caused rising ground water levels in Santa Clara Valley and South Bay Area as surface deliveries have reduced the need for ground water pumping. Levels continued to drop in the east side of Sacramento Valley, in Yuba, San Joaquin, and Sacramento Counties. In the San Joaquin Valley, ground water levels were generally stable in the area from the Chowchilla River northward. In the southern San Joaquin Valley, the general trend of ground water levels was down, with the central portion showing a drop of four feet and the southern part about 10 feet this past water year. In the Mendota-Huron area water levels in the deep confined aquifer have shown a significant rise of about 90 feet in the last five years as the surface supply to Westlands Water District (federal Central Valley Project service area) from the joint federal-state aqueduct continues to replace ground water pumping. Overdraft in the Tulare Irrigation District area has caused land subsidence while the water levels have remained in the same range.



Southern California

Water levels in most Southern California areas continued to decline, but at a slightly decreased rate compared to the previous year, except in areas influenced by artificial recharge operations or reduced pumpage as a result of ground water adjudication. Artificial recharge appears to be effective in raising water levels in San Gabriel Valley, Central Coastal Plain, and Santa Clara River Valley. Reduction in ground water pumpage due to adjudication appears to be effective in stabilizing water levels in West Coastal Plain and San Fernando Valley. The impact of some recharge programs, such as in the Coachella Valley, has not been fully realized because of their short-term operation.

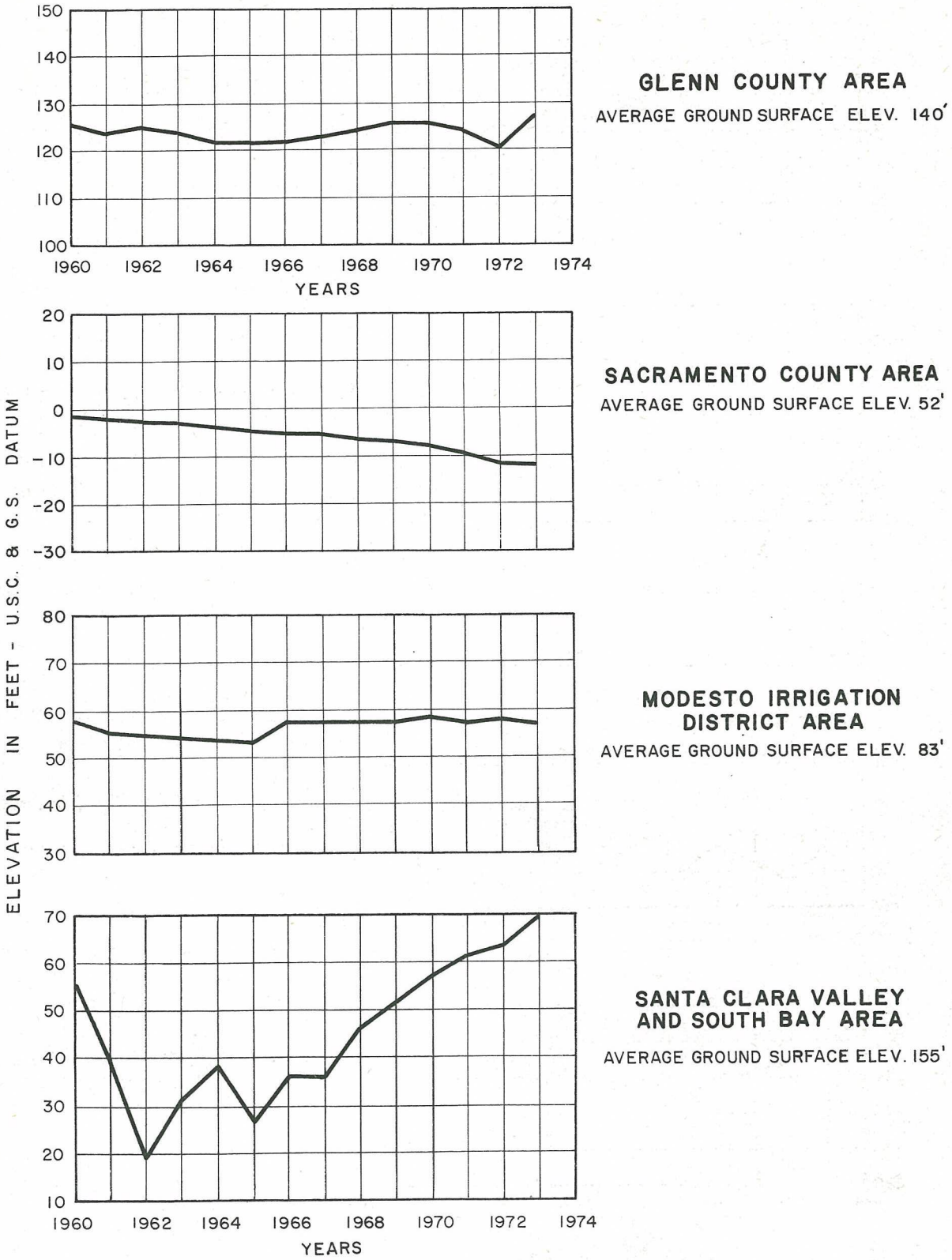


Figure 7. FLUCTUATION OF AVERAGE GROUND WATER LEVELS - NORTHERN AND CENTRAL CALIFORNIA

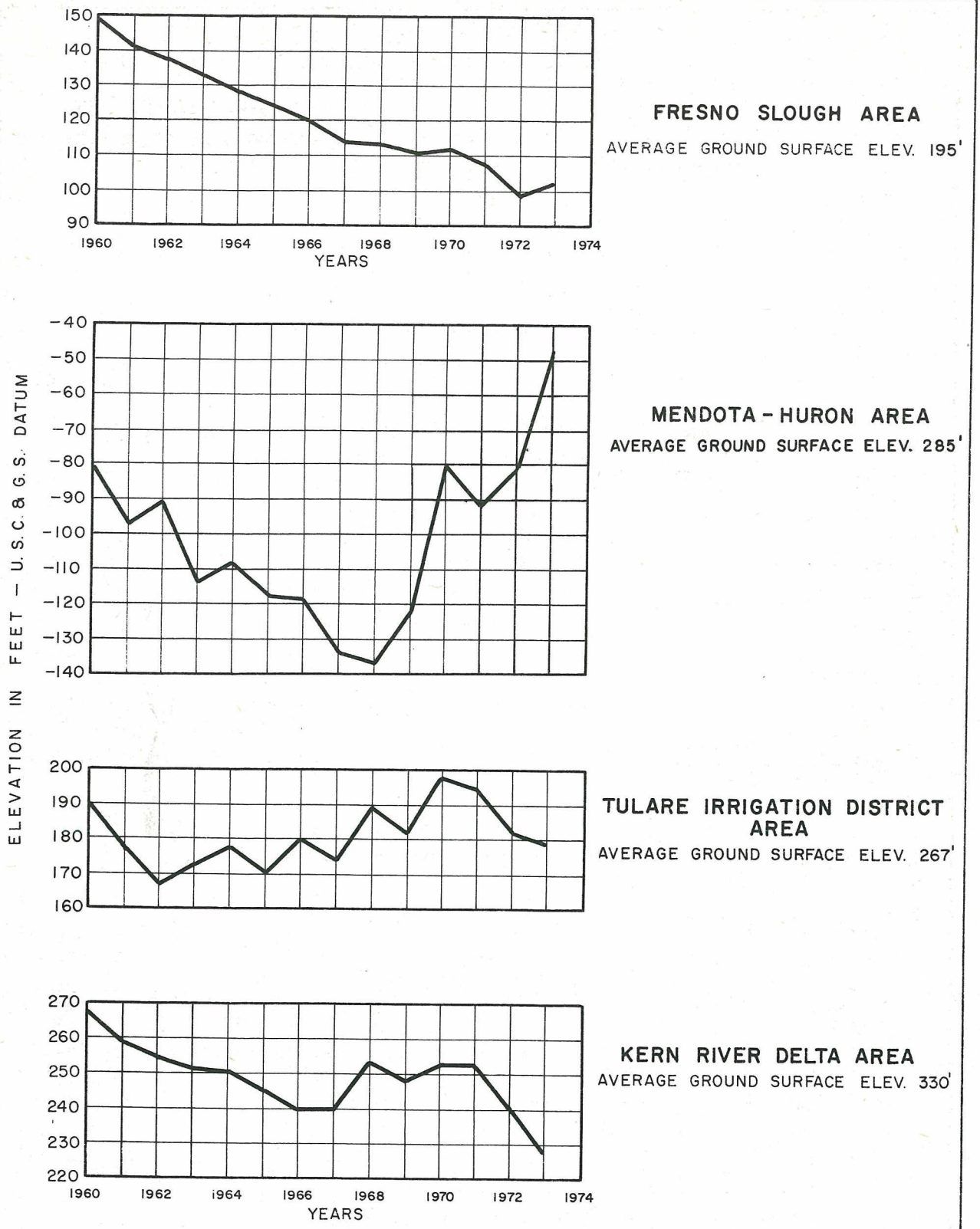


Figure 8. FLUCTUATION OF AVERAGE GROUND WATER LEVELS - SAN JOAQUIN VALLEY

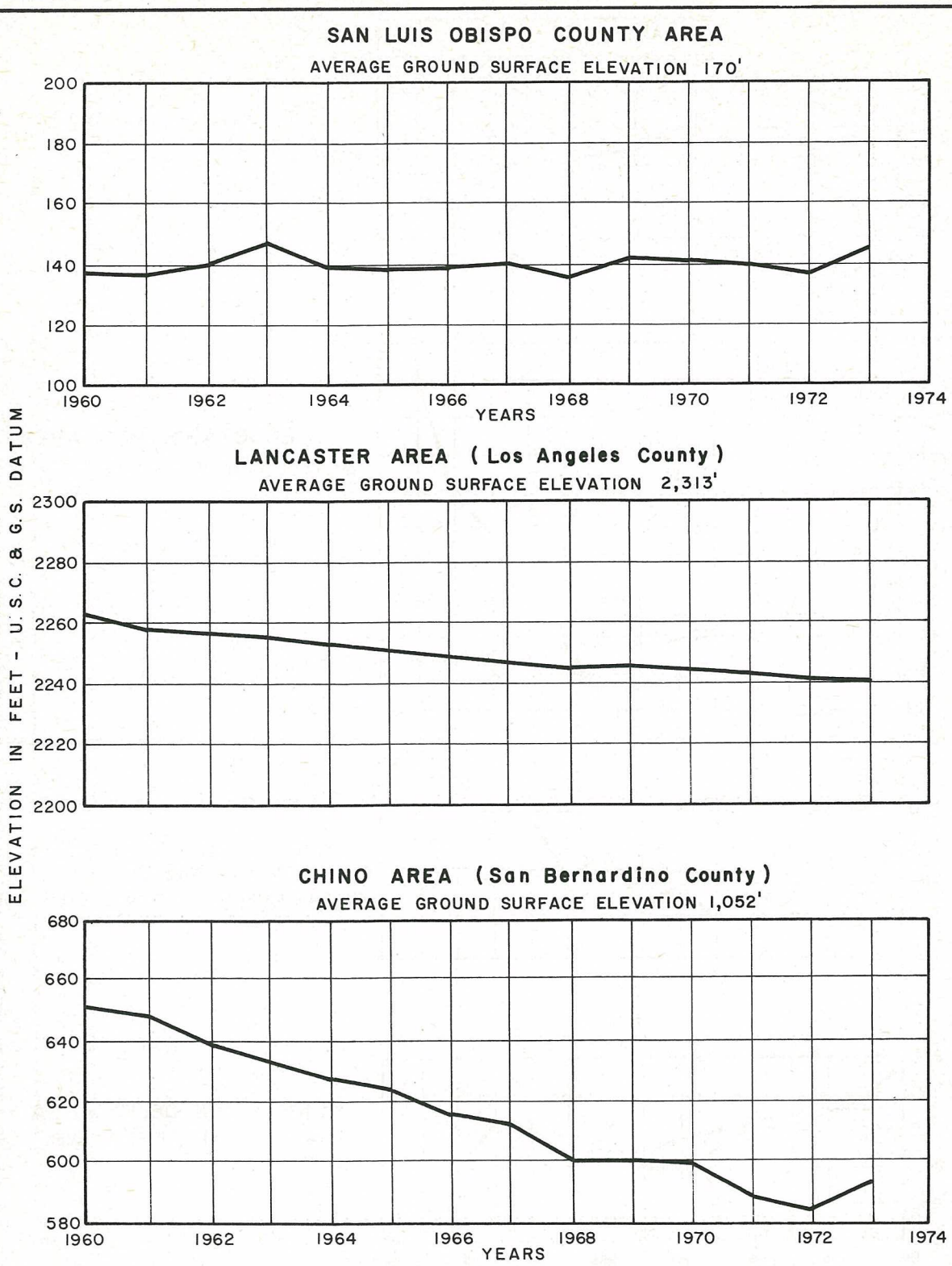


Figure 9. FLUCTUATION OF AVERAGE GROUND WATER LEVELS-SOUTHERN CALIFORNIA

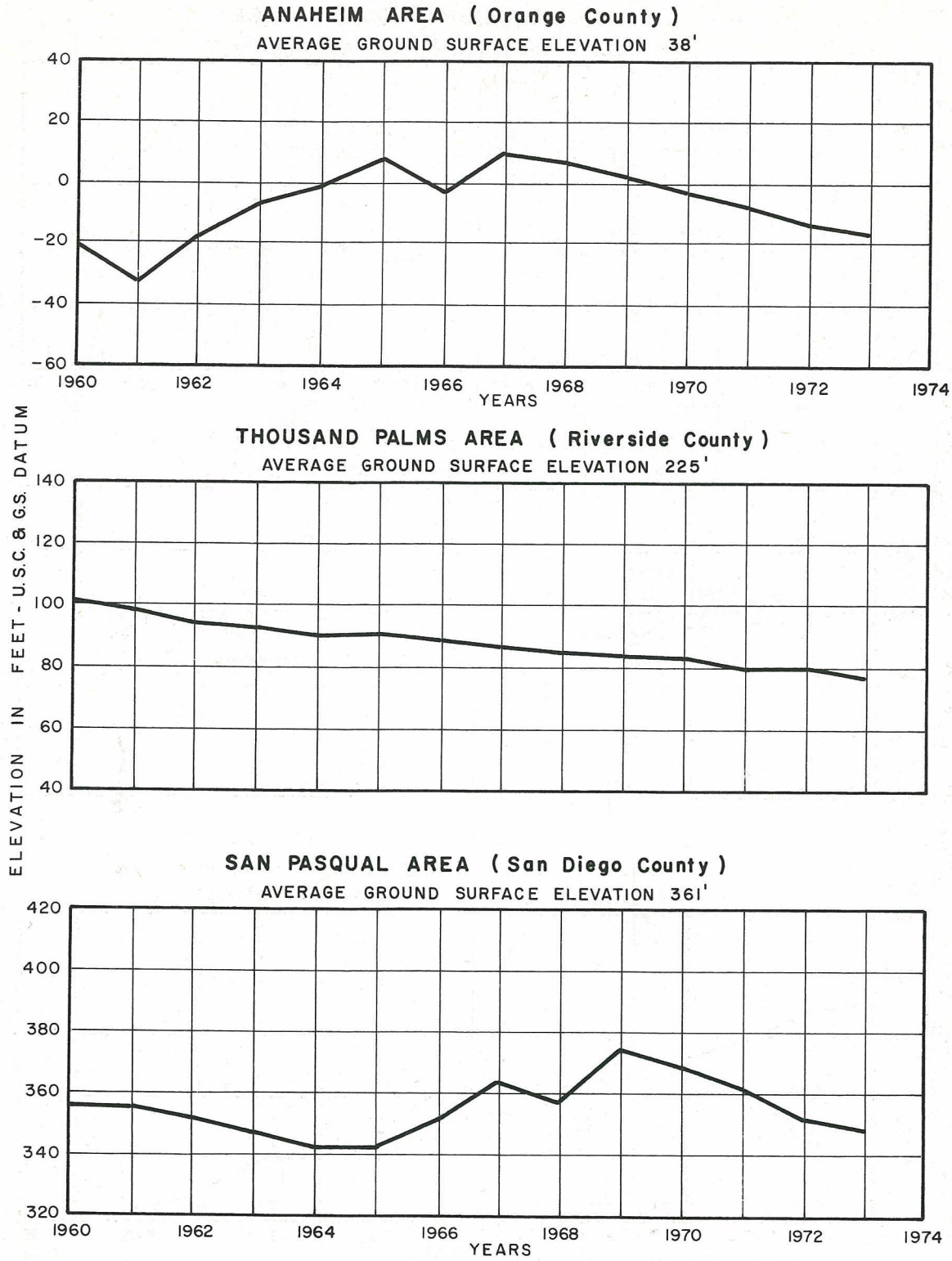


Figure 9. FLUCTUATION OF AVERAGE GROUND WATER LEVELS - SOUTHERN CALIFORNIA (Continued)

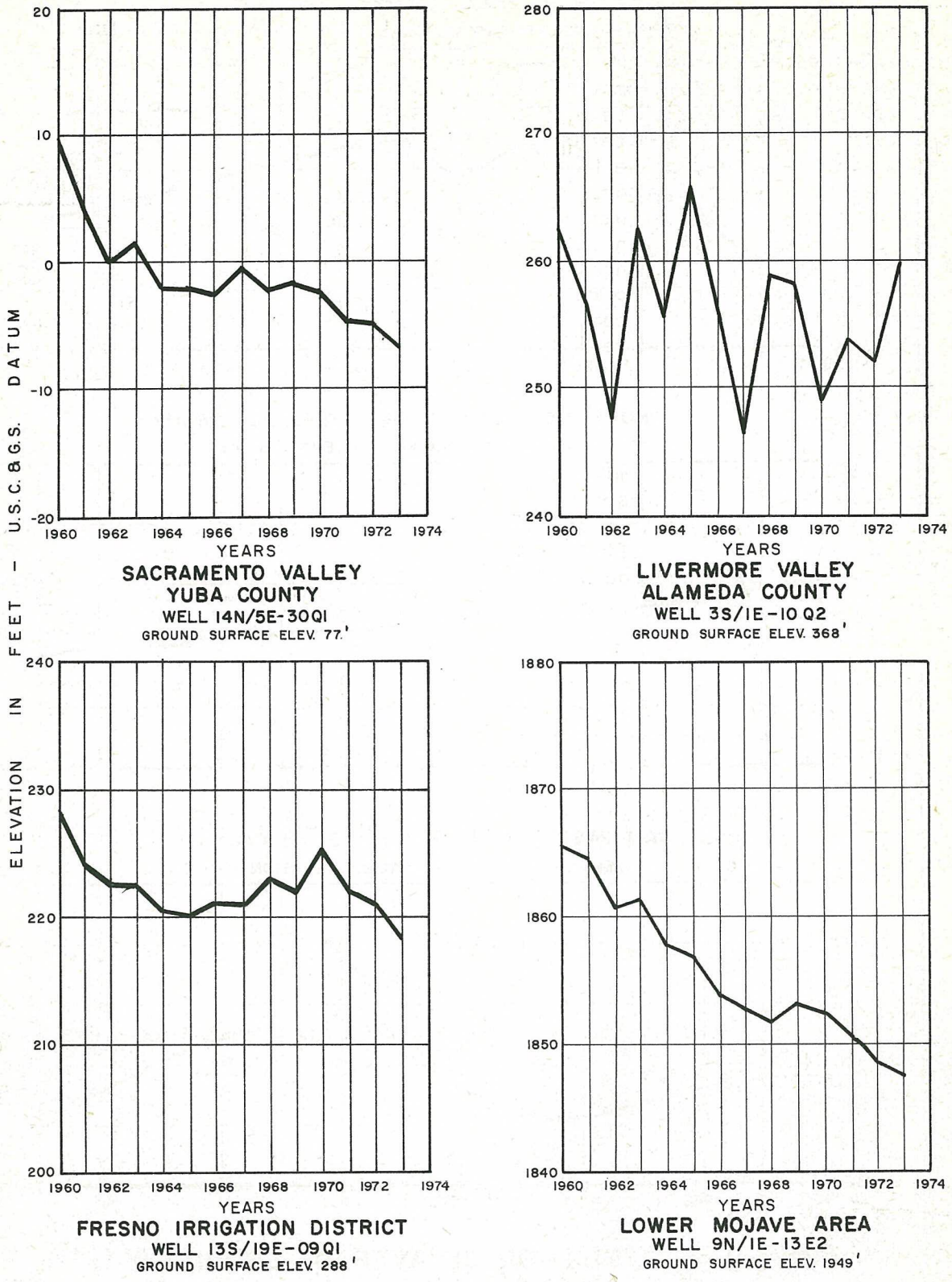


Figure 10. FLUCTUATION OF WATER LEVELS IN SELECTED WELLS

WATER QUALITY

As other sections in this report have indicated, the precipitation and succeeding runoff during the 1973 water year was above normal, except along the northernmost part of the State. The quality of California's water resources pretty much reflected these better-than-average conditions, particularly the surface waters whose qualities tend to vary with flow. In the case of ground water, where changes in quality are more subtle and require considerably more time to come about, no appreciable changes or reversals in trends occurred.

Surface Water

In 1972, a dry year, mineral quality in California streams was generally worse than in prior normal or above normal years. The effects of the dry year of 1972 were quickly erased by the above-normal runoff of 1973.

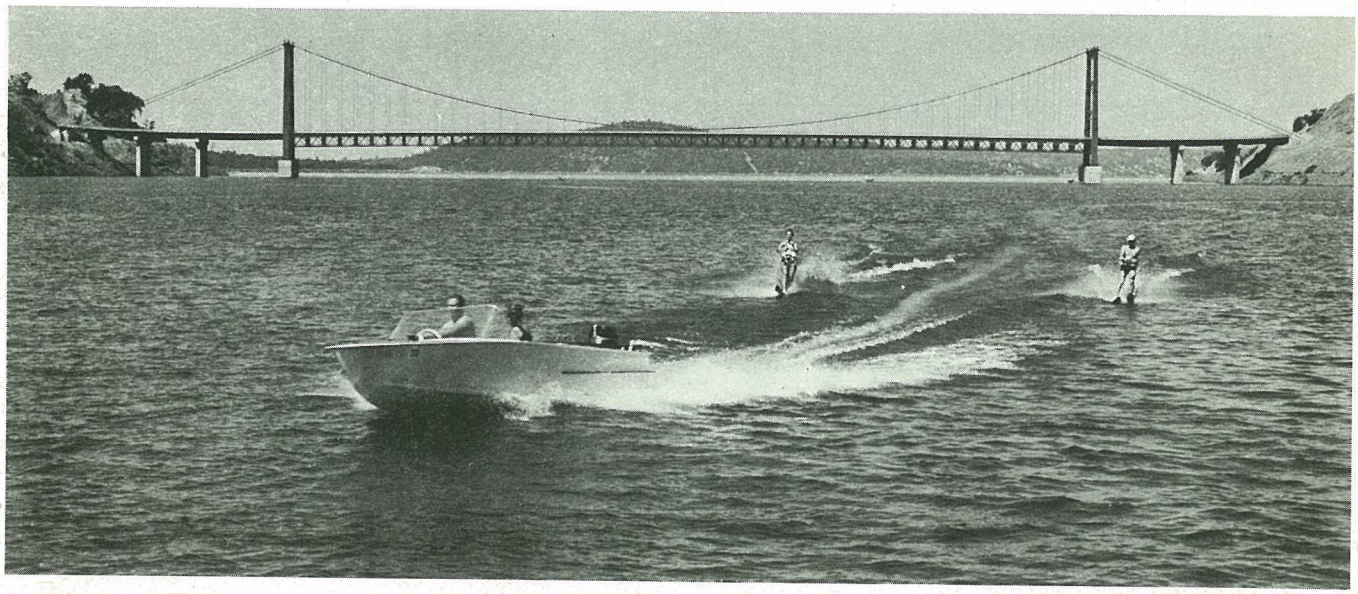
Seasonal variations in quality, as measured by the total dissolved solids concentration, are tabulated on page 28 for 12 important streams. Values are for single samples taken each season, and may not represent the average quality for the season. Six of the 12 streams are plotted on the next two pages, combining flow and quality on the same graph.

In general, the larger, snow-fed streams have the lowest concentrations; those streams more predominantly rain-fed have higher concentrations; and those streams with more development and where precipitation is less have the highest concentrations.

Ground Water

Long-term trends in ground water quality, as measured by total dissolved solids concentration at selected wells for a number of ground water basins in California, are shown on page 29. These graphs generally depict either a tendency toward higher concentrations or a leveling-off in concentration.

Throughout most of the State there appears to have been no significant change in ground water quality during 1973. Deterioration in quality is taking place in a few basins, however.



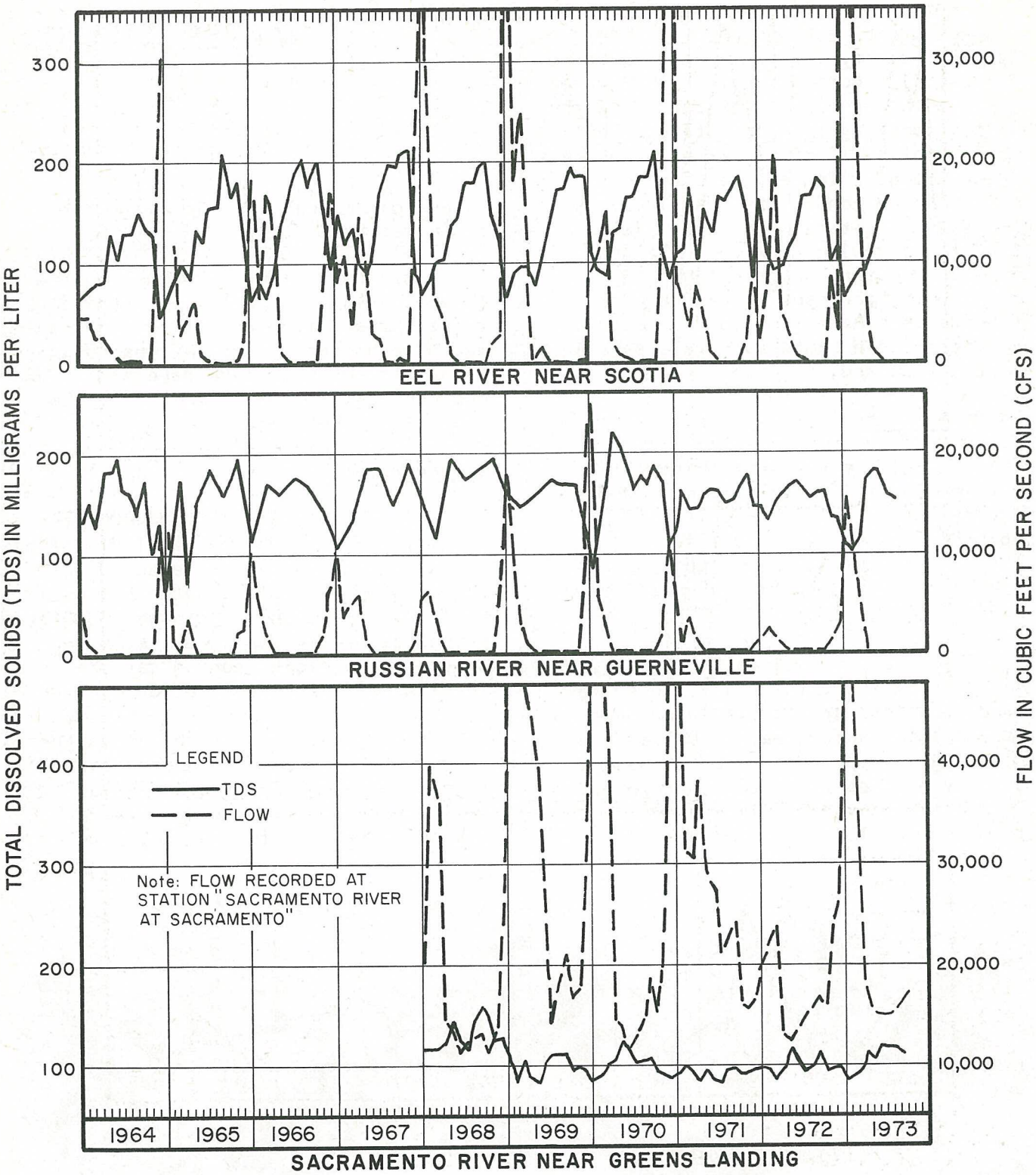


Figure 11. VARIATION IN WATER QUALITY AND FLOW IN SELECTED STREAMS 1964-1973

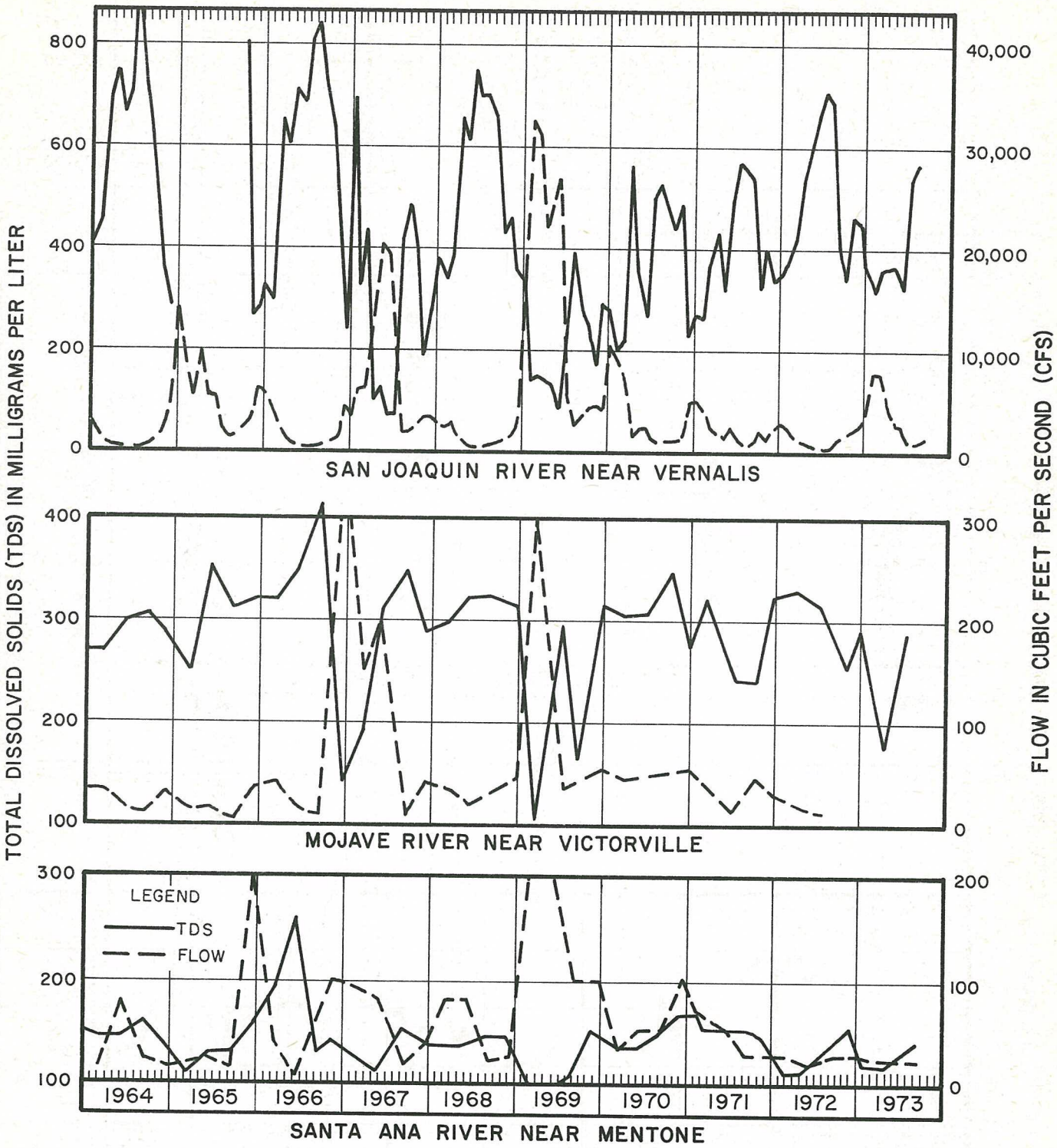


Figure 12. VARIATION IN WATER QUALITY AND FLOW IN SELECTED STREAMS 1964-1973

SEASONAL VARIATION IN TOTAL DISSOLVED
SOLIDS CONCENTRATION AT SELECTED STREAM STATIONS
In Milligrams per Liter
(equivalent to parts per million - ppm)
1972-1973

STATION		Fall	Winter	Spring	Summer
River	At or Near				
Colorado	Imperial Dam	1,020	867	774	797
Eel	Scotia	172	66	92	163
Feather	Nicolaus	60	48	66	55
Klamath	Klamath	149	73	75	115
Mojave	Victorville	253	292	173	295
Russian	Guerneville	162	109	175	157
Sacramento	Green's Landing	93	85	107	117
San Joaquin	Vernalis	367	409	286	562
Santa Ana	Mentone	152	118	114	135
Santa Clara	Santa Paula	1,501	1,464	1,124	1,098
Trinity	Lewiston	52	57	53	52
Truckee	Farad	60		65	54

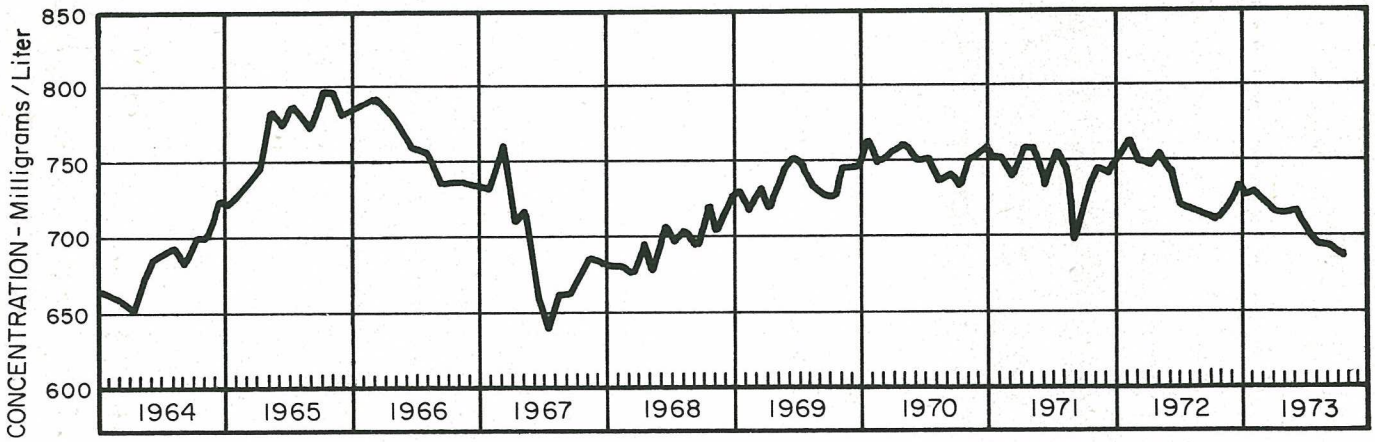


Figure 13. VARIATION IN TOTAL DISSOLVED SOLIDS IN COLORADO RIVER AT COLORADO AQUEDUCT INTAKE (LAKE HAVASU)

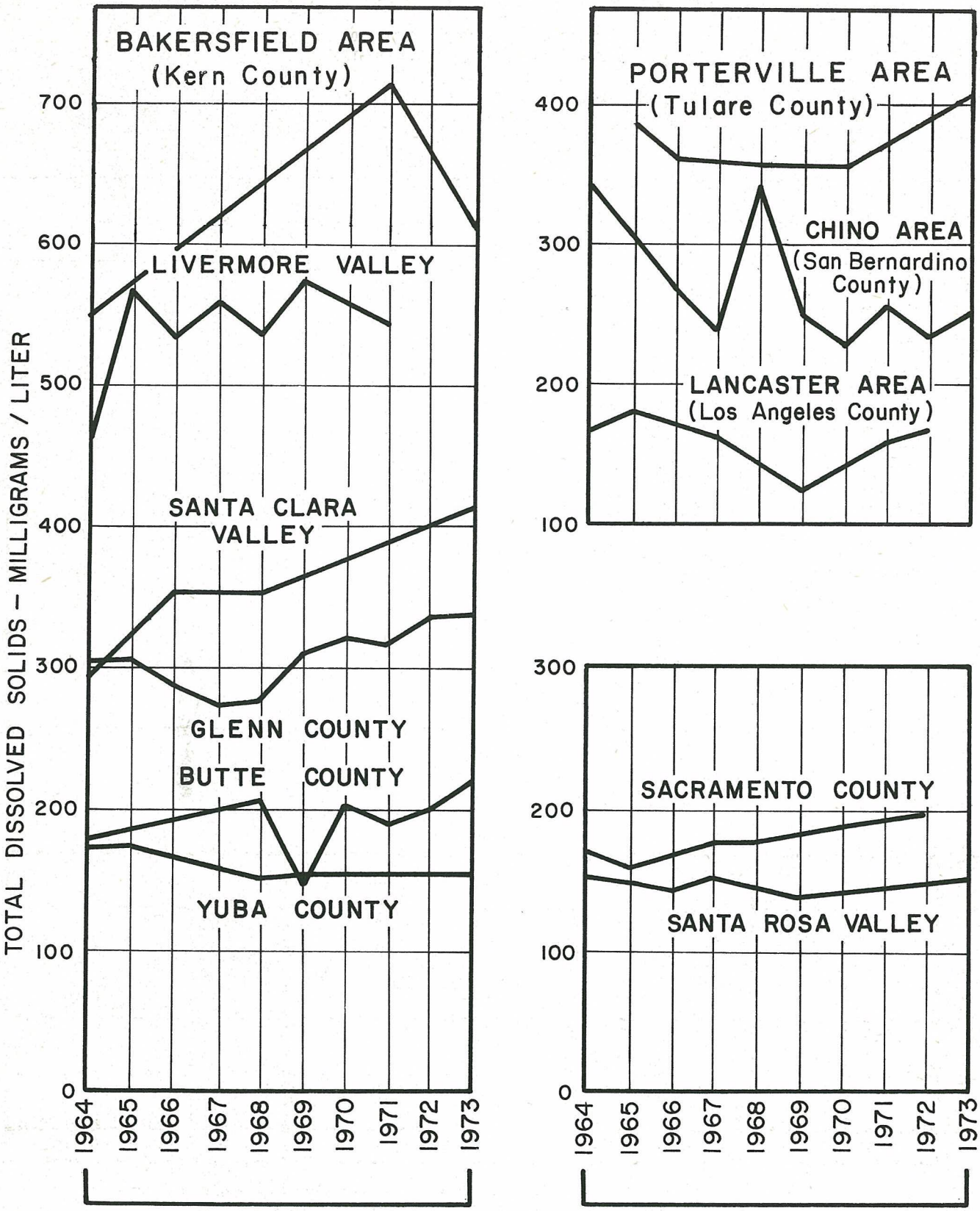
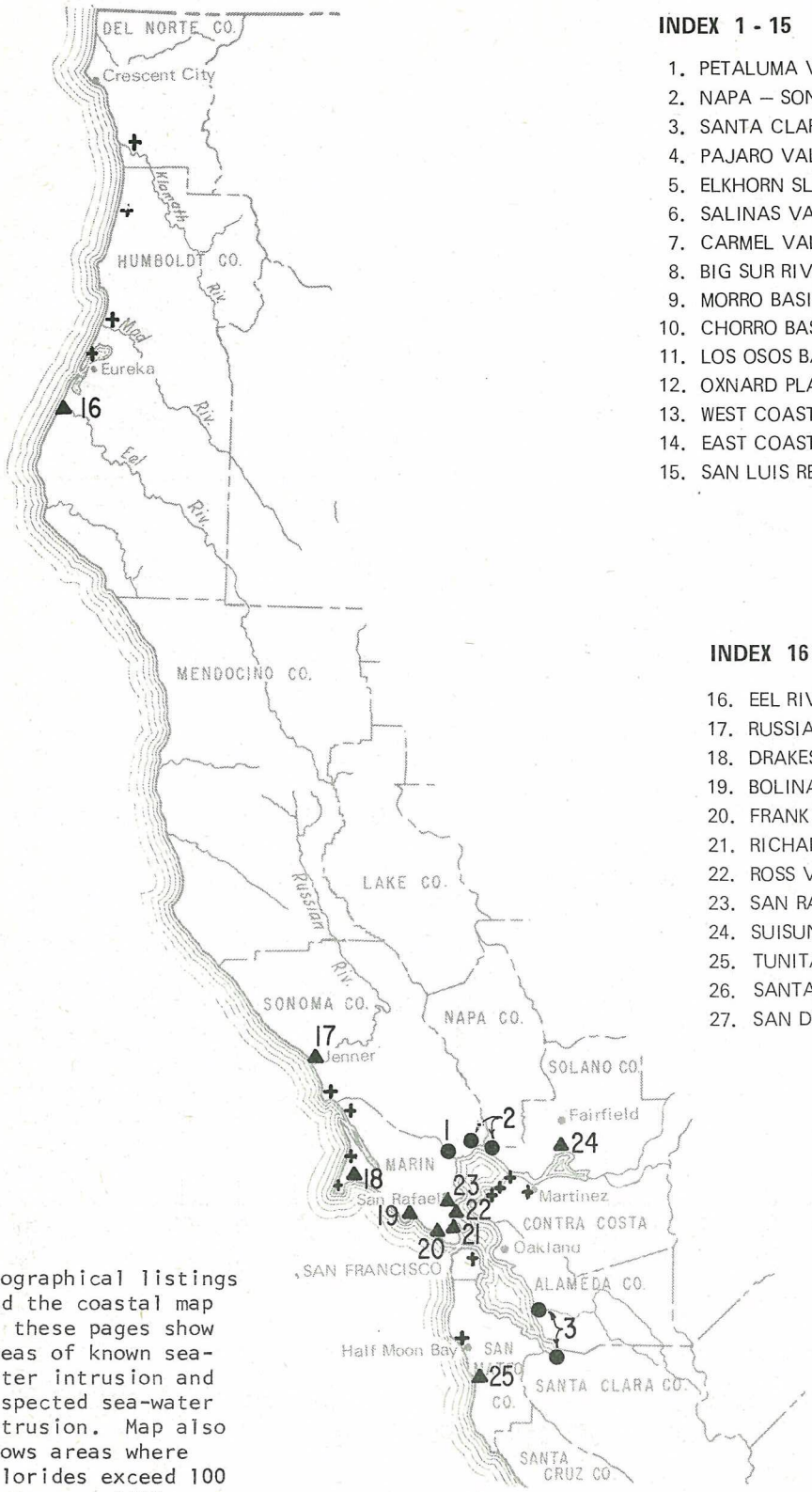


Figure 14. VARIATION IN QUALITY AT SELECTED WELLS IN CALIFORNIA 1964-1973

FIGURE 15

SEA-WATER INTRUSION



INDEX 1 - 15 KNOWN

1. PETALUMA VALLEY
2. NAPA – SONOMA VALLEY
3. SANTA CLARA VALLEY
4. PAJARO VALLEY
5. ELKHORN SLOUGH AREA
6. SALINAS VALLEY PRESSURE AREA
7. CARMEL VALLEY
8. BIG SUR RIVER BASIN
9. MORRO BASIN
10. CHORRO BASIN
11. LOS OSOS BASIN
12. OXNARD PLAIN BASIN
13. WEST COAST BASIN
14. EAST COASTAL PLAIN PRESSURE AREA
15. SAN LUIS REY VALLEY – MISSION BASIN

INDEX 16 - 28 SUSPECTED

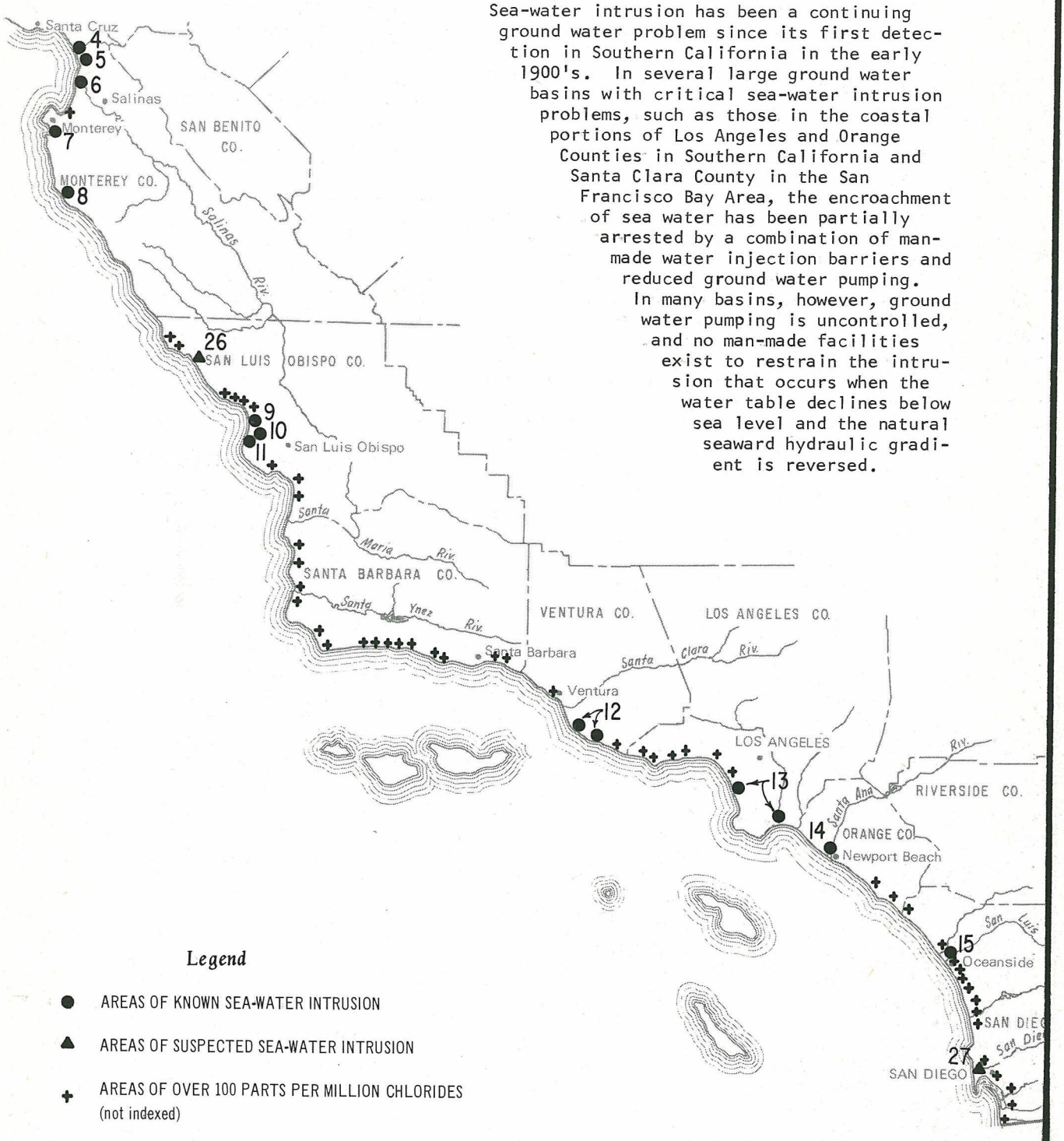
16. EEL RIVER VALLEY
17. RUSSIAN RIVER BASIN
18. DRAKES ESTERO BASIN
19. BOLINAS LAGOON BASIN
20. FRANK CREEK BASIN
21. RICHARDSON BAY BASIN
22. ROSS VALLEY BASIN
23. SAN RAFAEL BASIN
24. SUISUN – FAIRFIELD VALLEY
25. TUNITAS CREEK BASIN
26. SANTA ROSA CREEK BASIN
27. SAN DIEGO RIVER – MISSION VALLEY BASIN

Geographical listings and the coastal map on these pages show areas of known sea-water intrusion and suspected sea-water intrusion. Map also shows areas where chlorides exceed 100 parts per million.

FIGURE 15 (Continued)

IN CALIFORNIA

Sea-water intrusion has been a continuing ground water problem since its first detection in Southern California in the early 1900's. In several large ground water basins with critical sea-water intrusion problems, such as those in the coastal portions of Los Angeles and Orange Counties in Southern California and Santa Clara County in the San Francisco Bay Area, the encroachment of sea water has been partially arrested by a combination of man-made water injection barriers and reduced ground water pumping. In many basins, however, ground water pumping is uncontrolled, and no man-made facilities exist to restrain the intrusion that occurs when the water table declines below sea level and the natural seaward hydraulic gradient is reversed.



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DEPARTMENT OF WATER RESOURCES
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