






State of California
The Resources Agency

Department of
Water Resources

Bulletin 69-85

California High Water 1984-85

September 1986

Gordon K. Van Vleck
Secretary for Resources
The Resources Agency

George Deukmejian
Governor
State of California

David N. Kennedy
Director
Department of Water Resources

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

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ON THE COVER: Flood damage of varying degree may occur somewhere in California during every month of the year. To meet this challenge and mitigate the impact of local flooding, the Department of Water Resources sponsors a continual Flood Fight Training Program. The objective of the program is to train key personnel from local flood-control and other emergency agencies to apply proven techniques and methods to prevent or mitigate the impact of flooding.

At least one flood-fight school is scheduled annually at the Sacramento Maintenance Yard in Bryte; additional classes are conducted as needed.

The site at the Sacramento Maintenance Yard offers simulated field conditions for training in procedures for controlling "boils," preventing levee overtopping, combating levee wave-wash erosion, and protecting structures from flood water intrusion. A training film and classroom lectures are integral parts of the school.

The Department will also provide instructors to qualified agencies wishing to sponsor flood fight schools in other parts of the State. A minimum of 25, with a maximum of 80, trainees per session are required.

For further information, call 800-952-5530, or write the Department of Water Resources, Flood Operations Branch, P. O. Box 942836, Sacramento, CA 94236-0001.

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FOREWORD

For the fourth consecutive water year, the first quarter (October through December) of 1984-85 produced much higher-than-normal precipitation. This condition, linked with an above-average storage carryover, usually guarantees an adequate water supply for specific years, regardless of the rainfall and snowpack during the rest of the season.

For the second consecutive year, however, precipitation during the normally highly productive second quarter (January through March) was disappointing. In 1985, January, historically the most productive month of the year, was virtually rainless. Except for March, the ensuing months also ended in the "below normal" or "dry" category. Although carryover storage from the previous year was 10 percent above average, the below-normal runoff and prolonged periods of above-average temperatures forced the drawdown of many reservoirs to very low levels by late summer. In addition, ground water supplies were heavily drawn upon to meet the agricultural needs of the great Central Valley.

On a positive note, flooding during Water Year 1984-85 was virtually nonexistent. Although some local flooding, including flash floods, occurred in the South Lahontan and high desert areas, no major rivers reached flood stage.

Bulletin 69-85 is the eighteenth in a series that reports high water and flood events in graphic and narrative form. Because no dramatic or significant flood-related events occurred, this particular issue is primarily limited to graphic form.

David N. Kennedy, Director
Department of Water Resources
The Resources Agency
State of California

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State of California
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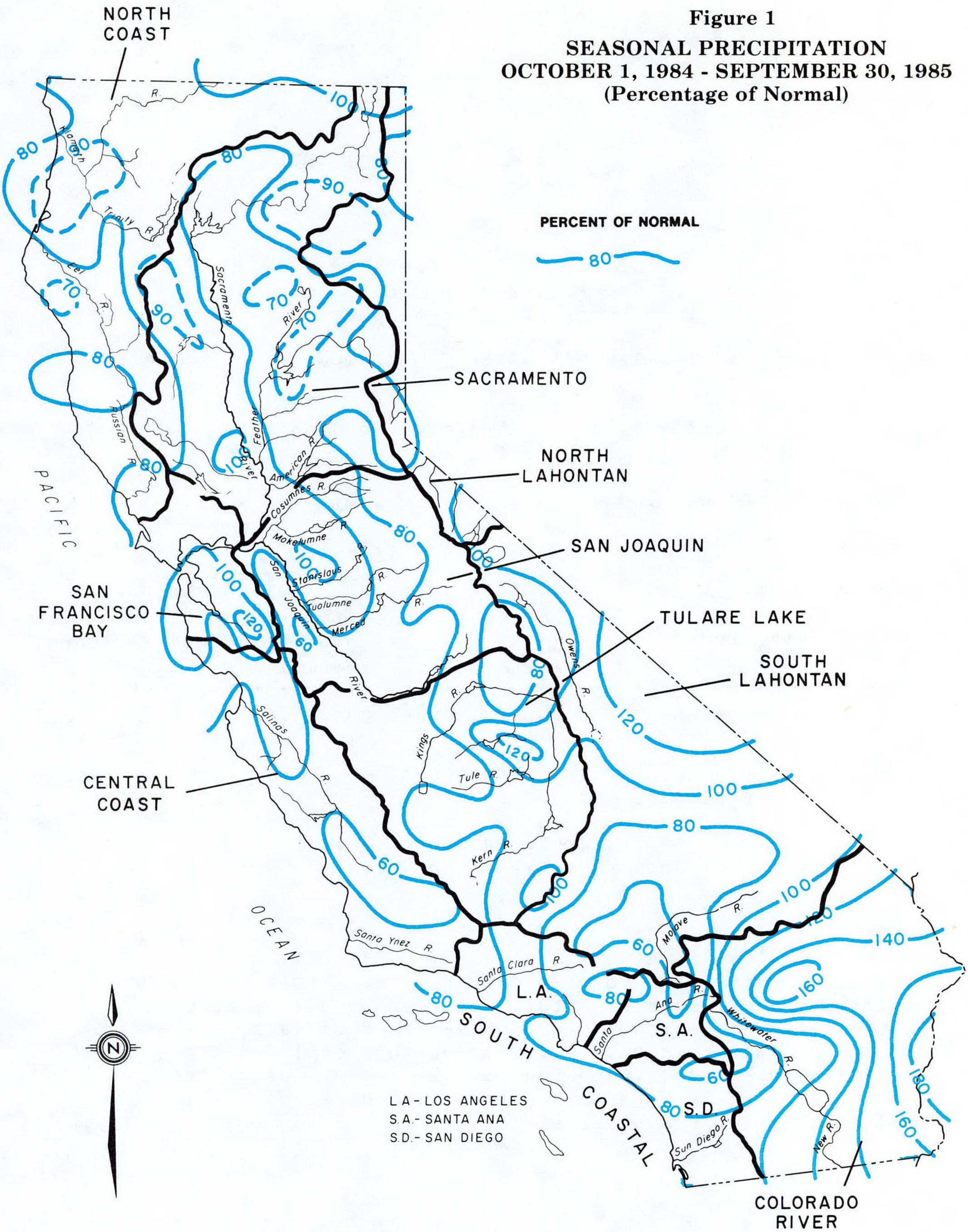
The California Water Commission serves as a policy advisory body to the Director of Water Resources on all California water resources matters. The nine-member citizen commission provides a water resources forum for the people of the State, acts as a liaison between the legislative and executive branches of State Government, and coordinates Federal, State, and local water resources efforts.

Figure 1
SEASONAL PRECIPITATION
OCTOBER 1, 1984 - SEPTEMBER 30, 1985
(Percentage of Normal)



WEATHER PATTERNS OF 1984-85

Water Year 1985 presented California with its first subnormal seasonal precipitation since Water Year 1981. Figure 1 depicts seasonal precipitation across the State. Total statewide precipitation was recorded as 85 percent of normal. The only major hydrographic area with above-normal precipitation was the Colorado Desert, with 155 percent. The Sacramento Valley, with 75 percent of normal, had the lowest percentage.

Similar to the previous water year, the normal winter storm pattern came to an untimely halt. This year, however, the cessation of normal precipitation patterns occurred much earlier. After December 15, the Sierra Nevada did not experience another important storm until early February. Following a wet October and November in most of the State, there was not another truly wet month until March 1985, as a large mound of high pressure extending into the upper atmosphere blocked the passage of almost all storms during the normally wettest time of the year.

The unusual aspects of the season are presented in Figure 2, which shows accumulated precipitation at Blue Canyon in the American River Basin. The only months with above-normal precipitation were October, November, and March. The wettest month at Blue Canyon was November with 17.06 inches, more than twice the normal amount. Table 1 summarizes precipitation in percentage of normal for three prominent California regions: the north includes the drainage basins of the upper Sacramento and Feather rivers; the central covers the area from the Yuba to the Merced River; the south includes the area from the Upper San Joaquin to the Kern River.

Table 1. Precipitation in Percentage of Normal

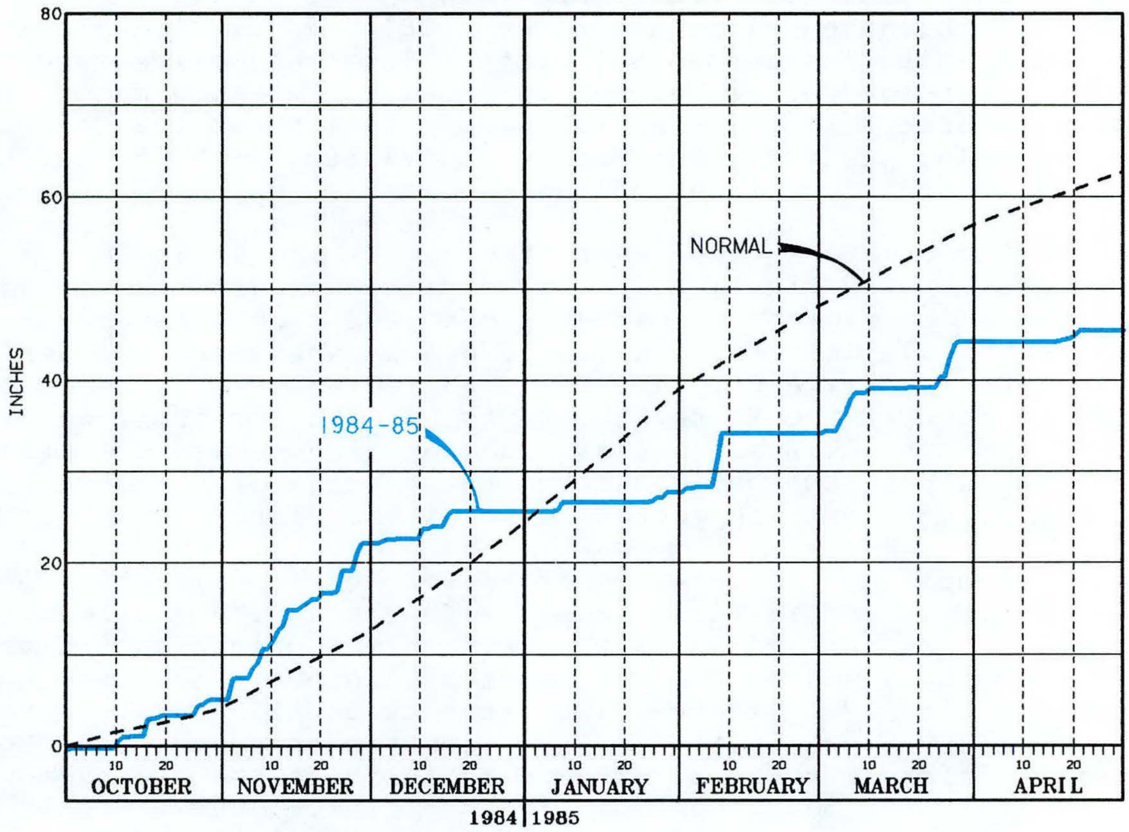
Season	North	Central	South
Fall 1984 (Sept.-Nov.)	173	165	159
Winter 1984-85 (Dec.-Feb.)	28	36	51
Spring 1985 (Mar.-May)	49	68	73

October 1984

An active Pacific weather system spread generous rains across northern and central California on October 10-11. Amounts were generally 1 to 3 inches in the northern mountains, tapering to one half-inch in the southern Sierra. Sacramento exceeded its October normal of 0.90 in. during this one storm only, when 0.91 in. fell.

Figure 2 ACCUMULATED PRECIPITATION AT BLUE CANYON, AMERICAN RIVER BASIN

OCTOBER 1, 1984 - APRIL 30, 1985



NOTE: ELEVATION OF STATION 5,280 FEET.

An unseasonably cold and windy storm from the Alaskan Gulf swept across northern and Central California on October 16-17. Wind gusts to 50 mph were reported in both the Bay Area and Central Valley. Two climbers were found dead just 50 feet from the top of El Capitan in Yosemite Park; they were trapped in the worst October snowstorm in 30 years in Yosemite, where 16-25 in. fell in 12 hours. Blue Canyon reported a new record 24-hour October snowfall of 14.6 in. Storm totals included 3.07 in. for San Francisco and 1.90 in. at Lodgepole. However, precipitation was light in Southern California and from Eureka northward.

On October 16, Sacramento (49°) and Stockton (53°) recorded their lowest maximum temperatures of record for the month. Other October weather systems were considered minor. Altogether, October precipitation was above normal except in Southern California and in the upper Sacramento drainage areas, both of which were deficient.

November 1984

The North Coast was hit with its first major wind and rain storm of the season November 1-2. Gusts exceeding 60 mph were reported at Eureka, and Honeydew (Mattole River Basin) was swamped with 8.10 in. of rainfall in 18 hours. A series of wet storms from November 8-13 provided heavy precipitation over a much larger area. Through satellite imagery, Figures 3 and 4 portray some of this activity.

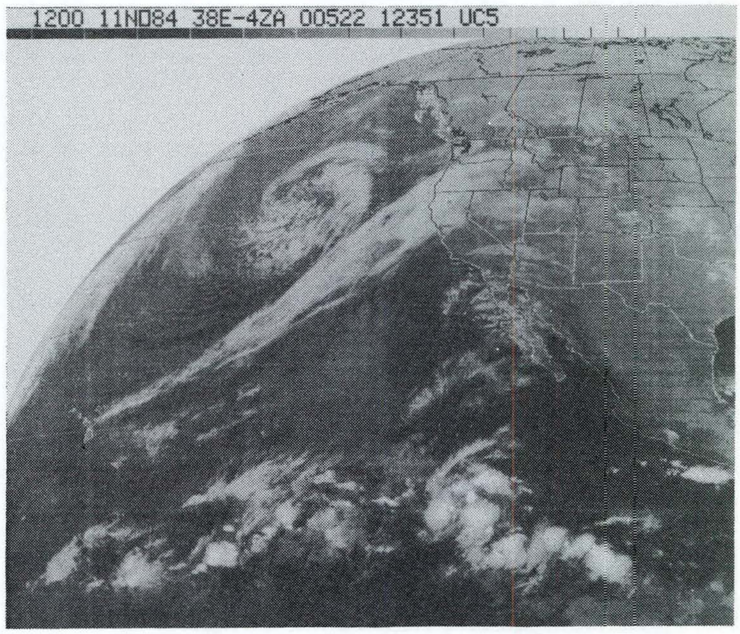


Figure 3

November 11, 1984, 1200 GMT (0400 PST) from GOES WEST. This infrared depiction shows a long fetch of subtropical moisture triggering heavy rains on the north coast of California. The cloud pattern from a deep upper-level low-pressure center is visible further to the northwest.

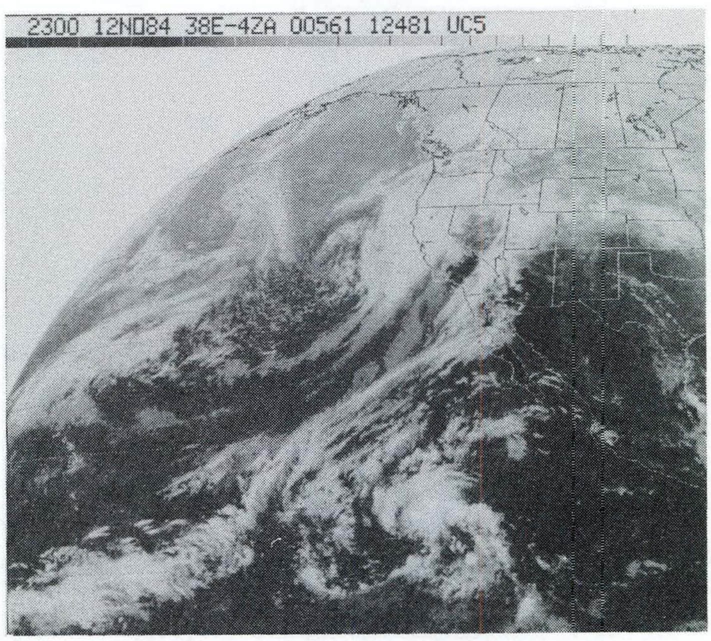


Figure 4

November 11, 1984, 2300 GMT (1500 PST) from GOES WEST. This infrared satellite imagery depicts surface low development west of California as the upper-level low-pressure center moves southeast. Heavy precipitation has spread into central California.

Storm totals for the period include: Honeydew, 19.10 in.; Gasquet (Smith River Basin), 10.20 in.; Shasta Dam, 7.79 in.; Bucks Lake (Feather River Basin) 7.04 in.; Huntington Lake (upper San Joaquin Basin), 4.70 in. Rainfall of almost 2 in. was common from the Bay Area northeast through the Sacramento Valley. Up to 2 feet of snow fell in much of the Sierra Nevada above 7,000 feet.

The storm track from the Alaskan Gulf into California remained active through the rest of November. De Sabla (Feather River Basin) was rainless on only six days in November. Blue Canyon set a new November snowfall record with more than 70 inches; the old record was 68.3 inches in 1973. By the end of the month, snow depths in the Sierra Nevada above 6,000 feet were generally 5 feet or greater.

Eureka and San Francisco received 40 percent of their normal annual precipitation during October and November. Many central and northern California locations reported twice the normal precipitation for November. Honeydew had 39.52 in., or 276 percent of normal. In the upper Sacramento River Basin, Dunsmuir, where the normal is 8.89 in. received 23.84 in., Mt. Hamilton near San Jose saw a record wet November with 8.40 in. In Southern California, however, November precipitation was close to normal.

December 1984 - January 1985

During December a massive high pressure ridge began developing near the West Coast, and few major storms reached the Sierra Nevada drainage basins during December and January. December precipitation in the Sierra Nevada ranged from 10 percent of normal in the north to 30 percent in the south. In northern California, dry January records were set at Eureka (0.65 in.), Yreka (0.16 in.), Fort Ross (0.09 in.) and Covelo (0.44 in.).

Two storm periods during the latter half of December brought Southern California to near or slightly above normal. January, however, was much drier in the Southland, with precipitation averaging only about 30 percent of normal.

Strong Santa Ana winds on December 12-13 caused considerable damage in the Los Angeles area. In Riverside County, blowing dust and sand reduced visibility to only 10 feet in some places. On December 18-19, heavy snow fell in the Lancaster-Antelope Valley area in Southern California. Edwards Air Force Base was closed for the first time because of snowfall.

The same upper-level disturbance dumped 8 to 12 in. of snow around Lake Isabella and 14 to 18 in. at Tehachapi Pass. On January 12, strong gusty northeast winds up to 80 mph caused damage in both the southern Sierra Nevada and Southern California. Low visibility on freeways caused by blowing dust and sand led to numerous traffic accidents.

February - March 1985

The season's wettest storm brought heavy precipitation to most of California during February 7-9. Heavy rain, with snow above 4,000 feet, began falling in northern California on February 7 as subtropical moisture was drawn into the State from the southwest, while a cold polar front moved slowly southward. This combination of events produced a new 24-hour February snowfall record at Blue Canyon, where 42 in. fell during 24 hours beginning at 10 a.m. on February 7. The Blue Canyon storm total exceeded 50 in., with a water equivalent of 5.82 in. See Figure 5 for satellite imagery of that storm.

Other storm totals included: Four Trees (5,120 feet) in the Feather River Basin, 11.16 in.; Kentfield in Marin County, 8.70 in.; Leggett in the Eel River Basin, 7.40 in.; Yosemite National Park, 4.06 in. Totals approaching 2 in. were reported at Sacramento, San Francisco, and Los Angeles.

A small tornado caused local damage at a mobile home park in the Mission Gorge area of San Diego on February 4. On February 21, northeast wind gusts to 60 mph caused damage in Los Angeles County. Following the major storms of 7-9 February, however, very little precipitation fell anywhere in California during the rest of the month. Once again the West Coast high-pressure ridge was

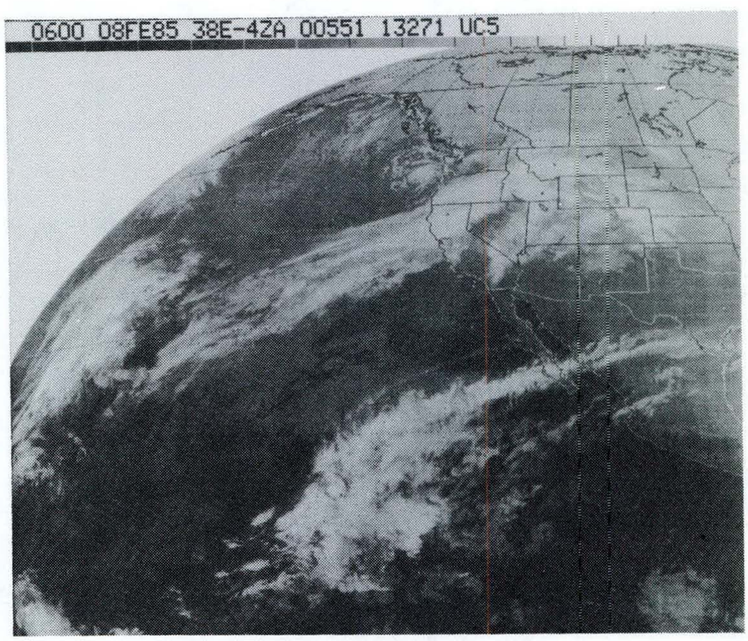


Figure 5

February 8, 1985, 0600 GMT (2200 PST, February 7, 1985). This infrared depiction shows heavy precipitation falling in northern California. Subtropical moisture is being drawn into the State from the southwest, while a polar cold front drops slowly southward. A 24-hour February snowfall record of 42 inches is set at Blue Canyon February 7-8.

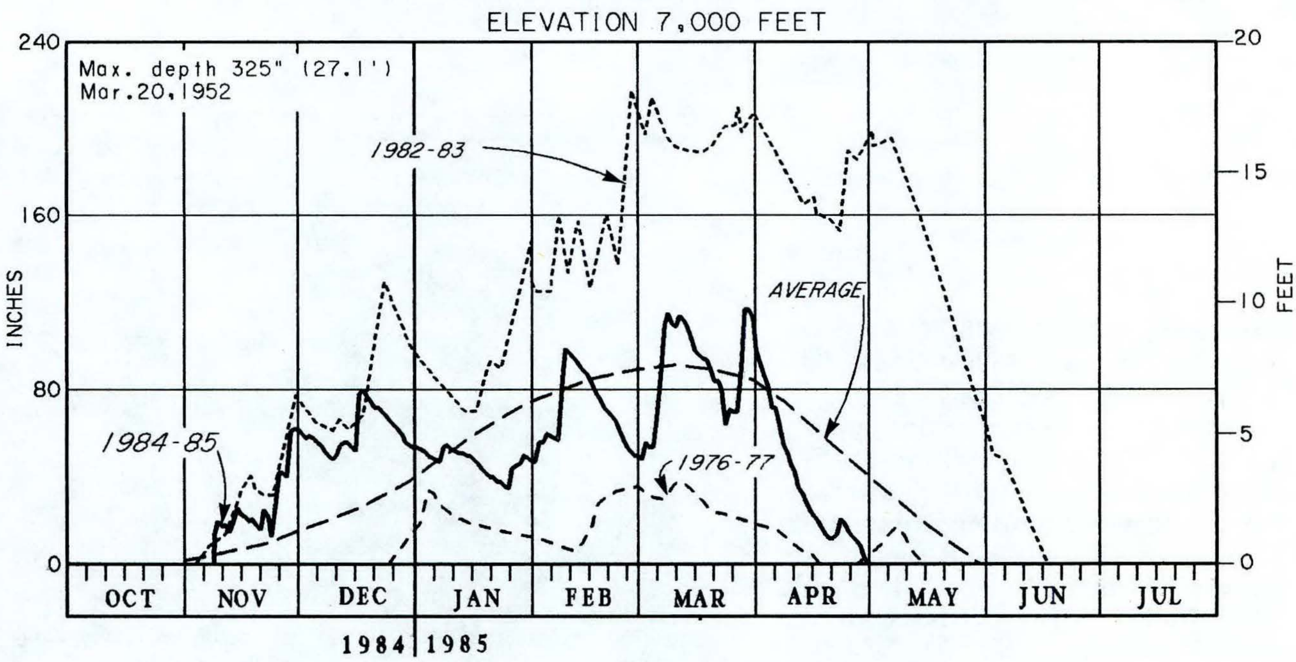
the culprit, as statewide precipitation during February averaged only 55 percent of normal. December, January, and February were the second driest of those months over the past 40 years in the northern Sierra Nevada. (Water Year 1977 was the driest.)

March - April 1985

For the first month since November, near-normal precipitation fell over much of the State during March. Storm systems moved through California during the first and last weeks of the month. As with most of the storm systems during this season, the storms were quite cold, dropping snow to low elevations and producing little lower elevation runoff. March precipitation totals ranged from 2 to 3 in. on the Sacramento Valley floor up to 9 to 10 in. in the central Sierra Nevada.

During March 2 through 7 a series of storms dropped 6 feet of snow at Bucks Lake in the Feather River Basin; water content was 5.68 in. Snow fell on March 5-6 as low as 1,000 feet in the foothills east of Sacramento. During the first week of March, about 5 feet of snow fell at Norden, and by March 8 the depth had reached 115 in. Figure 6 shows the snow-depth profile at Donner Summit (Norden) for the season.

Figure 6 SNOW DEPTH AT NORDEN



Another series of cold storms dumped more snow on the mountains from March 25 through 29. On March 27, Redding experienced an unusually heavy snowfall ranging from 3 to 8 in. across the city. In the foothills of the upper Sacramento Valley, a foot of snow fell in both Paradise and Weaverville.

On March 11 a small tornado caused minor damage at Hollister in San Benito County. Strong downslope winds occurred on the east side of the Sierra Nevada on March 26 and 27. Gusts reached 90 mph near Crowley and 58 mph at Bishop.

Following a cool, damp March in much of California, April 1985 found the State reverting to a dry pattern. The northern Sierra Nevada had the driest April of the last 40 years, with only 9 percent of normal precipitation. Statewide precipitation averaged only about 15 percent of normal. Only a few areas of California had more than one inch; the largest amount was 1.86 in. 11 miles east of Crescent City. Folsom experienced its second totally dry April of record, while many Southern California areas also reported a rainless April.

Record average temperatures for April were established at Blue Canyon with 54.3° (10.1° above normal) and Mt. Shasta City with 51.7° (6.1° above normal). On April 25, strong northerly winds with blowing dust dropped visibilities to near zero in parts of Merced County. A 20-car pileup resulted, in which four people died.

May - September 1985

Most of California was very dry during May; no rain fell in much of Central and Southern California. Only a few locations in the far north had more than 1 inch. Both the central and southern Sierra Nevada experienced the driest May in 40 years.

Most of the June precipitation fell during the first three days. Totals were above normal in parts of the southern Sierra, Central Valley, and North Coast only. The highest total during June was 4.58 in. at Jed Smith State Park in Del Norte County. Bakersfield received 0.44 in. compared to a normal of 0.07 in. The most unusual weather of the month occurred on June 18-20, when very large thunderstorms developed in the Sierra Nevada and adjacent areas. On June 8, funnel clouds were sighted west of Reno. The National Weather Service radar in Sacramento detected thunderstorm tops to 57,000 feet near Truckee on June 19. On June 20 the thunderstorms drifted west over the Central Valley. Vacaville and Fairfield residents reported wind gusts exceeding 40 mph, and one person was injured by lightning. On June 2, hail (1/4-1/2 in. diameter) damaged 300 acres of pistachios in western Kern County.

June was warm in California with average temperatures as high as 7 degrees above normal in the southern Sierra. The average

Sacramento June temperature of 77.5° was 5.3° above normal, making it the second warmest June of record. Sacramento temperatures reached 105° or higher on a record six consecutive days--June 11 through 16. Many daily temperature records were set across the State during the month. The most extreme temperature was attained on June 18, when Death Valley reached 122° after an overnight low of 93°.

July precipitation totals were also above normal in parts of interior Southern California, the Sierra Nevada, and the Mt. Shasta area. Yosemite National Park had its wettest July in the last 40 years with 2.31 inches of rainfall. On July 15 there were heavy rains and flash flooding in parts of Riverside and San Bernardino counties. Lightning killed two people at Yosemite Park and one at Kings Canyon on July 27. Mt. Shasta City with 1.69 in. had its second wettest July of record. In San Diego County, Henshaw Dam had 2.42 in. of rain, compared with a July normal of 0.31 in.

July temperatures were also above normal in most of California. Fresno had 26 days with highs of 100° or above. Santa Maria and San Francisco recorded the warmest July of record. In both Sacramento and San Diego, it was the third warmest July on record.

During August 1985, near-normal temperatures and seasonable dryness prevailed in most of California. The heaviest showers fell in northern California on August 17-18, when subtropical moisture from tropical storm Marty moved northward. Local amounts of 1/2 in. fell east of Sacramento in the Sierra and along the North Coast.

Most of California had above-normal precipitation during September. Several periods of showers were triggered by cold upper-level low-pressure centers, which drifted along the California Coast. The most significant of these weather systems set off unusually heavy rains in the upper Sacramento River Basin on September 7-8. The storm spread record early snow into the Sierra Nevada on September 9-10. Storm totals included 6.35 in. at Shasta Dam, 4.52 in. at De Sabla, and 1.94 in. at Blue Canyon. Blue Canyon received its earliest September snow of record with 1 in. on September 9.

Some of the heavier snowfall totals included: Echo Summit, 1 foot; Mammoth Lakes, 2 feet; and Twin Peaks, 3 feet. The storm system also produced a waterspout in San Francisco Bay on September 10. Showers in Southern California on September 18-19 exceeded 1/2 in. at a number of locations. Heaviest was 1.59 in. at Julian in San Diego County. For the month El Centro received 1.86 in., compared to a normal of 0.19 in. The September total of 6.38 in. at Shasta Dam exceeded seven times the normal amount.

Blue Canyon and Bakersfield had the coolest September of record. Most Sierra Nevada and California desert stations were at least 5° below normal during September. At Blue Canyon, the average temperature of 54.4° was 8.4° below normal.

HYDROGRAPHS OF MAJOR STREAMS AND RESERVOIRS

STREAM HYDROGRAPHS

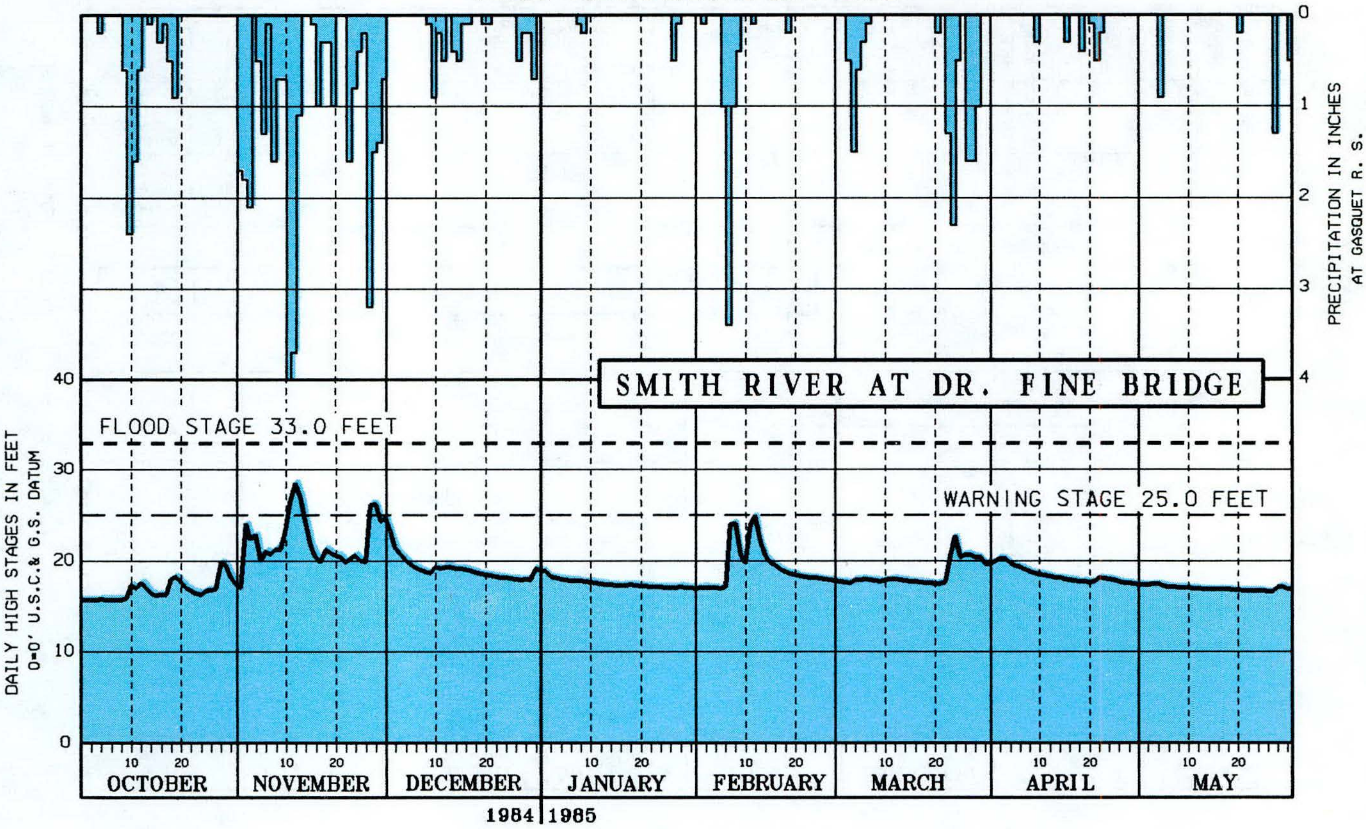
The following stream hydrographs verify that no flood events occurred on the major California river systems of the North Coast and the Central Valley. On the North Coast, the Smith and Eel Rivers exceeded warning stages in November but neither came close to reaching flood stage.

Warning stage is the stage at which water levels are high enough to necessitate levee patrolling or other precautionary measures. Flood stage is the stage at which the flow in a flood control project is at maximum design capacity or at which overbank flows are sufficient to cause considerable inundation and/or threat to life and property.

In the Central Valley, the largest stream rise was caused by the February 7 to 9 storm which brought heavy rainfall to the valley and foothill areas and heavy snowfall in the Sierra above 4,000 feet. Conditions preceding the storm were so dry that the impact of the storm was much less severe than it would have been had the storm followed a wet period.

Figure 7 LOCATION OF HYDROGRAPHS

Figure 8 HYDROGRAPHS OF THE SMITH AND KLAMATH RIVERS



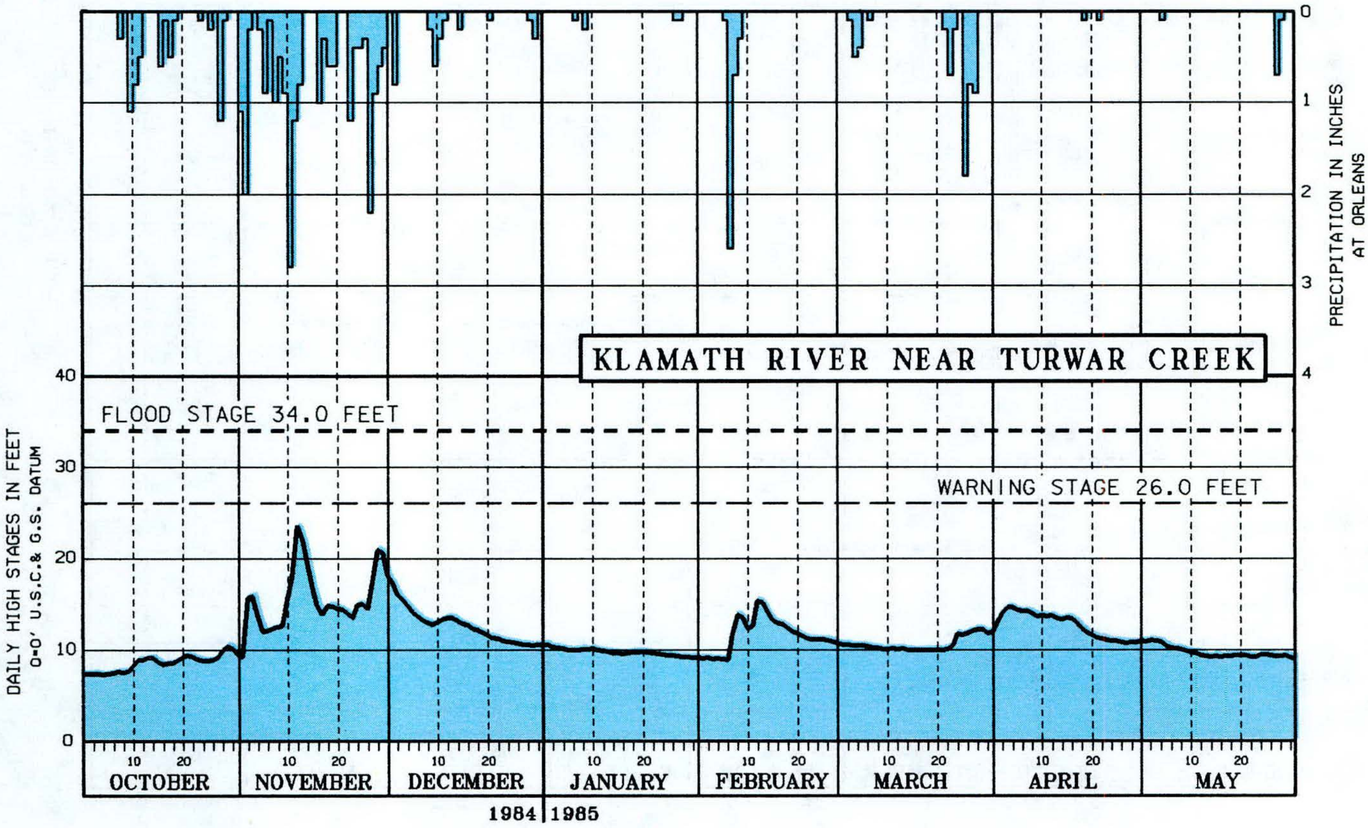
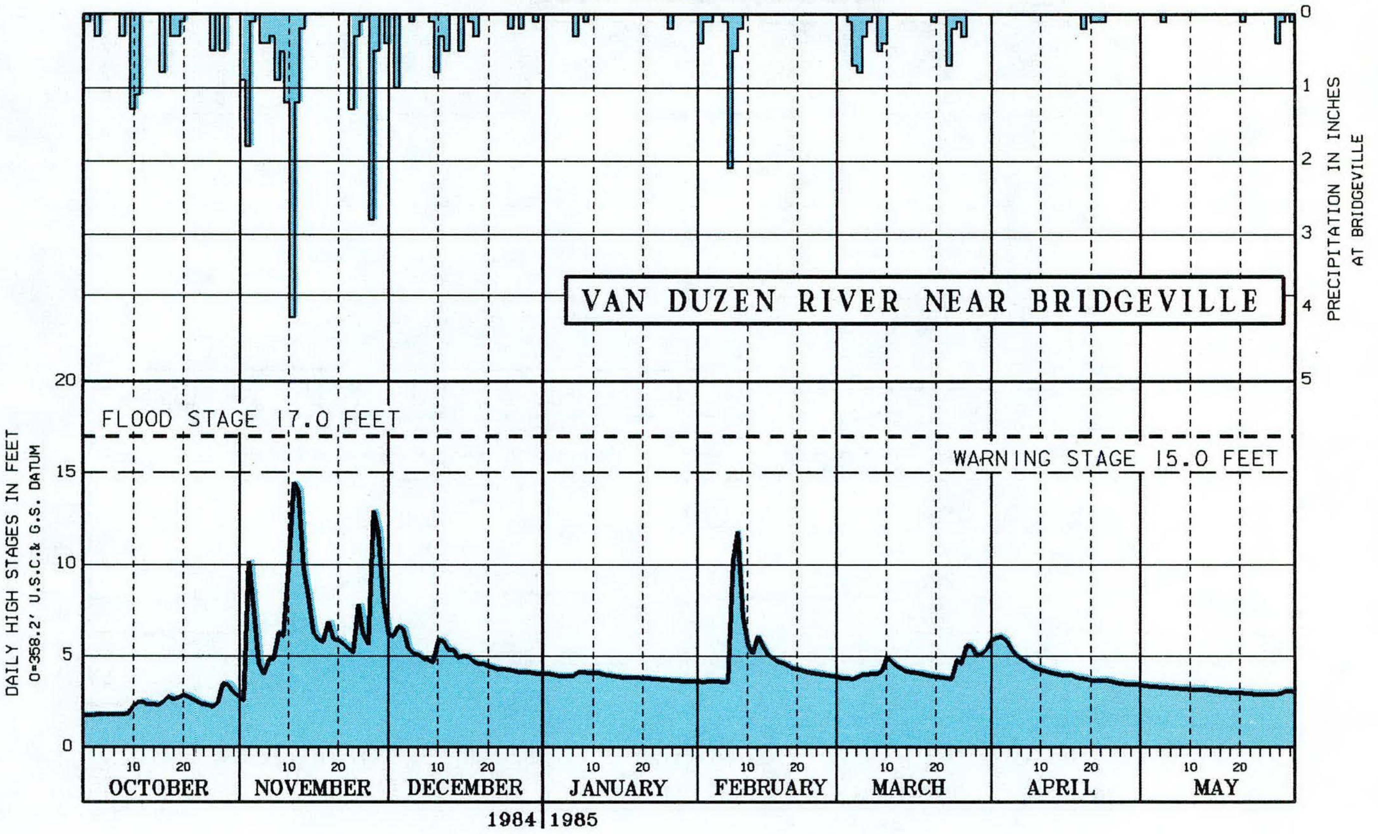


Figure 9 HYDROGRAPHS OF THE VAN DUZEN AND EEL RIVERS



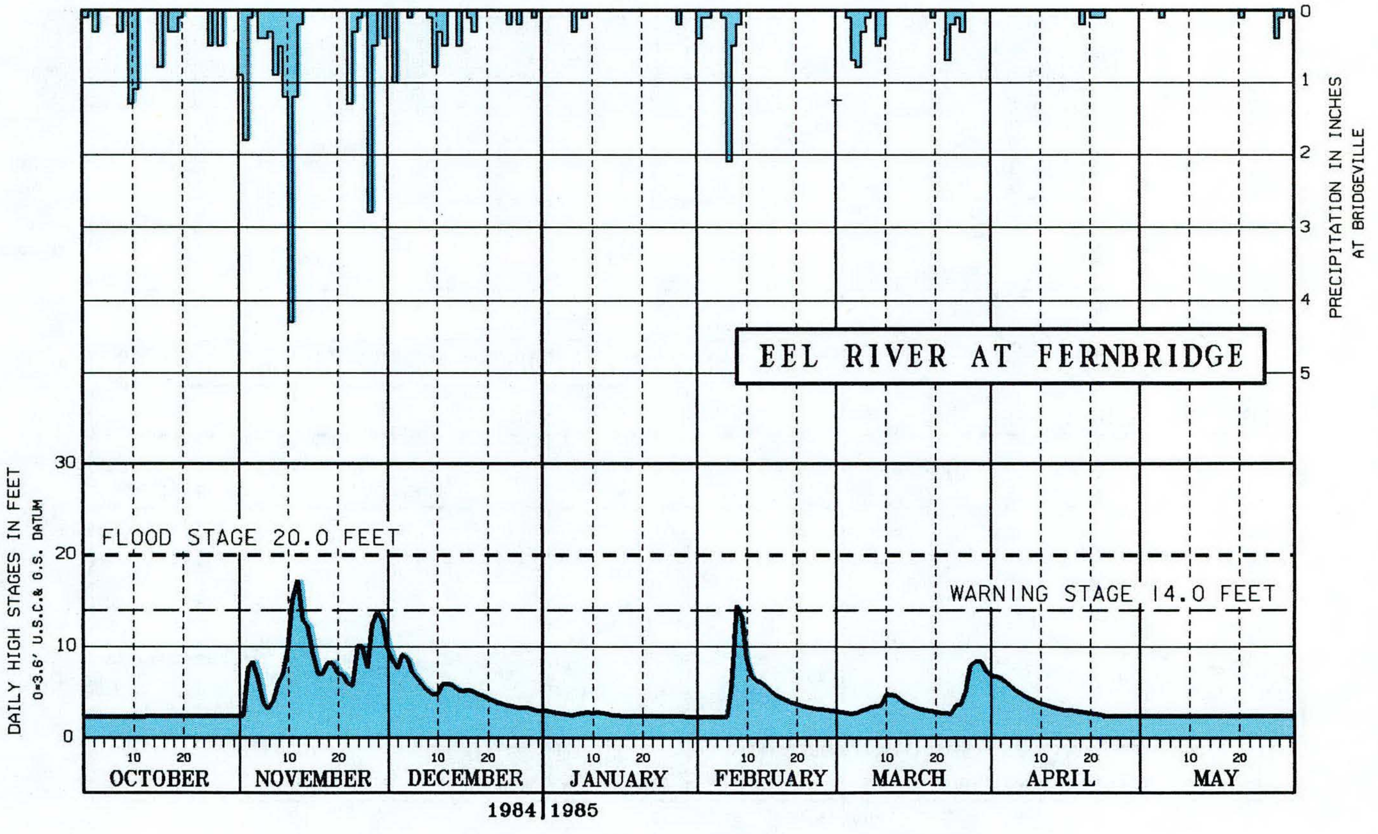
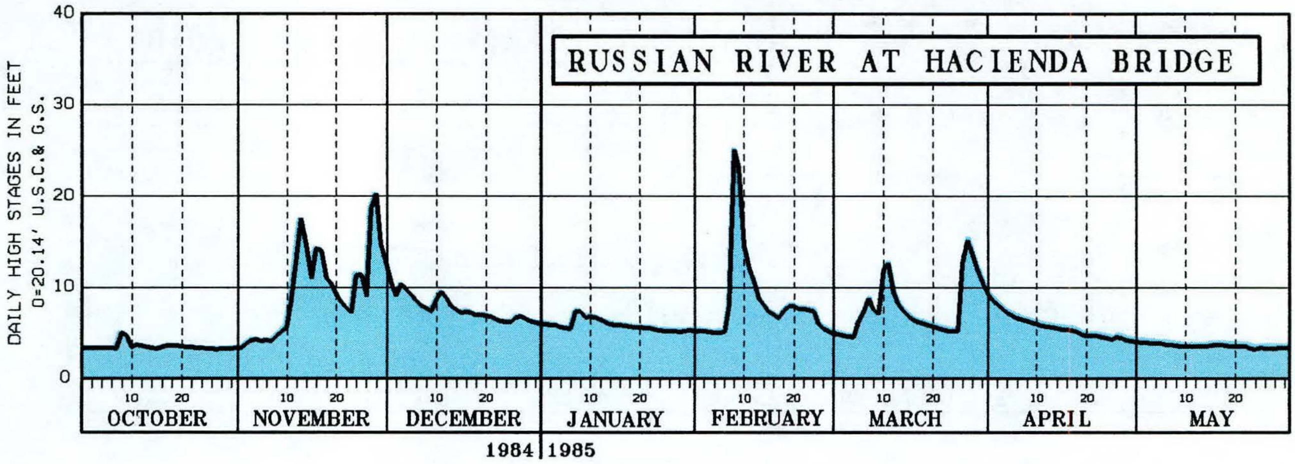


Figure 10 HYDROGRAPHS OF THE RUSSIAN AND NAPA RIVERS



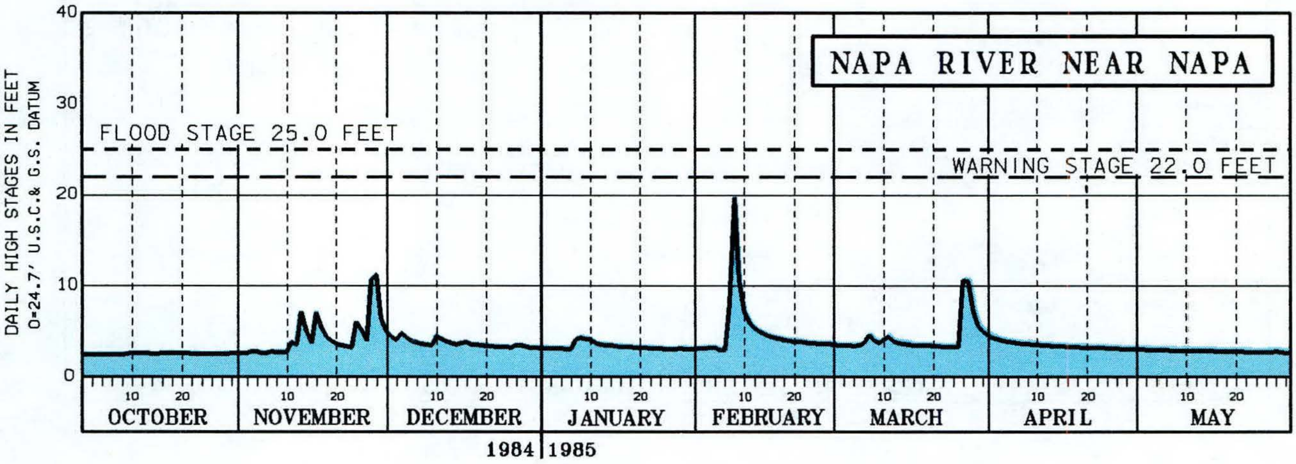


Figure 11 HYDROGRAPHS OF THE SACRAMENTO RIVER AT VARIOUS LOCATIONS

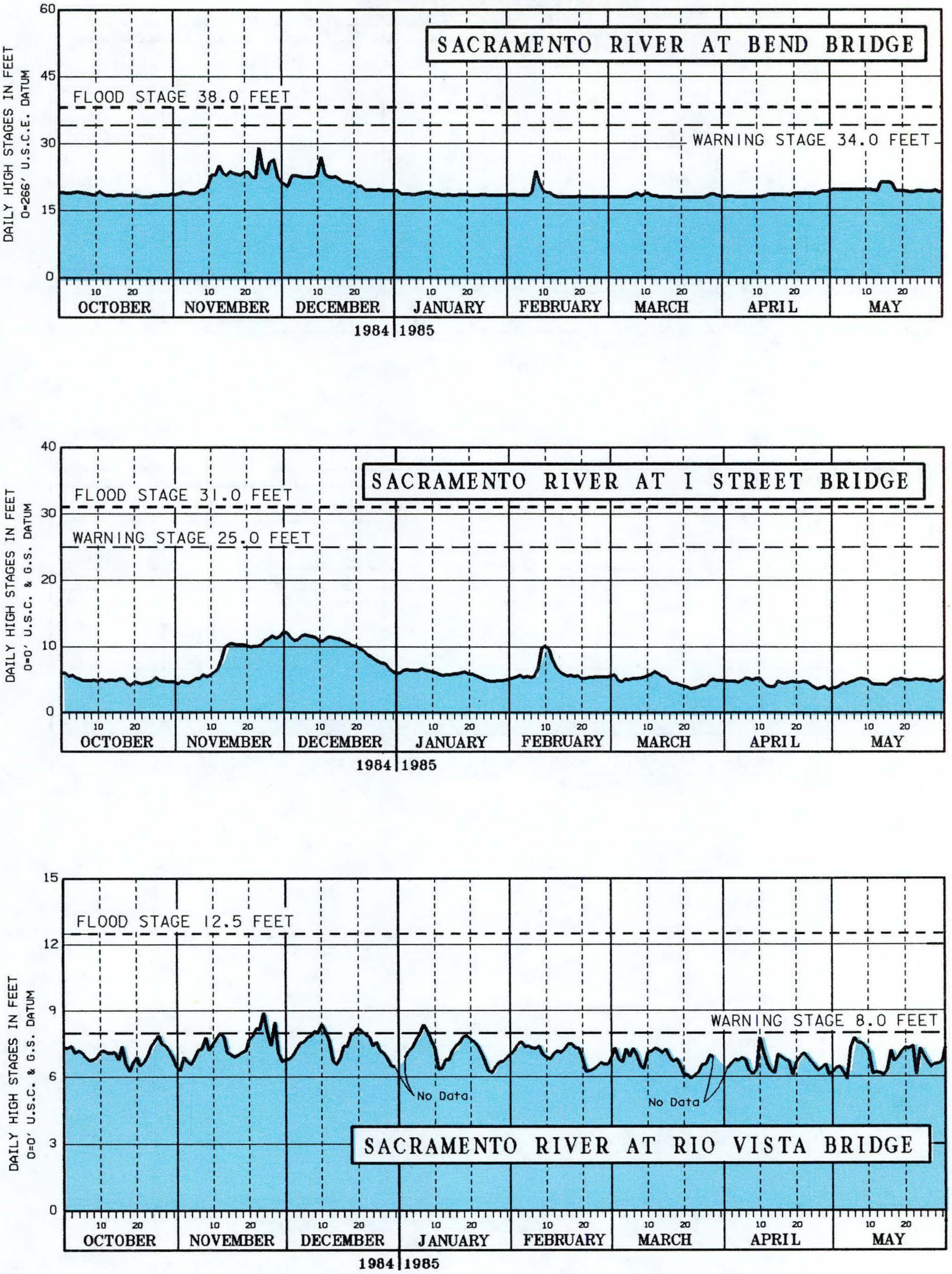
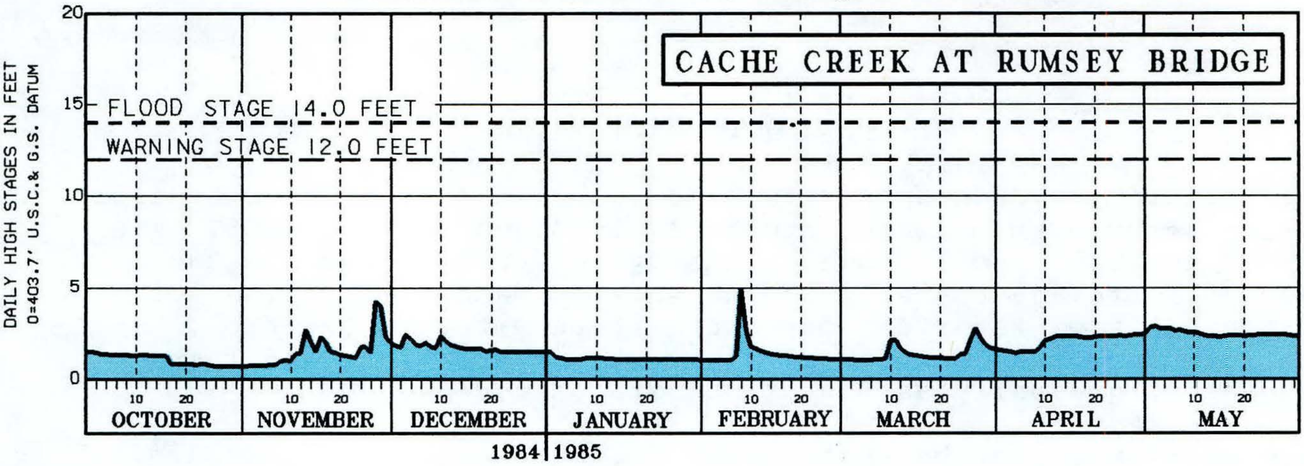
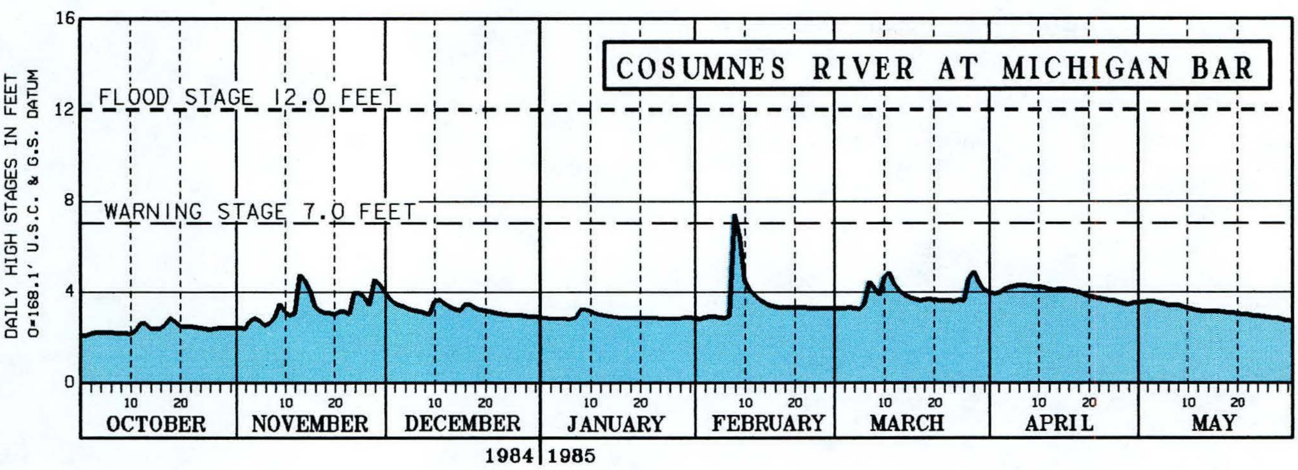
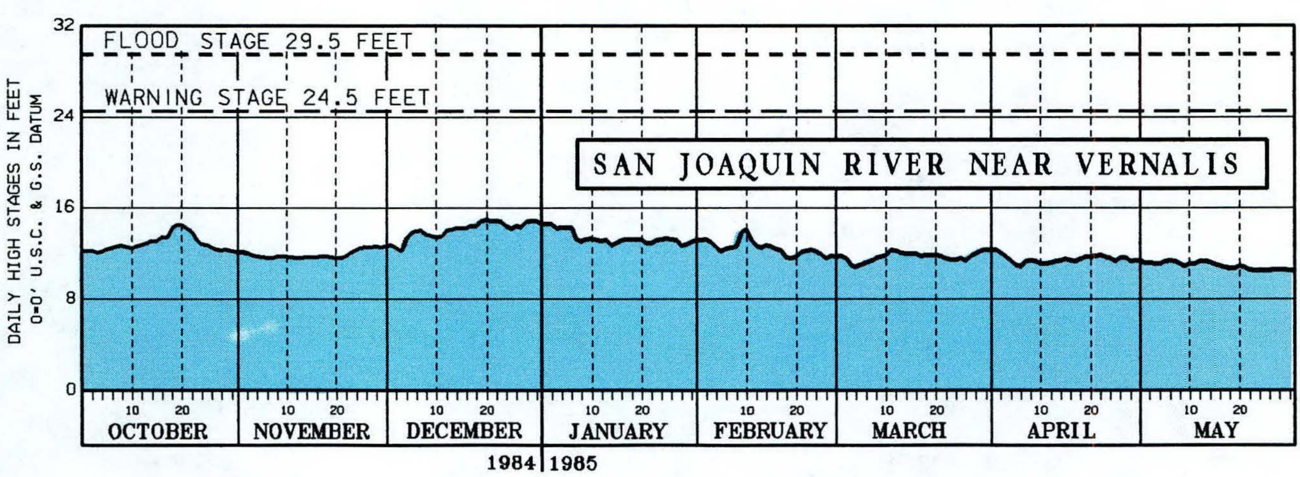


Figure 12 HYDROGRAPHS OF CACHE CREEK, COSUMNES AND SAN JOAQUIN RIVERS







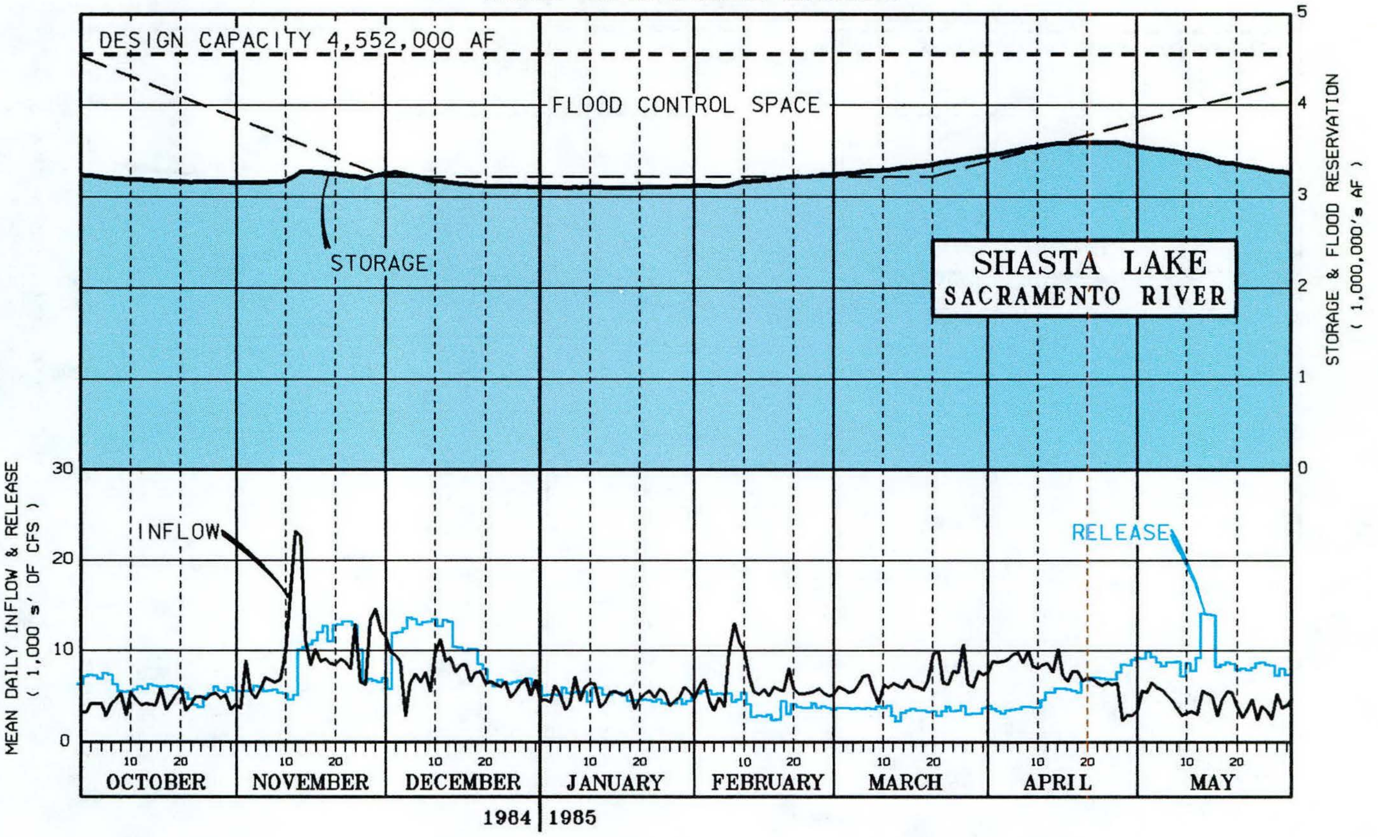
RESERVOIR HYDROGRAPHS

The following hydrographs show what occurred at the major Central Valley reservoirs between October 1, 1984 and May 31, 1985. The "flood control space" shown in the hydrographs represents the reservoir storage space, which is vacated each year as the wet season begins. Reservoir operators store water in the flood control space when downstream river stages are high, and then release it gradually as downstream stages recede.

Some reservoirs in the central and southern Sierra include additional flood control space during the snowmelt season. The peak melt usually occurs near mid-May.

The flood control storage spaces shown in the hydrographs are maximum requirements and may be reduced somewhat when warranted by hydrometeorological conditions.

Figure 13 HYDROGRAPHS OF SHASTA AND OROVILLE LAKES



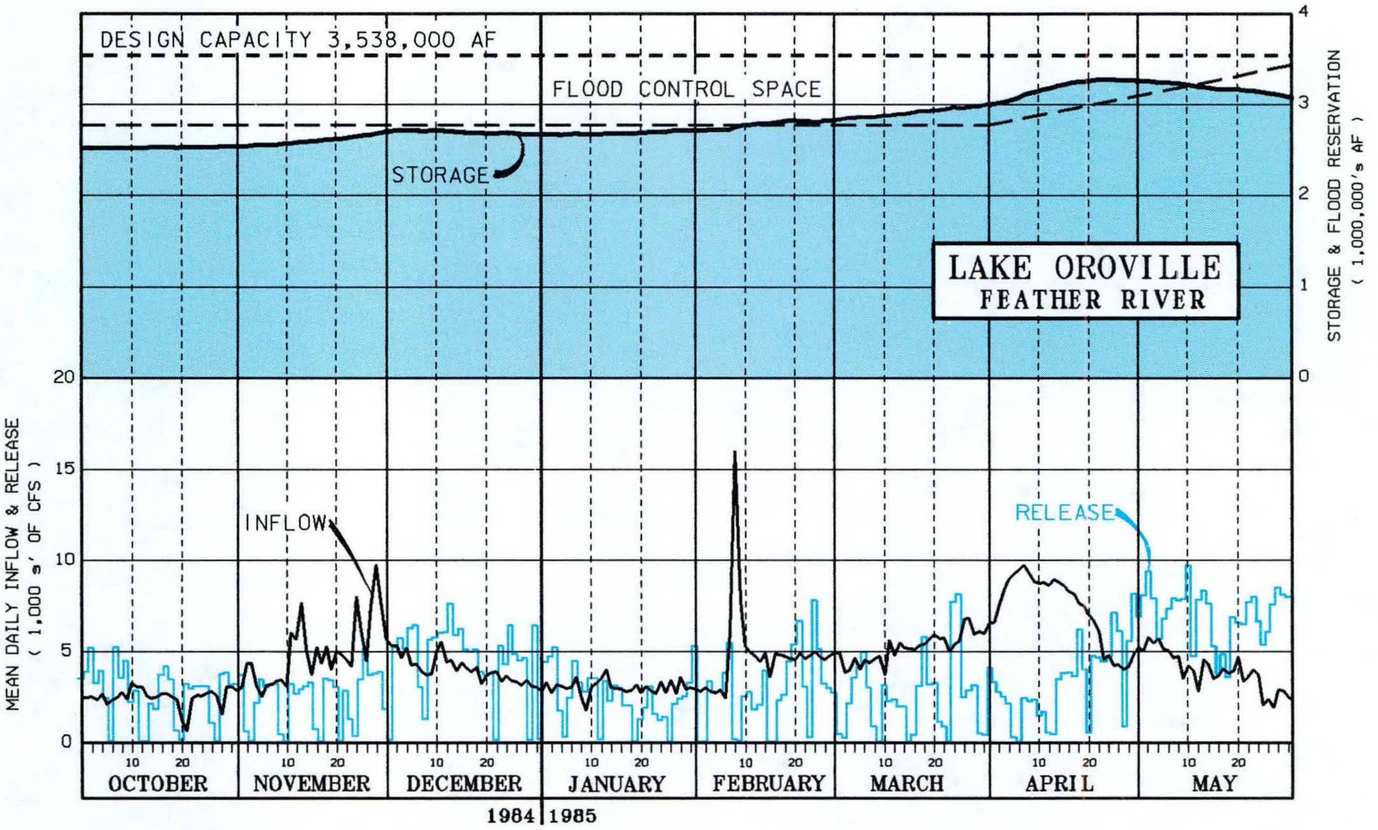
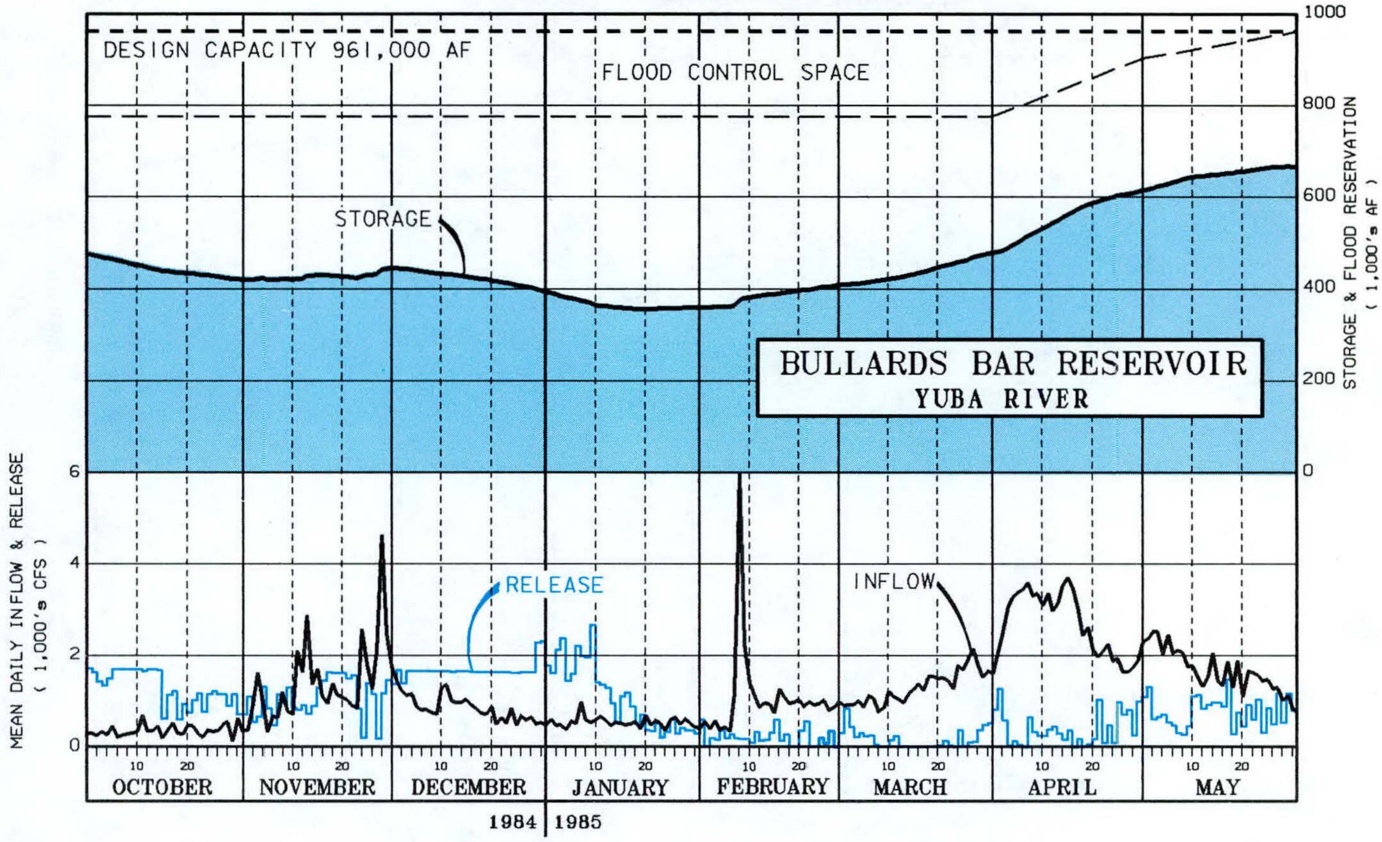


Figure 14 HYDROGRAPHS OF BULLARDS BAR RESERVOIR AND FOLSOM LAKE



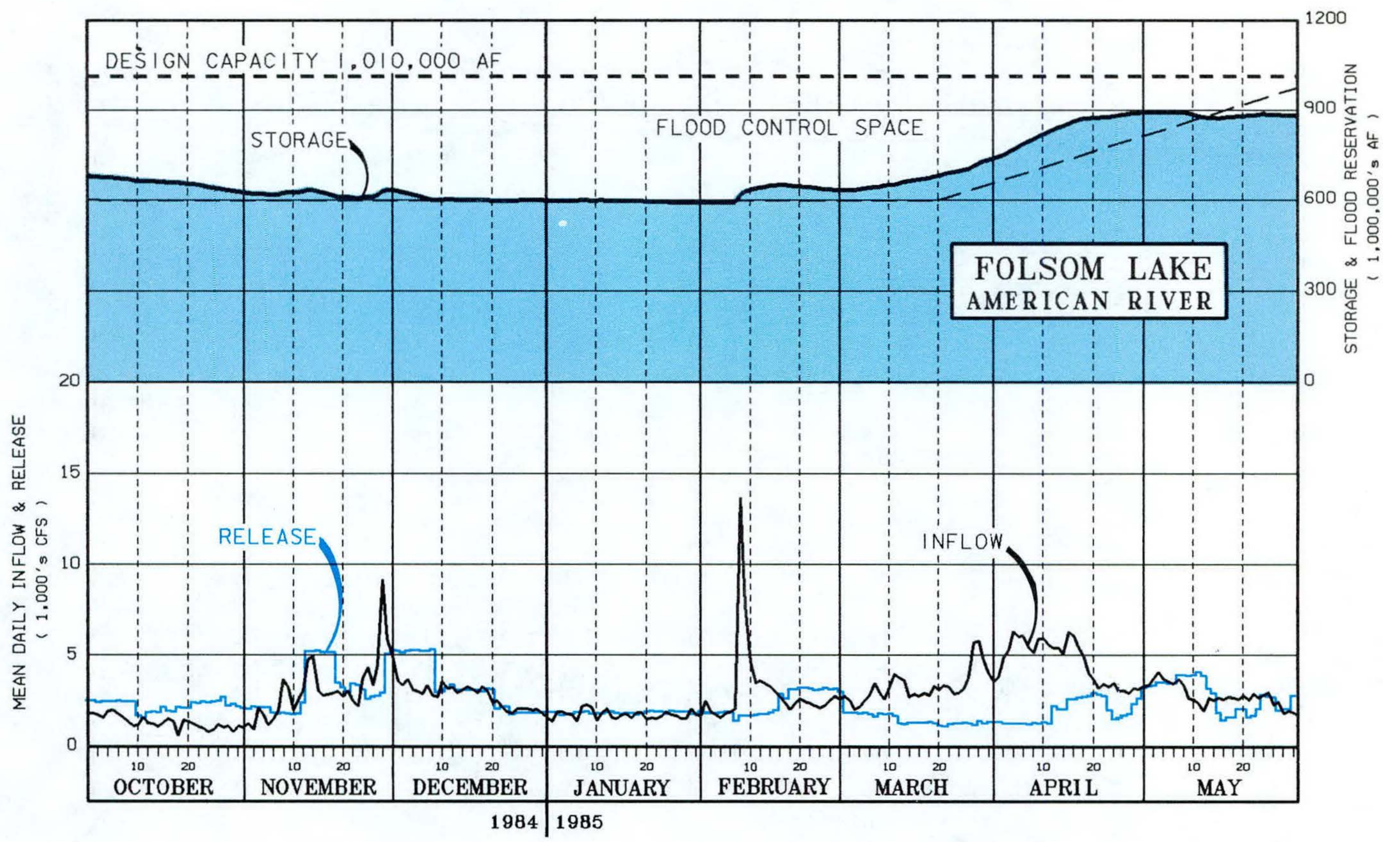
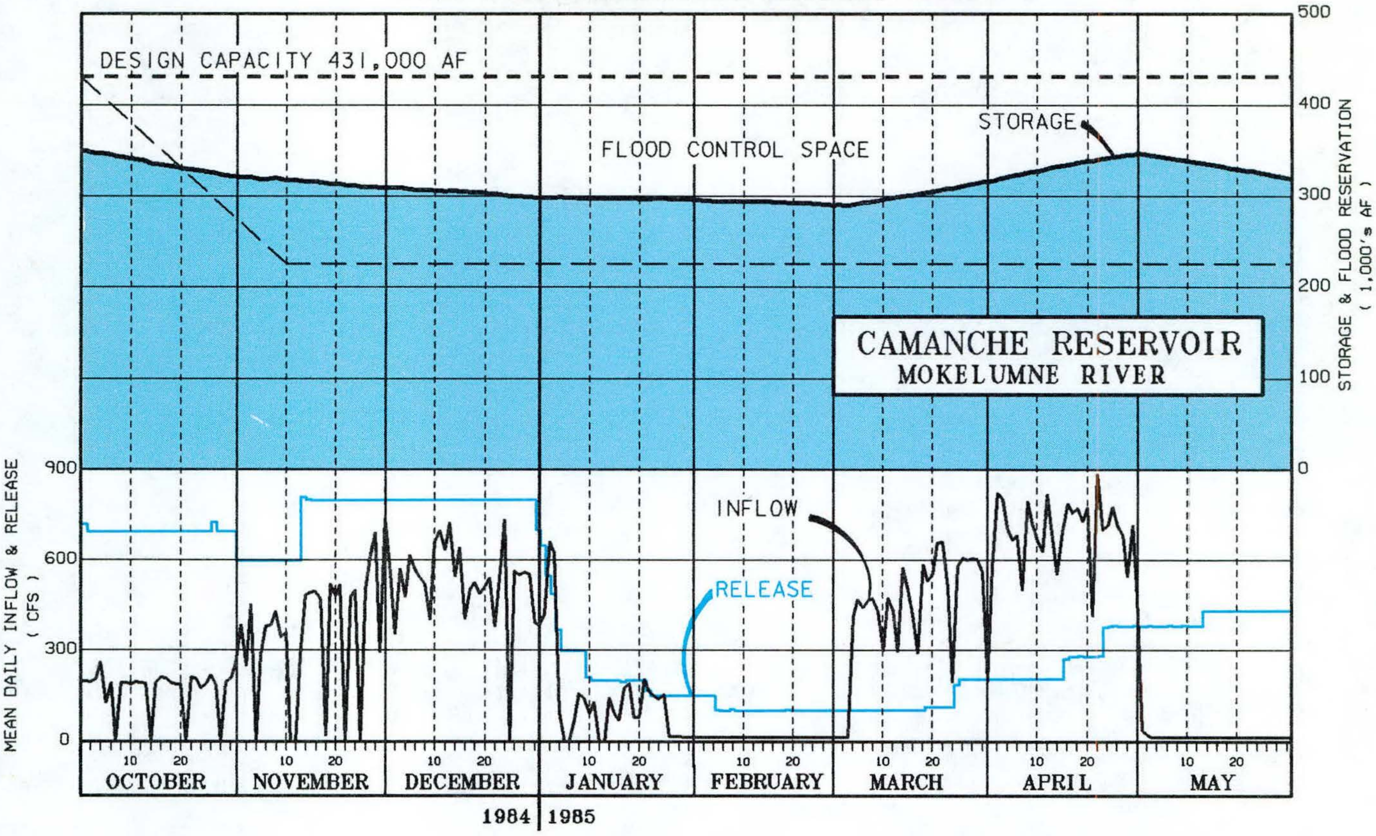


Figure 15 HYDROGRAPHS OF CAMANCHE AND NEW MELONES RESERVOIRS



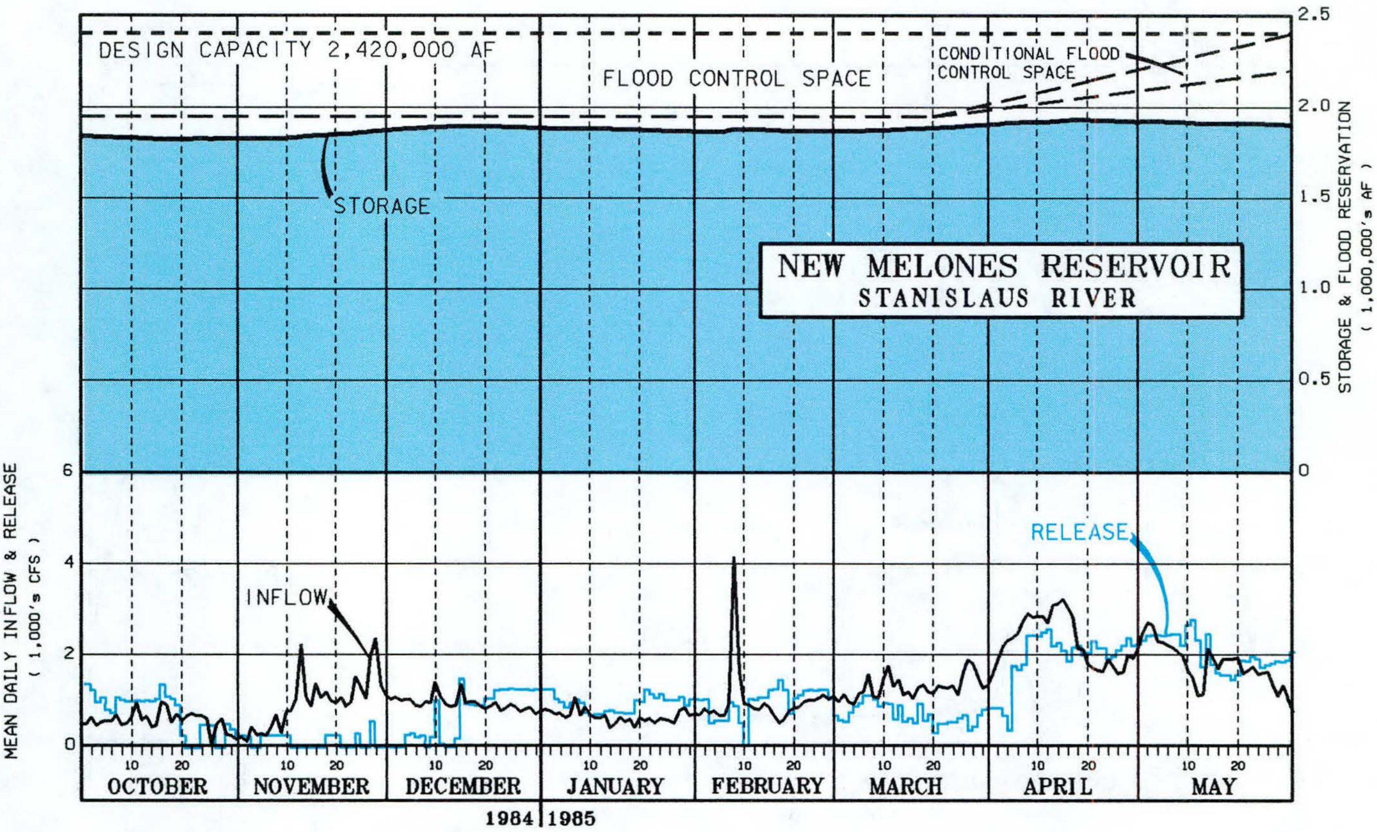
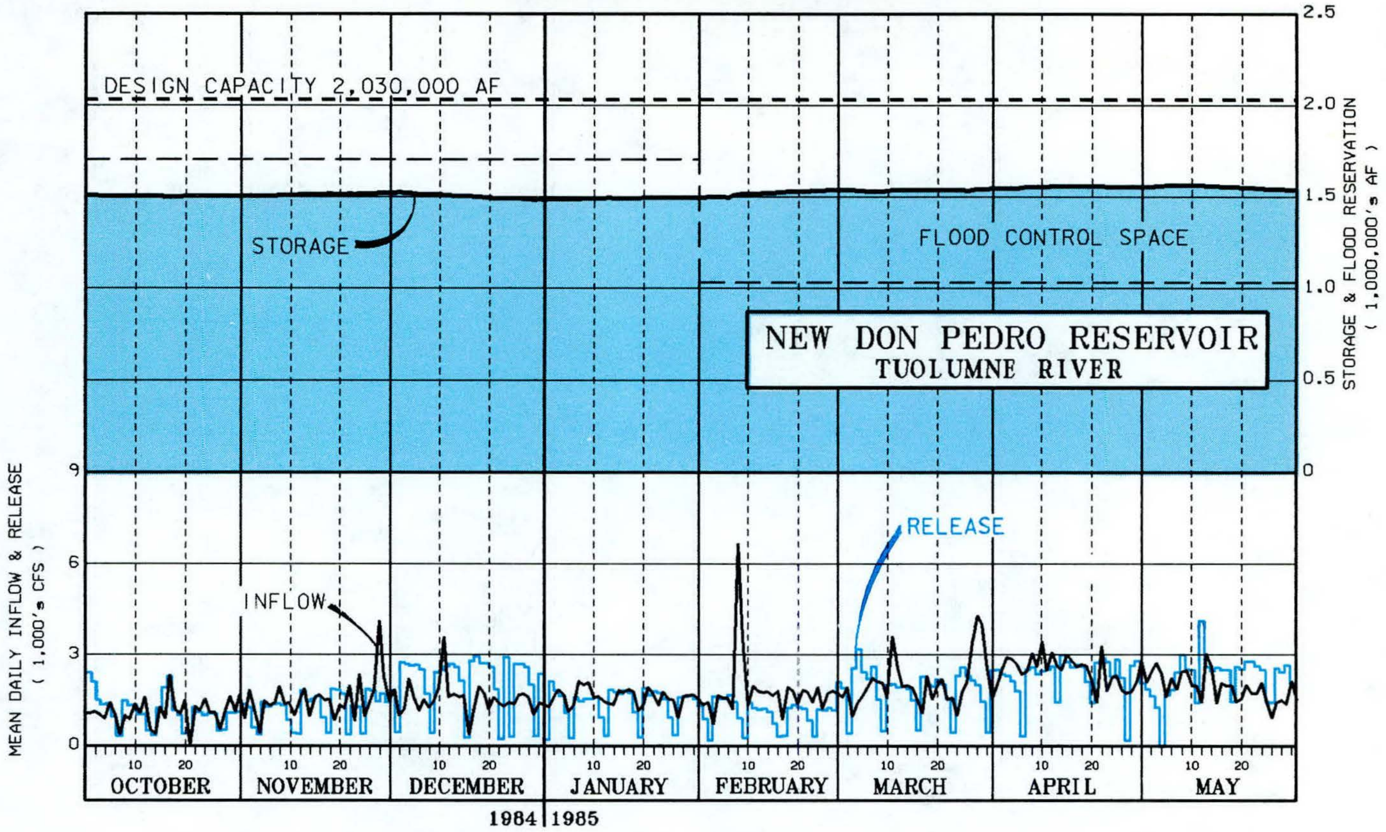


Figure 16 HYDROGRAPHS OF NEW DON PEDRO RESERVOIR AND LAKE MC CLURE



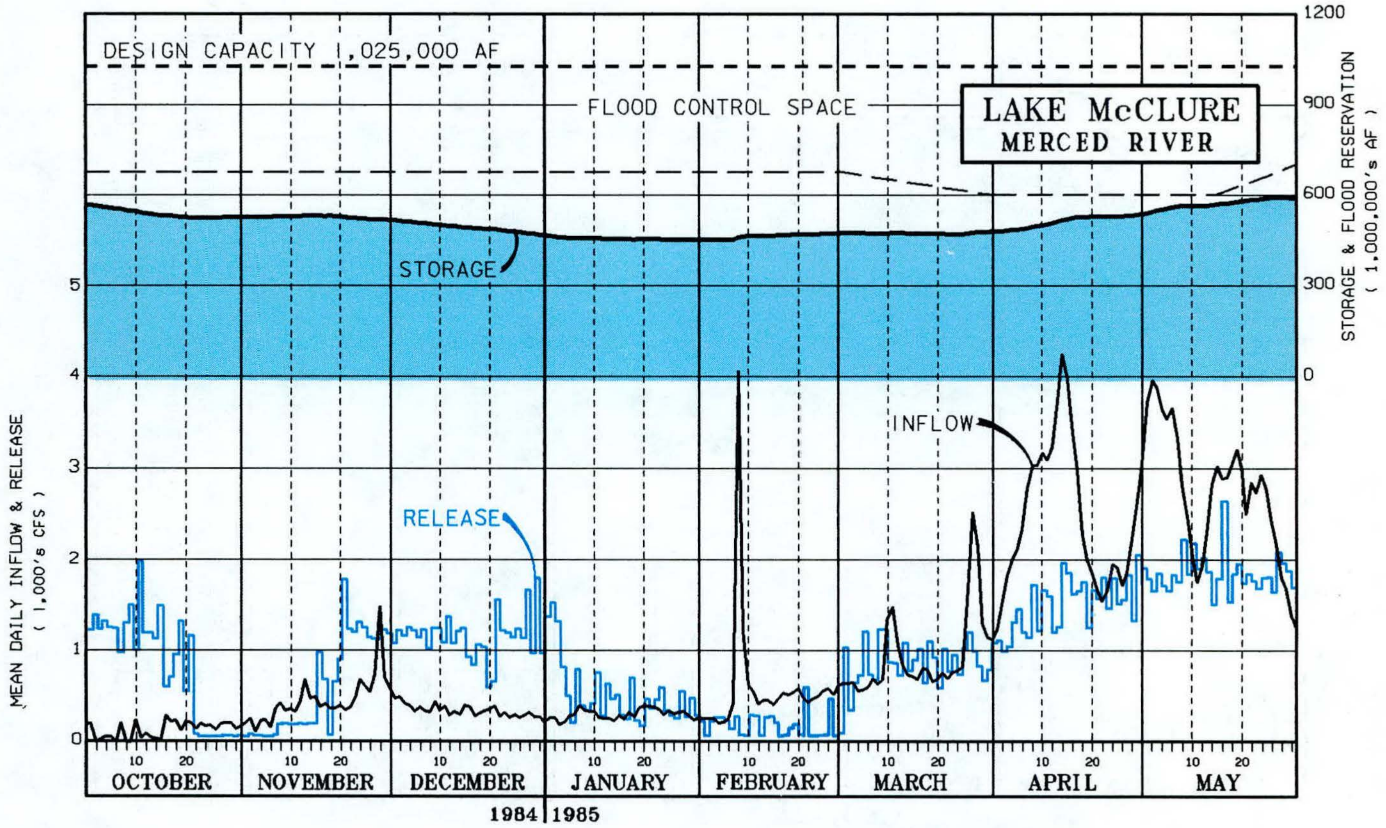
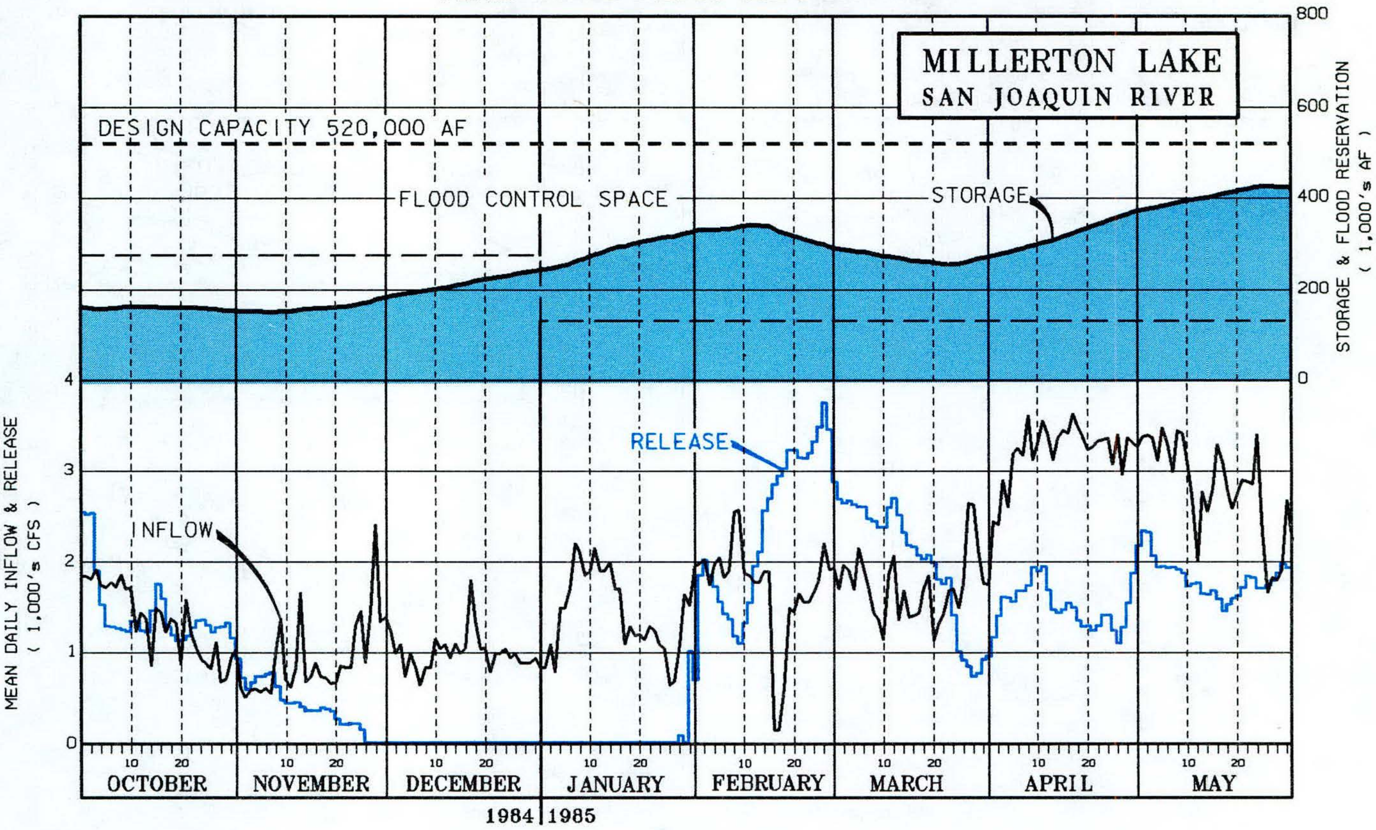


Figure 17 HYDROGRAPHS OF MILLERTON LAKE AND PINE FLAT RESERVOIR



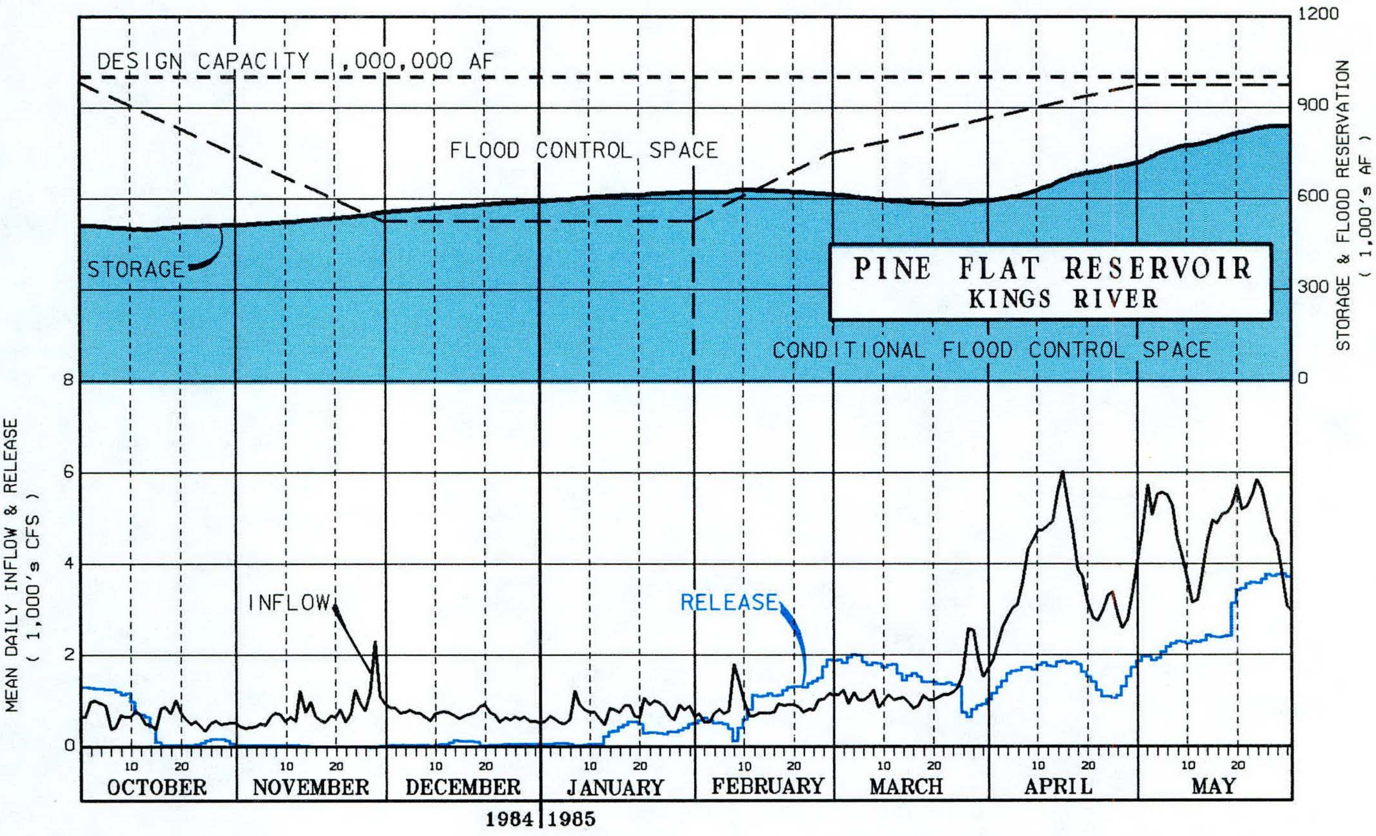
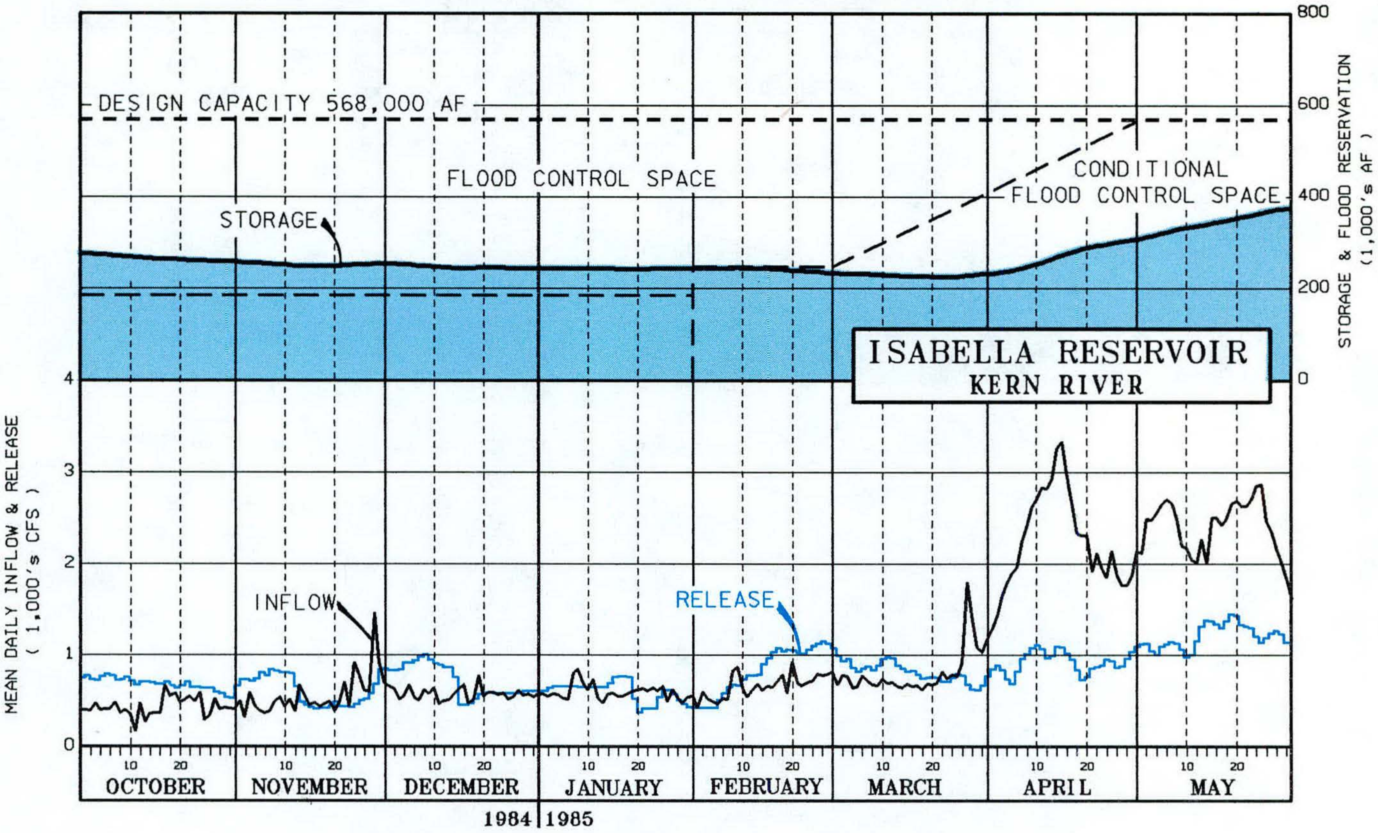
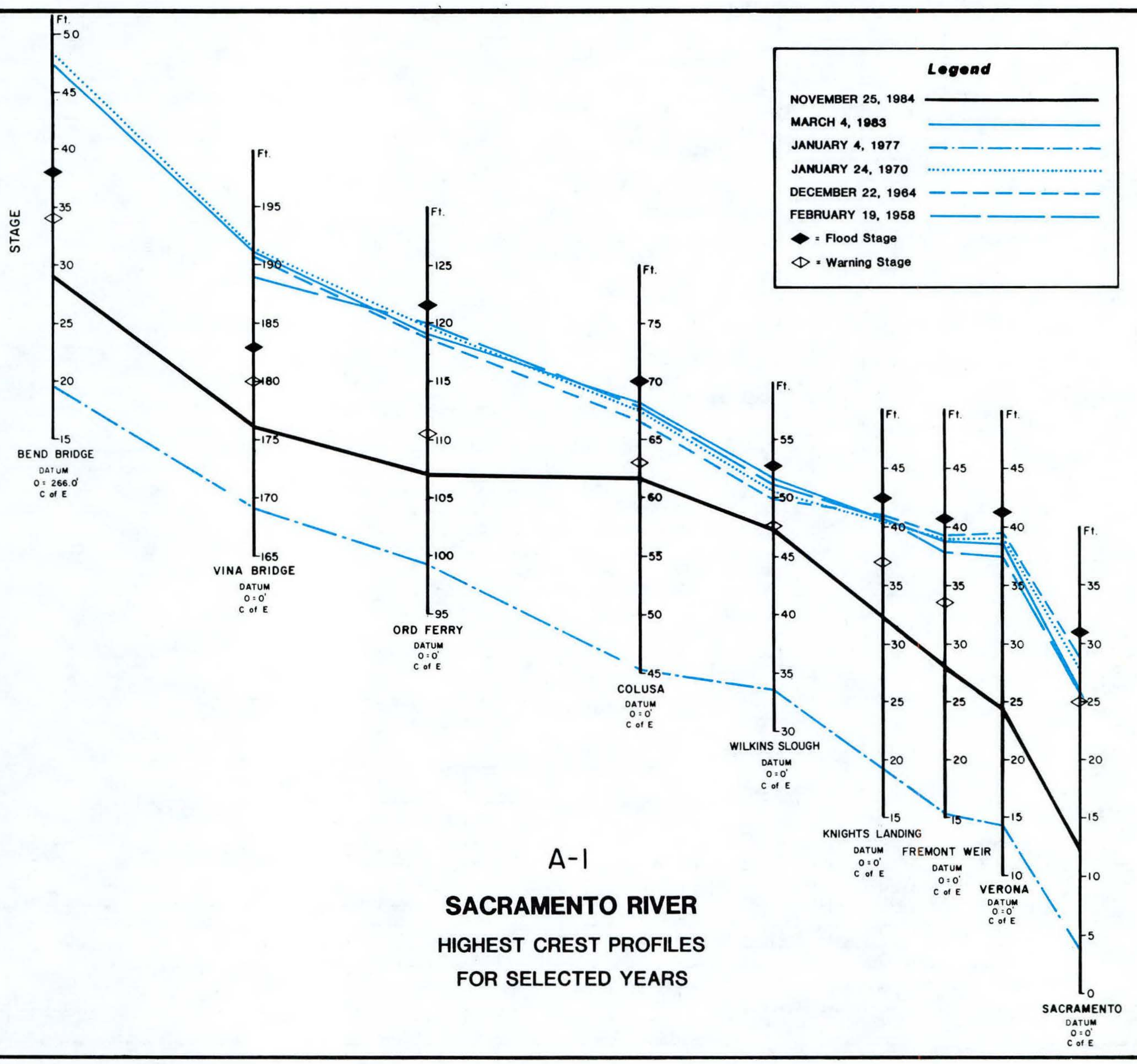


Figure 18 HYDROGRAPH OF ISABELLA RESERVOIR



APPENDIX A

SACRAMENTO RIVER CREST AND WEIR OVERFLOW RECORDS

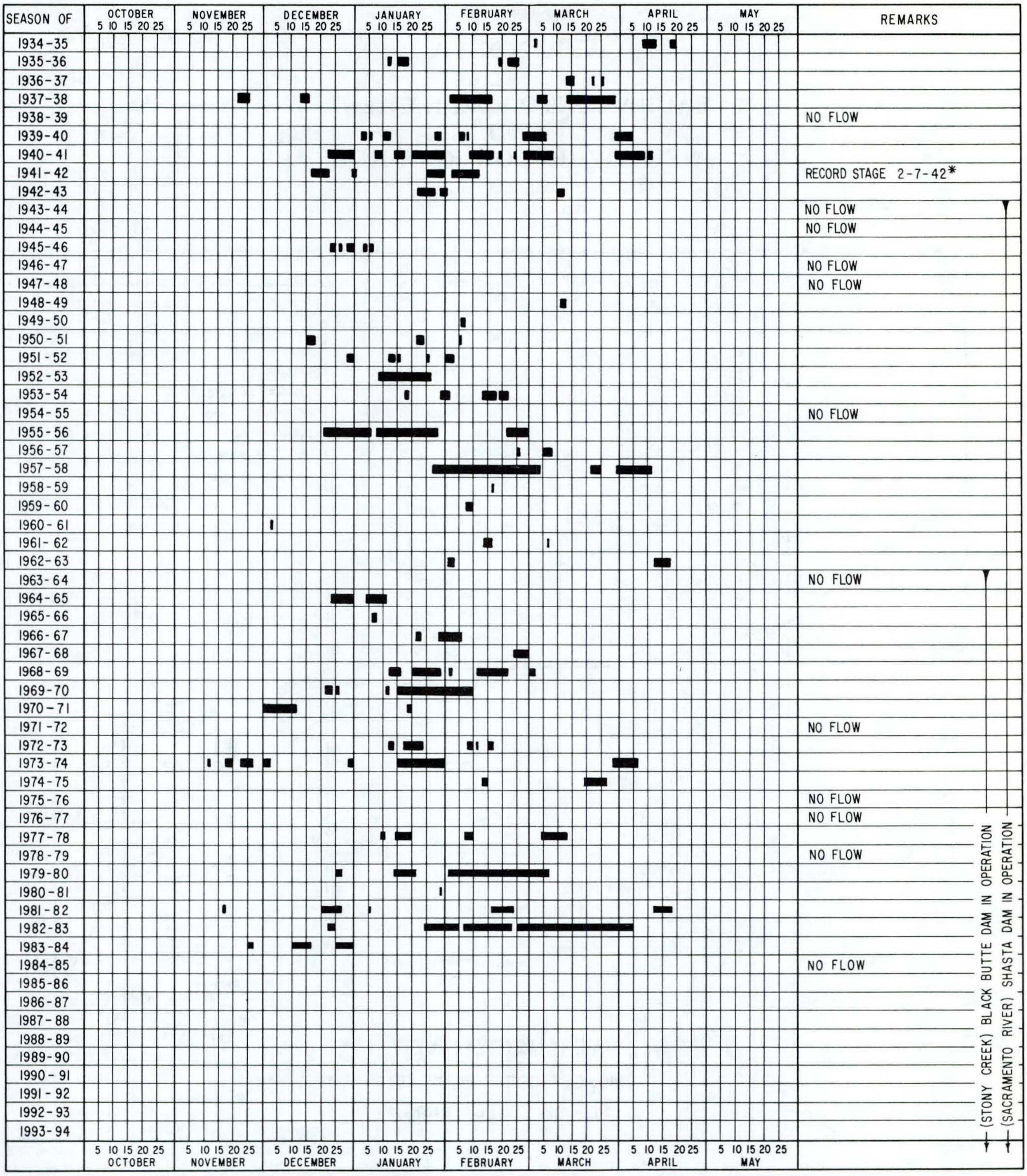


A-1

SACRAMENTO RIVER

HIGHEST CREST PROFILES FOR SELECTED YEARS

Figure A-2 PERIOD OF RECORD OF OVERFLOW OF THE MOULTON WEIR



NOTE:

Data compiled from records of D.W.R. stream gaging station "Sacramento River at Moulton Weir."

Datum: 0 = 0' U.S.E.D.

Period of record: 1935 to present

Crest elevation = 76.75 feet

LEGEND

Designates periods of flow over weir

*83.8 feet

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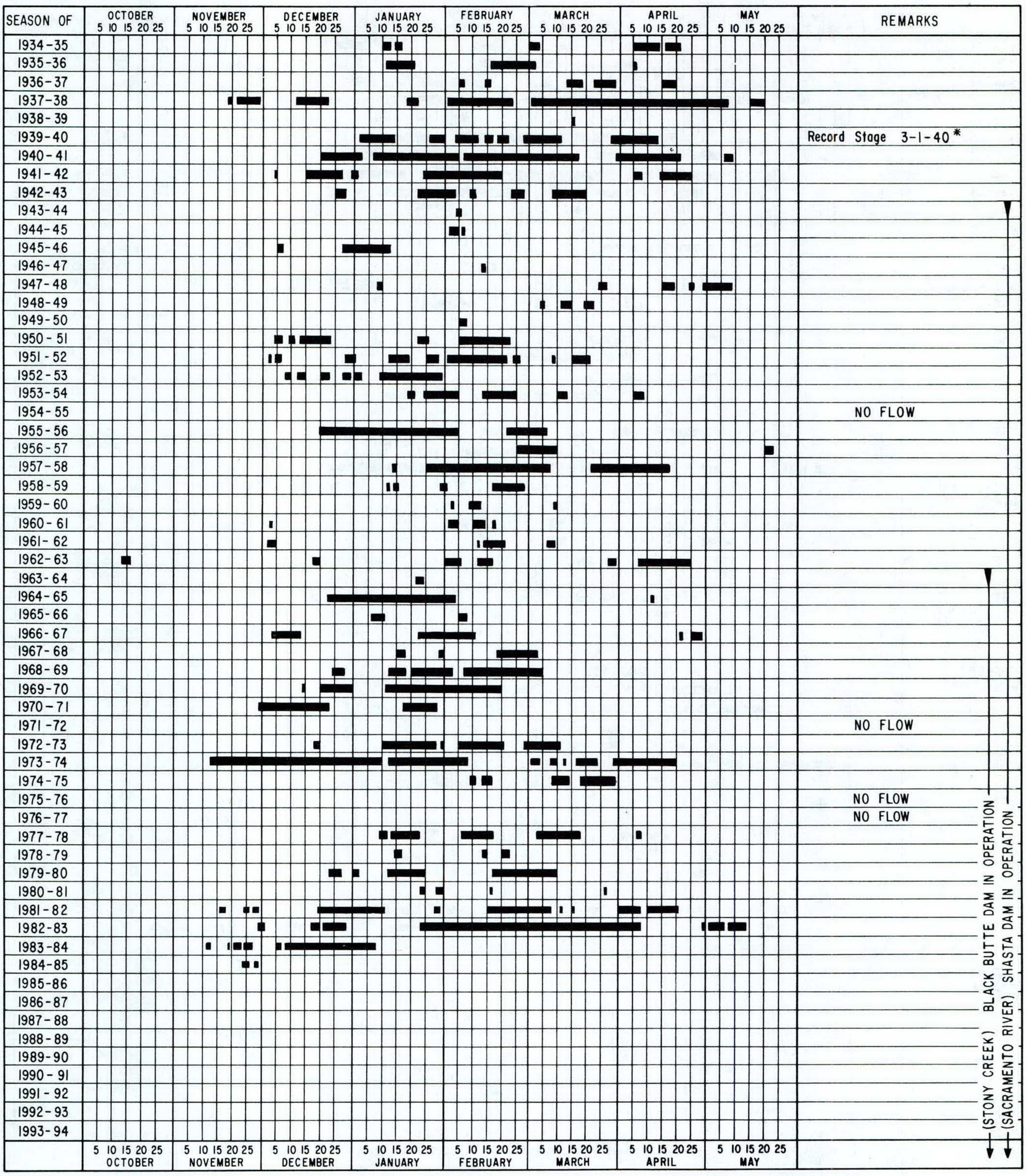
Figure A-3 PERIOD OF RECORD OF OVERFLOW OF THE COLUSA WEIR



NOTE:

Data compiled from records of D.W.R. stream gaging station Sacramento River at Colusa Weir

Datum: 0 = 0' U.S.E.D.

Period of record: 1935 to present

Crest elevation: 61.80 feet

LEGEND

▬ Designates periods of flow over weir

* 70.6 feet

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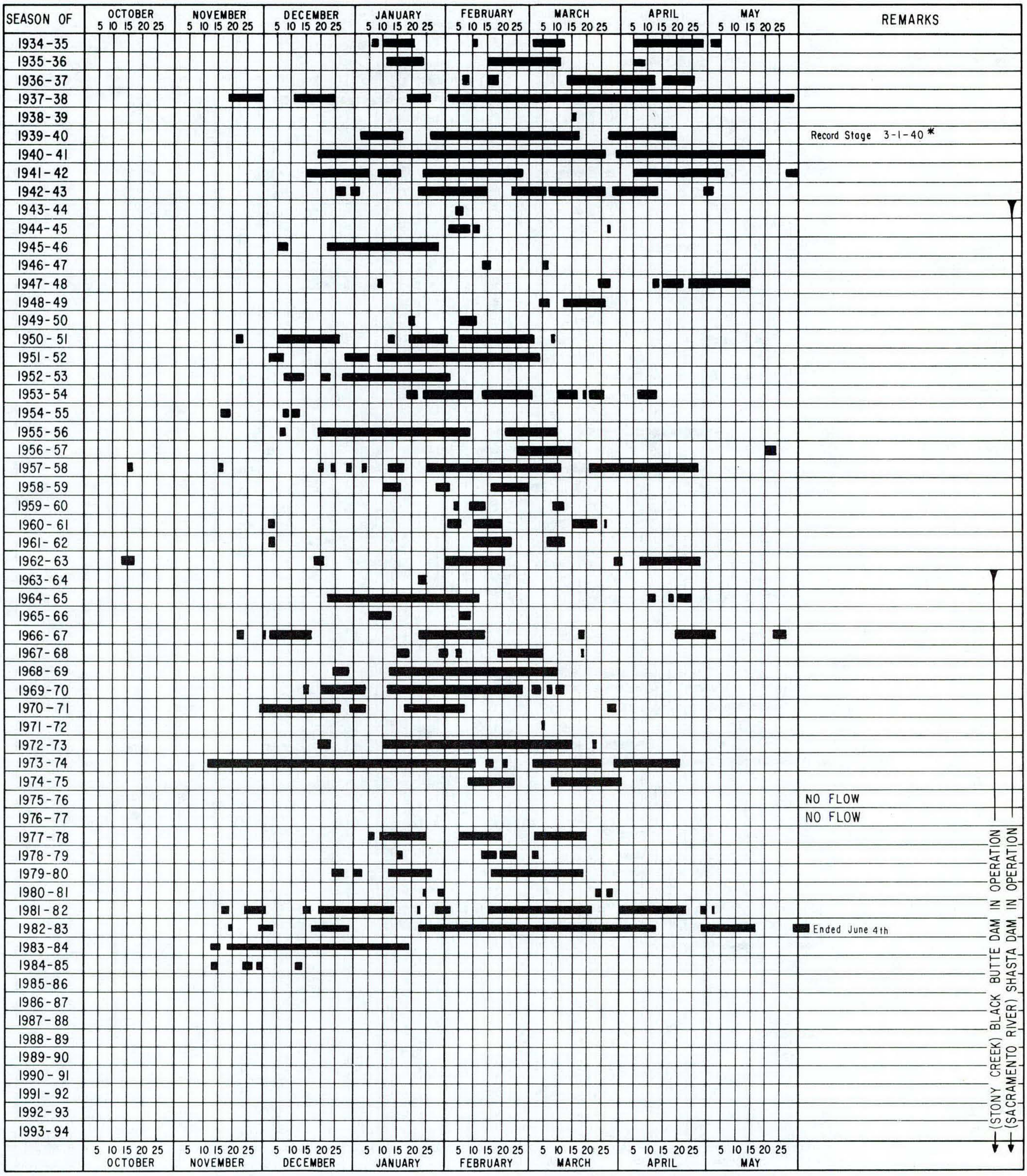
Figure A-4 PERIOD OF RECORD OF OVERFLOW OF THE TISDALE WEIR



NOTE:

Data compiled from records of D.W.R. stream gaging station "Sacramento River at Tisdale Weir"

Datum: 0=0' U.S.E.D.

Period of record: 1935 to present

Crest elevation = 45.45 feet

LEGEND

▬ Designates periods of flow over weir

*53.3 feet

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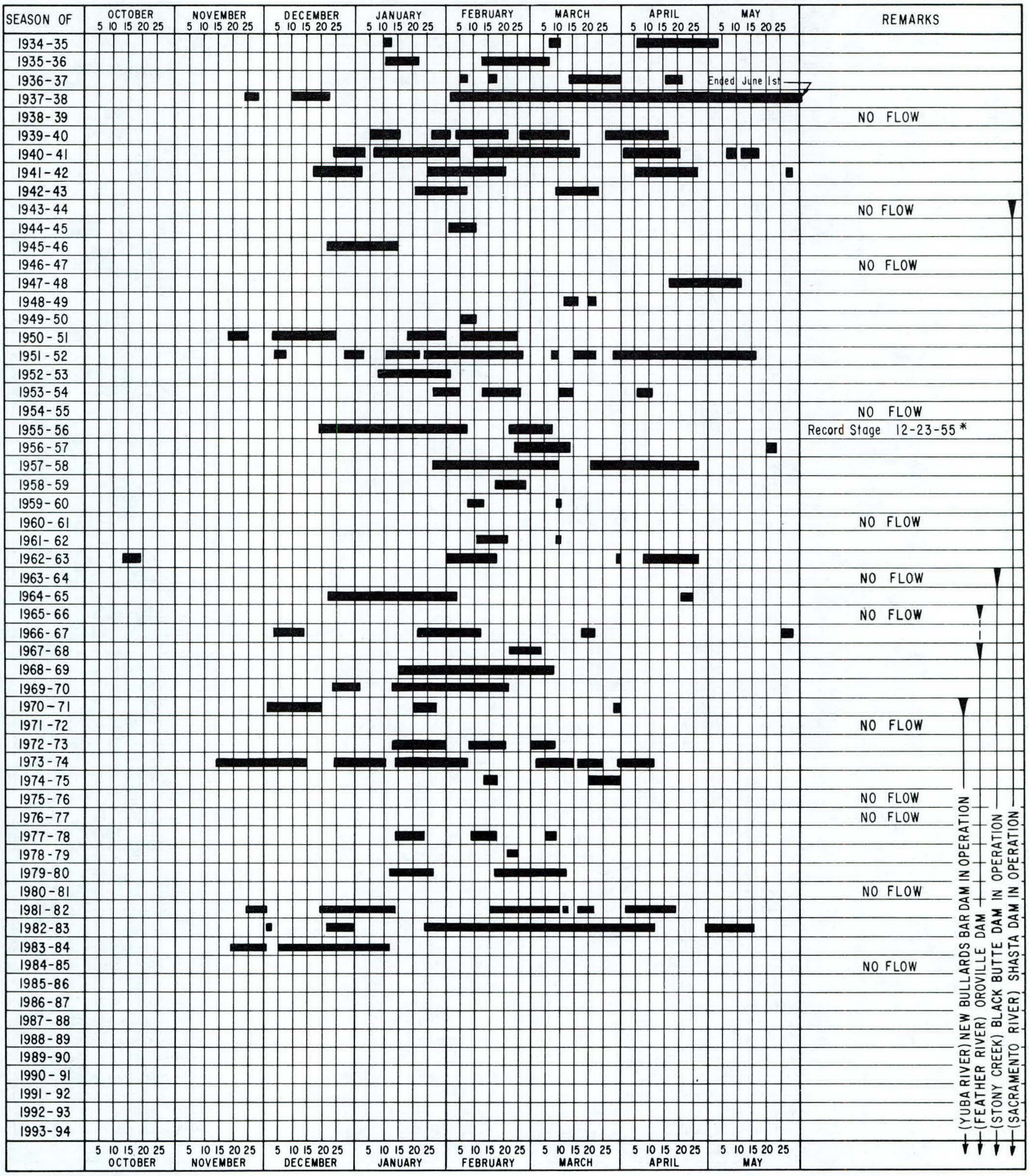
Figure A-5 PERIOD OF RECORD OVERFLOW OF THE FREMONT WEIR



NOTE:

Data compiled from records of D.W.R. stream gaging station "Sacramento River at Freemont Weir, West End"

Datum: 0 = 0' U.S.E.D.

Period of record: 1934 to present

Crest elevation = 33.50 feet

LEGEND

Designates periods of flow over weir

* 39.7 feet

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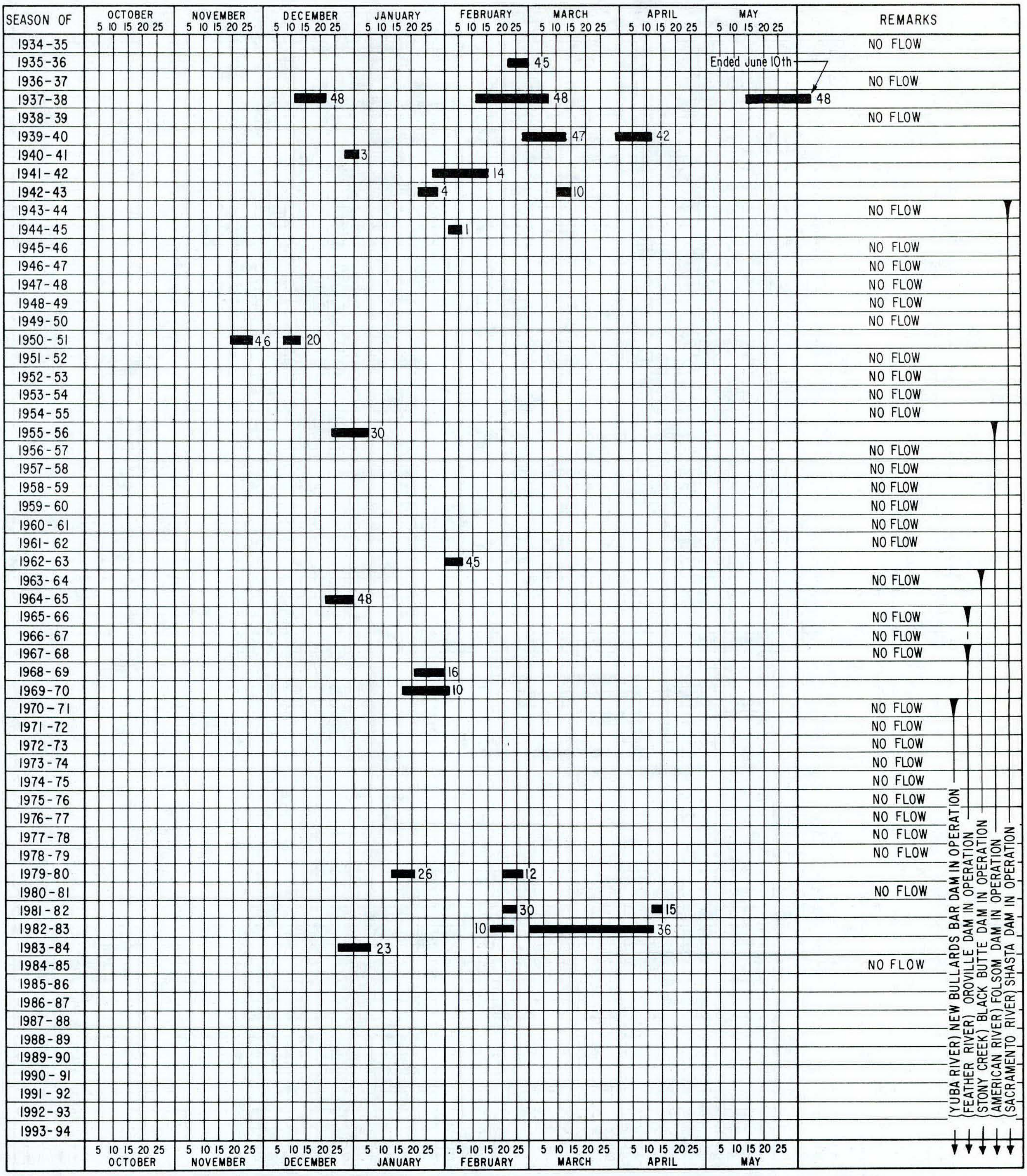
Figure A-6 PERIOD OF RECORD OF OVERFLOW OF THE SACRAMENTO WEIR



NOTE:

Data compiled from records of D.W.R. stream gaging station "Sacramento Weir Spill to Yolo Bypass, near Sacramento.

Datum: 0=0' U.S.E.D.

Period of record: 1926 to present

Crest elevation = 24.75 feet

Elevation of top of gates = 31.0 feet

LEGEND

5 — Designates periods of flow over weir and total number of gates opened.

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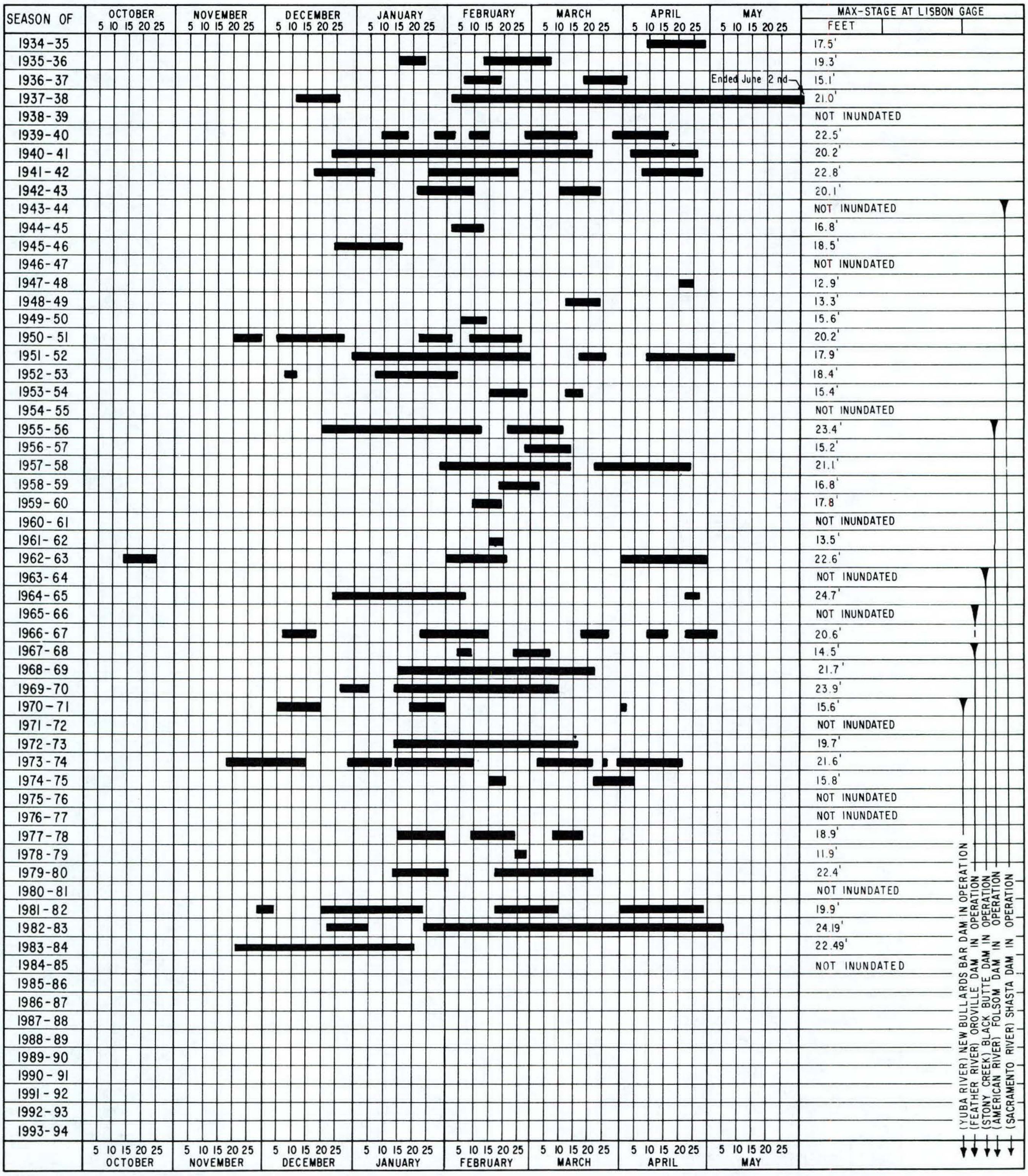
Figure A-7 PERIOD OF RECORD OF INUNDATION OF THE YOLO BYPASS



NOTE:

Data compiled from records of D.W.R. stream gaging station "Yolo Bypass near Lisbon."

Datum: 0=U.S.E.D. Datum

Period of Record: 1914 to Present

Assumed overflow of Bypass at stage above 11.5' on the Lisbon gage.

LEGEND

Designates period of inundation of Bypass.

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CONVERSION FACTORS

Quantity	To Convert from Metric Unit	To Customary Unit	Multiply Metric Unit By	To Convert to Metric Unit Multiply Customary Unit By
Length	millimetres (mm)	inches (in)	0.03937	25.4
	centimetres (cm) for snow depth	inches (in)	0.3937	2.54
	metres (m)	feet (ft)	3.2808	0.3048
	kilometres (km)	miles (mi)	0.62139	1.6093
Area	square millimetres (mm^2)	square inches (in^2)	0.00155	645.16
	square metres (m^2)	square feet (ft^2)	10.764	0.092903
	hectares (ha)	acres (ac)	2.4710	0.40469
	square kilometres (km^2)	square miles (mi^2)	0.3861	2.590
Volume	litres (L)	gallons (gal)	0.26417	3.7854
	megalitres	million gallons (10^6 gal)	0.26417	3.7854
	cubic metres (m^3)	cubic feet (ft^3)	35.315	0.028317
	cubic metres (m^3)	cubic yards (yd^3)	1.308	0.76455
	cubic dekametres (dam^3)	acre-feet (ac-ft)	0.8107	1.2335
Flow	cubic metres per second (m^3/s)	cubic feet per second (ft^3/s)	35.315	0.028317
	litres per minute (L/min)	gallons per minute (gal/min)	0.26417	3.7854
	litres per day (L/day)	gallons per day (gal/day)	0.26417	3.7854
	megalitres per day (ML/day)	million gallons per day (mgd)	0.26417	3.7854
	cubic dekametres per day (dam^3/day)	acre-feet per day (ac-ft/day)	0.8107	1.2335
Mass	kilograms (kg)	pounds (lb)	2.2046	0.45359
	megagrams (Mg)	tons (short, 2,000 lb)	1.1023	0.90718
Velocity	metres per second (m/s)	feet per second (ft/s)	3.2808	0.3048
Power	kilowatts (kW)	horsepower (hp)	1.3405	0.746
Pressure	kilopascals (kPa)	pounds per square inch (psi)	0.14505	6.8948
	kilopascals (kPa)	feet head of water	0.33456	2.989
Specific Capacity	litres per minute per metre drawdown	gallons per minute per foot drawdown	0.08052	12.419
Concentration	milligrams per litre (mg/L)	parts per million (ppm)	1.0	1.0
Electrical Conductivity	microsiemens per centimetre (uS/cm)	micromhos per centimetre	1.0	1.0
Temperature	degrees Celsius (°C)	degrees Fahrenheit (°F)	(1.8 × °C)+32	(°F−32)/1.8

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