

State of California  
The Resources Agency

DEPARTMENT OF WATER RESOURCES  
Division of Operations and Maintenance

# **STATE WATER PROJECT ANNUAL REPORT OF OPERATIONS 2000**

**February 2005**

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Governor  
State of California

**Mike Chrisman**  
Secretary for Resources  
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**Lester A. Snow**  
Director  
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## Foreword

This is the twenty-seventh in a series of annual reports summarizing the water and energy operation of the California State Water Project. Although the reports in this series are published considerably after the reference year, they document the official record of operations and provide an important source of historical data. This report summarizes the operation of Project facilities during 2000 and includes any revisions to data previously published in the more timely monthly "State Water Project, Operations Data" reports.

Chief  
Division of Operations and Maintenance



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## Conversion Factors

Quantity	Multiply	By	To obtain
<b>Area</b>	acre	43,560	square feet
<b>Volume</b>	cubic foot	7.481	gallons
	cubic foot	62.4	pounds of water
	gallon	0.13368	cubic feet
	acre-foot	325,900	gallons
	acre-foot	43,560	cubic feet
	million gallons	3.07	acre-feet
<b>Flow</b>	cubic foot/second (cfs)	450	gallons/minute (gpm)
	gallons/minute	0.002228	cubic feet/second (cfs)
	million gallons/day	1.5472	cubic feet/second (cfs)
	cubic foot/second (cfs)	646,320	gallons a day
	cubic foot/second (cfs)	1.98	acre-feet a day
	million gallons/day (mgd)	1,120	acre-feet a year
<b>Pressure</b>	feet head of water	0.433	pounds/square inch (psi)
<b>Power</b>	kilowatts (kW)	1.3405	horsepower (hp)

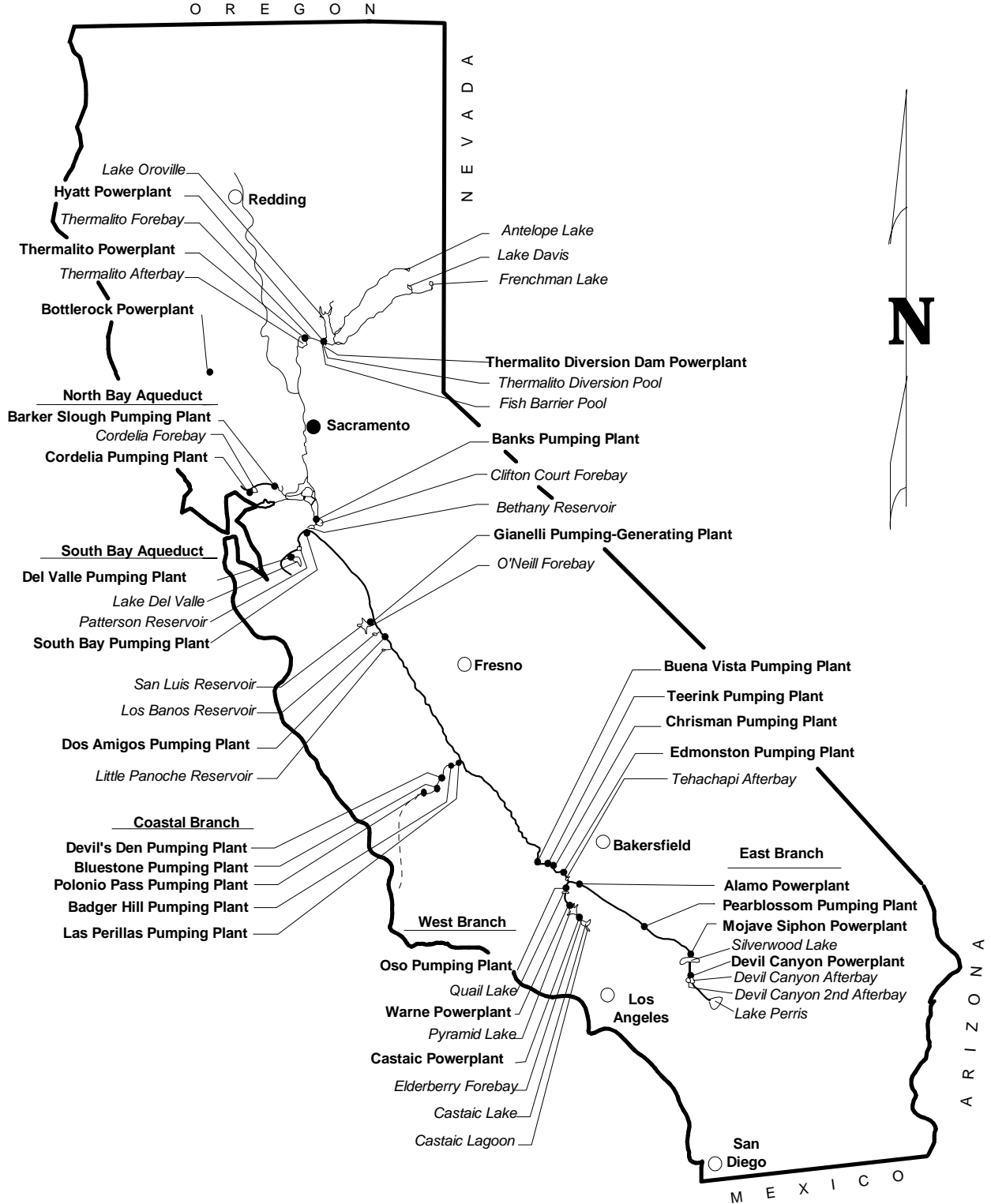
## Abbreviations and Units

The following abbreviations are commonly used throughout this report.

AF	acre-feet
Banks	Harvey O. Banks Delta Pumping Plant
California Aqueduct	Governor Edmund G. Brown California Aqueduct
CEA	Capacity Exchange Agreement
cfs	cubic feet per second
CVP	Central Valley Project
D-1485	Water Rights Decision 1485
DFG	Department of Fish and Game
DO	dissolved oxygen
DOI	Delta Outflow Index
DPR	Department of Parks and Recreation
DWR	Department of Water Resources
EC	electrical conductivity
FRSA	Feather River Service Area
ft	feet
KCWA	Kern County Water Agency
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
LADWP	Los Angeles Department of Water and Power
MAF	million acre-feet
MW	megawatt
MWh	megawatt-hour
MWDSC	Metropolitan Water District of Southern California
NDOI	Net Delta Outflow Index
PG&E	Pacific Gas and Electric Company
SCE	Southern California Edison
SDWA	South Delta Water Agency
SRI	Sacramento River Index
SWP	State Water Project
SWRCB	State Water Resources Control Board
USBR	United States Bureau of Reclamation

# Map 1

## Project Facilities



## *Introduction*

The 2000 Annual Report of Operations for the State Water Project is divided into seven parts. The first two parts, "Highlights of 2000 Operation" and "Project Status in 2000," cover conditions and events of statewide significance. The following three sections cover water conditions, water operations, and energy operations in 2000. The sixth part, "Sacramento-San Joaquin Delta Operations," gives special emphasis to Delta operations, a key aspect of the SWP. The last part, "Project Operations by Field Division," provides details on activities by field division as outlined on Map 2.

## *Highlights of 2000 Operation*

Managing available water supplies during the 1987-1992 drought required activities designed to make the most beneficial use of water available to the SWP. The Department of Water Resources initially structured its plan of operations according to the concept of a firm yield. Firm yield is the quantity of water that can be made available on a firm annual basis to water contractors during a drought period. In 1991, after years of discussion, DWR changed its method of determining delivery amounts and replaced the concept of firm yield with the concept of variable yield. Operating on the basis of a variable yield makes efficient use of available water supplies during a drought. Annual Table A represents the total amount of project water that an SWP contractor may request each year, according to that contractor's long-term water supply contracts. Approved Table A (previously called entitlement) represents the amount of annual Table A requested by the contractors and approved for delivery by the Department, based on hydrologic conditions, current reservoir storage, and total requests by the SWP water contractors. DWR also developed programs to compensate for the lack of storage facilities. These programs include water transfers, exchanges, loans, storage, purchases, and carry-over entitlement for delivery at a later date.

Contractor requests for Table A water for the 1999-00 water year were about 3.62 MAF. The initial allocation in November 1999 provided for 57 percent of Table A requests or 2.06 MAF. On February 25, 2000, due to increased supplies, DWR allocated 70 percent of Table A requests or 2.88 MAF. As a result of additional improvements in water conditions, allocations were further increased to 100 percent on March 10, 2000. Unusually dry conditions from mid-March on caused a reduction in approved Table A amounts to 3.42 MAF or 90 percent of Table A requests.

Water Year runoff statewide was 95 percent of average. Runoff ranged from 45 percent in October through December and 180 percent in February. The total amount of unimpaired runoff to Lake Oroville for the 1999-00 water year was about 4.21 MAF.

The Sacramento River Index was classified as "wet" with just over 18.9 MAF. The San Joaquin River Index was classified as "above normal" with 5.9 MAF.

The 1999-00 water year closed with statewide precipitation at 95 percent of average. California precipitation followed a typical La Nina pattern for the second year in a row. Northern Sierra precipitation dropped from 90 percent to 60 percent by the end of December with statewide snowpack at 20 percent of average. By the end of February, precipitation rose to 110 percent in the Sierras and the snowpack climbed to 125 percent of normal. Precipitation in Central California rose to 250 percent.

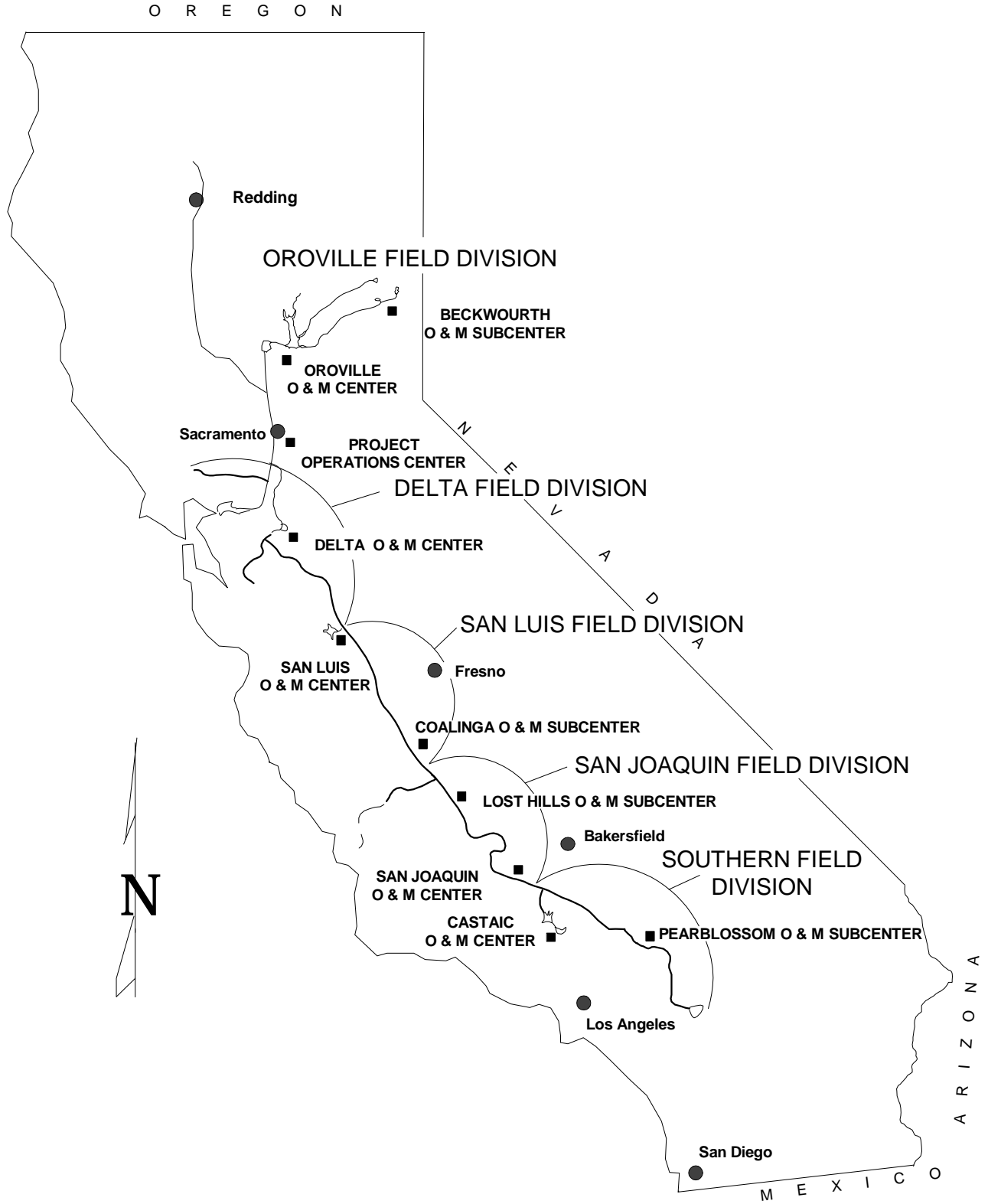
There was some high water on the major rivers, mostly in February and March, but very few flood stages occurred and flood-related problems were at a minimum.

The DWR-USBR Coordinated Operations Agreement monitors the daily difference between each agency's releases from storage and Delta exports. "Balanced" conditions are declared when releases are in danger of not meeting Delta outflow requirements. "Excess" conditions are declared when releases exceed Delta outflow requirements. DWR and USBR declared balanced Delta water conditions from January 1 to January 19, from April 14 to April 16, from May 1 to May 8, from June 5 to August 31, from September 13 to October 30, and from November 6 to December 31 during 2000.

The SWP depends on a complex system of dams, reservoirs, Powerplants, pumping plants, canals, and aqueducts to deliver water. Although initial transportation facilities were essentially completed in 1973, other facilities have been constructed since then and still others are under construction or are scheduled to be built as needed. The SWP facilities now comprise 28 dams and reservoirs, 25 pumping and generating plants, and nearly 660 miles of aqueducts.

Energy resources totaled 12,112,258 MWh which included generation of 7,674,611 MWh from SWP energy resources, purchases of 2,310,825 MWh, and

# Map 2 Field Division Boundaries



**Table 1. Project Pumping by Plant  
2000**

(in acre-feet)

Pumping Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Hyatt	6,652	18,951	0	5,948	0	0	363	11,532	56,550	66,724	71,769	50,198	288,687
Thermalito	7,702	20,066	0	11,634	0	5,364	0	9,195	55,299	64,141	83,441	65,268	322,110
Barker Slough	3,946	2,201	1,338	703	2,437	5,027	5,882	5,851	6,729	4,243	2,241	3,228	43,826
Cordelia	2,789	1,499	1,159	420	2,100	2,317	2,588	2,443	3,713	2,895	1,948	2,612	26,483
Banks													
State	395,929	356,420	257,590	180,473	97,696	251,955	332,493	356,609	387,824	289,107	304,085	290,352	3,500,533
Federal	0	81	82,980	0	0	0	0	0	0	1,690	18,097	1,879	104,727
Other 4/	0	65,182	2,441	0	0	0	26,698	20,200	0	15,871	0	0	130,392
Total	395,929	421,683	343,011	180,473	97,696	251,955	359,191	376,809	387,824	306,668	322,182	292,231	3,735,652
South Bay	11,523	5,793	4,445	12,886	13,098	15,982	16,715	16,670	11,132	5,854	4,447	12,393	130,938
Del Valle	0	0	0	456	82	261	0	0	0	0	5/ 3,398	1,430	5,627
Gianelli 1/													
State	207,525	152,915	-475	1,206	0	20,202	6,376	43,431	123,545	61,930	101,471	93,180	811,306
Federal	145,492	191,483	225,763	3,584	0	0	0	31,091	119,697	179,544	222,297	162,575	1,281,526
Total	353,017	344,398	225,288	4,790	0	20,202	6,376	74,522	243,242	241,474	323,768	255,755	2,092,832
O'Neill 2/													
State	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal	158,695	173,195	181,173	55,575	0	21,697	29,547	67,860	98,298	164,615	193,450	192,295	1,336,400
Total	158,695	173,195	181,173	55,575	0	21,697	29,547	67,860	98,298	164,615	193,450	192,295	1,336,400
Dos Amigos 1/													
State	173,785	203,377	245,404	258,310	294,219	415,390	439,886	406,620	273,135	240,076	264,490	243,206	3,457,898
Federal	36,864	44,912	19,045	99,237	108,090	201,608	162,088	88,519	0	0	0	42,505	802,868
Other 4/	0	11,868	44,628	0	0	0	26,121	18,822	522	6,533	0	0	108,494
Total	210,649	260,157	309,077	357,547	402,309	616,998	628,095	513,961	273,657	246,609	264,490	285,711	4,369,260
Las Perillas	3,679	6,444	4,692	10,552	14,885	20,396	20,951	17,509	10,289	5,283	3,243	1,961	119,884
Badger Hill	3,679	6,444	4,692	10,552	14,885	20,396	20,951	17,509	10,289	5,283	3,243	1,961	119,884
Devil's Den	1,428	1,293	1,305	2,159	2,795	3,704	3,013	3,157	2,959	1,688	1,605	1,281	26,387
Bluestone	1,306	1,199	1,207	2,013	2,670	3,598	2,875	2,993	2,793	1,569	1,478	1,200	24,901
Polonio Pass	1,473	1,355	1,359	2,230	2,830	3,663	3,031	3,185	2,949	1,741	1,658	1,321	26,795
Buena Vista	124,589	98,966	132,110	171,852	153,263	174,164	177,036	177,241	156,541	156,168	177,537	172,458	1,871,925
Teerink	124,376	94,729	126,130	167,713	141,464	155,426	157,989	164,589	154,446	155,932	180,073	175,063	1,797,930
Chrisman	119,998	91,623	121,156	160,651	132,893	144,455	147,272	155,626	148,195	153,056	173,931	171,617	1,720,473
Edmonston	118,632	91,195	120,233	158,154	127,885	140,148	141,668	151,517	145,041	149,363	175,152	170,933	1,689,921
Oso	48,131	29,087	39,861	81,494	47,265	55,839	56,944	60,228	64,398	70,055	92,788	76,736	722,826
Castaic 3/	55,426	22,776	17,833	55,822	68,600	77,638	87,127	118,779	101,859	52,747	59,250	64,540	782,397
Pearblossom	66,780	56,851	73,256	67,408	68,299	67,367	68,244	73,172	66,719	67,843	74,871	88,257	839,067

1/ Joint state-federal facility.

2/ O'Neill Pumping Plant is a federal facility.

3/ Pumping at Castaic Pumping Plant is for the City of Los Angeles.

4/ Pumping at Banks for Cross Valley Canal water delivered to Westlands Water District.

5/ Includes 779 AF pumped to Del Valle Reservoir, and 2,619 AF pumped to South Bay Aqueduct.

2,126,822 MWh of Net Power Exchange (see Figure 4). Energy loads of 12,1125,258 MWh include sales of 2,921,882 MWh, 8,831,722 MWh used to deliver water to SWP contractors, and losses and system imbalances of 358,654 MWh (see Figure 6).

SWP facilities delivered 5,545,833 AF of water to 43 agencies, including 27 long-term water contractors, in 2000 as shown on Table 2. This amount is approximately 229 TAF more than the total State and

federal water deliveries from the SWP in 1999 and is the largest annual total of record. This amount includes contractor deliveries of 3,368,167 AF; (2,980,662 AF of Table A water and 387,505 AF of other water) Federal deliveries of 1,083,306 AF, prior water right deliveries of 1,083,590 AF, and 10,770 AF of flexible storage withdrawal. See the "Water Deliveries and Aqueduct Operations" section for more details on water deliveries.

## *Project Status in 2000*

### *Project Facilities*

The SWP conserves water for distribution to much of California's population and to irrigated agriculture. It also provides flood control, water quality control, electrical power generation, new recreational opportunities, and enhancement of sport fisheries and wildlife habitat.

SWP facilities in operation during 2000 included: 28 water storage facilities, 3 pumping-generating plants, 6 Powerplants, 17 pumping plants, and nearly 660 miles of aqueduct.

The SWP begins with three small lakes on the Feather River tributaries: Lake Davis, Frenchman Lake, and Antelope Lake. The branches and forks of the Feather River flow into Lake Oroville, the SWP's principal reservoir with a capacity of about 3.5 MAF. From Oroville, water flows through a complex system of powerplants, then down the Feather River into the Sacramento River before reaching the Delta. From the northern Delta, water is supplied to Napa and Solano counties through the North Bay Aqueduct.

Near Byron, in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. The Banks Pumping Plant lifts water into Bethany Reservoir. It is then lifted by the South Bay Pumping Plant into the South Bay Aqueduct. Through the South Bay Aqueduct water is supplied to Alameda and Santa Clara Counties. Most of the water from the Bethany Reservoir, however, flows into the Governor Edmund G. Brown California Aqueduct. At O'Neill Forebay, part of the water is pumped through the Gianelli Pumping-Generating Plant for storage in San Luis Reservoir until needed. DWR's share of storage in the reservoir is 1,062,183 AF.

Water not stored in San Luis Reservoir continues its flow south and is raised 1,069 ft by four pumping plants: Dos Amigos, Buena Vista, Teerink, and Chrisman. In the southern San Joaquin Valley, the Coastal Branch Aqueduct serves agricultural areas west of the California Aqueduct. At the Tehachapi

Mountains, Edmonston Pumping Plant raises the water 1,926 ft and the water enters 8.5 miles of tunnels and siphons. Once the water has crossed the Tehachapi Mountains, it flows through the California Aqueduct into the Antelope Valley.

The California Aqueduct then divides into two branches, the East Branch and West Branch. The East Branch carries water through the Antelope Valley into Silverwood Lake. From Silverwood Lake, the water enters the San Bernardino Tunnel and drops 1,418 ft into Devil Canyon Powerplant, then to Lake Perris, SWP's southernmost reservoir. Decades after most existing portions of the State Water Project were built, the East Branch Extension, a 13-mile pipeline project to serve the Yucaipa Valley and the San Geronio Pass area in San Bernardino and Riverside counties, is now poised for construction. The \$77 million Phase I of this project will help meet the region's water needs for the next 40 years, reduce groundwater overdraft and provide more flexibility for local water systems. Completion of Phase I is scheduled for the year 2001, and will provide an annual supply of up to 8,650 acre-feet to the San Geronio Pass Water Agency. (Phase II, which is now in early conceptual stages and won't be built until demand increases, will provide an additional 8,650 acre-feet annually.)

Water in the West Branch flows through Warne Powerplant into Pyramid Lake. From Pyramid Lake, the water flows through the Angeles Tunnel and Castaic Powerplant into Castaic Lake, terminus of the West Branch. For the location of facilities cited here, see Map 1.

Lake Oroville and San Luis Reservoir are the primary conservation facilities of the SWP's 28 dams and reservoirs. The remaining 26 dams and reservoirs are used principally to regulate the conserved supply into water delivery patterns designed to fit local needs. Of those 26, the five largest are Lake Del Valle located in Alameda County; and Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris in Southern California. Lake Del Valle is approximately

**Table 2. Water Deliveries 1962-2000**

(in acre-feet)

Agency	1962-1995	1996	1997	1998	1999	2000	TOTALS
<b>Oroville Field Division</b>							
Last Chance Creek W.D. (Local Supply)	232,323	11,404	12,590	10,046	12,241	13,502	292,106
Plumas Co. F.C. & W.C.D.*	9,881	360	231	0	0	0	10,472
County of Butte*	7,627	257	189	528	287	587	9,475
Thermalito I.D. (Local Supply)	35,114	2,613	1,730	2,271	2,567	2,478	46,773
Prior Water Rights Deliveries	22,142,971	921,737	991,710	870,937	1,094,989	1,083,590	27,105,934
Yuba City*	5,384	820	1,005	1,054	1,096	901	10,260
<b>Delta Field Division</b>							
Napa CO. F.C. & W.C.D. *(Local Supply)	157,846	4,893	4,341	5,359	5,304	4,958	182,701
Alameda Co. W.D.* (Local Supply)	648,549	23,850	25,022	26,580	29,544	27,962	781,507
A.C.F.C. & W.C.D., Zone 7* (Local Supply)	606,881	37,582	40,372	37,044	43,024	44,644	809,547
Pleasanton Township W.D.	674	0	0	0	0	0	674
Santa Clara Valley W.D.*	1,840,387	44,850	60,601	39,610	52,945	78,258	2,116,651
Marin W.D.	4,594	0	0	0	0	0	4,594
San Francisco W.D.	82,286	0	0	0	0	0	82,286
Skylonda M.W.D.	10	0	0	0	0	0	10
Oak Flat W.D.*	144,343	4,904	5,238	4,286	4,871	4,508	168,150
Mustang W.D.	4,256	0	0	0	0	0	4,256
Granite Construction	120	0	0	0	0	0	120
Lake Del Valle ( E.B.R.P.D. )	2,756	150	155	0	0	0	3,061
Orestimba Creek	100	0	0	0	0	0	100
Recreation Fish and Wildlife	4,397	0	0	114	139	145	4,795
CVP Water	5,783	298	376	513	607	655	8,232
Solano Co. F.C.W.C.D.*	186,399	29,999	33,530	29,766	34,753	37,015	351,462
<b>San Luis Field Division</b>							
Dept. Parks & Rec. ( STATE )	1,056	76	93	72	93	73	1,463
Dept. Fish & Game ( STATE )	8,942	753	270	336	812	755	11,868
Fed. Customers ( Rec.+ Joint-Use )	28,319,266	1,491,450	1,493,362	1,013,030	1,256,771	1,083,991	34,657,870
Fed. Customers (Misc.)	248,201	348	43	7,117	29	0	255,738
Westlands Water District	10,900	0	0	136,519	130,969	0	278,388
<b>San Joaquin Field Division</b>							
Tulare Lake Basin W.S.D.*	2,962,879	238,070	20,469	17,677	262,451	178,360	3,679,906
Empire West Side I. D.*	86,295	1,868	0	542	3,176	1,799	93,680
County Of Kings*	63,822	4,000	0	15	4,000	3,600	75,437
Hacienda W.D.	75,895	0	0	0	0	0	75,895
Kern County Water Agency*	21,051,925	1,022,516	841,319	757,771	1,107,539	1,152,824	25,933,894
Kern Water Bank	7,501	0	0	0	0	0	7,501
Dudley Ridge Water District*	1,362,719	53,353	68,638	55,450	59,611	58,873	1,658,644
Devils Den Water District	339,947	0	0	0	0	0	339,947
J.G. Boswell	117,430	0	0	0	0	0	117,430
Shell Cal Prod.	85,914	0	0	0	0	0	85,914
Alameda County WD	0	6,200	10,000	3,780	16,100	13,380	49,460
A.C.F.C. & W.C.D., Zone 7* (Local Supply)	0	0	0	5,970	22,910	23,940	52,820
Green Valley Water District	11,054	0	0	0	0	0	11,054
Federal Wheeling	1,240,773	9,206	11,272	14,081	10,476	28,962	1,314,770
General Wheeling	0	0	0	0	12,804	0	12,804
Castaic Lake Water Agency*	23,065	14,052	4,870	311	4,086	8,395	54,779
M.W.D. Of S.C.	100,092	95,000	126,486	69,234	138,012	0	528,824
Santa Clara Valley WD	0	45,000	35,000	23,800	30,000	23,730	157,530
San Luis Obispo County	0	0	1,099	3,592	3,743	3,962	12,396
Santa Barbara County	0	0	7,439	18,618	20,137	22,741	68,935
Central Coastal Water Authority	0	86	527	0	0	0	613
Department of Fish and Game	0	0	0	0	0	0	0
<b>Southern Field Division</b>							
A.V.E.K. W.A.*	855,720	57,672	63,729	54,271	70,512	84,938	1,186,842
M.W.D. Of S.C.*	14,475,947	498,380	586,537	363,052	681,605	1,357,393	17,962,914
Littlerock Creek I. D.*	12,309	494	444	404	342	0	13,993
Mojave Water Agency*	104,663	6,111	12,638	4,580	6,705	10,019	144,716
Desert Water Agency*	501,484	102,622	69,990	70,647	58,100	58,234	861,077
Coachilla Valley Water District*	311,491	62,219	68,340	85,709	50,480	42,323	620,562
Crestline-Lake Arrowhead Water Agency*	28,709	1,209	1,138	704	1,145	1,458	34,363
San Gabriel Valley M.W.D.*	178,350	15,989	18,175	9,310	21,729	15,140	258,693
San Bernardino Valley M.W.D.*	271,012	6,064	9,654	1,878	12,874	18,399	319,881
Santa Barbara	1,240	0	0	0	0	0	1,240
Dept. Parks & Rec., L.A. Co. Rec. Dept.	62,126	2,928	3,624	1,585	3,279	6,559	80,101
Piru Creek Fish Enhancement	2,915	0	0	0	0	0	2,915
Castaic Lake Water Agency*	211,327	19,704	22,842	19,782	28,813	33,674	336,142
Palmdale Water District*	60,509	11,434	11,861	8,752	13,278	9,060	114,894
United Water C.D. (Local Supply)	998	0	0	0	0	0	998
Ventura County FCD*	5,824	0	1,850	1,850	1,850	4,048	15,422
Los Angeles Dept. of Water and Power	1,495	0	0	0	0	0	1,495
Lilico Pictures	10	0	0	0	0	0	10
<b>Totals</b>	<b>99,326,486</b>	<b>4,850,521</b>	<b>4,668,799</b>	<b>3,778,547</b>	<b>5,316,798</b>	<b>5,545,833</b>	<b>123,486,984</b>

\* Long-term contractors

1/ Includes Thermalito Afterbay, Palermo Canal, Upper Feather lakes deliveries.

2/ Hacienda Water District was annexed by Tulare Lake Basin WSD in 1981.

3/ Repayment of preconsolidation water.

4/ Advance storage of ground water, by agreement between KCWA and DWR

5/ Includes 237 AF of Vallejo Permit water transferred to Napa.



four miles from the city of Livermore. The four southern reservoirs--Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris--are near the metropolitan areas of southern California, where water supplies are mainly imported. Information about these reservoirs, including amounts of unimpaired runoff to Lake Oroville and storage levels for SWP's conservation, and other storage facilities are summarized in this report.

### ***Outages and Limitations***

Major outages, construction, and operating limitations of SWP facilities during 2000 were:

#### ***January***

- Pearblossom Pumping Plant Unit 4 out of service from January 3 to August 26 to repair pump casing.
- Hyatt Powerplant Unit 5 out of service from January 12 to February 10 for annual maintenance.
- Thermalito Pumping-Generating Plant Unit 3 out of service from January 12 to March 2 for annual maintenance.
- Devil Canyon Powerplant Unit 4 out of service from January 18 to March 14 for annual maintenance and turbine wheel warranty work.
- Buena Vista Pumping Plant Unit 6 out of service from January 27 to November 29 for annual maintenance and discharge valve repair.

#### ***February***

- Edmonston Pumping Plant Unit 13 out of service from February 1 to March 29 to retrofit unit circuit breaker.
- South Bay Pumping Plant Unit 8 out of service from February 7 to March 24 to replace motor.
- Barker Slough Pumping Plant Unit 7 out of service from February 7 to April 18 to refurbish pump.
- Warne Powerplant Unit 1 out of service from February 7 to February 25 for Peace Valley Pipeline inspection, annual maintenance, and transformer KYI work.
- Hyatt Powerplant Unit 3 out of service from February 14 to March 1 for annual maintenance.

- South Bay Pumping Plant Unit 2 out of service from February 22 to August 26 to refurbish pump.
- Pearblossom Pumping Plant Units 8 out of service from February 24 to April 4 to repair shaft seal.

#### ***March***

- South Bay Pumping Plant Unit 7 out of service from March 6 to April 12 to replace pump motor.
- Gianelli Pumping-Generating Plant Unit 7 out of service from March 6 to April 20 to install capacitors for new unit circuit breaker.
- Gianelli Pumping-Generating Plant Unit 8 out of service from March 6 to April 28 to install capacitors for new unit circuit breaker.
- Edmonston Pumping Plant Unit 11 out of service from March 7 to repair discharge valve. Completion expected in 2001.
- Hyatt Powerplant Unit 6 out of service from March 22 to April 20 for annual maintenance and to clean and refurbish exciter.
- Thermalito Pumping-Generating Plant Unit 4 out of service from March 22 to May 18 for annual maintenance and unit voltage regulator replacement.
- Banks Pumping Plant Unit 10 out of service from March 10 to October 4 for annual maintenance, discharge valve overhaul, and work on No. 5 penstock gate.
- Banks Pumping Plant Unit 11 out of service from March 10 to July 3 for annual maintenance, discharge valve overhaul, and work on No. 5 penstock gate.

#### ***April***

- Dos Amigos Pumping Plant Unit 3 out of service from April 5 to May 25 for biennial maintenance.
- Devil Canyon Powerplant Unit 1 out of service from April 5 to April 19 for work on transformers KY1A and KY2A.
- Devil Canyon Powerplant Unit 2 out of service from April 5 to June 2 for annual maintenance, unit circuit breaker replacement, and for work on transformers KY1A and KY2A.

- Mojave Siphon Powerplant Unit 2 out of service from April 17 to May 2 to test generator efficiency.
- Hyatt Powerplant Unit 1 out of service from April 24 to May 19 for annual maintenance and to clean and refurbish exciter.

#### *May*

- Gianelli Pumping-Generating Plant Unit 7 out of service from May 7 to June 6 to repair butterfly valve linkage pins.
- Gianelli Pumping-Generating Plant Unit 8 out of service from May 7 to June 7 to repair butterfly valve linkage pins.

#### *June*

- Banks Pumping Plant Unit 5 out of service from June 1 to June 15 to repair motor reactor.

#### *July*

- Chrisman Pumping Plant Unit 6 out of service from July 3 to December 2 to repair leaking packing box.

#### *August*

- Pearblossom Pumping Plant Unit 2 out of service from August 28 to repair pump casing and rewind stator. Completion expected in 2001.

#### *September*

- Dos Amigos Pumping Plant Unit 2 out of service from September 5 to replace impeller and install new field poles. Completion expected in 2001.
- Gianelli Pumping-Generating Plant Unit 1 out of service from September 5 to October 11 for biennial maintenance and pump/turbine repair.
- Gianelli Pumping-Generating Plant Unit 2 out of service from September 25 to November 9 for biennial maintenance and repair of pump/turbine and butterfly valve seat.

- South Bay Pumping Plant Unit 2 out of service from September 26 to balance motor and pump. Completion expected in 2001.

#### *October*

- Hyatt Powerplant Unit 6 out of service from October 2 to October 25 for annual maintenance and turbine shutoff valve downstream seat repair.
- Cordelia Pumping Plant Unit 2 out of service from October 16 to December to refurbish pump and motor.
- South Bay Pumping Plant Unit 3 out of service from October 26 to refurbish motor and repair pump and discharge valve. Completion expected in 2001.
- Hyatt Powerplant Unit 1 out of service from October 29 to December 19 for annual maintenance.

#### *November*

- Mojave Siphon Powerplant Unit 2 out of service from November 1 to November 30 for annual maintenance.
- Banks Pumping Plant Unit 8 out of service from November 2 to December 9 for work on Unit 9 and work on No. 4 penstock gate.
- Banks Pumping Plant Unit 9 out of service from November 2 to overhaul discharge valve and work on No. 4 penstock gate. Completion expected in 2001.

#### *December*

- Gianelli Pumping-Generating Plant Unit 5 out of service from December 1 to install new impeller nut cover. Completion expected in 2001.
- Mojave Siphon Pumping Plant Unit 3 out of service from December 2 for annual maintenance. Completion expected in 2001.

## ***Water Supply Conditions***

The SWP meets its contractual obligations by monitoring precipitation and calculating runoff to coordinate the operation of the complex system of dams and reservoirs. Information on those activities is based on the water supply conditions of the 2000 calendar year and the 1999-00 water year.

### ***Precipitation and Snowpack***

Water year 1999-00 was the second La Nina year in a row, with its typical wetter north – drier south pattern. Considering the total seasonal amounts, statewide precipitation was close to average. The total precipitation, however, masked some strong monthly variations. Most of the rainy season was dry, especially in the south, where drought prevailed until January. Most of the rain and snow in the State fell between mid-January and mid-March.

Statewide precipitation during October and November 1999 was about 70 percent of average with a strong north-to-south gradient. Northern Sierra precipitation accumulation dropped from 90 percent of average at the end of November to about 60 percent of average at the end of December. This very dry month left the statewide snowpack at about 20 percent of normal on January 1, 2000.

About two weeks into the new calendar year, conditions began to change dramatically. By the end of February 2000, statewide snowpack and northern Sierra precipitation had increased to approximately 110 percent and 125 percent of average, respectively. February precipitation was 250 percent of average across Central California and twice average statewide.

The wet weather stopped in mid-March, limiting March precipitation to 55 percent of coverage in the northern Sierra. The statewide snowpack peaked on March 13, and dropped to average on April 1. Fair and warmer weather and northeasterly winds caused some sublimation losses of water from the snow and early melting of the pack. This dry period was interrupted by brief storms in mid-April and mid-May, which slowed the snowmelt. Precipitation during the spring and summer months was slightly below average in Northern California.

The Northern Sierra Eight Station Precipitation Index finished with 56.7 inches for the water year (114 percent of average). The Feather River Basin was among the driest mountain basins, with average October through March total precipitation, and 80 percent of average spring rain.

### ***Runoff and Storage***

Unimpaired runoff represents the natural water production of a river basin, unaltered by upstream diversions, storage, export of water to or import of water from other basins.

Sacramento River Runoff is the sum (in MAF) of Sacramento River at Bend Bridge, Feather River inflow to Lake Oroville, Yuba River at Smartville, and American River inflow to Folsom Lake. The Water Year sum is also known as the Sacramento River Index, and was previously used to determine year type classifications under State Water Resources Control Board (SWRCB) Decision 1485.

Despite the monthly variation in precipitation, statewide water year runoff totaled 95 percent of average. The Sacramento River and San Joaquin River regions were slightly above average, while the Tulare Lake, North Lahontan, and South Lahontan regions pulled down the statewide average. Feather River unimpaired inflow to Lake Oroville was 4.2 MAF (94 percent of average).

Statewide runoff during the dry fall was only 45 percent of average. This climbed to 180 percent of average in February. Consequently, the operational focus at some Central Valley reservoirs shifted from drought management to flood control in March. The early onset of snowmelt helped raise March and April unimpaired runoff above average in most regions. The snowmelt peaked near May 24 in most snow-fed rivers. Runoff during July dropped to 85 percent of average in the Sacramento River region, and 50 percent of average in the San Joaquin River region.

The Sacramento River Index for water year 1999-00 was 18.9 MAF (105 percent of average). The Sacramento Valley 40-30-30 Index was “above normal”; thus ending a 5-year period during which the water year type was wet. San Joaquin River system unimpaired runoff from the Stanislaus, Tuolumne, Merced, and San Joaquin Rivers was 5.9 MAF (104 percent of average). The San Joaquin Valley 60-20-20 Index was “above normal”.

There was some high water on the major rivers, mostly in February and early March, but very few flood stages occurred and flood-related problems were at a minimum.

Reservoir storage started well with good carryover from the previous wet year. Statewide storage ranged from 120 percent of average at the start of the water year and after the February storms, to 110 percent at the end.

Additional and more specific information is available via the internet at:  
<http://cdec.water.ca.gov/snow-rain.html>.

## *Water Operations*

### *Reservoir Operations*

Lake Oroville and San Luis Reservoir are the two main conservation facilities for SWP water supplies. Tables 8 and 13 summarize the operations of these reservoirs during the 2000 calendar year.

Lake Oroville began 2000 with 2,186,332 AF of storage, 501,545 less than it held at the beginning of 1999. Storage in Lake Oroville peaked on May 29, 2000 at 3,131,132 AF (89 percent of normal maximum operating capacity) and ended the year at 49 percent of normal capacity or 1,724,942 AF. The net effect of operations and water conditions at Lake Oroville resulted in a decrease in storage of 457,113 AF.

At the beginning of 2000, Lake Del Valle held 28,156 AF (70 percent of maximum conservation capacity). Highest end-of-month storage was in April at 39,879 AF (99 percent of maximum conservation capacity). At the end of the year Lake Del Valle held 25,080 AF (63 percent of maximum conservation capacity).

At the start of 2000, San Luis Reservoir held 1,187,142 AF, 59 percent of its normal maximum operating capacity (2,027,835 AF); the SWP held 717,426 AF, 68 percent of its maximum operating capacity (1,062,183 AF. SWP storage at the end of 2000 decreased to 481,654 AF. End-of-year federal storage was 988,785 AF, for a year-end total of 1,470,439 AF.

SWP southern reservoirs (Pyramid, Castaic, Silverwood, and Perris) have a combined maximum operating storage capacity of 701,320 AF. The total combined storage of 624,964 AF at the beginning of 2000 decreased to 636,265 AF by the end of the year.

The following tabulation compares normal operating capacity in the principal SWP reservoirs with end-of-year storage for 1999 and 2000:

Reservoir	Normal Maximum Operating Capacity	End-of-year Storage 1999	End-of-year Storage 2000
Lake Oroville	3,537,580	2,186,332	1,724,942
Lake Del Valle	40,000	28,156	25,080
San Luis Reservoir (State Share)	1,062,183	717,426	481,677
Pyramid Lake	171,200	159,592	166,362
Silverwood Lake	74,970	69,304	73,707
Lake Perris	131,450	119,833	108,793
Castaic Lake	323,700	276,235	288,568
Totals	5,341,083	3,556,878	2,869,129

### *Water Deliveries and Aqueduct Operations*

Generally, water diverted from the Sacramento-San Joaquin Delta is delivered to SWP storage facilities and to contractors through Banks Pumping Plant and Barker Slough Pumping Plant for a variety of beneficial uses. In addition to delivering Table A water to long-term water supply contractors, SWP transports water to other public agencies through exchanges or purchases; provides water for wildlife and recreational uses; and conveys water to meet local water rights agreements. Historical information about water deliveries made to long-term contractors and other agencies through 2000 has been organized in Table 2.

The SWP contractors' long-term water supply contracts set forth Table A amounts, which determine how much water a contractor may request each year from the Department. In 2000, 216,237 AF of 1999 approved Table A water was classified as 1999 carryover water and was delivered. It had been stored in SWP storage facilities in 1999; this amount does not include 1,500 AF of carryover water transferred from Dudley Ridge to Kern.

Annual Table A represents the total amount of project water that an SWP contractor may request each year, according to that contractor's long-term water supply contracts. Approved Table A represents the amount of annual Table A requested by the contractors and approved for delivery by the Department, based on hydrologic conditions, current reservoir storage, and total requests by the SWP water contractors. The Department is not always able to deliver the quantity of water requested by the contractors; under certain conditions, a lesser, amount, allocated according to the long-term water supply contracts and the process noted above, is made available for delivery.

Approved Table A amounts may also be referred to in this chapter as approved amounts or approved water.

The long-term water contracts were amended as needed. During 2000, the Department executed seven amendments to these contracts.

The Department also enters into miscellaneous agreements with SWP contractors and other agencies, which may be amended periodically, to convey SWP and non-SWP water through the California Aqueduct and approve the construction, operation, and maintenance of turnouts along SWP facilities. During 2000, the Department executed 14 water

conveyance/storage agreements and 3 turnout agreements with SWP contractors.

For several years, DWR has offered contractors the opportunity to carry over for delivery during the next year a portion of their Table A water approved for delivery in the current year. The carry-over program was designed to encourage the most effective use of water, and to avoid obligating the contractors to use or lose the water by December 31. Because operational constraints may change from year to year, an agreement in which the conditions of the approval are listed is signed each year with participating contractors. In 2000, 216,237 AF of 1999 approved Table A was classified as 1999 carryover and had been stored in SWP storage facilities in 1999; this amount does not include 1,500 AF of carryover water transferred from Dudley Ridge to Kern. SWP approved 291,344 AF 2000 carryover water for delivery in 2001.

Pursuant to Article 54 of the Monterey Amendments, the flexible storage program provides SWP contractors participating in the repayment of the capital costs of Castaic Lake and Lake Perris the option to withdraw water in excess of approved deliveries. The objective of this program is to provide additional flexibility and water management benefits to local participating agencies.

Available “flexible storage” is approximately 50 percent of active storage, providing for 160,000 AF at Castaic Lake and 65,000 AF at Lake Perris. Participating contractors of the Castaic Lake flexible storage program include Metropolitan, Ventura, and Castaic Lake. Respectively, each can withdraw a maximum amount of 153,940 AF, 1,377 AF, and 4,683 AF. At Lake Perris, Metropolitan can withdraw a maximum amount of 65,000 AF. Any participating contractor is given 5 years to replace the water with Table A water, purchased water, exchange water, or local water.

Two SWP contractors participated in the Flexible Storage Program in 2000. Metropolitan withdrew 8,181 AF from Lake Perris in the spring and Castaic Lake withdrew 2,589 AF during the winter from Castaic Lake.

The Article 21 water program allows a contractor to take delivery of water over the approved and scheduled Table A amounts for the current year. In 2000, thirteen contractors participated in the program. A total of 308,257 AF of Article 21 water was delivered to Napa, Alameda-Zone 7, Alameda County, Santa Clara, Dudley Ridge, Kern, Tulare, Coachella, Desert, San Gabriel, Solano, and Metropolitan. Empire took delivery of 528 AF of unscheduled water.

The SWP delivered 677 AF of recreation water for facilities at Lake Oroville, Lake Del Valle, O'Neill Forebay, Silverwood Lake, and Lake Perris. In addition, 2,600 AF of recreation water was delivered to Castaic Lake and Castaic Lagoon, an impoundment downstream from Castaic Lake devoted entirely to recreation. The SWP delivered 753 acre-feet of water to use in managing wildlife in the Pilibos Wildlife Area, located on about 770 Acres of land near O'Neill Forebay, 40 miles south of Los Banos.

During 2000, SWP provided water service to 44 agencies, including 27 long-term water contractors. SWP facilities were used to convey non-project water for other agencies, including the CVP. In addition, SWP facilities were used to deliver recreation water, local runoff to prior water right users, Table A, Article 21, unscheduled, and Article 54 water.

Total Project (State and federal) deliveries for 2000 totaled 5,545,833 AF (the largest annual total of record to date). This total includes State contract deliveries of 3,368,167 AF, federal deliveries of 1,083,306 AF, Oroville Complex diversions of 1,082,995 AF, 595 AF of Upper Feather River deliveries, and 10,770 AF of Flexible Storage Withdrawal. State contract deliveries include a total of 2,980,662 AF of entitlement and entitlement-related water to 27 long-term contractors, plus 387,505 AF of other water. A graph showing the historical annual deliveries from SWP facilities is shown in Figure 1. Amounts of 2000 water deliveries are shown by field division on Map 2, and include Table A water, permit water, local supply, recreation, purchases, wheeling, carryover, extended carryover, exchange, bypass, water transfers, interruptible, storage, and unscheduled surplus water. Totals by agency are shown in Table 2.

The following table is a summary of contract deliveries in 2000:

Table A Water		Other Water	
M & I	1,621,262	Purchase Pool A	80,787
Agricultural	794,186	Purchase Pool B	184,691
Extended			
Carryover	168,871	Federal Wheeling	5,549
Bypass	6,100	General Wheeling	1,000
Interruptible	308,257	Local	31,575
Carryover	47,366	Recreation	25,286
Storage	665	Unscheduled Surplus	528
Transfer	1,927	Exchange Water	58,089
Exchange	26,075		
Benecia	3,921		
Vallejo	1,500		
<b>Total</b>	<b>2,980,662</b>	<b>Total</b>	<b>387,505</b>
<b>Total Water</b>		<b>3,368,167</b>	

## ***Significant Operational Activities***

### ***January***

- Y2K rollover was uneventful for the SWP. There were no Y2K related problems to the SWP control system.
- Excess conditions declared in the Delta on January 20. This declaration was made by mutual agreement with the Bureau when it was evident that runoff being produced by continuing storm events was more than needed to meet Sacramento Valley uses and project exports.

### ***February***

- The State's share of San Luis Reservoir storage was filled on February 23, nearly two months later than it would have been filled if not for the export reductions in the previous spring and in December. In all, SWP pumping in 2000 was reduced by 500 TAF to protect delta smelt and spring-run Chinook salmon. Although the SWP was finally successful in recovering the water, the delayed filling of San Luis Reservoir had several impacts on project operations. First, it delayed delivery of Interruptible Water to the SWP contractors until February 16, 2000 (a 35-day delay). This resulted in about 150 TAF reduction in the amount of Interruptible Water that could have been delivered in 2000. The delayed filling of San Luis Reservoir also caused CDWR to postpone the wheeling of water for Cross Valley Canal contractors until February 22.
- Late in February, incidental take of winter-run sized juvenile Chinook and adult delta smelt caused the National Marine Fisheries Service and the Fish and Wildlife Service to request DWR and USBR to reduce pumping. Biologists concluded that an adjustment in exports could allow the projects to avoid reaching the 2 percent red light level for winter-run sized Chinook. They also believed that reducing exports would also reduce the salvage of adult delta smelt, migrating upstream to spawn. After re-viewing hydrologic data, DWR concluded the risk San Luis Reservoir storage, Interruptible Water deliveries, and wheeling of CVC water was low; thus, exports at Banks were decreased from about 9,000 cfs to 6,000 cfs from February 24 through March 1.

### ***March***

- Metropolitan Water District of Southern California began drawdown of Lake Perris on March 27 to augment current Diamond Valley Lake fill operations. MWDSC plans to remove about 15,000 AF of their flexible storage from Lake Perris over the next couple of months.
- Take/salvage of the Endangered Species Act listed fish continues to be an ongoing concern. Fill of the CVP share of San Luis was delayed several days to decrease salvage of salmon and smelt in late February. (Genetic analysis of winter-run sized salmon salvaged indicates that only 35-40 percent were likely winter-run.)

### ***April***

- Delta exports were curtailed on April 15, 2000 for the Vernalis Adaptive Management Program. Combined SWP/CVP exports were limited to 2,250 cfs. The SWP voluntarily participated in the export reduction with the expectation that SWP water supply impacts will be made up by federal agencies.
- Sacramento, Feather, and American river releases were increased in the latter half of April to meet the Delta X2 water quality standard of minimum 29,200 cfs three day running average Delta outflow for 15 days. It was decided to time the river releases to coincide with the planned VAMP export reduction for the second half of April to maximize the use of Delta outflow. Preliminary data showed the standard would be in effect for 13 days in May.
- Significant snow pack sublimation, coupled with additional releases to meet the X2 standard and higher than expected delivery of Interruptible Water resulted in a reduction in the ability of the SWP to deliver 100 percent of the requested allocation. On April 20, water delivery allocations were reduced from 100 percent to 90 percent, which equates to a reduction from 3.62 MAF to 3.41 MAF.

### ***May***

- For May, the projects were required to meet the X<sub>2</sub> standard at Roe Island for 9 days. This was a direct result of meeting the April Roe Island X<sub>2</sub> requirement during the second half of the month and a late-April storm that forced the Delta into excess conditions. The result of meeting the May X<sub>2</sub> requirement was about 100 TAF of additional water being released from Oroville.

- During the VAMP period, which extended from April 17 through May 17, SWP pumping remained at a low level of less than 1,500 cfs. Following the VAMP, pumping was scheduled to be increased to about 5,500 cfs. However, this planned pumping rate was adjusted down in an effort to avoid high salvage of delta smelt. Even though exports were less than 3,000 cfs, salvage of delta smelt exceeded 9,769 fish. This is the level at which DWR and USBR must reinitiate consultation with the Fish and Wildlife Service. By the end May, total salvage of delta smelt exceeded 49,000 fish.

### *June*

- Clifton Court intake continued at a low rate to avoid high salvage of delta smelt. From June 16 to June 28 the intake was decreased even more because of water quality concerns. The intake was increased the last few days of June because of the relaxation of the E/I ratio to 45 percent.
- Delta conditions varied widely during the month of June. From June 1 through June 4, the conditions were in excess with restricted operations due to E/I ratio. From June 5 through June 20, balanced conditions with suspended accounting were declared. One June 21, SWP and USBR resumed balanced conditions with accounting. These conditions continued through the end of the month.

### *July*

- Kern County Water Agency transferred 38,834 AF of Agricultural Entitlement water and 5,166 AF of M&I Entitlement water to USBR in O'Neill Forebay from July 10 through July 31.
- SWP diversion rate into Clifton Court Forebay was permitted to increase from 6,680 cfs to 7,180 cfs by the U. S. Army Corps of Engineers. The increase of 500 cfs was approved July through September for three years beginning in 2000. SWP intended to use the increased capacity in 2000 to mitigate export reductions taken to benefit fisheries earlier in the year.
- Clifton Court intake was decreased from a scheduled 7,180 cfs to 5,000 cfs from July 21 to the end of the month in an attempt to improve the 14-day electrical conductivity at Jersey Point.
- DWR started using SAP to input water related data.

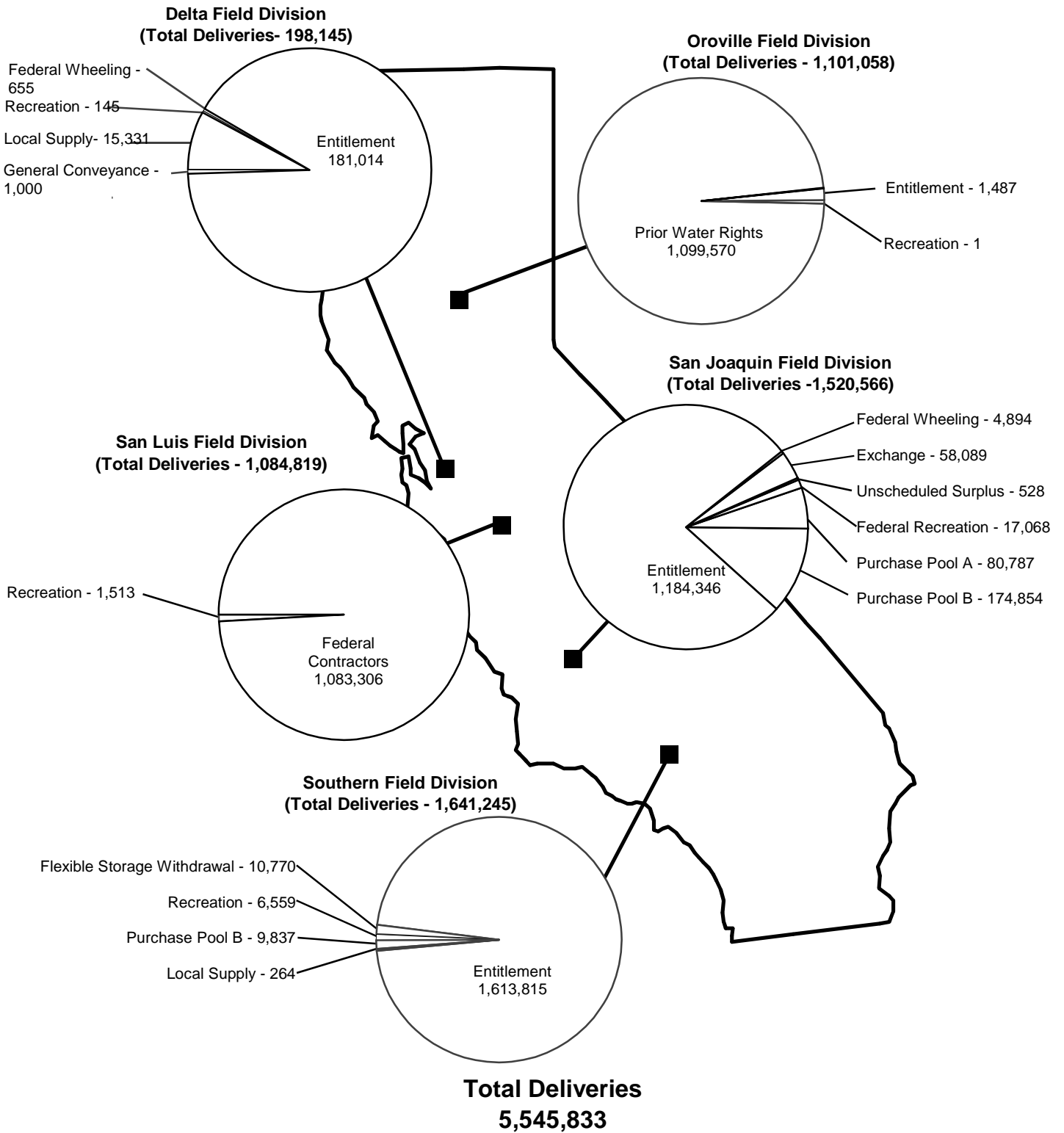
### *August*

- By mutual agreement, USBR and DWR declared balanced water conditions in the Delta with suspended accounting on August 31.
- USBR purchased 16,769 AF of Agricultural water and 2,231 AF of M&I Entitlement water from the Kern Water Bank. Kern County Water Agency took the water and exchanged it with the USBR in O'Neill Forebay from August 1 through August 10.
- From August 12, through August 31, DWR pumped Cross Valley Canal water at Banks Pumping Plant for USBR according to the Cross Valley Canal Wheeling agreements. The water was pumped at a rate of 1,010 AF per day, for a total of 20,200 AF.
- Cross Valley Canal Contractors transferred 18,822 AF of entitlement water to Westlands Water District during the month of August.
- Kern County Water Agency transferred 17,347 AF of agricultural entitlement water to Westlands Water District during the month of August. KCWA also exchanged 56,067 AF of various types of water with WWD in August.
- Pearblossom Unit 3 returned to service on August 29, 2000. The unit had been undergoing extensive maintenance since December 23, 1996.

### *September*

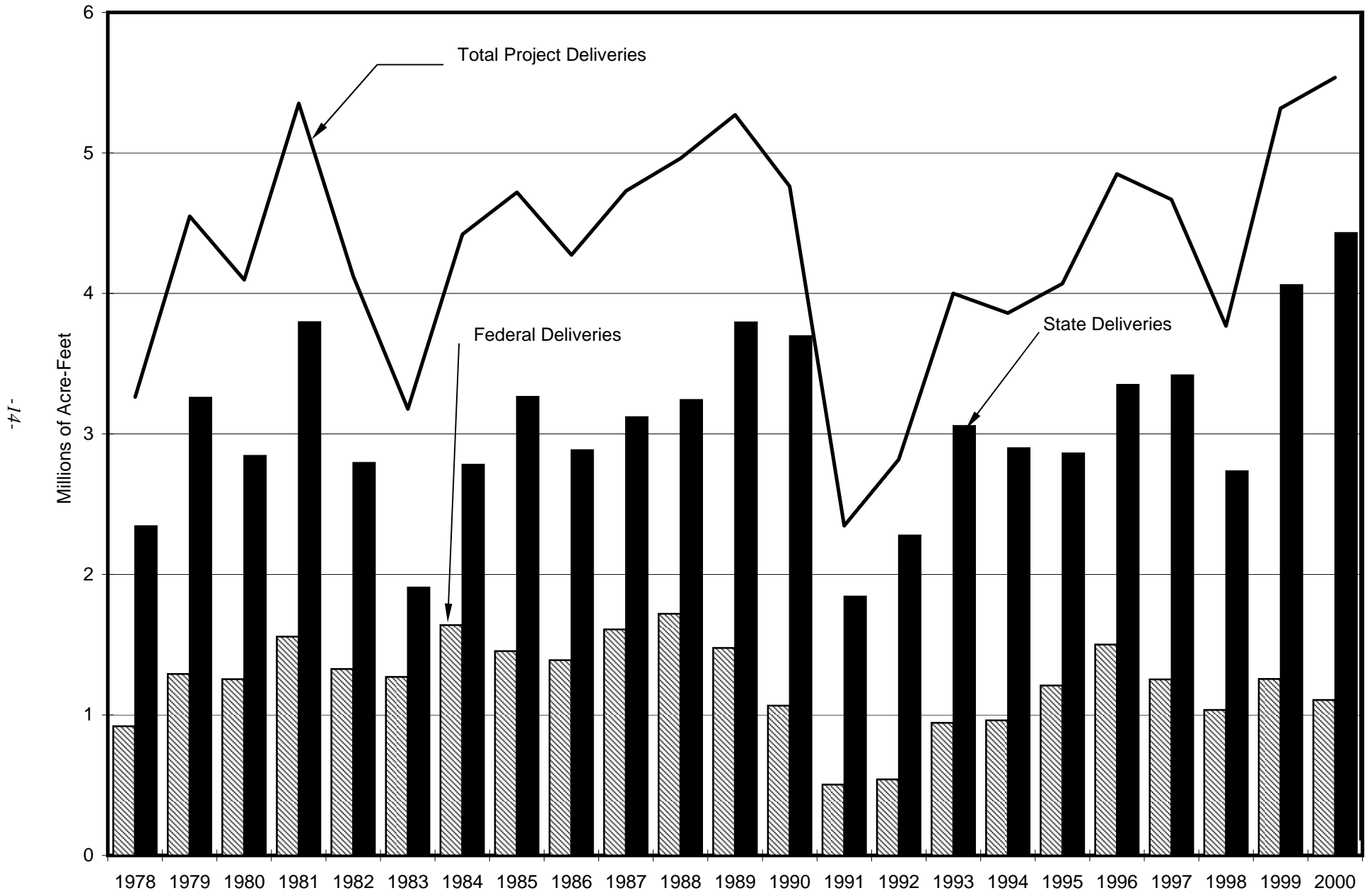
- Lake Oroville storage was well below average, 2.24 MAF, due to lower than average runoff in the Feather River basin and higher than average releases. Lower than average runoff in the Feather River basin was due to only 90 percent of average precipitation. The high releases were necessitated by the record high deliveries and higher than normal Delta X2 outflow requirements the previous spring. The State's share of San Luis Reservoir storage was below average for September due also to the record high deliveries.
- Kern County Water Agency transferred 8,191 AF of Agricultural Table A water and 1,089 AF of M&I Table A water to USBR in O'Neill Forebay from September 5 through September 9.
- On September 20 and 21, 2000, the three-day average percent of inflow diverted at Tracy Pumping Plant and Clifton Court Forebay (commonly referred to as the 3-day E/I ratio)

### Map 3 2000 Water Deliveries (in acre-feet)





**Figure 1. Total Deliveries from SWP Facilities**  
Annual Totals



exceeded the standard of 65 percent. Joint Operations staff erroneously scheduled diversions into Clifton Court Forebay based on compliance with the 14-day average percent of inflow (14-day E/I ratio). This came to Joint Operations attention late afternoon on the 21st. To minimize the exceedence for the 21st, Joint Operations staff directed the closure of the Clifton Court Forebay gates and adjusted the schedules as necessary. Total diversion into Clifton Court on the 21st averaged 6,550 cfs. The 3-day E/I ratio for the 20th was 66.1 percent and for the 21st was 66.8 percent. The 14-day E/I for the same days was 61.8 percent. Joint Operations prepared a letter to the SWRCB briefly explaining this exceedence of a standard. Joint Operations also prepared a letter to the United States Army Corps of Engineers briefly describing this occurrence and the actions taken.

### **October**

- The first three weeks of October were marked by the Delta Cross Channel experiment. This involved operating the DCC gates tidally, closing them for the ebb tide, opening them for the flood tide while monitoring fish movement and salinity conditions. The third part of the experiment began October 20 and originally involved the complete closure of the DCC for three weeks. But with growing concerns for the degradation of water quality, the "closed" component was changed to 1/2 time tidally operated (or closed 75 percent of the time.) It was thought that this might help refine the analysis of the effect of gate operations, salinity control, and fish movement while still providing some water quality benefits.
- On October 26, the Data Assessment Team along with the Operations Fisheries & Facilities Group held a joint conference call to assess the viability of "relaxing" the Export/Inflow ratio in order to divert water to credit the Environmental Water Account. The fishery agencies agreed, and DWR/USBR sent notice to the SWRCB of the Projects' intent to exceed the 65 percent E/I ratio standard. The first water credited to the EWA from the "relaxed" E/I ratio came on October 31.
- Pine Flat Powerplant was unavailable for generation at 0800 on October 16 due to downstream water demands. The demands were less than the plant minimums.
- Drawdown of Pyramid Lake began during the second week of October for a scheduled boat ramp installation by the Department of Boating

and Waterways. Initial drawdown was completed on October 15, 2000. Original construction period was October 16 to October 17, 2000 but due to construction difficulties was extended to October 20, 2000. Refill of Pyramid Reservoir was initiated after construction clearances were released.

- Banks Pumping Plant was forced out of service on October 2, 2000 due to lightning protection wire falling across all 3 phases of the Contra-Tesla 230 kV line. PG&E made temporary repairs and the plant was made available.
- Inspection of the North Bay Aqueduct began on October 29.

### **November**

- The SWP wheeled approximately 23 TAF of Merced Irrigation District water, which was transferred to the USBR Level 4 refuge supply. This transfer began in mid-October and was expected to be completed by the 3rd of December.
- USBR completed payback of 70 TAF to the SWP on November 30 for impacts associated with export curtailments occurring in 1999. Completed refill of Pyramid Lake after boat ramp installation in mid-October. Boat ramp was installed in coordination with the Department of Boating and Waterways and will be a dedicated ramp for use by law enforcement and the U.S. Forest Service at Pyramid.

### **December**

- At the beginning of December, an unusual tide scenario brought about sudden degradation in western Delta EC. Both CVP and SWP were forced to respond by reducing exports for several days.
- An increase in the presence of juvenile Chinook salmon in the lower Sacramento River triggered the closure of the Delta Cross Channel gates on December 22. The gates were opened on December 26 when the real-time monitoring indicated emigration of juvenile Chinook salmon had decreased. Overall out migration appeared to be low for December; as a consequence, no Environmental Water Account water was expended to reduce exports (100 TAF of EWA water assets were originally set aside for use in December).

## *Energy Operations*

### *Energy Resources*

Table 3 shows amounts of energy generated at SWP facilities in 2000, as well as energy purchased for SWP operations. Total energy produced by SWP facilities and others was 12,112,258 MWh in 2000.

Energy generation from SWP's eight hydroelectric plants (Hyatt, Thermalito, Gianelli, Warne, Castaic, Alamo, Mojave, and Devil Canyon) during 2000 totaled 5,267,872 MWh, as illustrated in Figure 3.

The SWP receives energy under contract from five small hydroelectric facilities (total capacity of 30 MW) owned and operated by MWDSC. In 2000, these plants furnished 175,327 MWh of energy to the SWP. DWR has exchange arrangements with Southern California Edison and the Los Angeles Department of Water and Power to provide transmission of this energy.

The DWR-SCE Power Contract has been in effect since April 1983. Under this contract, part of the Hyatt-Thermalito Complex generation and all of the output of Devil Canyon and Alamo Powerplants are delivered to SCE. The energy is generally delivered during on-peak periods and a greater amount of energy is returned during off-peak periods. SCE and other entities combined net return and additional to the SWP during 2000 was 2,126,897 MWh.

Long term contracted energy purchases, such as MWD Hydro, are itemized separately in Table 3. Other purchases totaled 2,310,825 MWh from various utilities and power marketers, such as Pacific Gas and Electric Company and Enron Power Marketing, Inc.

### *Energy Loads*

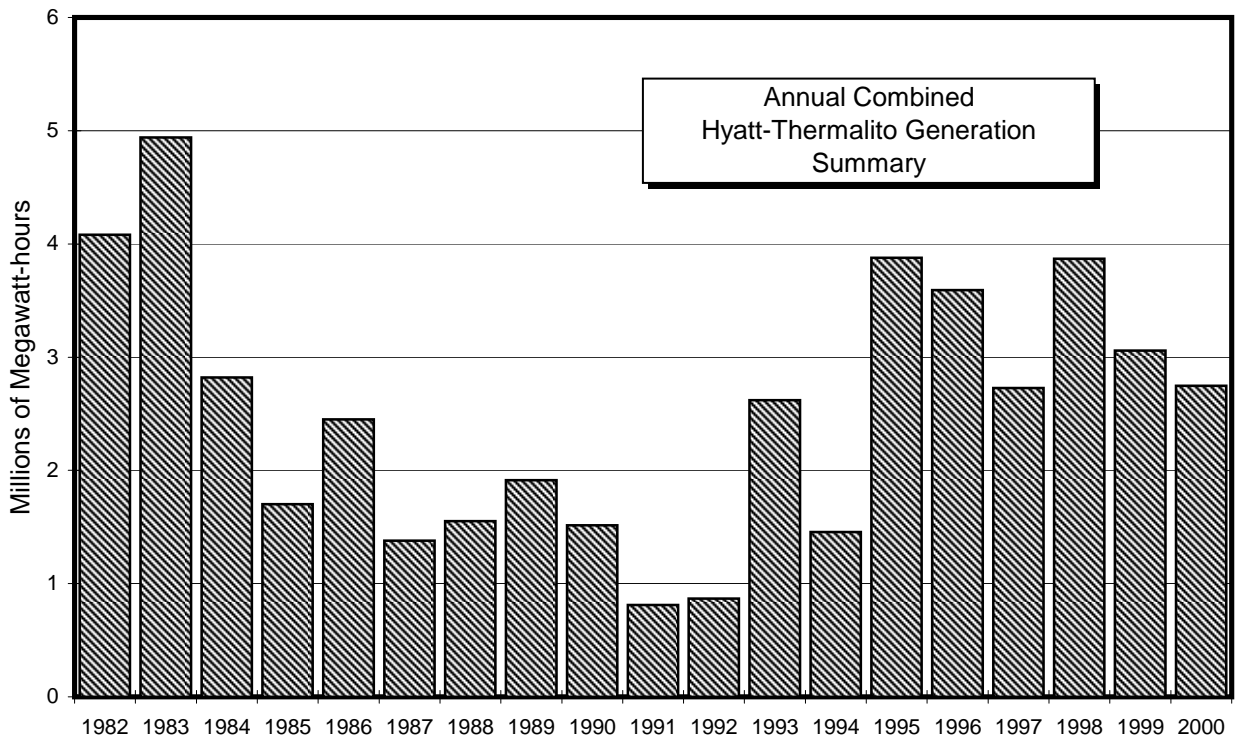
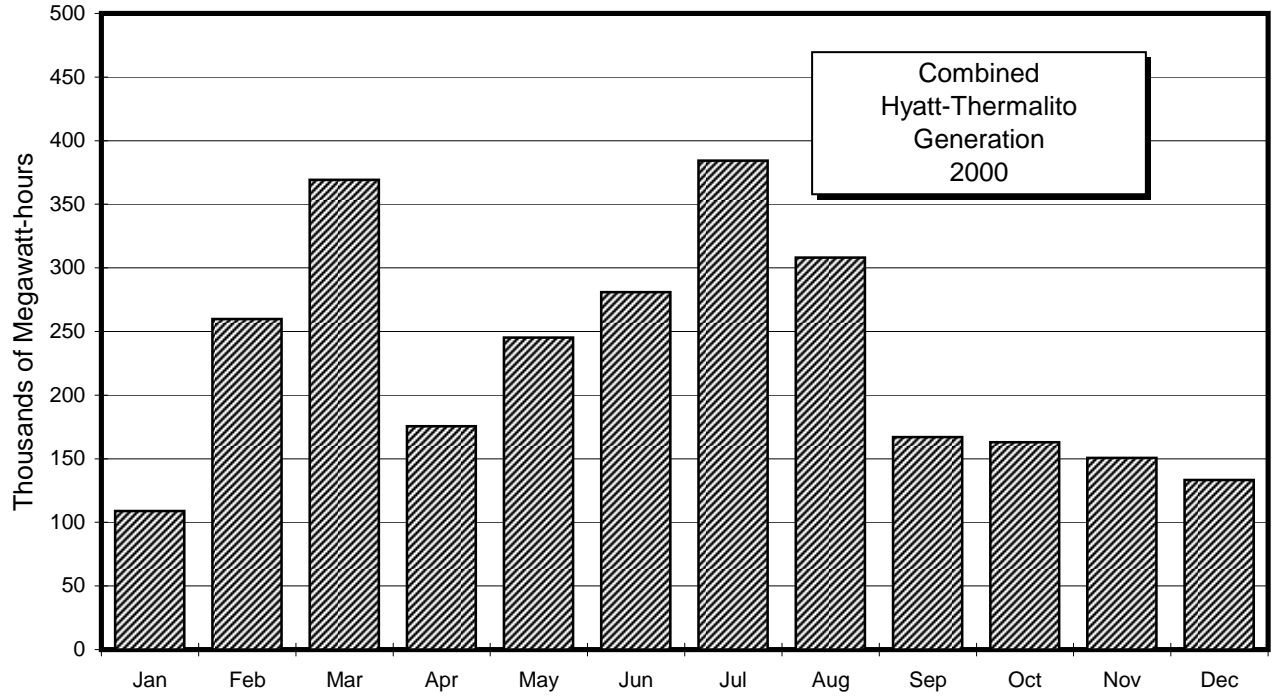
Energy load data (total energy used by the SWP) is summarized in Table 4, and Figures 5 and 6. For the purposes of balancing energy resources and loads, this report itemizes those amounts required to meet SWP supplies and demands separately from those amounts required to meet total DWR supplies and demands. Besides SWP energy loads of 8,831,722 MWh, total DWR energy loads include sales of 2,921,882 MWh, and losses and system imbalances of 358,654 MWh, for a total of 12,112,258 MWh.

The San Joaquin Field Division, which includes the only stretch of Aqueduct with no reservoirs, accounted for over half of the total project energy load. Included in this amount are 3,886,309 MWh used at Edmonston Pumping Plant with peak pumping occurring in August.

In 2000, the Department sold power to 24 utilities and 16 power marketers, resulting in revenues of over \$167.02 million. The largest sale was 596,543 MWh to California Power Exchange. The Department also received \$190.24 million in revenues for capacity, exchanges, and transmission arrangements, including \$179.95 million for transactions made through ISO.

The source of energy data contained in this report is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.

**Figure 2. Combined Operation of Hyatt-Thermalito Powerplants**

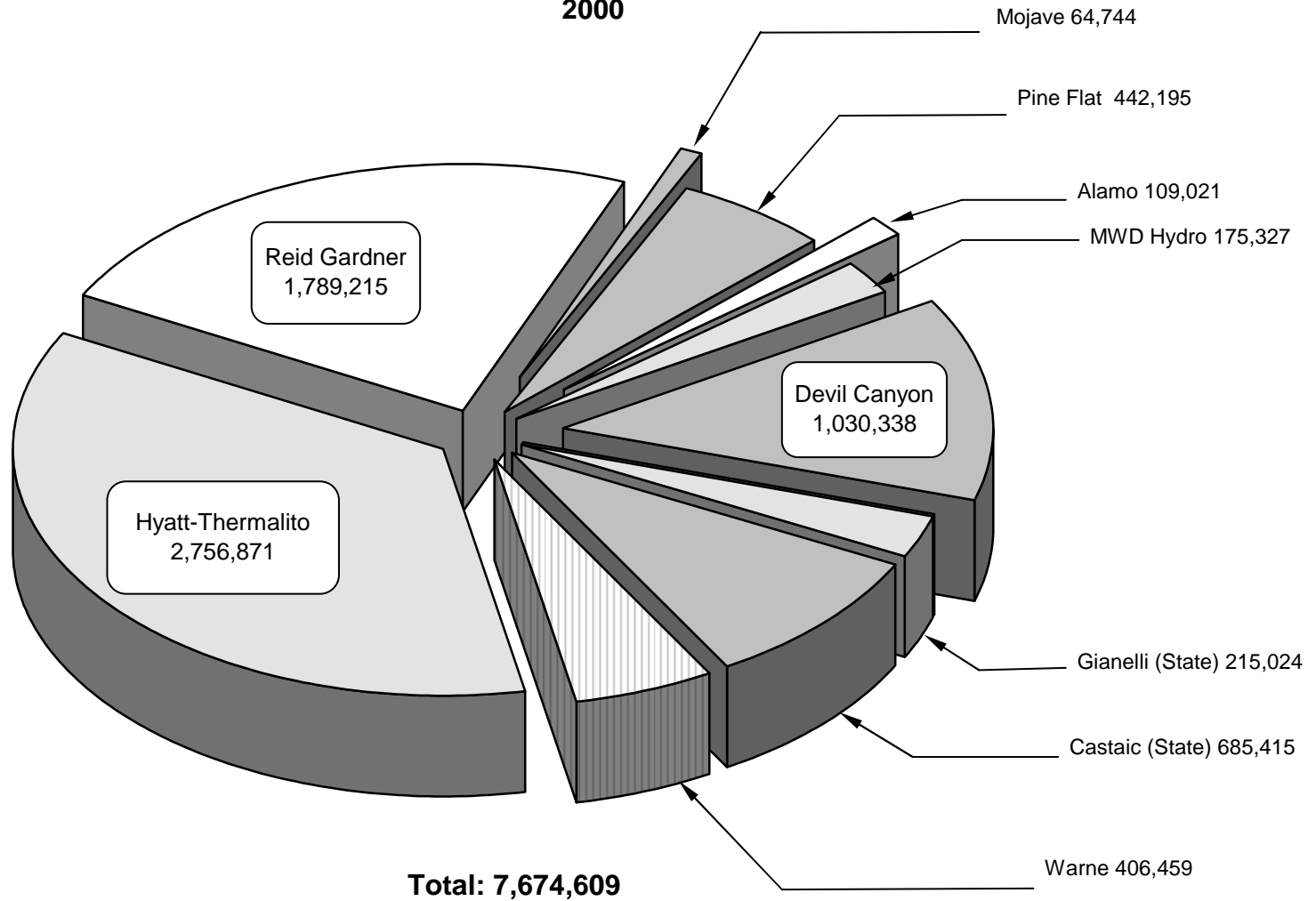


Note: The source of energy data contained on this page is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.

**Figure 3. SWP Energy Resources**

(all values in MWh)

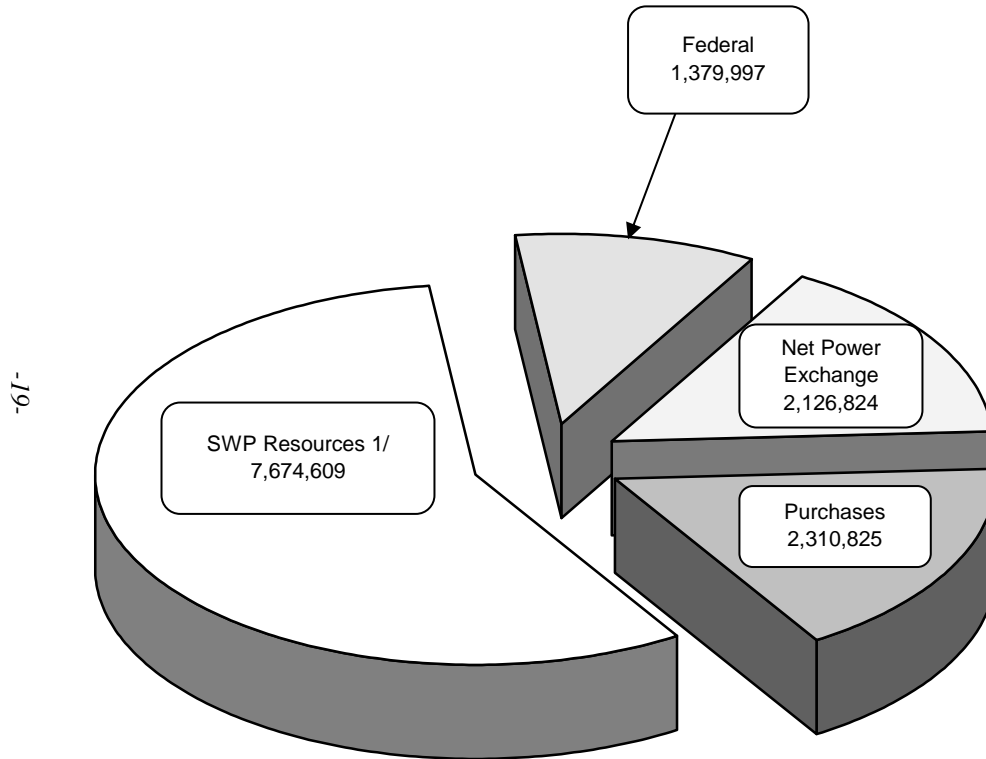
**2000**



-18-

Note: Purchases, Other Sources, and SCE Return Additional are not shown here. All values are metered readings at plants and are not adjusted for transmission losses. The source of energy data contained on this page is the State Water Projects Analysis Office, Bulletin 132-01. No CAISO transaction date was used.

**Figure 4. Total Energy Resources**  
(all values in MWh)  
**2000**



**Total: 13,492,255**

1/ See Figure 3 for a breakdown of SWP Energy Resources.

Note: The source of energy data contained on this page is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.

Purchases

Arizona Electric Power	12,000
Amoco Energy Trading Corp.	15,200
Aquila Power Corp.	2,465
Bonneville Power Adm.	2,400
City & County of San Francisco	3,250
Duke Energy	823,710
Electric Clearing House, Inc.	33,200
Enron Power Marketing, Inc.	6,470
Idaho Power Co.	34,288
LA Dept. of Water and Power	446
Modesto Irrigation District	60
MIECO, INC.	2,400
Northern California Power Agency	205
PacifiCorp	613,033
PG&E Energy Trading	3,200
PacifiCorp Power Marketing, Inc.(PPM)	5,949
Puget Sound Energy	2,800
Powerex	64
California Power Exchange	482,664
Southern Company Energy Marketing, Inc.	330
Sempra Energy Trading, Inc.	231,074
Sacramento Municipal Utility District	2,031
City of Santa Clara Electric Dept.	114
Williams Energy Services Co.	33,472
<b>Total Purchases</b>	<b>2,310,825</b>

Power Exchange Summary

Power Exchange Delivered to SCE	-2,541,017
Power Exchange Received from SCE	4,668,796
Power Exchange Delivered to Other Entities	-3,851,717
Power Exchange Received from Other Entities	3,850,835
Power System Imbalances	-73
<b>Net Power exchange</b>	<b>2,126,824</b>

**Table 3. Total Energy Resources  
2000**

(in megawatt-hours)

Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Hyatt-Thermalito 1/	108,827	259,837	369,124	175,572	245,297	281,055	384,404	308,198	175,189	165,647	150,533	133,188	2,756,871
Gianelli													
State	236	0	174	25,560	52,445	42,566	35,183	22,690	7,197	4,139	10,806	14,029	215,024
Federal	12,632	0	496	121,445	353,938	374,667	235,663	137,482	33,412	17,974	42,003	50,284	1,379,997
Total	12,868	0	670	147,005	406,383	417,233	270,846	160,172	40,609	22,113	52,809	64,313	1,595,021
Warne 2/	27,555	18,021	23,863	45,623	26,423	31,154	31,168	33,608	36,601	38,741	51,850	41,851	406,459
Castaic	47,183	27,692	37,721	78,464	43,617	54,670	52,887	56,738	61,848	80,345	76,505	67,743	685,415
Mojave	5,170	4,542	5,549	3,489	5,267	5,362	5,411	6,043	5,364	5,428	6,091	7,028	64,744
Alamo	8,862	6,789	8,757	9,291	9,445	9,599	9,574	10,118	8,790	8,934	8,849	10,014	109,021
Devil Canyon	80,002	73,745	89,167	84,192	85,825	83,570	85,459	91,015	81,735	84,414	94,862	96,352	1,030,338
MWD Hydro	17,319	13,201	13,051	16,206	15,585	14,907	16,233	14,192	11,329	12,054	15,090	16,161	175,328
Reid Gardner	96,713	163,927	180,335	134,944	54,653	169,461	171,571	164,363	170,905	166,305	173,166	142,872	1,789,215
Pine Flat	0	0	6,384	27,634	83,797	130,256	120,941	57,358	11,093	4,731	0	0	442,194
Purchases 3/	188,334	70,417	164,592	173,659	137,805	158,971	230,865	311,828	238,281	143,433	191,965	300,675	2,310,825
Power Exchange	276,586	137,891	72,794	124,845	82,896	37,289	35,542	55,052	337,005	431,618	330,456	204,923	2,126,897
Power Exchange Imbalances	0	0	0	0	0	0	-60	-10	0	0	-3	0	-73

1/ Includes Table Mountain and Hyatt out adjusted to Tesla.

2/ Includes station-service energy.

3/ Includes Arizona Elec. Power, Amoco, Aquila, Bonneville Power Adm., City and Co. of San Francisco, Pacific Gas and Electric, Duke Energy, Electric Clearing House, Enron, Idaho Power Company, L.A. Dept. of Water and Power, Modesto I.D., MIECO, NCPA, PacifiCorp, Puget Sound, Williams Energy Services, PowerEx, California Power Exchange, Southern Company Energy Marketing, Sempra, SMUD, City of Santa Clara.

Total State: 12,112,258  
Total Federal: 1,379,997  
Total Energy Resources: 13,492,255

Note: The source of energy data contained on this page is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.

**Table 4. Total Energy Loads  
2000**

(in megawatt hours)

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Hyatt-Thermalito 1/	5,566	15,988	55	6,447	136	71	330	8,983	42,951	49,877	54,654	39,767	224,825
North Bay 2/	1,712	1,113	661	298	1,166	1,670	2,037	2,155	2,697	1,677	1,030	1,526	17,742
South Bay	9,467	5,176	3,789	10,371	10,828	13,670	14,416	14,501	9,441	5,071	3,993	10,372	111,093
Del Valle	9	8	9	35	12	21	7	7	8	6	142	68	332
Banks													
State	113,300	101,030	73,246	52,000	28,354	72,228	94,446	101,797	111,111	81,759	87,532	83,651	1,000,454
Federal	0	24	24,645	0	0	0	0	0	0	502	5,373	558	31,102
Bottle Rock 3/	53	49	47	40	38	33	33	32	31	35	39	40	470
Gianelli													
State	65,372	51,878	72	464	95	6,076	1,925	10,891	33,219	17,426	29,948	29,766	247,130
Federal	45,357	66,563	96,098	1,500	0	0	0	6,913	32,199	50,111	66,321	51,296	416,358
Dos Amigos													
State	23,848	28,021	33,492	33,684	38,635	55,901	59,988	54,819	36,877	31,449	34,974	32,076	463,764
Federal	5,070	7,806	8,808	12,920	14,151	27,118	25,712	14,499	72	902	0	5,598	122,656
Pine Flat 3/	268	239	125	0	0	0	0	0	0	125	222	235	1,214
Las Perillas	311	510	367	827	1,179	1,612	1,660	1,362	810	412	248	161	9,459
Badger Hill	719	1,347	947	2,268	3,214	4,455	4,558	3,825	2,242	1,077	621	381	25,654
Devil's Den	1,064	968	980	1,589	2,026	2,616	2,172	2,341	2,124	1,255	1,182	948	19,265
Bluestone	1,004	915	926	1,507	1,953	2,559	2,096	2,251	2,036	1,183	1,117	901	18,448
Polonio	1,087	988	998	1,614	2,023	2,589	2,178	2,343	2,108	1,267	1,202	963	19,360
Buena Vista	30,396	23,923	32,109	41,956	37,134	42,301	42,796	43,016	37,962	37,955	43,200	42,358	455,108
Teerink	33,535	25,469	33,838	44,688	37,783	41,672	42,066	43,660	41,032	41,728	47,974	46,676	480,121
Chrisman	77,680	58,585	77,600	101,634	82,651	91,330	91,752	97,085	92,147	94,414	109,797	106,700	1,081,375
Edmonston	278,917	210,713	277,067	363,765	294,084	321,541	325,110	346,645	331,545	342,394	402,169	392,359	3,886,309
Oso	13,377	8,103	10,967	22,209	12,942	15,298	15,397	16,334	17,525	18,982	25,105	20,856	197,095
Mojave 3/	3	2	1	28	3	0	0	3	0	1	0	2	43
Pearblossom	45,484	38,801	50,124	45,901	46,458	45,729	46,255	49,550	45,271	46,239	50,830	59,877	570,517
Warne 3/	181	100	137	23	322	238	243	144	54	33	0	80	1,555
Alamo 3/	1	21	11	1	4	5	5	7	5	6	4	3	72
Devil Canyon 3/	80	76	47	30	31	11	9	6	1	6	3	17	317
Sales	151,203	184,541	362,375	158,731	208,183	293,030	381,727	274,041	276,221	339,826	159,272	132,732	2,921,882
Actual Deviation	2,152	17,497	11,518	9,373	33,804	4,202	47,972	55,396	57,919	31,585	54,911	32,324	358,654

1/ Pumpback and Station Service

2/ Includes Barker Slough, Cordelia, and Cordelia Interim Pumping Plants.

3/ Station Service only.

Total State: 12,112,258

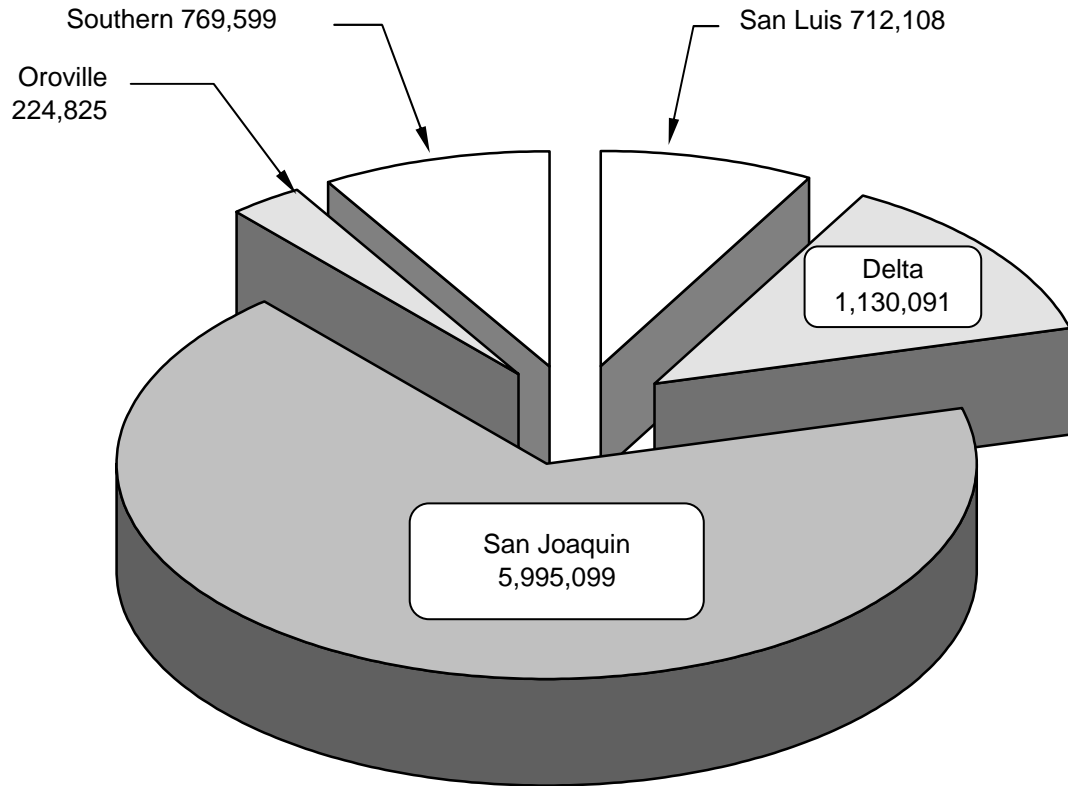
Total Federal: 570,116

Total Loads: 12,682,374

Note: The source of energy data contained on this page is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.



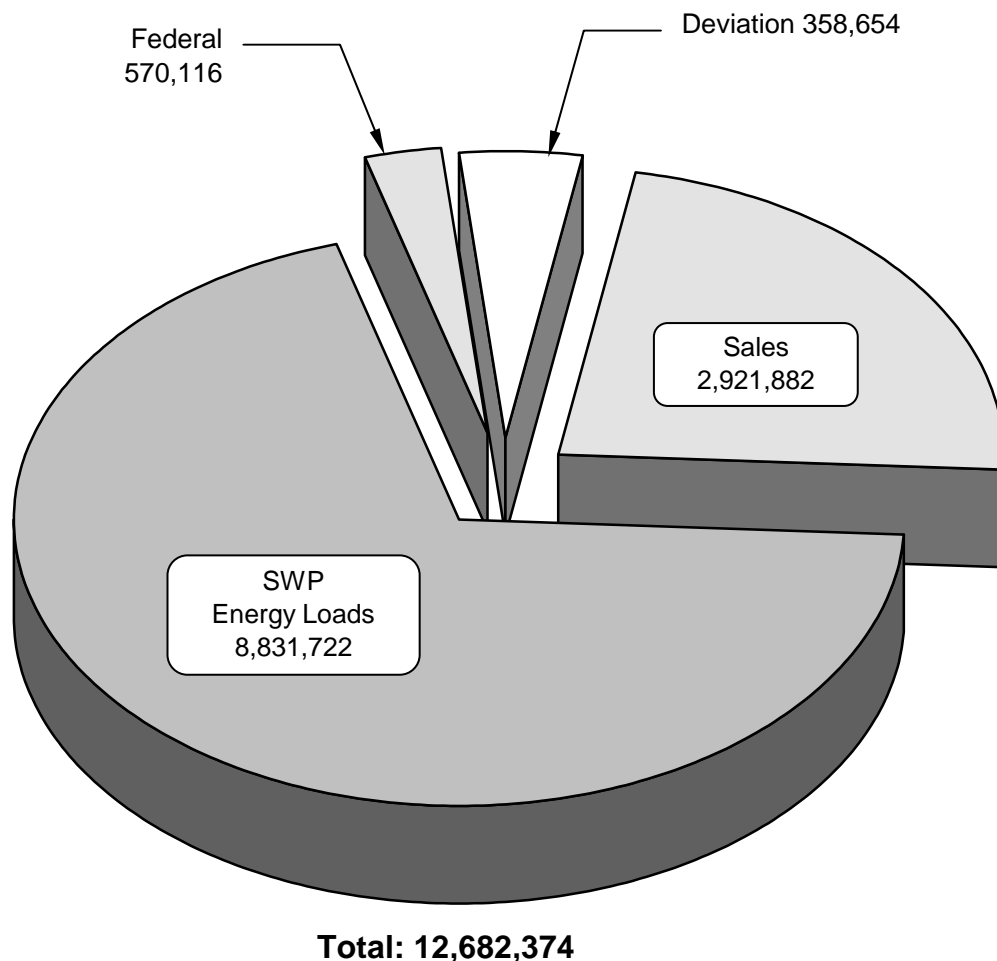
**Figure 5. SWP Energy Loads**  
**2000**  
 (all values in MWh)



**Total: 8,831,722**

Note: The source of energy data contained on this page is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.

**Figure 6. Total Energy Loads  
2000**  
(all values in MWh)



Note: See Figure 5 for breakdown of SWP Energy Loads. The source of energy data contained on this page is the State Water Project Analysis Office, Bulletin 132-01. No CAISO transaction data was used.

Sales

Duke Energy Trading	956,992
California Power Exchange	596,543
Nevada Power Company	388,318
Sempra Energy Trading Corp.	288,794
City of Riverside	137,774
Sacramento Municipal Utility District	75,918
Coral Power LLC	62,349
City of Glendale	55,925
Powerex	51,795
Enron Power Marketing Inc.	41,337
City and County of San Francisco	38,998
Pacific Gas & Electric Energy Services	36,575
Northern California Power Agency	31,907
Puget Sound Power & Light Company	20,310
PacifiCorp	19,950
Aquila Power Corp.	19,426
Enron Energy Services	18,762
American Electric Power	15,331
City of Redding	9,436
Arizona Public Service	9,071
Los Angeles Dept. Of Water & Power	8,913
Idaho Power Company	7,088
Amaco Energy Trading Corp.	6,400
Williams Energy	4,508
City of Azusa	4,332
Bonneville Power Administration	3,349
City of Vernon	2,200
Southern Company Energy Marketing	2,180
Seattle City Light	1,640
Avista Corp.	1,500
Modesto Irrigation District	1,029
Portland General Electric Company	1,005
PacifiCorp Power Marketing Inc.	800
Turlock Irrigation District	633
Electric Clearing House Inc.	400
MWD of Southern California	200
City of Burbank	144
Pacific Gas & Electric Energy Trading	50
<b>Total</b>	<b>2,921,882</b>

## ***Sacramento - San Joaquin Delta Operation***

### ***Delta Resources and Environmental Issues***

The 738,000-acre Delta is the heart of California's water environment. The Delta, at the convergence of the Sacramento and San Joaquin Rivers, is a network of islands, sloughs, marshes, and reclaimed farmland that stretches from Sacramento to San Francisco Bay. A source of drinking water for about two-thirds of California's population, the Delta also provides irrigation for the Central Valley, which produces about 55 percent of the country's fruits and vegetables.

The State Water Resources Control Board has adopted water quality control plans and policies to protect the Delta's water quality and ecosystem while at the same time maintaining SWP water supply reliability.

### ***CALFED Bay-Delta Program***

The CALFED Bay-Delta Program is a cooperative effort among State and federal agencies and California's environmental, urban, and agricultural communities. CALFED was started in 1995 to address environmental and water management problems associated with the Bay-Delta system.

CALFED released the *Draft Programmatic Environmental Impact Statement/Environmental Impact Report for the Bay-Delta Program* on June 25, 1999, followed by a 90-day public comment period that ended September 23, 1999.

The Final EIS/EIR, released in July 2000, was the result of unprecedented collaboration among State and federal agencies and stakeholders.

In 2000, the CALFED Bay-Delta Program published a plan to fix Delta water problems and address its major water challenges over the next 30 years. The Department has vigorously supported CALFED.

Agreement on the plan was jointly announced by State and federal authorities on June 9, 2000, and the plan was formalized in a Record of Decision issued on August 28, 2000.

CALFED actions in 2000 included developing a contingency plan to reduce critical water shortages, continuing Integrated Storage Investigation operations, establishing operating principles and a financial plan for the Environmental Water Account, and identifying south Delta improvements.

### ***Net Delta Outflow Index***

Delta outflow is not measured directly due to the major tidal influence in the Delta. Instead an index of Delta outflow is calculated using measured inflows, exports, and estimated in-Delta water use. A new method of calculating Delta outflow was introduced in the 1995 Principles for Agreement on Bay-Delta Standards. This new index, the Net Delta Outflow Index, considers inflows of the Yolo Bypass system, the eastside stream system (the Mokelumne, Cosumnes, and Calaveras rivers), San Joaquin River at Vernalis, and Sacramento Regional Wastewater Treatment Plant. Major Delta exports and the estimated in-Delta water use are deducted from the cumulative inflow total to produce the index. The NDOI became effective for use in Delta standards compliance on January 1, 1995. Table 5 shows the computed daily NDOI for 2000.

The NDOI calculated flows cannot be directly compared to the prior Delta Outflow Index, as the Sacramento River bypass flows and several eastside stream flows were not included in the earlier DOI calculations. Those flows can be quite substantial during high flow periods. In 2000, the Yolo Bypass flows contributed 22 percent of total Delta inflow and, during the extremely high flow events of March, contributed over 60 percent of inflow. A comparison of Delta Inflow and NDOI is plotted on Figure 7. Gross channel depletion is the sum of evapotranspiration and net increase in soil moisture of Delta lands plus evaporation from Delta channels.

The 2000 daily NDOI averaged 26,715cfs for the year and was only 350 cfs less than the 1999 daily average. The greatest average monthly NDOI occurred in March at 103,866 cfs and the greatest average daily was 183,272 cfs on March 1. The lowest average monthly NDOI occurred in September (4,942 cfs) and the year's lowest average daily NDOI was on September 20 with 2,115 cfs.

D-1485 standards set a minimum NDOI at Chippis Island for adequate water for fisheries. The Export Intake ratio was exceeded on September 20 and 21, 2000 because of an operational error.

The term Sacramento River accretions/depletions refers to the difference between the amounts of water released to the Sacramento and its tributaries by the CVP and SWP, and the amount which flows past Sacramento and into the Delta. Depending on the time of year and hydrologic conditions, this amount

may represent a net gain (accretion) or a net loss (depletion). Accretions/Depletions are forecasted for both short-term and long-term operations planning purposes. Short-term forecasts, up to about seven days in the future are used to estimate inflows to the Delta, at key points on the Sacramento River, and to provide guidance to project operators on predicting release requirement 5-7 days in advance (the maximum travel time from Keswick Dam to the Delta). Such short-term predictions of accretions/depletions may make use of real time flow data, temperature and weather forecasts, travel time, non-project reservoir releases, existing trends in accretions and depletions, and on advice and input from some of the major districts using water on the Sacramento.

Longer-range forecasts of accretions and depletions are made for purposes of planning operations on a seasonal or monthly basis. For this purpose, accretion/depletions are treated as monthly quantities and are customarily forecasted or estimated for 12 months into the future. This discussion will focus on the long-range forecasts of accretions/depletions.

Annually, the net accretions/depletions has ranged from about 1.0 million acre-feet (in 1977) to over 20 million acre-feet (1983). The range of this quantity, in addition to the scope and complexity of the processes within the Sacramento Valley add to the problems of

forecasting accretions/depletions accurately. Fortunately, certain predictable tendencies help to characterize the accretions/depletions. Furthermore, operational considerations limit the range of accretions which have any practical effect on project operations to periods of Delta balanced conditions. When Excess conditions exist, the projects are storing and exporting as much water as possible. Thus the accuracy of the estimate of accretions/depletions is significant to project operations only within the range that is associated with the projects capability to respond operationally.

Forecasts of Delta requirements are perhaps the most difficult to make. There are so many factors that can influence conditions in the Delta that it is unlikely that any forecast will succeed in correctly identifying them all. For example, there are four major water export locations in the Delta, but literally hundreds of minor exporters. There are forecasted tide tables, but no long-term forecasts of barometric pressure, which can affect the magnitude of the tide; and there are no long-term forecasts of daily meteorological events. Despite the inaccuracies, forecasts of Delta requirements are necessary. Without them, planning for upstream reservoir operations and south of the Delta water deliveries would be impossible and the reliability of the projects would be compromised. Table 6 includes monthly totals for the Sacramento River accretion/depletions.

**Table 5. Net Delta Outflow Index  
2000**

(in cfs-days except as noted)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4,012	37,242	183,272	25,056	28,416	11,156	7,955	13,475	7,794	2,904	13,940	9,391
2	4,364	38,355	180,388	22,860	28,931	11,246	2,281	9,782	6,676	3,329	12,599	9,383
3	4,645	37,742	170,914	22,430	29,155	11,035	15,888	11,606	6,748	3,976	8,944	9,423
4	4,325	38,316	161,230	20,978	29,656	10,868	8,962	8,600	7,506	3,627	8,310	7,593
5	4,165	37,014	150,888	22,336	29,607	9,775	9,163	9,320	8,539	3,708	3,919	5,953
6	4,455	35,096	152,824	21,040	30,263	10,434	11,445	8,477	6,753	4,221	3,306	5,888
7	4,100	33,671	157,251	20,100	32,078	10,612	9,323	7,701	6,667	3,557	4,636	5,510
8	4,380	32,616	157,189	18,811	34,330	10,071	9,531	8,790	5,648	4,316	3,882	5,579
9	3,998	30,631	167,652	17,909	35,865	10,284	9,457	8,888	5,431	4,551	3,964	6,005
10	4,035	29,306	167,878	18,777	35,090	10,723	9,127	7,494	4,951	4,734	3,951	6,408
11	3,743	31,118	163,903	18,976	33,730	11,532	9,076	6,919	4,500	5,611	3,638	6,171
12	6,952	40,205	154,854	19,754	29,910	11,940	8,227	4,749	4,236	6,289	3,915	7,815
13	8,445	54,099	145,604	21,469	25,059	11,644	7,261	3,865	3,734	6,267	3,882	7,926
14	8,972	72,471	137,088	25,881	21,454	11,630	7,633	3,975	4,660	6,727	3,969	7,946
15	9,603	119,178	123,635	31,342	19,365	10,534	8,275	4,616	3,795	6,620	4,461	8,985
16	10,212	174,065	104,472	32,706	18,861	10,009	8,169	5,394	3,735	4,733	4,082	8,863
17	10,573	173,892	88,089	33,803	20,082	9,913	8,356	6,183	4,067	3,507	4,239	7,573
18	16,134	174,786	74,116	42,053	20,613	9,746	8,762	4,177	3,608	3,773	5,027	8,679
19	23,627	159,602	66,432	42,914	21,783	9,483	8,727	5,273	3,405	4,708	4,672	7,988
20	25,597	144,644	61,422	44,071	21,203	9,045	10,081	4,722	2,115	4,140	4,372	5,226
21	24,127	133,466	59,054	45,684	19,079	8,434	10,193	4,149	2,847	3,833	5,080	4,129
22	24,210	125,115	52,588	43,649	17,498	7,420	10,003	4,147	4,756	5,934	5,862	6,299
23	26,866	123,882	48,255	35,317	17,056	6,527	10,858	4,338	5,650	4,142	6,204	7,226
24	28,400	147,646	46,170	33,519	16,280	7,313	11,462	5,908	5,892	3,427	6,538	7,375
25	44,760	158,583	43,788	32,615	19,098	9,883	11,846	7,047	4,236	4,093	6,538	7,448
26	60,172	156,043	41,135	31,252	18,304	8,571	11,712	5,175	4,655	4,000	6,383	7,357
27	62,746	154,265	37,060	30,104	18,018	9,734	11,554	5,310	3,766	7,666	5,191	6,371
28	59,708	161,718	34,624	28,489	17,634	9,886	11,484	5,232	4,875	9,735	5,402	5,751
29	48,147	181,346	31,984	27,608	11,892	9,463	11,099	5,942	3,539	12,235	4,131	5,293
30	36,746		28,701	27,759	13,115	8,480	11,292	5,217	3,464	15,869	9,887	4,995
31	35,689		27,377		12,627		15,472	6,190		17,039		4,965
Total	617,908	2,836,113	3,219,837	859,262	726,052	297,391	304,674	202,661	148,248	179,271	170,924	215,514
Ave.	19,933	94,813	103,866	28,642	23,421	9,913	9,828	6,537	4,942	5,783	5,697	6,952
Max.	62,746	181,346	183,272	45,684	35,865	11,940	15,888	13,475	8,539	17,039	13,940	9,423
Min.	3,743	29,306	27,377	17,909	11,892	6,527	2,281	3,865	2,115	2,904	3,306	4,129
Total In AF	1,225,621	5,625,430	6,386,547	1,702,456	1,440,124	589,875	604,321	401,978	294,050	356,594	339,028	427,472

Annual Total = 19,393,495 acre-feet

**Table 6. Sacramento Basin and Sacramento-San Joaquin Delta Operations  
2000**

(in thousands of acre-feet except as noted)

Month	Upstream Reservoir Releases to River			Sacramento River Accretions or Depletions 2/	Delta Inflow				Net Delta Consumptive Use	Delta Exports					Net Delta Outflow Index
	Keswick 1/	Oroville 1/	Nimbus		Sacramento River at Sacramento 3/	Miscellaneous Inflows 4/	San Joaquin River at Vernalis	Total Inflow		Clifton Court Forebay Intake 5/	Barker Slough Pumping Plant	Tracy Pumping Plant	Contra Costa Pumping Plant	Total Exports	
Jan	327	190	218	360	1,456	72	127	1,654	-180	397	4	197	10	608	1,226
Feb	1,327	332	573	1,492	3,527	2,047	397	5,971	-326	425	2	236	8	672	5,625
Mar	1,604	691	365	1,614	3,724	2,441	778	6,942	-4	341	1	208	10	560	6,387
Apr	426	257	253	330	1,600	146	322	2,068	42	178	1	131	15	324	1,702
May	677	248	233	71	1,285	145	305	1,735	109	100	2	78	5	185	1,440
Jun	745	255	157	-105	958	137	176	1,271	221	254	5	181	20	460	590
Jul	902	475	201	-146	1,287	107	121	1,515	268	355	7	266	16	643	604
Aug	764	387	117	-78	1,106	72	129	1,307	232	382	7	270	14	673	402
Sep	464	225	90	75	922	45	139	1,105	153	385	9	253	12	659	294
Oct	375	168	124	32	732	40	171	942	9	310	5	258	4	577	357
Nov	321	146	129	77	748	57	145	950	49	316	2	242	2	563	338
Dec	305	151	154	126	860	67	136	1,063	97	295	3	240	1	539	427
Total	8,237	3,525	2,614	3,847	18,205	5,375	2,944	26,524	669	3,737	48	2,560	118	6,462	19,393

1/ Time lagged values (Keswick: 5 days; Oroville: 2 days).

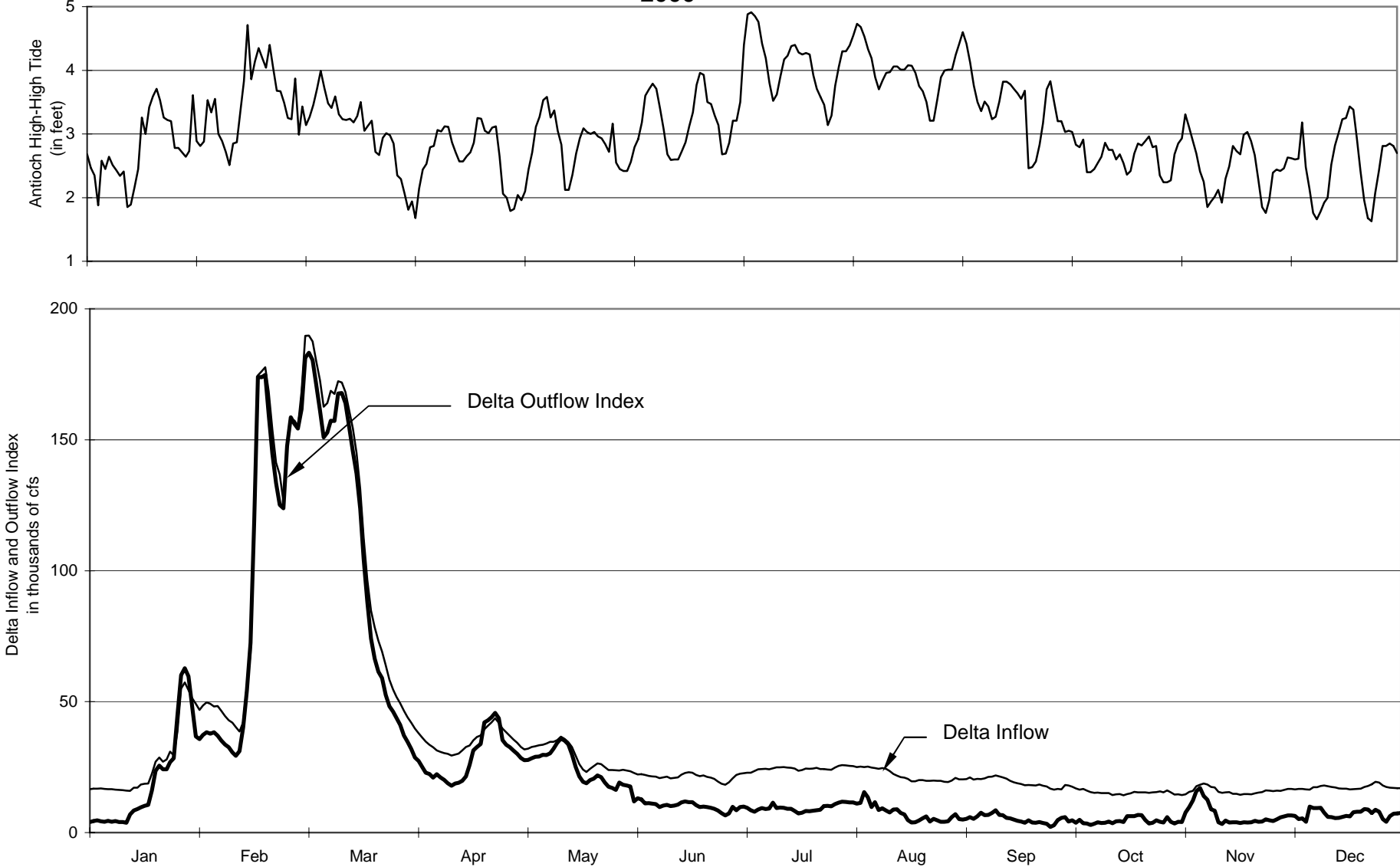
2/ The difference between amounts released at Sacramento, and amounts which flow into the Delta.

3/ These values are based on a measured daily average taken from the Sacramento River at Freeport and include Sacramento County Regional Waste Treatment Plant.

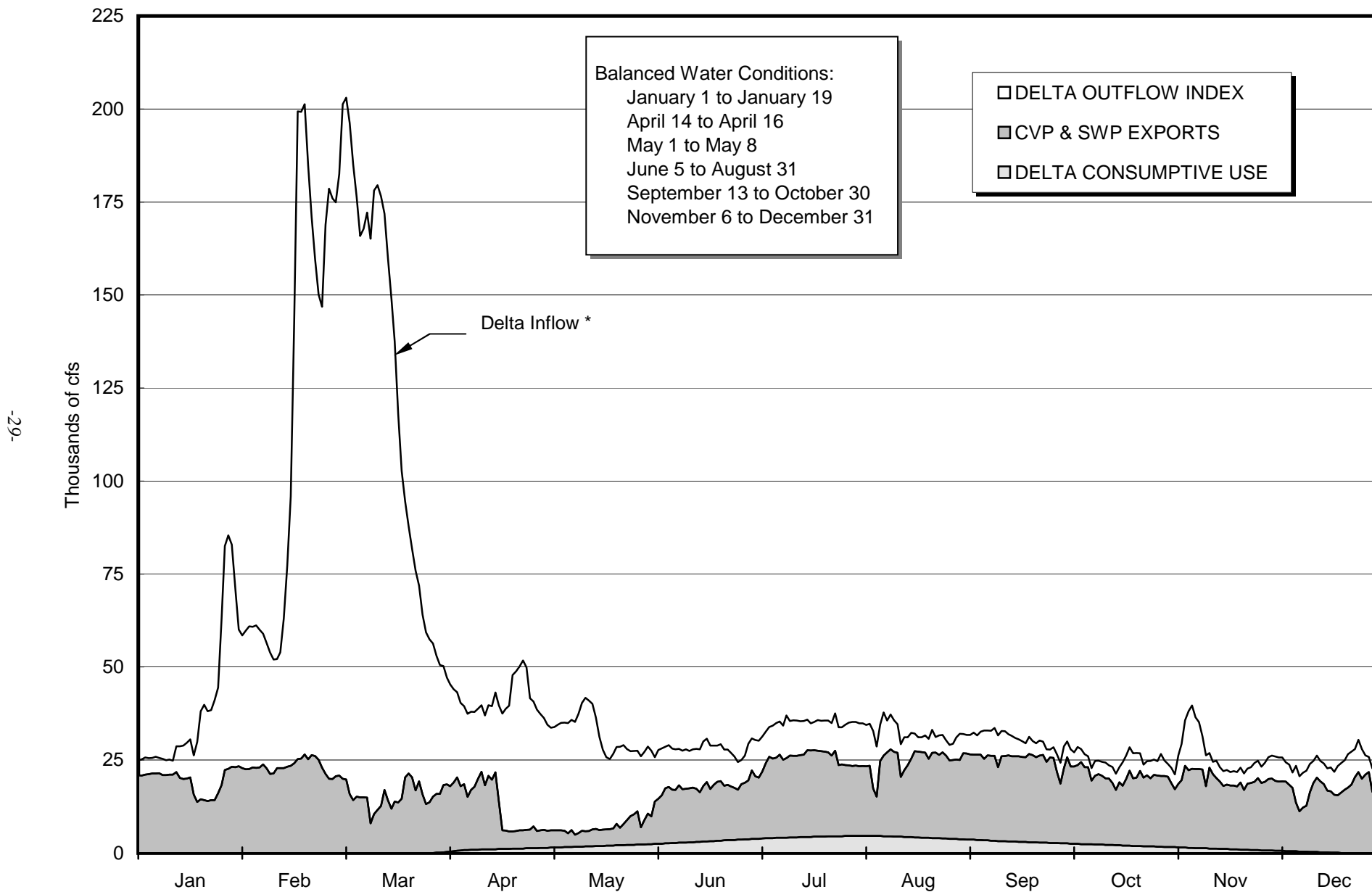
4/ Includes Yolo Bypass, Eastside Streams, and Miscellaneous Inflows.

5/ Includes Byron Bethany Diversion Canal.

**Figure 7. Delta Tide, Inflow, and Outflow Index  
2000**



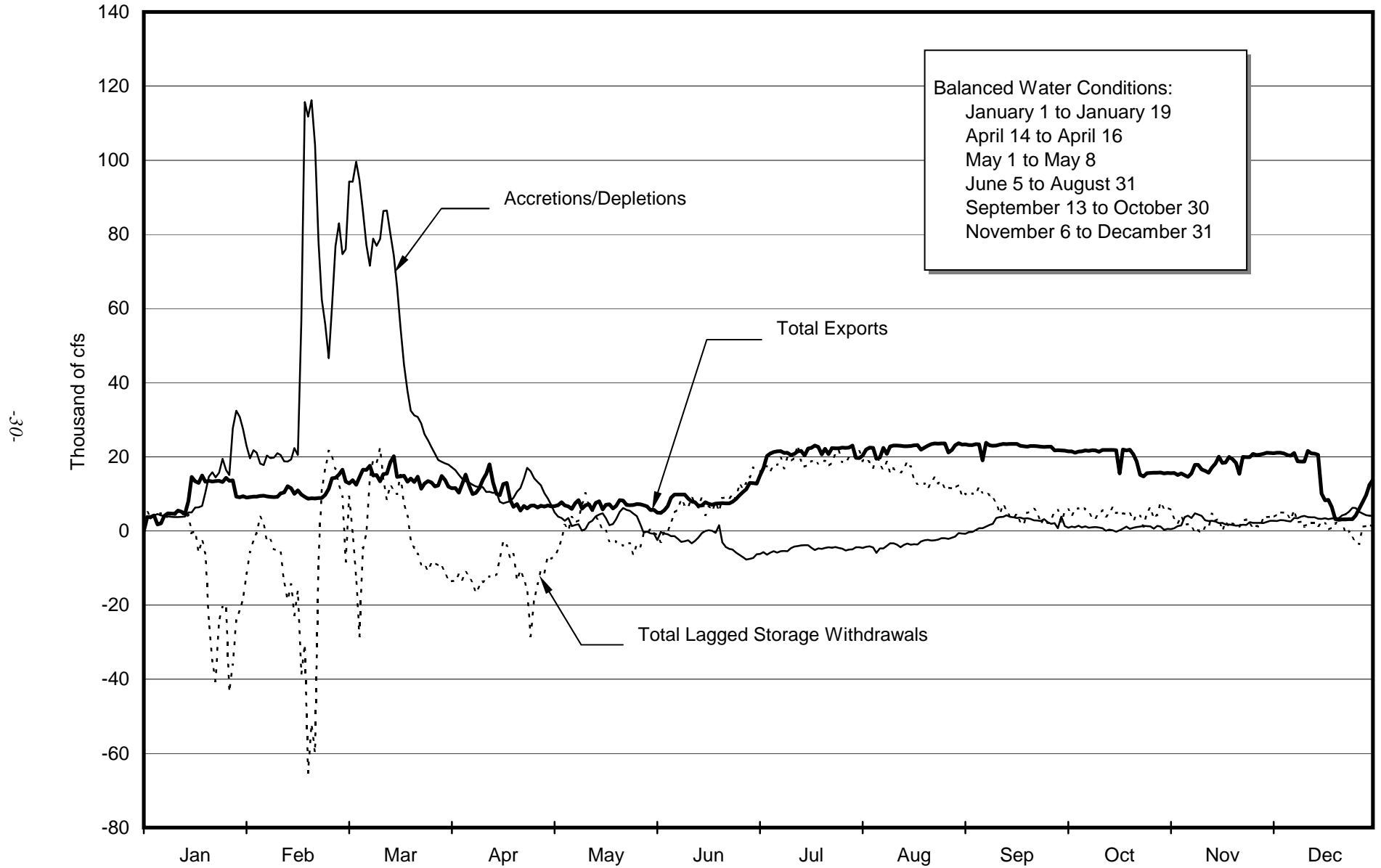
**Figure 8. Coordinated Delta Operations  
2000**



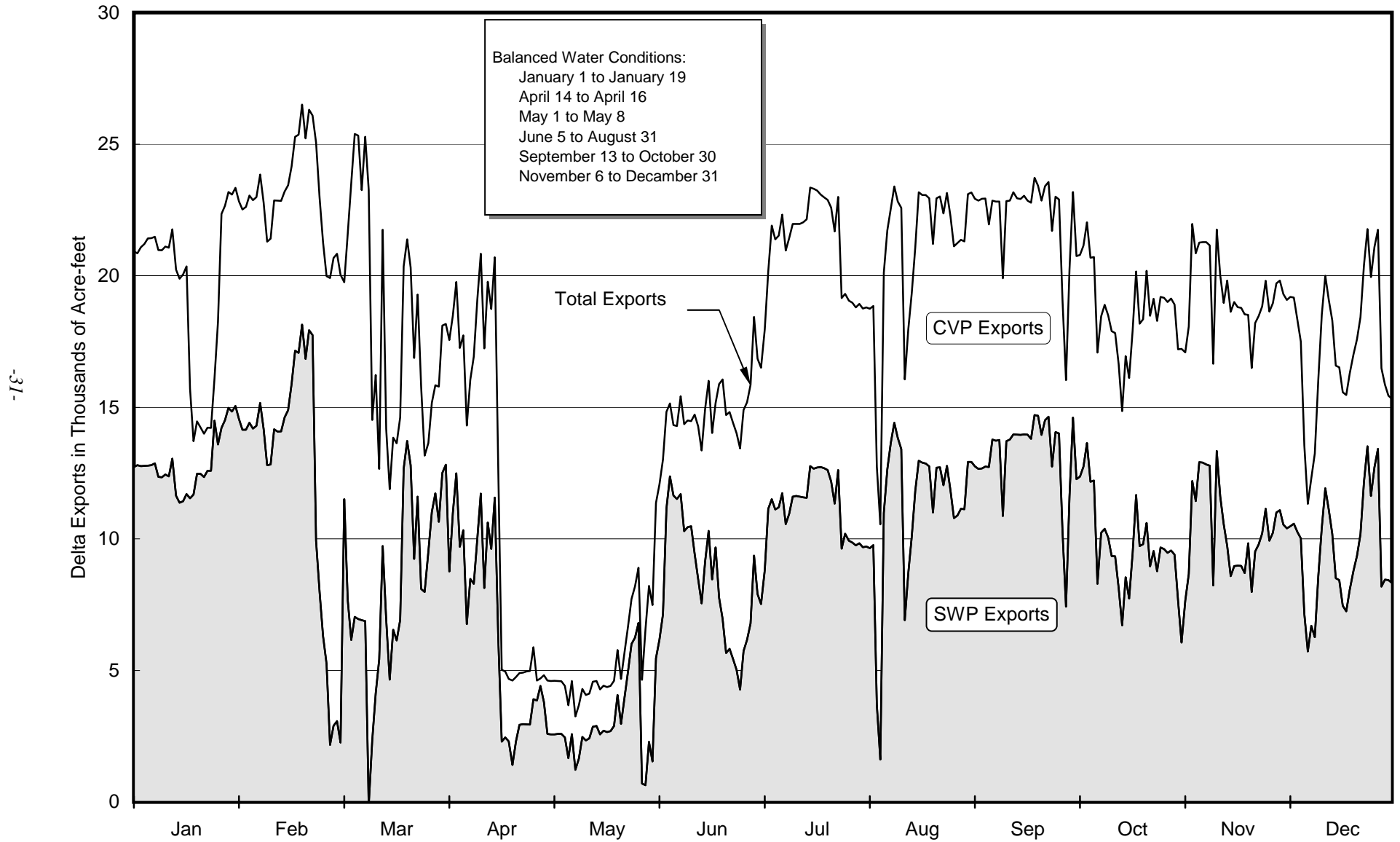
\* Delta inflow = Exports + Outflow + Consumptive Use.



**Figure 9. Coordinated Delta Operations  
Lagged Storage Withdrawals  
2000**



**Figure 10. Coordinated Delta Operations**  
**Delta Exports**  
**2000**



## *Project Operations by Field Division*

### *Oroville Field Division*

#### *Water Storage*

SWP water storage facilities in the Oroville Field Division include Lake Oroville, Thermalito Forebay and Afterbay (Oroville-Thermalito Complex) and upper Feather River reservoirs consisting of Lake Davis, Frenchman Lake, and Antelope Lake. Lake Oroville operations store winter and spring runoff for later SWP use for power generation, flood control, recreation, fish and wildlife enhancement, in addition to water supply.

The Upper Feather River Reservoirs have a combined capacity of 162,000 AF. Monthly operations for the three Upper Feather River reservoirs are presented in Table 7. The table below compares storage capacity with the largest end-of-month storage for each reservoir for the last five years:

Year	Reservoir (Capacity)		
	Antelope 22,566	Frenchman 55,477	Davis 84,371
2000	(Apr) 23,409	(Apr) 54,627	(May) 71,573
1999	(May) 23,447	(Apr) 57,651	(May) 80,205
1998	(Apr) 24,030	(Apr) 56,969	(Jun) 74,142
1997	(Jan) 27,696	(Jan) 58,350	(Jan) 83,929
1996	(Dec) 23,944	(Mar) 57,881	(May) 81,858

Unimpaired runoff into Lake Oroville for the 1999-00 water year was about 4.21 MAF (94 percent of average). Lake Oroville storage at the beginning of 2000 was 2,186,332 AF (62 percent of normal maximum operating capacity). Storage peaked on June 13, 2000 at 3,131,132 AF, (89 percent of normal maximum operating capacity). Lowest storage in Lake Oroville in 2000 was 1,724,086 (49 percent of normal maximum operating capacity) on December 31.

Lake Oroville's computed inflow is tabulated in Table 8 and plotted along with releases, diversions, and storage withdrawals on Figure 11. A ten-year historical summary of Lake Oroville's storage and inflow is illustrated on Figure 12.

Water temperatures on and below the lake's surface are monitored very closely throughout the year at various locations around the lake. Two intakes to the powerplant have shutters that control the depth from which water enters the plant. Adding or

removing shutters as necessary can then control the temperature of water entering the fish hatchery. A complete illustration of water temperature and intake operation is shown on Figure 14.

#### *Water Deliveries*

Project water stored in the Upper Feather Area lakes flows into Lake Oroville through the North and Middle Forks of the Feather River. Deliveries of prior water rights from the Upper Feather Area totaled 13,502 AF (local supply) from Frenchman Lake and 595 AF (non-project) from Lake Davis as shown in Table 7..

Water stored in Lake Oroville is released into the Thermalito Diversion Dam Pool, from which specified quantities are released into both the Feather River and the Thermalito Power Canal. Contract deliveries totaled 901 AF from the Feather River. Power Canal deliveries totaled 587 AF of contract water and 2,478 AF for Prior Water Rights. From the Thermalito Afterbay, additional water is released to the Feather River and several local distribution systems used to deliver water to prior water right holders. These deliveries are collectively called the Feather River Service Area diversions. FRSA diversions are not considered SWP benefits, as they predate the SWP construction, and would have occurred in the absence of the SWP to the limit of available natural river flows. Nearly all FRSA diversions are for agricultural use and totaled 1,082,995 AF in 2000, about 11,178 AF less than in 1999. All FRSA and Upper Feather Area Prior Water Rights diversions are detailed below:

Last Chance Creek	13,502
Valverde-Romelli	595
Richvale Canal	160,750
Sunset Pumps	10,309
Western Canal Lateral	3,895
Western Canal	309,540
Tudor Mutual	4,280
Garden Highway	14,006
Plumas Mutual	11,057
Dana Brothers	57
Sutter Butte Canal	561,930
Oswald Water District	546
Palermo Canal	6,625
Thermalito I. D.	2,478
Total in AF	1,083,590

Table 2 shows a breakdown of total deliveries by agency, map 3 show a breakdown by water type. Total deliveries in the Oroville Field Division were 1,101,058 AF in 2000.

### Table 7. Upper Feather Area Lakes Monthly Operation

**2000**

(in acre-feet except as noted)

Month	Lake Storage			Outflow						Inflow	
	Water Surface Elevation (in feet)	End of Month Storage	Storage Change	Stream-Flow Maint.	Regulated Release		Total Regulated Release	Spill	Estimated Evaporation and Seepage	Total Outflow	Computed
					Prior Water Rights						
					Local Supply	Non-Project					

**Antelope Lake Capacity 22,566 acre-feet**

Jan	4993.77	15,645	157	1,230	0	0	1,230	0	52	1,282	1,439
Feb	4995.51	16,983	1,338	1,150	0	0	1,150	0	61	1,211	2,549
Mar	4999.49	20,295	3,312	1,230	0	0	1,230	0	98	1,328	4,640
Apr	5002.90	23,409	3,114	1,190	0	0	1,190	5,028	187	6,405	9,519
May	5002.31	22,853	-556	668	0	0	668	4,961	301	5,930	5,374
Jun	5001.44	22,048	-805	1,190	0	0	1,190	272	509	1,971	1,166
Jul	4999.65	20,435	-1,613	1,230	0	0	1,230	0	671	1,901	288
Aug	4997.59	18,670	-1,765	1,230	0	0	1,230	0	683	1,913	148
Sep	4995.85	17,252	-1,418	1,190	0	0	1,190	0	544	1,734	316
Oct	4994.34	16,076	-1,176	1,230	0	0	1,230	0	233	1,463	287
Nov	4993.15	15,184	-892	1,190	0	0	1,190	0	119	1,309	417
Dec	4991.97	14,330	-854	1,230	0	0	1,230	0	79	1,309	455
<b>Total</b>	---	---	-1,158	13,958	0	0	13,958	10,261	3,537	27,756	26,598

**Frenchman Lake Capacity 55,477 acre-feet**

Jan	5579.78	43,416	1,159	123	0	0	123	0	94	217	1,376
Feb	5581.39	45,638	2,222	115	0	0	115	0	96	211	2,433
Mar	5584.44	50,031	4,393	123	0	0	123	0	172	295	4,688
Apr	5587.46	54,627	4,596	98	190	0	288	0	504	792	5,388
May	5586.75	53,524	-1,103	0	2,729	0	2,729	0	513	3,242	2,139
Jun	5584.47	50,076	-3,448	0	3,370	0	3,370	0	831	4,201	753
Jul	5581.86	46,441	-3,635	0	3,088	0	3,088	0	942	4,030	395
Aug	5578.86	42,177	-4,264	0	3,080	0	3,080	0	1,304	4,384	120
Sep	5577.80	40,776	-1,401	0	845	0	845	0	857	1,702	301
Oct	5577.54	40,437	-339	46	200	0	246	0	365	611	272
Nov	5577.51	40,398	-39	168	0	0	168	0	208	376	337
Dec	5577.60	40,515	117	184	0	0	184	0	143	327	444
<b>Total</b>	---	---	-1,742	856	13,502	0	14,358	0	6,029	20,387	18,645

**Lake Davis Capacity 84,371 acre-feet**

Jan	5767.58	57,328	2,475	615	0	0	615	0	225	840	3,315
Feb	5768.68	60,976	3,648	575	0	0	575	0	232	807	4,455
Mar	5770.02	65,593	4,617	1,396	0	0	1,396	0	413	1,809	6,426
Apr	5771.68	71,573	5,980	1,160	0	0	1,160	0	1,196	2,356	8,336
May	5771.49	70,874	-699	899	0	24	922	0	1,214	2,136	1,437
Jun	5770.77	68,260	-2,614	803	0	61	864	0	2,358	3,222	608
Jul	5769.89	65,137	-3,123	735	0	187	922	0	2,281	3,203	80
Aug	5768.91	61,755	-3,382	710	0	287	997	0	2,482	3,479	97
Sep	5768.29	59,668	-2,087	856	0	36	893	0	1,683	2,576	489
Oct	5767.83	58,145	-1,523	922	0	0	922	0	925	1,847	324
Nov	5767.57	57,296	-849	893	0	0	893	0	523	1,416	567
Dec	5767.32	56,485	-811	922	0	0	922	0	356	1,278	467
<b>Total</b>	---	---	1,632	10,487	0	595	11,082	0	13,888	24,970	26,602

**Table 8. Lake Oroville Monthly Operation**

**2000**

(in acre-feet except as noted)

Capacity 3,537,577 acre-feet

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Outflow					Hyatt Pumpback	Computed Inflow 2/
				Hyatt Generation 1/	Palermo Canal	Evaporation	Spill	Total Outflow		
Jan	813.30	2,345,401	159,069	193,101	184	729	0	194,014	6,652	346,431
Feb	846.81	2,765,788	420,387	424,758	61	936	0	425,755	18,951	827,191
Mar	852.25	2,838,641	72,853	595,257	100	3,388	0	598,745	0	671,598
Apr	871.52	3,107,588	268,947	274,663	290	5,080	0	280,033	5,948	543,032
May	872.91	3,127,657	20,069	385,438	749	6,556	0	392,743	0	412,812
Jun	854.86	2,874,068	-253,589	446,377	1,064	9,790	7	457,238	0	203,649
Jul	818.96	2,413,006	-461,062	628,504	1,060	9,613	0	639,177	363	177,752
Aug	785.61	2,033,621	-379,385	536,021	1,140	8,869	0	546,030	11,532	155,113
Sep	774.75	1,919,813	-113,808	304,718	1,060	6,548	0	312,326	56,550	141,968
Oct	766.33	1,834,794	-85,019	299,127	556	3,601	0	303,284	66,724	151,541
Nov	758.88	1,761,850	-72,944	284,145	171	1,430	0	285,746	71,769	141,033
Dec	755.03	1,724,942	-36,908	254,488	204	773	0	255,465	50,198	168,359
Total	---	---	-461,390	4,626,597	6,639	57,313	7	4,690,556	288,687	3,940,479

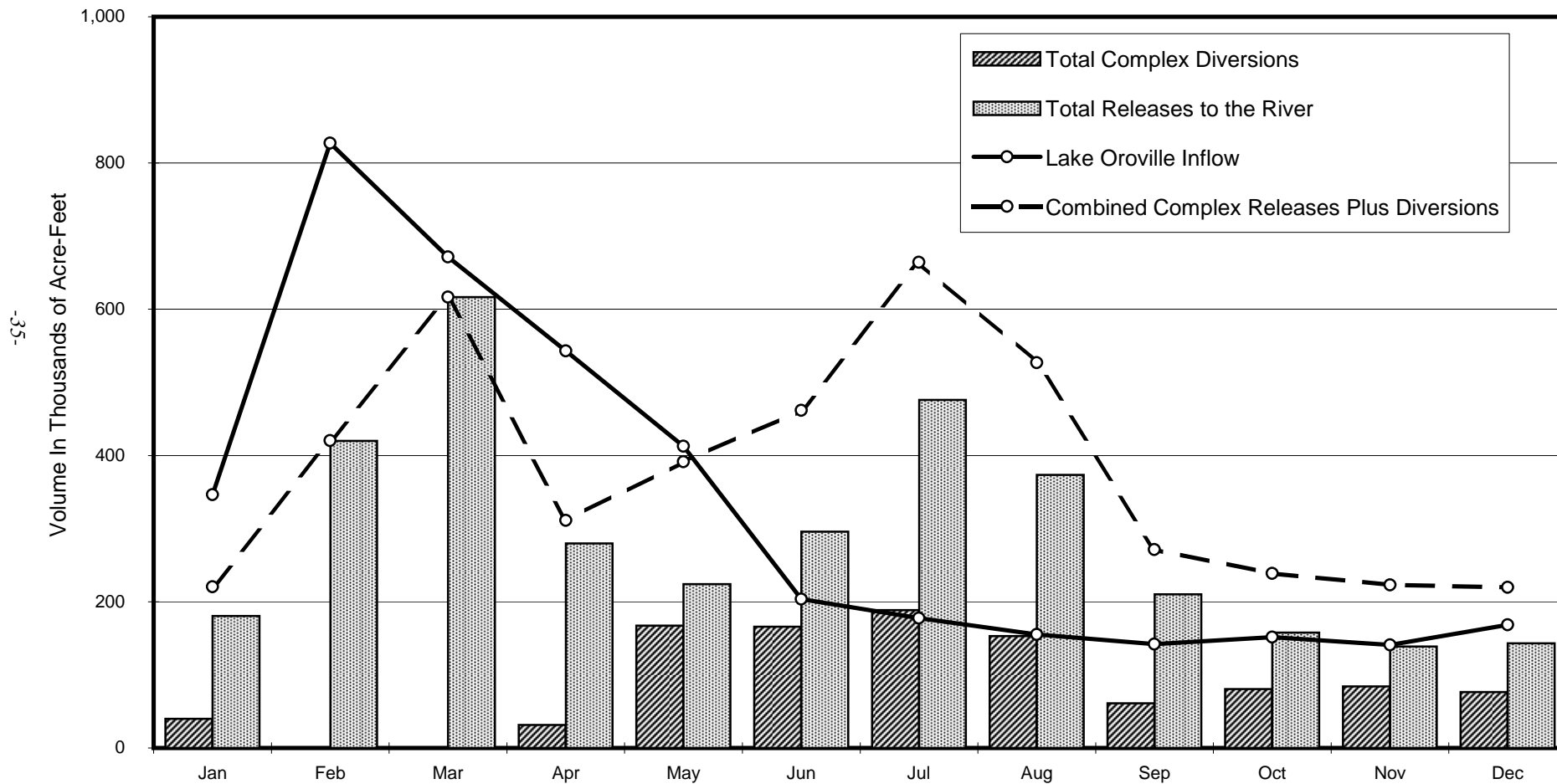
1/ Includes bypass flows.

2/ Does not include pumpback.

**Figure 11. Oroville-Thermalito Complex**

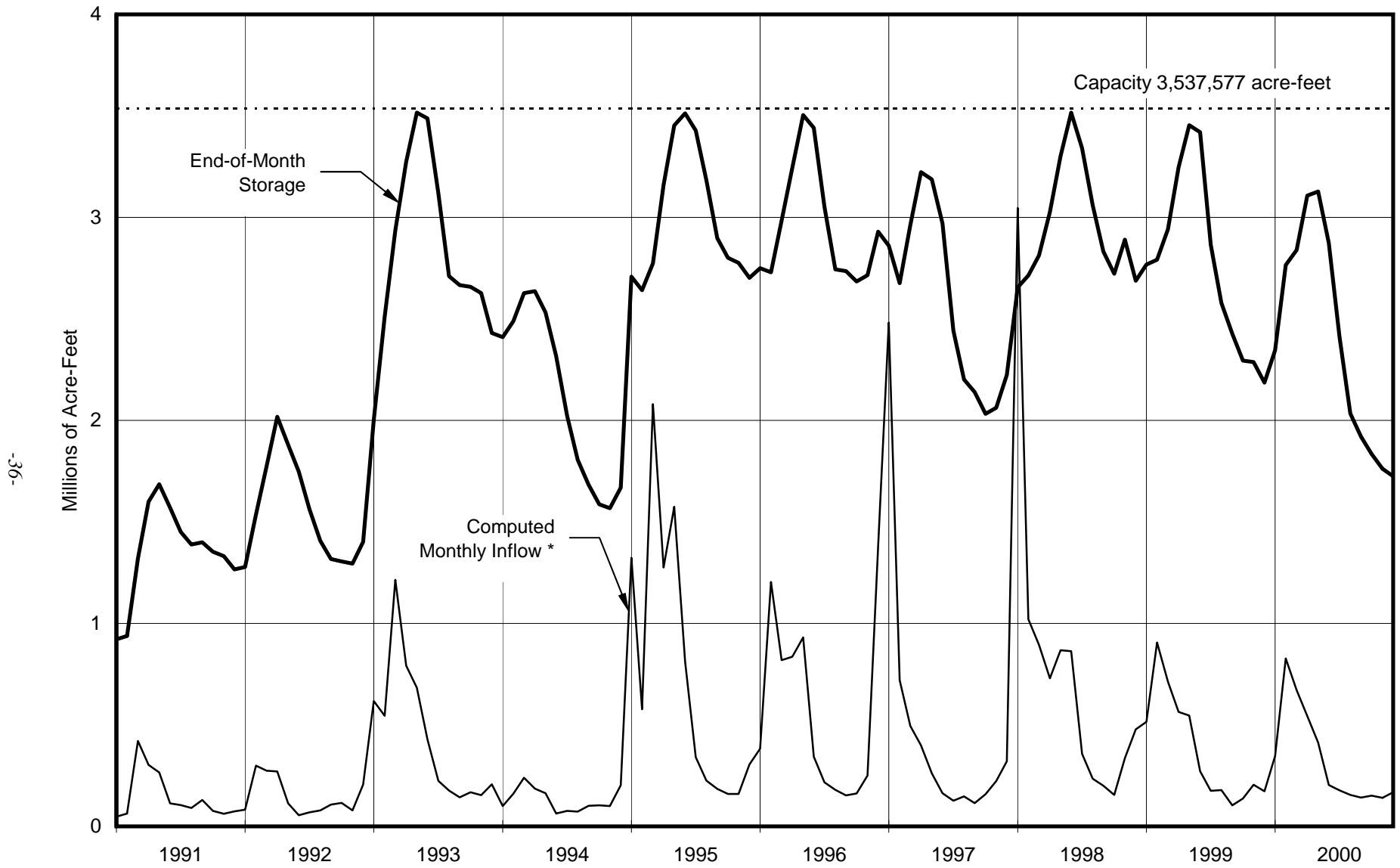
Inflow, Releases, and Diversions

**2000**



Note: Releases include flows at fish barrier dam, fish hatchery, and afterbay river outlet. Diversions include Butte County, Thermalito Irrigation District, Sutter Butte Canal, Western Lateral, Richvale Canal, Sunset Pumps, and Western Canal. The area between the plotted lines above the Inflow line represents amounts derived from storage.

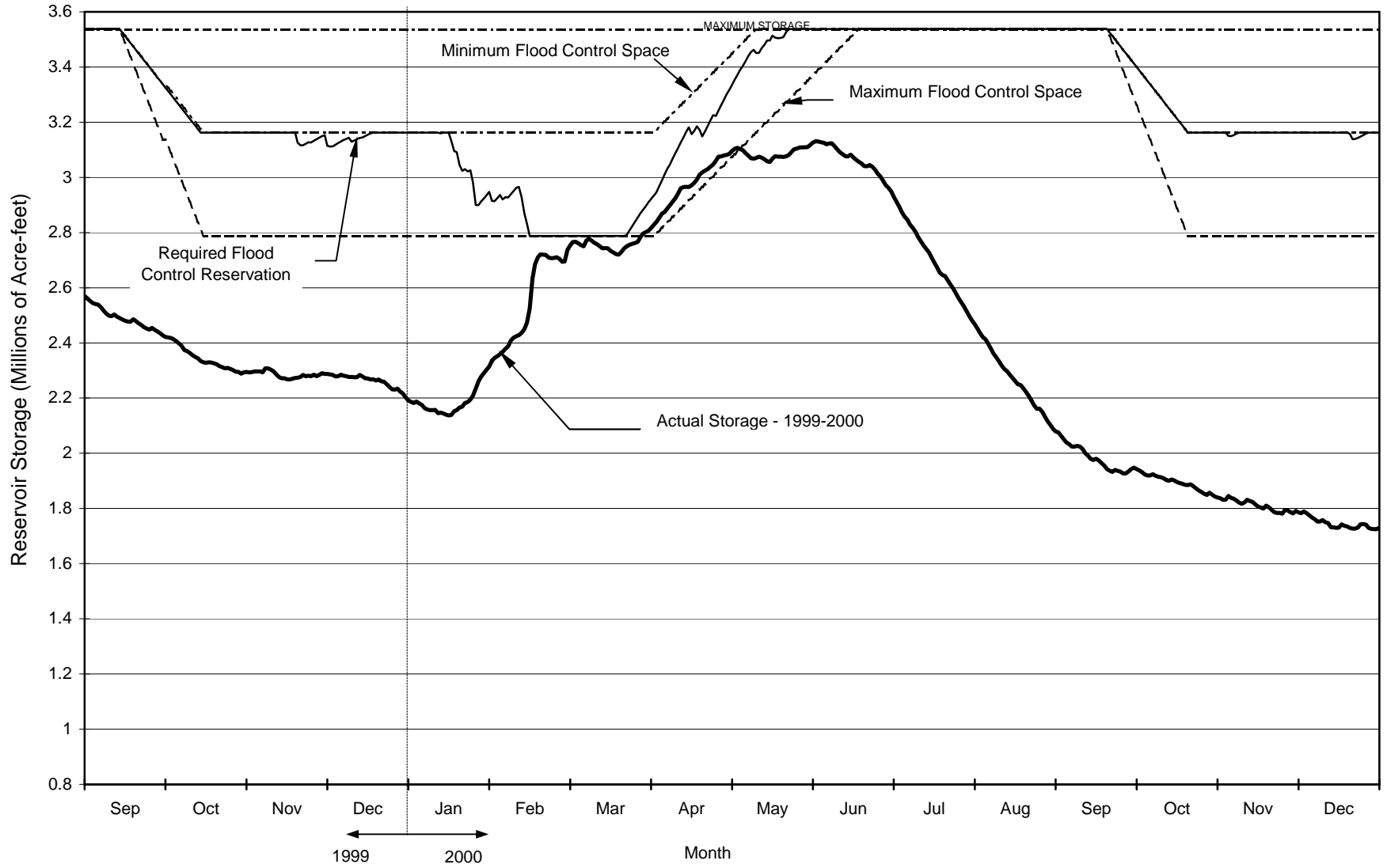
Figure 12. Historical Lake Oroville Operation



\* Excludes pumpback.

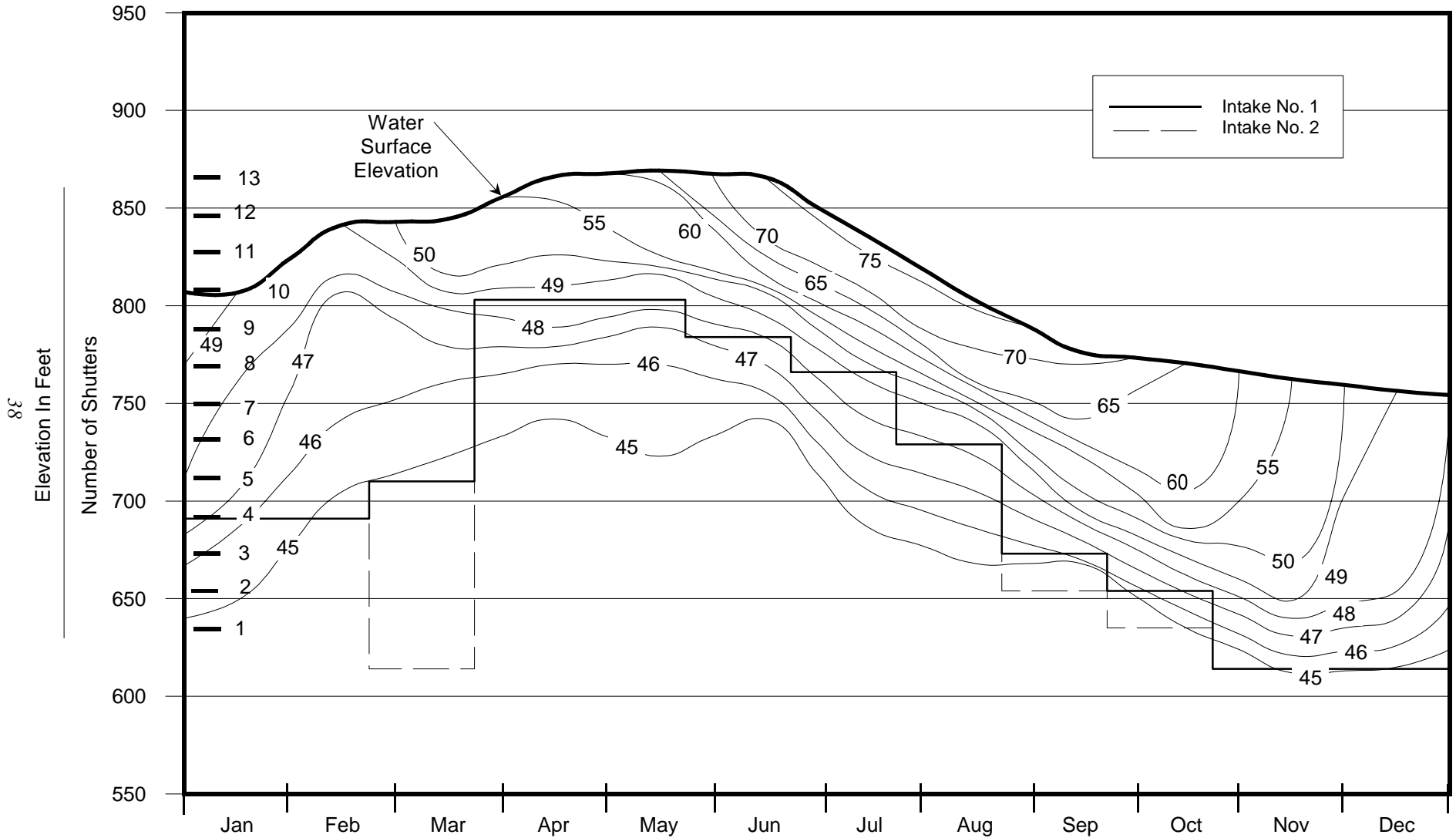
Figure 13. Operation of Lake Oroville for Flood Control

1999-2000





**Figure 14. Lake Oroville Temperatures**  
**2000**  
 ( isotherms in degrees Farenheit )



Note: Temperature data is taken once per month and averaged for the rest of the year.

**Table 9. Thermalito Forebay Monthly Operation  
2000**

Including Diversion Pool and Power Canal  
(end of month storage in acre-feet)

Month	Storage 1/	Storage Change	Inflow			Outflow					Losses (-) And Gains (+)
			Lake Oroville Releases 2/	Kelly Ridge Generation	Thermalito Pumpback	Thermalito Generation 3/	Butte County 4/	Thermalito Irrigation District	Releases To River 5/	Hyatt Powerplant Pumpback	
Jan	23,532	1,708	193,101	9,990	7,702	169,495	89	90	37,980	6,652	5,221
Feb	22,074	-1,458	424,758	14,640	20,066	424,034	158	71	36,414	18,951	18,706
Mar	24,221	2,147	595,257	15,660	0	582,214	186	115	39,057	0	12,802
Apr	23,441	-780	274,663	15,130	11,634	263,890	119	183	33,887	5,948	1,820
May	23,475	34	385,438	15,600	0	367,087	2	227	39,238	0	5,550
Jun	23,257	-218	446,384	14,930	5,364	429,861	3	362	37,150	0	480
Jul	22,717	-540	628,504	14,450	0	613,505	17	393	38,472	363	9,256
Aug	23,065	348	536,021	15,180	9,195	515,816	4	381	38,321	11,532	6,006
Sep	24,151	1,086	304,718	11,950	55,299	282,686	3	272	37,640	56,550	6,270
Oct	23,661	-490	299,127	12,160	64,141	277,283	4	171	38,731	66,724	6,995
Nov	23,696	35	284,145	7,480	83,441	269,840	1	110	37,798	71,769	4,487
Dec	23,956	260	254,488	2,980	65,268	236,826	1	103	38,600	50,198	3,252
Total	---	2,132	4,626,604	150,150	322,110	4,432,537	587	2,478	453,288	288,687	80,845

1/ Sum of Thermalito Forebay and Diversion Pool.

2/ Sum of releases from Lake Oroville through Hyatt plant, spill, and spillway leakage.

3/ Includes bypass flows.

4/ Includes 16 AF recreation water delivered to Delaware Water Co..

5/ Sum of Diversion Dam generation plus Hatchery.

**Table 10. Thermalito Afterbay Monthly Operation  
2000**

(end of month storage in acre-feet)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow	Outflow						Losses (-) And Gains (+)
				Thermalito Generation 1/	Sutter Butte Canal	Western Canal Lateral	Richvale Canal	Western Canal	River Outlet	Thermalito Pumpback	
Jan	129.35	30,025	-19,290	169,495	21,180	61	11,400	6,990	142,600	7,702	1,148
Feb	132.19	39,815	9,790	424,034	0	0	0	0	383,683	20,066	-10,495
Mar	133.73	45,658	5,843	582,214	0	0	0	0	577,438	0	1,067
Apr	126.05	20,306	-25,352	263,890	21,980	99	2,420	6,900	245,951	11,634	-258
May	132.10	39,485	19,179	367,087	91,200	697	20,500	52,310	184,820	0	1,619
Jun	131.95	38,938	-547	429,861	88,310	784	22,330	51,300	258,632	5,364	-3,688
Jul	127.93	25,621	-13,317	613,505	95,820	918	26,900	60,550	437,443	0	-5,191
Aug	132.50	40,961	15,340	515,816	86,340	733	22,270	43,170	335,300	9,195	-3,468
Sep	129.85	31,655	-9,306	282,686	45,530	49	4,270	10,120	172,379	55,299	-4,345
Oct	132.41	40,627	8,972	277,283	35,670	275	14,480	30,060	119,243	64,141	-4,442
Nov	131.64	37,818	-2,809	269,840	38,270	145	17,920	27,650	101,000	83,441	-4,223
Dec	127.53	24,441	-13,377	236,826	37,630	134	18,260	20,490	104,400	65,268	-4,021
Totals			-24,874	4,432,537	561,930	3,895	160,750	309,540	3,062,889	322,110	-36,297

1/ Includes bypass flows.

## *Delta Field Division*

### *Water Storage*

The Delta Field Division consists of the North Bay Aqueduct, the South Bay Aqueduct, and the California Aqueduct from Clifton Court Forebay to Check 12. Along these waterways, water storage operations take place at Clifton Court Forebay, Bethany Reservoir, Travis Tank, Napa Terminal Tank, the California Aqueduct, and Lake Del Valle. Water storage data at the South Bay Aqueduct are not reported; storage changes are assumed to be zero for operational purposes.

Pumping from Lake Del Valle back into the Aqueduct usually occurs in the fall and is detailed in Table 11. Inflow and storage changes for the last ten years at Lake Del Valle are shown on Figure 15. Project water flows from the Delta into Clifton Court Forebay through the Clifton Court control gates. A schedule of daily gate operation is published in the SWP Monthly Report of Operations. Monthly inflows to Clifton Court Forebay along with corresponding storage changes are shown in Table 11.

### *Water Deliveries*

The Delta Field Division delivered 198,145 AF of water in 2000. These and other deliveries are summarized in Table 2.

The North Bay Aqueduct system, completed in May 1988, begins in the North Delta at the Barker Slough Facilities. Sacramento River water is conveyed through Cache, Lindsey, and Barker sloughs to the Barker Slough pumping plant. From the pumping plant, water is conveyed by pipe for 24 miles northwest to contractors in Napa and Solano Counties and to the Cordelia Pumping Plant. Deliveries are made to Solano County water users via turnouts along the pipe's length. From the Cordelia Pumping Plant, the North Bay Aqueduct terminates at the Napa Terminal Tank. The Aqueduct supplied 41,973 AF to Napa and Solano counties.

A division-wide total of 154,975 AF went to SWP entitlement contractors, 15,331 AF of Local Water was conveyed to Alameda County Flood Control and

Water Conservation District, Zone 7, and to the Alameda County Water District, 655 AF of Federal Wheeling to Musco Olive and the V. A. Cemetery, 1,000 AF of General Wheeling to Alameda County Flood Control and Water Conservation District, Zone 7, 5,988 of Article 21 water, 1,539 of Article 21E water, 14,591 of Extended Carryover water, and 145 AF of Recreation water.

### *Pumping Plants*

Delta Field Division pumping plants include Barker Slough Pumping Plant and Cordelia Pumping Plant on the North Bay Aqueduct, Banks on the California Aqueduct, and South Bay and Del Valle Pumping Plants on the South Bay Aqueduct. Monthly pumping data is summarized for the year in Table 1.

Banks Pumping Plant was originally built to accommodate 11 units. Initially, seven pumps were constructed for a total pumping capacity of 6,400 cfs. Construction of the final four pumps was completed in 1990, each with a design capacity of 1,067 cfs and a new total capacity of 10,670 cfs. Export pumping rates are increased on weekends to take advantage of less costly off-peak electricity. This produces sharp peaks in the export rate at about 7-day intervals.

In 2000, The SWP diverted 3,735,652 AF of water at Banks Pumping Plant, including 104,727 AF of Federal water and 130,392 AF of CVP water wheeled by the Department. Below is a five-year summary of federal, State, and total pumping at Banks:

Banks Pumping Plant in Acre-Feet			
Year	Federal & Other	State	Total
2000	235,119	3,500,533	3,735,652
1999	35,704	2,671,131	2,706,835
1998	28,087	1,659,323	1,687,410
1997	201,033	2,343,653	2,544,686
1996	210,121	3,031,102	3,241,223

**Table 11. Lake Del Valle Monthly Operation**

**2000**

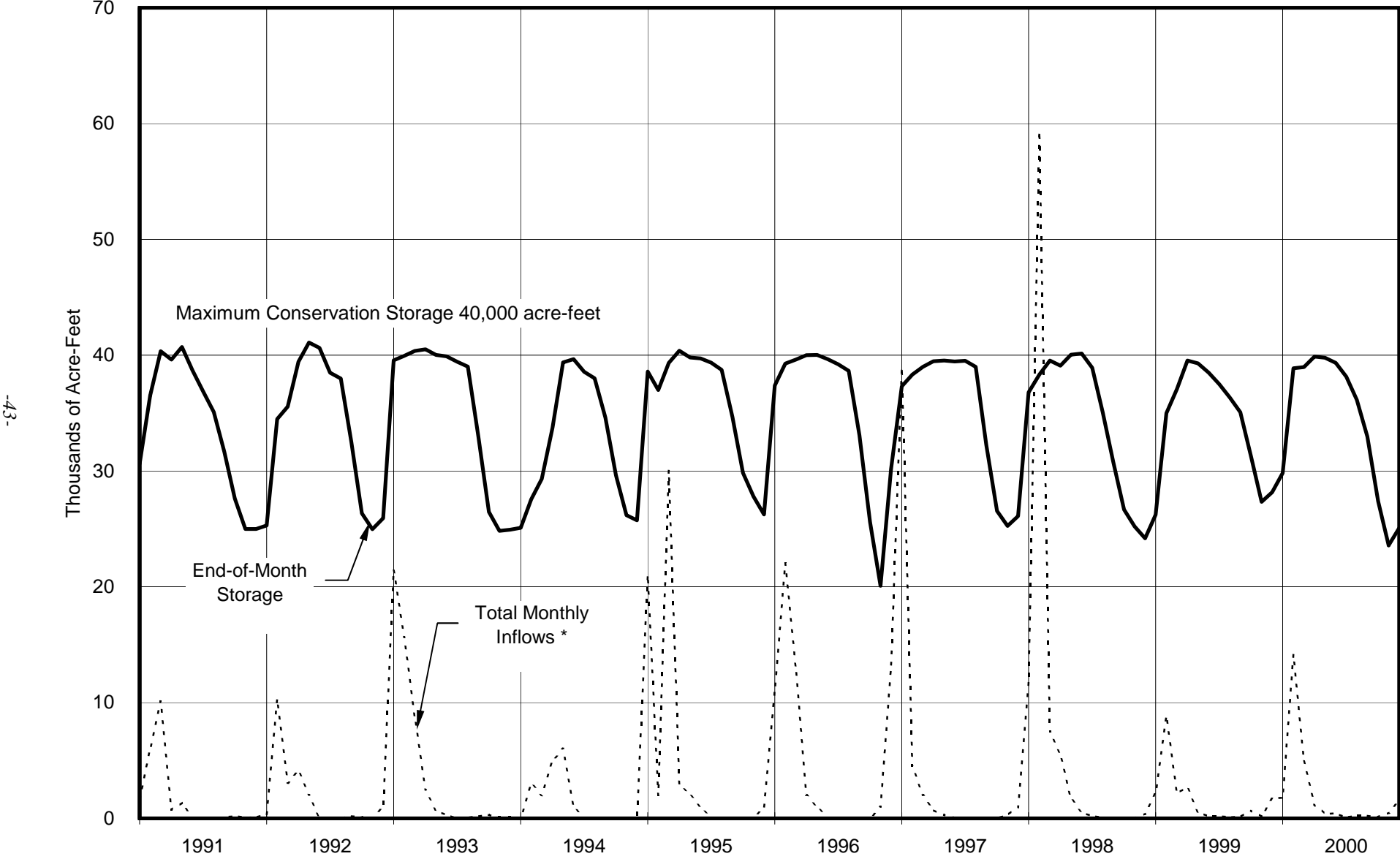
(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow		Outflow					Precipitation (inches)
				Natural 1/	From South Bay Aqueduct	Arroyo Valle	South Bay Aqueduct	Recreation Deliveries 2/	Evaporation	Total	
Jan	687.37	29,822	1,655	1,788	0	0	75	4	54	133	4.56
Feb	701.50	38,862	9,040	14,093	0	1,679	3,316	2	56	5,053	5.74
Mar	701.65	38,966	104	4,972	0	922	3,794	4	148	4,868	1.55
Apr	702.95	39,879	913	754	456	0	82	10	205	297	0.54
May	702.80	39,776	-103	325	82	0	217	15	278	510	0.60
Jun	702.17	39,330	-446	166	261	0	466	15	392	873	0.15
Jul	700.46	38,143	-1,187	77	0	0	846	29	389	1,264	0.00
Aug	697.51	36,147	-1,996	233	0	0	1,780	24	425	2,229	0.00
Sep	692.60	32,979	-3,168	215	0	0	3,039	0	344	3,383	0.00
Oct	683.04	27,388	-5,591	118	0	0	5,521	28	160	5,709	2.79
Nov	675.53	23,585	-3,803	-304	779	0	4,204	6	68	4,278	0.43
Dec	678.61	25,080	1,495	131	1,430	0	0	8	58	66	0.47
Total	---	---	-3,087	22,568	3,008	2,601	23,340	145	2,577	28,663	16.83

1/ Total inflow from stream gaging station above Lang Canyon and accretions/depletions.

2/ To East Bay Regional Park District.

Figure 15. Historical Lake Del Valle Operation



\* Natural and pumped inflows.

**Table 12. Clifton Court Forebay Monthly Operation  
2000**

(elevation in feet, storage in acre-feet)

Month	Water Surface Elevation	Storage	Storage Change	Inflow
Jan	-0.81	16,520	666	396,859
Feb	0.79	19,966	3,446	425,129
Mar	-0.18	17,876	-2,090	341,537
Apr	-1.44	15,167	-2,709	181,388
May	-0.35	17,510	2,343	105,316
Jun	0.46	19,254	1,744	260,758
Jul	-1.61	14,802	-4,452	359,813
Aug	0.82	20,030	5,228	386,552
Sep	-0.66	16,843	-3,187	387,005
Oct	0.80	19,987	3,144	310,532
Nov	-1.91	14,158	-5,829	316,353
Dec	-0.80	16,542	2,384	294,615
Total	---	---	688	3,765,857

## *San Luis Field Division*

### *Water Storage*

San Luis Reservoir reached its maximum end-of-month storage for 2000, 2,026,438 AF (100 percent of maximum operating storage), in March. Maximum operating storage capacity in San Luis is 2,027,835 AF. Minimum end-of-month storage for the year, 666,886 AF (33 percent of maximum operating storage) occurred in August. The State's share of San Luis Reservoir end-of-month storage reached the maximum of 1,062,616AF in March (100 percent of State's maximum operating storage), and the minimum of 307,491 AF (29 percent of State's maximum operating storage) was reached in August. Table 13 and Figure 16 show San Luis Reservoir operations during 2000. Table 14 shows the monthly operation of O'Neill Forebay during 2000.

There are two different accounting procedures for calculating storage shares in O'Neill Forebay. One adjusts storage shares using actual SWP/USBR deliveries made from water out of O'Neill. The other method adjusts storage shares in O'Neill using amounts pumped for each agency derived from scheduled energy. Since scheduled pumping and water deliveries never match, there is always a difference that is carried over into subsequent months. These mismatches are used to "underschedule" or "overschedule" energy and pumping in order to bring the mismatch back into alignment or closer to zero.

### *Pumping and Generating Plants*

Total pumping in 2000 at Gianelli Pumping-Generating Plant was 2,092,832 AF. Water released from San Luis Reservoir to O'Neill Forebay for generation was 1,595,021 AF. Total pumping at Dos Amigos Pumping Plant in 2000 was 4,369,260 AF, about 195,962 AF more than was pumped in 1999. Table 15 summarizes joint-use plant activity on a monthly basis.

### *Water Deliveries*

Total deliveries from the San Luis Field Division were 1,084,819 AF in 2000. State and federal deliveries to the DFG and the Department of Parks and Recreation (DPR) from the O'Neill Forebay area and San Luis Reservoir (Reach 3) were 1,513 AF. The following tabulation details the components of these recreation deliveries:

O'Neill Forebay and San Luis Reservoir (Reach 3)			
	DPR	DFG	Total
State	73	748	821
Federal	60	610	670
Total	133	1,358	1,491
Pools 16, 17, & 18 (Reach 5)			
	DPR	DFG	Total
State	0	7	7
Federal	0	5	5
Total	0	12	12

Federal deliveries from the joint-use facilities in the San Luis Field Division during 2001 totaled 1,083,306 AF.

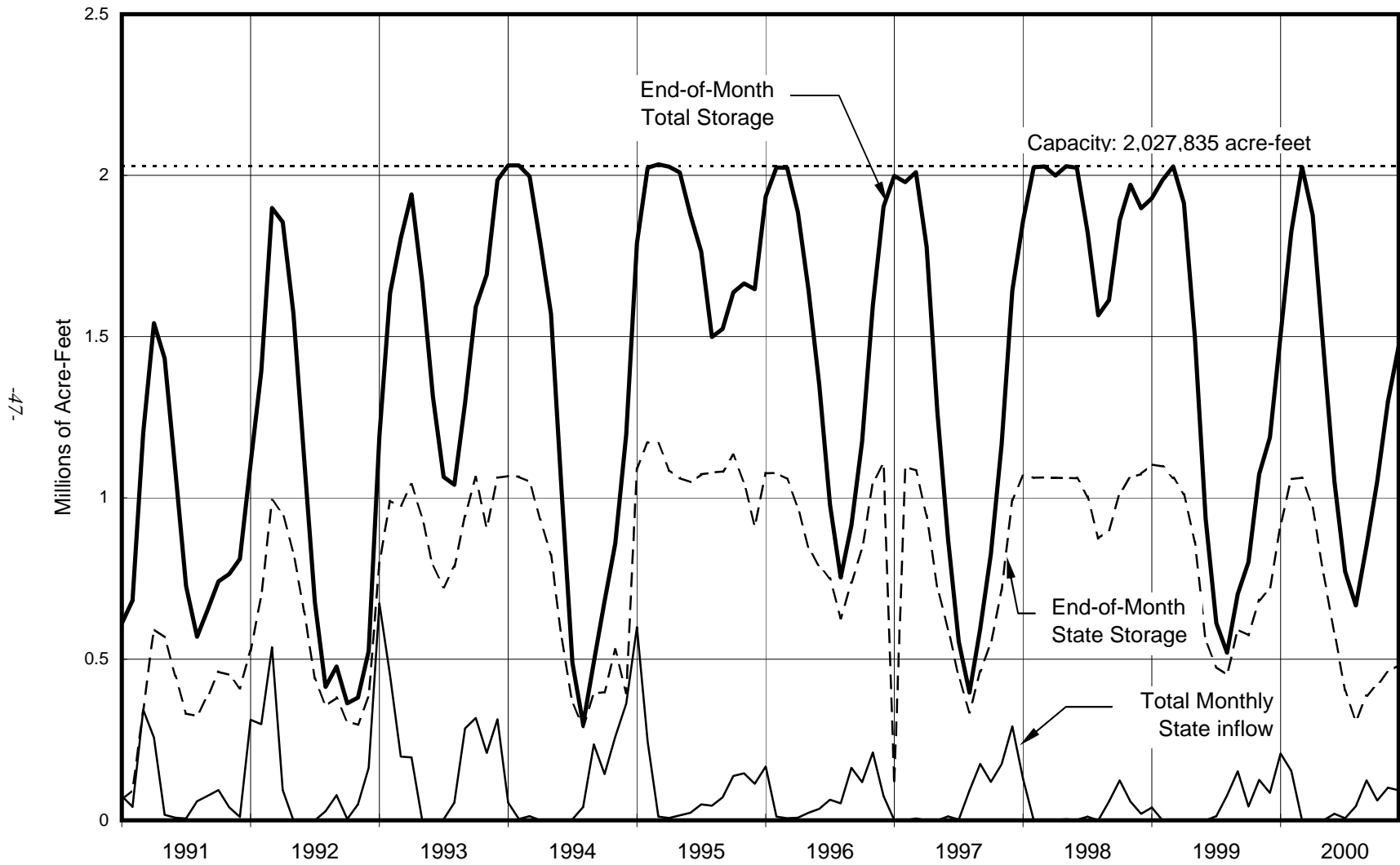


**Table 13. San Luis Reservoir Monthly Operation  
2000**

(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow	Outflow			Gain (+) And Loss (-)
				Gianelli P-G Plant Pumping	Gianelli P-G Plant Generation	Pacheco Tunnel	Parks and Rec. Del	
Jan	499.79	1,505,272	318,130	353,017	12,868	6,620	0	-15,399
Feb	526.81	1,825,778	320,506	344,398	0	5,403	0	-18,489
Mar	542.89	2,026,438	200,660	225,288	670	8,541	0	-15,417
Apr	530.90	1,876,126	-150,312	4,790	147,005	6,051	0	-2,046
May	496.04	1,462,484	-413,642	0	406,383	10,446	0	3,187
Jun	457.87	1,051,334	-411,150	20,202	417,233	14,302	0	183
Jul	429.00	771,746	-279,588	6,376	270,846	16,854	0	1,736
Aug	417.28	666,886	-104,860	74,522	160,172	12,928	0	-6,282
Sep	437.48	850,828	183,942	243,242	40,609	12,073	0	-6,618
Oct	457.93	1,051,945	201,117	241,474	22,113	8,437	0	-9,807
Nov	481.38	1,299,262	247,317	323,768	52,809	6,020	0	-17,622
Dec	496.74	1,470,439	171,177	255,755	64,313	6,828	12	-13,425
Total	---	---	283,297	2,092,832	1,595,021	114,503	12	-99,999

Figure 16. Historical San Luis Reservoir Operation



**Table 14. O'Neill Forebay Monthly Operation**

**2000**

(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow				Outflow				Gain (+) And Losses (-)
				Pump In 1/	O'Neill P-G Plant Pumping	Gianelli P-G Plant Generation	California Aqueduct Check 12	O'Neill P-G Plant Generation	Gianelli P-G Plant Pumping	Dos Amigos Pumping	Deliveries	
Jan	222.45	49,580	-1,146	0	158,695	12,868	372,781	1,832	353,017	210,649	241	20,249
Feb	222.55	49,847	267	0	173,195	0	401,666	0	344,398	260,157	626	30,587
Mar	219.39	41,579	-8,268	0	181,173	670	322,842	0	225,288	309,077	661	22,073
Apr	219.95	43,023	1,444	0	55,575	147,005	161,079	15,977	4,790	357,547	1,077	17,176
May	221.97	48,308	5,285	0	0	406,383	79,072	87,346	0	402,309	1,658	11,143
Jun	221.53	47,152	-1,156	0	21,697	417,233	224,294	44,010	20,202	616,998	2,777	19,607
Jul	222.52	49,767	2,615	0	29,547	270,846	321,937	1,627	6,376	628,095	3,366	19,749
Aug	222.70	50,246	479	0	67,860	160,172	339,102	342	74,522	513,961	2,207	24,377
Sep	220.56	44,609	-5,637	0	98,298	40,609	361,013	0	243,242	273,657	964	12,306
Oct	223.31	51,875	7,266	0	164,615	22,113	286,504	0	241,474	246,609	463	22,580
Nov	219.71	42,402	-9,473	0	193,450	52,809	306,182	0	323,768	264,490	172	26,516
Dec	221.56	47,230	4,828	0	192,295	64,313	266,305	0	255,755	285,711	401	23,782
Total	---	---	-3,496	0	1,336,400	1,595,021	3,442,777	151,134	2,092,832	4,369,260	14,613	250,145

1/ Pump-in located at Mile 79.67R.

**Table 15. Monthly Operations Summary, State-Federal San Luis Joint-Use Facilities**

**2000**

(In acre-feet except as noted)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Check 12													
State	372,781	401,585	239,862	161,079	79,072	224,294	321,937	339,102	361,013	284,814	288,085	264,426	3,338,050
Federal	0	81	82,980	0	0	0	0	0	0	1,690	18,097	1,879	104,727
Total	372,781	401,666	322,842	161,079	79,072	224,294	321,937	339,102	361,013	286,504	306,182	266,305	3,442,777
O'Neill P-G Plant													
Amount Pumped													
State	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal	158,695	173,195	181,173	55,575	0	21,697	29,547	67,860	98,298	164,615	193,450	192,295	1,336,400
Total	158,695	173,195	181,173	55,575	0	21,697	29,547	67,860	98,298	164,615	193,450	192,295	1,336,400
Generation													
Federal	1,832	0	0	15,977	87,346	44,010	1,627	342	0	0	0	0	151,134
O'Neill Forebay													
End-of-Month Storage													
State *	28,129	27,139	18,769	22,666	22,807	23,332	25,265	24,432	26,699	29,121	19,948	23,819	---
Federal *	21,451	22,708	22,810	20,357	25,501	23,820	24,502	25,814	17,910	22,754	22,454	23,411	---
Total	49,580	49,847	41,579	43,023	48,308	47,152	49,767	50,246	44,609	51,875	42,402	47,230	---
San Luis Reservoir													
End-of-Month Storage													
State	915,324	1,058,072	1,062,617	969,736	762,231	581,253	402,117	307,487	386,781	421,206	460,177	481,655	---
Federal	589,948	767,706	963,821	906,390	700,253	470,081	369,629	359,399	464,047	630,739	839,085	988,784	---
Total	1,505,272	1,825,778	2,026,438	1,876,126	1,462,484	1,051,334	771,746	666,886	850,828	1,051,945	1,299,262	1,470,439	---
Gianelli P-G Plant													
Amount Pumped													
State	207,525	152,915	-475	1,206	0	20,202	6,376	43,431	123,545	61,930	101,471	93,180	811,306
Federal	145,492	191,483	225,763	3,584	0	0	0	31,091	119,697	179,544	222,297	162,575	1,281,526
Total	353,017	344,398	225,288	4,790	0	20,202	6,376	74,522	243,242	241,474	323,768	255,755	2,092,832
Generation													
State	1,156	0	670	92,961	209,258	201,280	186,466	134,606	40,609	22,113	52,809	64,313	1,006,241
Federal	11,712	0	0	54,044	197,125	215,953	84,380	25,566	0	0	0	0	588,780
Total	12,868	0	670	147,005	406,383	417,233	270,846	160,172	40,609	22,113	52,809	64,313	1,595,021
Pacheco Tunnel													
Federal	6,620	5,403	8,541	6,051	10,446	14,302	16,854	12,928	12,073	8,437	6,020	6,828	114,503
Dos Amigos P.P.													
State	173,785	203,377	245,404	258,310	294,219	415,390	439,886	406,620	273,135	240,076	264,490	243,206	3,457,898
Federal	36,864	44,912	19,045	99,237	108,090	201,608	162,088	88,519	0	0	0	42,505	802,868
Other	0	11,868	44,628	0	0	0	26,121	18,822	522	6,533	0	0	108,494
Total	210,649	260,157	309,077	357,547	402,309	616,998	628,095	513,961	273,657	246,609	264,490	285,711	4,369,260

\* Negative storage values indicate a deficit in storage withdrawals versus amounts stored and positive values larger than the reservoir capacity indicate a surplus of amounts stored versus storage withdrawals.

## ***San Joaquin Field Division***

### ***Water Deliveries***

A total of 1,520,566 AF of State deliveries was made in the San Joaquin Field Division in 2000. Water types include Table A water, Article 21 water, Article 21E water, operational flood release, exchange water, purchase water, carryover water, Federal wheeling, recreation water, and transfer water. Kern County Water Agency (KCWA) represented 76 percent of the total SWP water delivered within the Division.

In addition to SWP deliveries, 17,068 AF of federal water was wheeled through SWP facilities to be delivered to the Kern National Wildlife Refuge.

The San Joaquin Field Division is the only field division in the SWP where there are no water storage

facilities. All deliveries made from the Aqueduct are summarized in Table 22, and are totaled by agency and water type in Map 2 and Table 2.

### ***Pumping Plants***

Pumping plants in the San Joaquin Field Division include Las Perillas and Badger Hill on the Coastal Aqueduct, and Buena Vista, Teerink, Chrisman, and Edmonston on the California Aqueduct. A complete monthly summary of amounts pumped at all of these plants is shown on Table 1. A summary of energy used to pump at each plant is shown on Table 4.

During 2000, 3,283,006 AF of State water and 21,962 AF of federal water flowed past Check 21 into the San Joaquin Field Division. A total of 1,689,921 AF was pumped at Edmonston Pumping Plant.

## ***Southern Field Division***

### ***Water Storage***

There are four storage reservoirs in the Southern Field Division (Pyramid, Castaic, Silverwood, and Perris) with a combined storage capacity of 701,320 AF. Combined storage at the beginning of the year was 626,081 AF. End-of-year combined storage was 637,678 AF. Complete monthly operation tables for all four reservoirs plus Elderberry Forebay and Castaic Lagoon, along with historical inflow and storage data for the last ten years, is summarized in Tables 16 through 21 and Figures 17 through 20.

### ***Water Deliveries***

SWP deliveries in the Southern Field Division totaled 1,641,245 AF. Thirteen agencies received the water, which was almost all Table A water. One exception was 6,559 AF of recreation water to the California Department of Parks and Recreation.

### ***Pumping and Generating Plants***

Pumping plants in the Southern Field Division include Oso and Castaic on the West Branch, and Pearblossom on the East Branch. Total water pumped in these three plants in 2000 was 2,344,290 AF. A complete monthly summary of amounts pumped is shown on Table 1. A summary of energy used to pump and station service energy at each plant is shown on Table 4.

Generating plants in the Southern Field Division include Warne and Castaic on the West Branch, and Alamo, Mojave Siphon, and Devil Canyon on the East Branch. Energy available from each generating plant is summarized in Table 3. Combined generation at all five plants in 2000 totaled 2,295,977 MWh.

**Table 16. Pyramid Lake Monthly Operation  
2000**

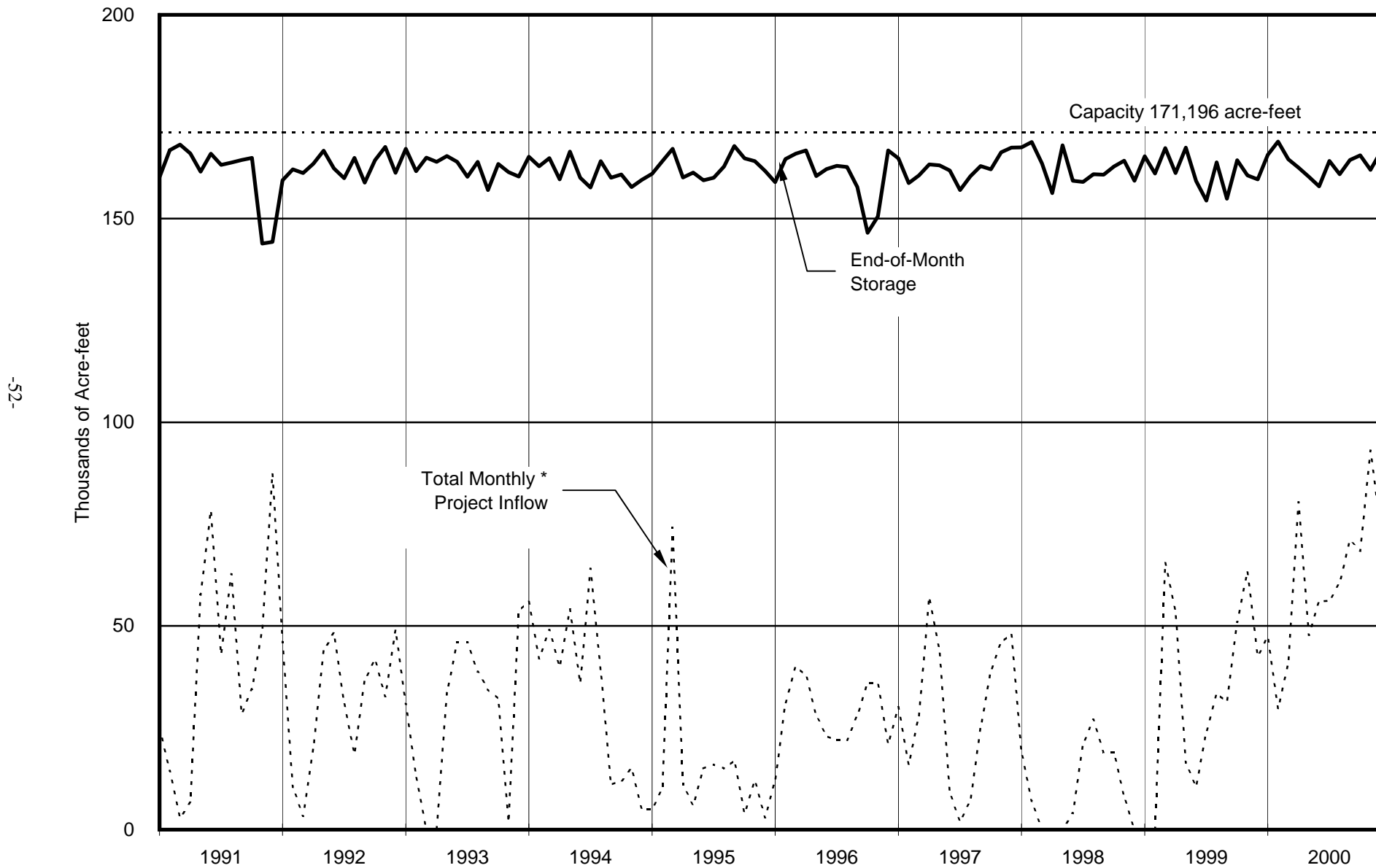
(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Natural Inflow Storage Shares	Storage Change	Inflow			Outflow			Computed Losses (-) Ans Gains (+)
					Project		Natural Stream Flow	Project		Natural To Piru Creek 2/	
					Castaic Powerplant Pumpback 1/	Warne Powerplant		Castaic Powerplant Generation	Deliveries		
Jan	2574.68	165,650	-1,753	6,058	55,426	47,274	987	94,839	0	603	-2,187
Feb	2577.21	168,883	-758	3,233	22,776	29,733	3,266	50,435	0	2,271	164
Mar	2573.79	164,523	487	-4,360	17,833	40,811	4,989	63,000	0	3,744	-1,249
Apr	2572.16	162,471	667	-2,052	55,822	80,320	2,822	134,521	0	2,641	-3,854
May	2570.38	160,250	-481	-2,221	68,600	47,757	1,366	114,872	0	1,553	-3,519
Jun	2568.46	157,876	-426	-2,374	77,638	56,046	607	129,424	0	1,514	-5,727
Jul	2573.49	164,144	-1,714	6,268	87,127	56,169	363	129,340	1	1,651	-6,399
Aug	2570.87	160,859	-3,052	-3,285	118,779	60,614	284	174,774	4	1,622	-6,562
Sep	2573.66	164,359	-4,161	3,500	101,859	64,014	338	153,151	1808	1,447	-6,305
Oct	2574.55	165,485	-4,849	1,126	52,747	68,439	460	115,540	396	1,148	-3,436
Nov	2571.76	161,970	-4,572	-3,515	59,250	92,997	595	151,331	1	318	-4,707
Dec	2575.24	166,362	-4,245	4,392	64,540	73,551	655	130,744	1	328	-3,281
<b>Total</b>	---	---	---	6,770	782,397	717,725	16,732	1,441,971	2211	18,840	-47,062

1/ Pumpback by Los Angeles Department of Water and Power (LADWP) from Elderberry Forebay through Castaic powerplant.

2/ Portions of these amounts are used to satisfy fishery enhancement agreement.

Figure 17. Historical Pyramid Lake Operation



\* Excludes pumpback by LADWP through Castaic Powerplant.

**Table 17. Elderberry Forebay Monthly Operation  
2000**

(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow		Outflow			Computed Losses (-) And Gains (+)
				Castaic Powerplant Generation	Natural Stream Flow	Castaic Powerplant Pumpback 1/	To Castaic Lake		
							Natural	Project	
Jan	1509.56	19,015	-4,602	94,839	48	55,426	48	44,389	374
Feb	1506.14	17,729	-1,286	50,435	1,349	22,776	1,349	29,325	380
Mar	1508.52	18,619	890	63,000	2,348	17,833	2,348	43,632	-645
Apr	1517.23	22,117	3,498	134,521	460	55,822	460	75,277	76
May	1523.54	24,771	2,654	114,872	95	68,600	95	44,860	1,242
Jun	1524.78	25,318	547	129,424	1	77,638	1	51,535	296
Jul	1515.01	21,165	-4,153	129,340	0	87,127	0	47,246	880
Aug	1516.05	21,589	424	174,774	0	118,779	0	55,921	350
Sep	1519.38	22,977	1,388	153,151	0	101,859	0	51,995	2,091
Oct	1511.23	19,661	-3,316	115,540	0	52,747	0	65,789	-320
Nov	1523.28	24,658	4,997	151,331	0	59,250	0	87,053	-31
Dec	1514.51	20,962	-3,696	130,744	0	64,540	0	69,973	73
<b>Total</b>	---	---	-2,655	1,441,971	4,301	782,397	4,301	666,995	4,766

1/ Pumpback by Los Angeles Department of Water and Power (LADWP) through Castaic Power Plant.

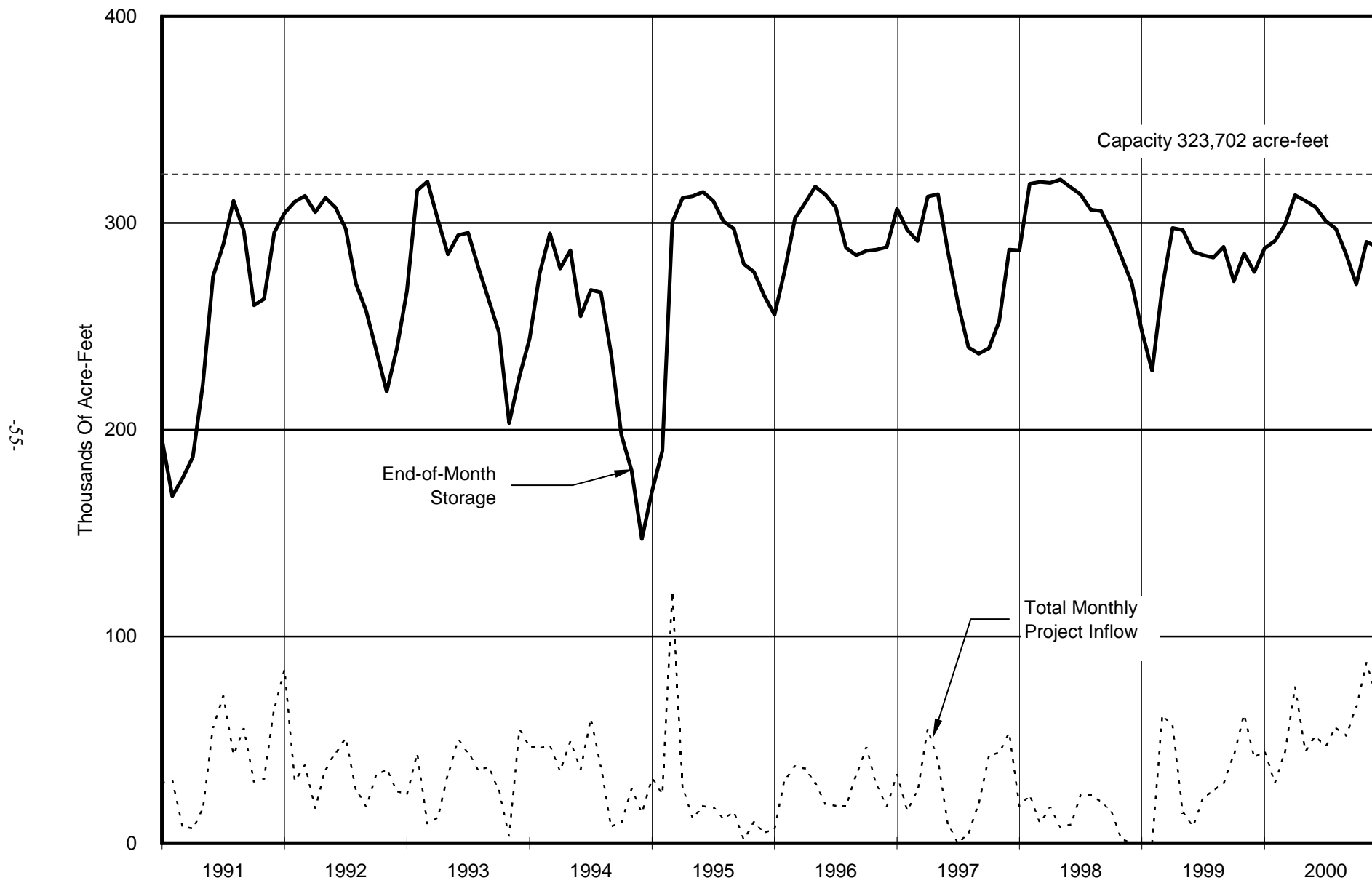


**Table 18. Castaic Lake Monthly Operation  
2000**

(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Natural Inflow Storage Shares	Storage Change	Inflow			Outflow		Computed Losses (-) Gains (+)
					From Elderberry Forebay		Natural	Deliveries	Released To Castaic Lagoon	
					Natural	Project				
Jan	1,498.37	287,775	78	11,540	48	44,389	129	33,745	0	719
Feb	1,500.02	291,228	1,587	3,453	1,349	29,325	1,370	27,726	1,210	345
Mar	1,503.69	298,997	4,936	7,769	2,348	43,632	1,709	39,530	708	318
Apr	1,510.35	313,403	5,857	14,406	460	75,277	461	63,759	0	1,967
May	1,509.13	310,734	3,389	-2,669	95	44,860	159	44,426	2,722	-635
Jun	1,507.74	307,710	-112	-3,024	1	51,535	26	53,638	3,528	2,580
Jul	1,504.62	300,985	-108	-6,725	0	47,246	4	56,209	239	2,473
Aug	1,502.80	297,102	-108	-3,883	0	55,921	0	61,918	217	2,331
Sep	1,497.00	284,926	-108	-12,176	0	51,995	0	65,352	108	1,289
Oct	1,489.84	270,309	-100	-14,617	0	65,789	8	81,870	240	1,696
Nov	1,499.83	290,829	-46	20,520	0	87,053	54	67,205	0	618
Dec	1,498.75	288,568	36	-2,261	0	69,973	82	73,458	241	1,383
<b>Total</b>	---	---	---	12,333	4,301	666,995	4,002	668,836	9,213	15,084

Figure 18. Historical Castaic Lake Operation



**Table 19. Castaic Lagoon Monthly Operation  
2000**

(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow	Natural Outflow		Deliveries to Recreation	Computed Losses (-) And Gains (+)
					Release From Castaic Lagoon			
					Surface	Sub-Surface		
Jan	1134.20	5,312	-69	0	0	22	47	0
Feb	1136.12	5,685	373	1,210	660	31	146	0
Mar	1134.87	5,441	-244	708	855	31	66	0
Apr	1134.14	5,300	-141	0	0	44	97	0
May	1136.47	5,754	454	2,722	2,087	62	119	0
Jun	1135.67	5,597	-157	3,528	3,484	60	141	0
Jul	1135.84	5,630	33	239	0	69	137	0
Aug	1135.50	5,564	-66	217	0	128	155	0
Sep	1134.71	5,410	-154	108	0	120	142	0
Oct	1134.74	5,416	6	237	0	150	81	0
Nov	1133.62	5,200	-216	0	0	149	67	0
Dec	1133.87	5,248	48	241	0	126	67	0
<b>Total</b>	---	---	-133	9,210	7,086	992	1,265	0

**Table 20. Silverwood Lake Monthly Operation**

**2000**

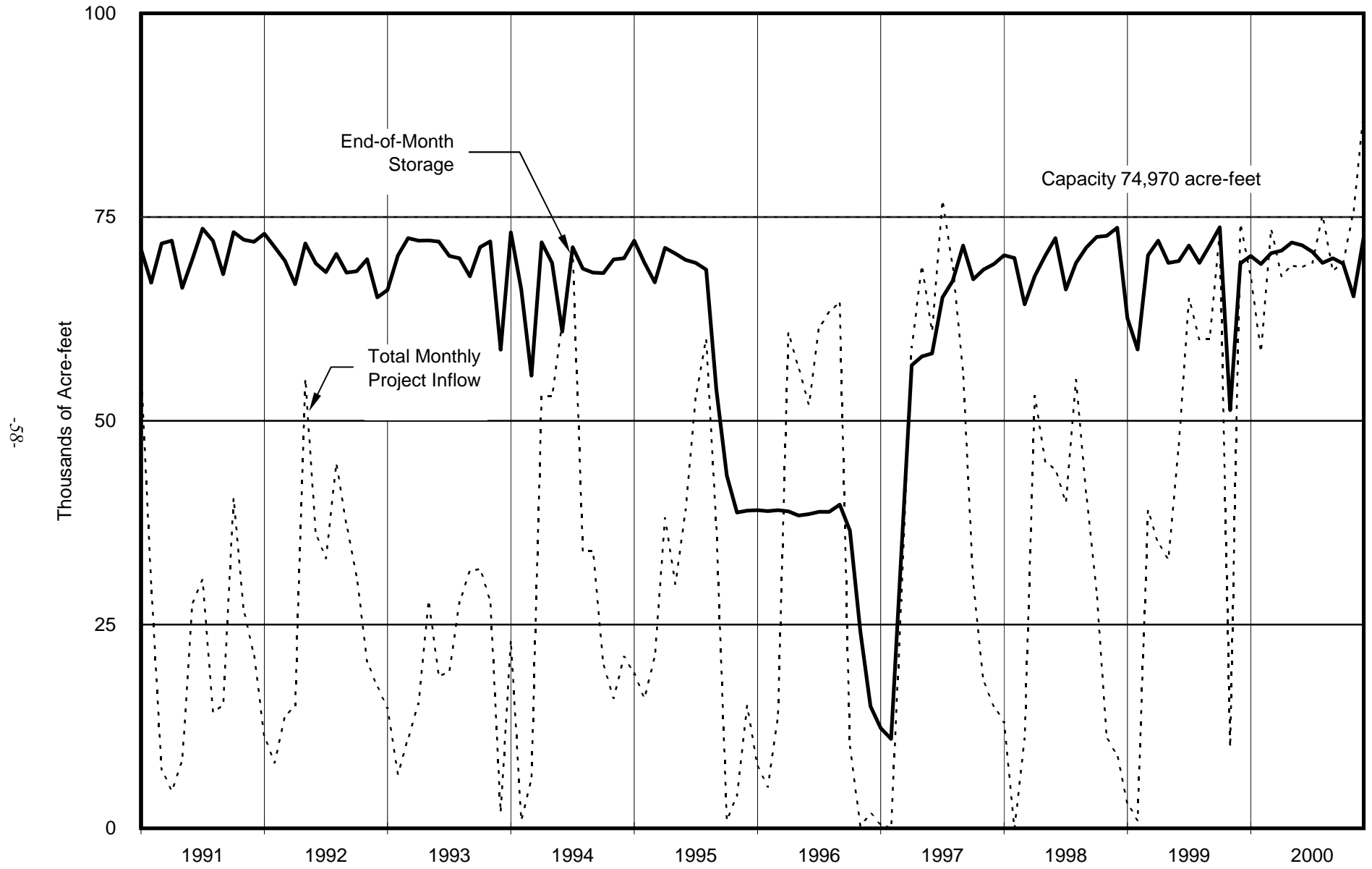
(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow			Outflow				Computed Losses (-) And Gains (+)	Total Natural Inflow Released 2/
				Mojave Siphon Powerplant	Mojave Bypass Flume	Natural 1/	Project			Natural Inflow to Mojave River		
							Delivered to CLAWA	Recreation	San Bernardino Tunnel			
Jan	3,350.05	70,223	919	67,672	0	34	62	2	67,431	11	719	11
Feb	3,349.00	69,238	-985	58,462	0	1,514	67	2	61,487	749	1,344	1,141
Mar	3,350.40	70,554	1,316	70,877	2,608	1,929	93	2	74,177	687	861	1,610
Apr	3,350.76	70,894	340	45,778	21,985	786	65	5	69,213	148	1,222	946
May	3,351.80	71,882	988	69,059	1,778	290	116	8	69,891	13	-111	414
Jun	3,351.43	71,530	-352	68,824	0	49	153	9	69,002	12	-49	107
Jul	3,350.61	70,751	-779	69,402	1,070	0	209	12	70,519	12	-499	12
Aug	3,349.15	69,379	-1,372	75,160	0	0	203	14	75,832	12	-471	53
Sep	3,349.76	69,951	572	68,392	497	0	181	10	67,816	12	-298	12
Oct	3,349.04	69,276	-675	69,435	0	0	118	6	69,666	11	-309	11
Nov	3,344.69	65,273	-4,003	75,627	0	0	86	2	79,558	10	26	10
Dec	3,352.49	72,542	7,269	87,902	35	19	105	2	80,646	10	76	10
<b>Total</b>	---	---	3,238	826,590	27,973	4,621	1,458	74	855,238	1,687	2,511	4,337

1/ Houston Creek appropriation included in total.

2/ Total releases made from Mojave Siphon to Las Flores Ranch Co., in exchange for natural inflow stored in lake, and from Silverwood Lake to Mojave River from outlet for Mojave W.A. The difference between this total column and the natural inflow released to Mojave River equals the Las Flores Ranch.

Figure 19. Historical Silverwood Lake Operation



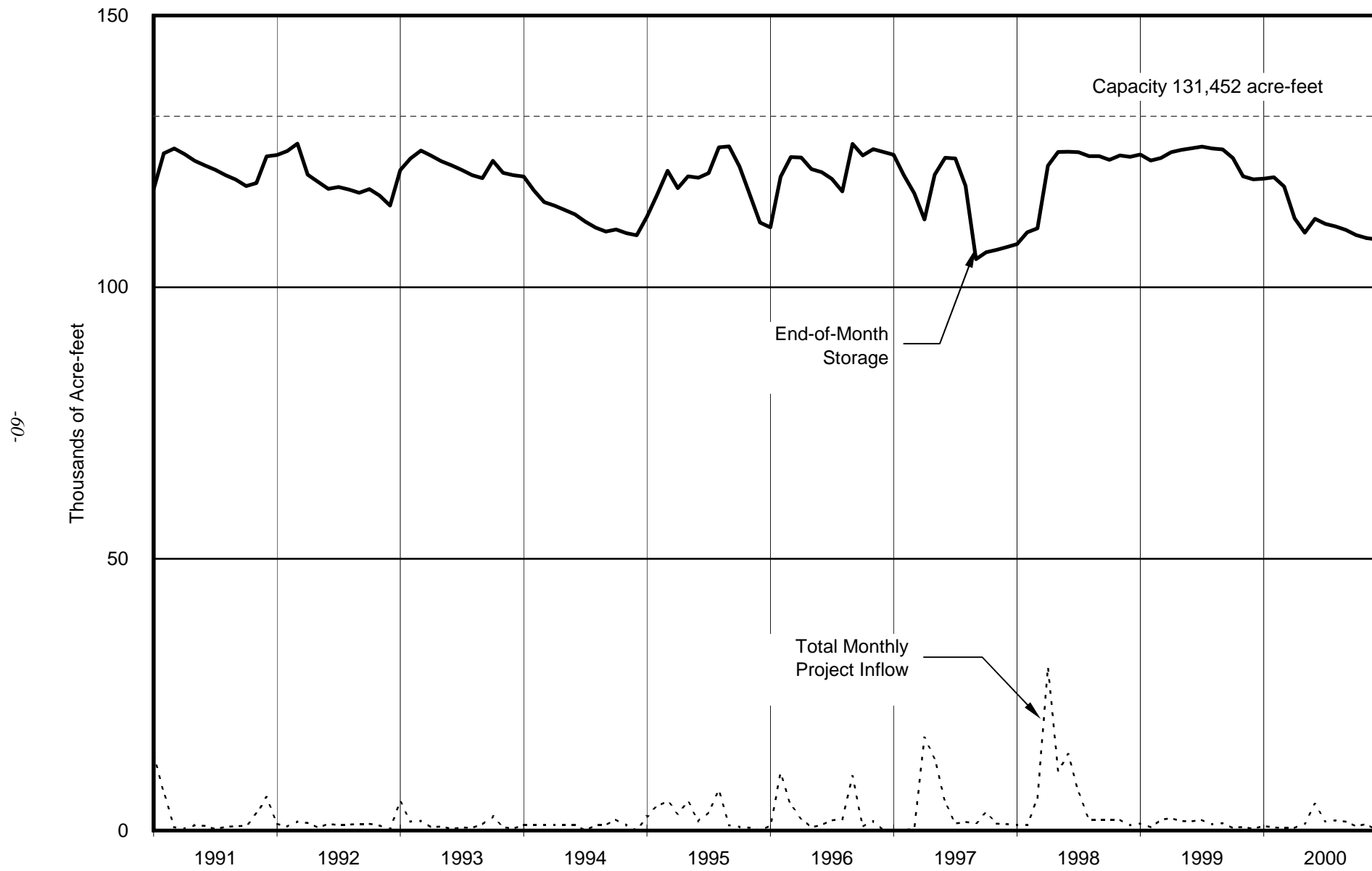
**Table 21. Lake Perris Monthly Operation  
2000**

(in acre-feet except as noted)

Month	Water Surface Elevation (in feet)	Storage	Storage Change	Inflow 1/	Outflow	Computed Losses (-) And Gains (+)
Jan	1584.97	119,968	135	843	629	-79
Feb	1585.08	120,215	247	540	516	223
Mar	1584.33	118,535	-1,680	531	1,573	-638
Apr	1581.67	112,650	-5,885	486	5,414	-957
May	1580.46	110,008	-2,642	1,330	2,141	-1,831
Jun	1581.64	112,584	2,576	4,814	536	-1,702
Jul	1581.22	111,649	-935	1,698	398	-2,235
Aug	1580.99	111,162	-487	1,884	347	-2,024
Sep	1580.71	110,552	-610	1,636	473	-1,773
Oct	1580.27	109,595	-957	782	316	-1,423
Nov	1580.01	109,031	-564	1,207	301	-1,470
Dec	1579.90	108,793	-238	47	305	20
Total	---	---	-11,040	15,798	12,949	-13,889

1/ Inflow calculated

Figure 20. Historical Lake Perris Operation







**Table 22. Summary of California Aqueduct Operation  
2000**

(in acre-feet)

Description	Jan	Feb	Mar	Apr	May	Jun
<b>DELTA FIELD DIVISION</b>						
Note: North Bay Aqueduct, South Bay Aqueduct, and Lake Del Valle they are shown here						
<b>North Bay Aqueduct</b>						
Pumped at Barker Slough Pumping Plant	3,946	2,201	1,338	1/ 703	2,437	5,027
Deliveries (Travis & Fairfield/Vacaville)	1,088	622	178	235	327	2,094
Pumped at Cordelia Pumping Plant	2,789	1,499	1,159	420	2,100	2,317
Deliveries (Benicia, Vallejo, A.C. 1&2, & Napa)	2,789	1,499	1,159	420	2,100	2,317
Computed Losses (-), Gains (+)	-69	-80	-1	-48	-10	-616
1/ Includes 5 AF for reservoir drain, repair, and refill.						
<b>California Aqueduct</b>						
Pumped at Banks Pumping Plant	395,929	421,683	343,011	180,473	97,696	251,955
Pumped at South Bay Pumping Plant	11,523	5,793	4,445	12,886	13,098	15,982
Deliveries to Contracting State Agencies	59	49	165	625	725	1,012
Change in Storage	-317	-540	571	-525	291	538
Outflow at Check 12	372,781	401,666	322,842	161,079	79,072	224,294
Computed Losses (-), Gains (+)	-11,883	-14,715	-14,988	-6,408	-4,510	-10,129
<b>South Bay Aqueduct</b>						
Pumped at South Bay Pumping Plant	11,523	5,793	4,445	12,886	13,098	15,982
Inflow from Lake Del Valle (Natural)	75	2,741	3,350	82	217	166
Inflow from Lake Del Valle (Project)	0	575	444	0	0	300
Inflow from Lake Del Valle (Contractor's Stored)	0	0	0	0	0	0
Outflow, To Lake Del Valle	0	0	0	456	82	261
Deliveries to Contracting State Agencies	11,581	9,099	8,194	12,502	13,223	16,177
Computed Losses (-), Gains (+)	-17	-10	-45	-10	-10	-10
<b>Lake Del Valle Operation:</b>						
Inflow from South Bay Aqueduct	0	0	0	456	82	261
Natural inflow	1,788	14,093	4,972	754	325	166
Releases to South Bay Aqueduct	75	3,316	3,794	82	217	466
Releases to Arroyo Valle	0	1,679	922	0	0	0
Deliveries to EBRP District	4	2	4	10	15	15
End-of-Month Storage	29,822	38,862	38,966	39,879	39,776	39,330
Change in Storage	1,655	9,040	104	913	-103	-446
Computed Losses (-), Gains (+)	-54	-56	-148	-205	-278	-392
<b>SAN LUIS FIELD DIVISION</b>						
<b>O'Neill Forebay Operation</b>						
End-of-Month Storage	49,580	49,847	41,579	43,023	48,308	47,152
Inflow, California Aqueduct	372,781	401,666	322,842	161,079	79,072	224,294
Inflow, O'Neill P.- G. Plant	158,695	173,195	181,173	55,575	0	21,697
Inflow, Gianelli P.- G. Plant	12,868	0	670	147,005	406,383	417,233
Miscellaneous Outflow (Phase 1)	1	0	0	0	0	0
Deliveries to Dept. of Fish and Game (State)	38	41	42	38	68	117
Deliveries to Dept. of Fish and Game (Fed.)	31	33	35	31	55	94
Deliveries to Dept. of Parks & Rec. (State)	0	0	0	0	0	0
Deliveries to Dept. of Parks & Rec. (Fed.)	0	0	0	0	0	0
Deliveries to Fed. Customers	171	552	584	1,008	1,535	2,566
Outflow, O'Neill P.- G. Plant	1,832	0	0	15,977	87,346	44,010
Outflow, Gianelli P.- G. Plant	353,017	344,398	225,288	4,790	0	20,202
Outflow, Dos Amigos P.P.	210,649	260,157	309,077	357,547	402,309	616,998
Change in Storage	-1,146	267	-8,268	1,444	5,285	-1,156
Computed Losses (-), Gains (+)	20,249	30,587	22,073	17,176	11,143	19,607
<b>San Luis Reservoir Operation</b>						
State End-of-Month Storage	915,324	1,058,072	1,062,617	969,736	762,231	581,253
Total End-of-Month Storage	1,505,272	1,825,778	2,026,438	1,876,126	1,462,484	1,051,334
Inflow, Gianelli P.- G. Plant	353,017	344,398	225,288	4,790	0	20,202
Outflow, Gianelli P.- G. Plant	12,868	0	670	147,005	406,383	417,233
Deliveries to Dept. of Parks & Rec. (Fed.)	1	0	0	1	0	1
Deliveries to Dept. of Parks & Rec. (State)	0	0	1	0	1	0
Pacheco Tunnel Diversion	6,620	5,403	8,541	6,051	10,446	14,302
Change in Storage (Total)	318,130	320,506	200,660	-150,312	-413,642	-411,150
Computed Losses (-), Gains (+)	-15,398	-18,489	-15,416	-2,045	3,188	184

**Table 22. Summary of California Aqueduct Operations**

**2000**

(in acre-feet)

Jul	Aug	Sep	Oct	Nov	Dec	Total	Description
are not within the Edmond G. Brown California Aqueduct, for completeness.							DELTA FIELD DIVISION
North Bay Aqueduct							
5,882	2/ 5,851	6,729	4,243	2,241	3,228	43,826	Pumped at Barker Slough Pumping Plant
3,160	3,046	2,794	1,208	215	523	15,490	Deliveries (Travis & Fairfield/Vacaville)
2,588	2,443	3,713	2,895	1,948	2,612	26,483	Pumped at Cordelia Pumping Plant
2,588	2,443	3,713	2,895	1,948	2,612	26,483	Deliveries (Benicia, Vallejo, A.C. 1&2, & Napa)
-134	-362	-222	-140	-78	-93	-1,853	Computed Losses (-), Gains (+)
2/ Includes 1 AF flow test spill at Cordelia.							
California Aqueduct							
359,191	376,809	387,824	306,668	322,182	292,231	3,735,652	Pumped at Banks Pumping Plant
16,715	16,670	11,132	5,854	4,447	12,393	130,938	Pumped at South Bay Pumping Plant
1,052	577	429	335	63	72	5,163	Deliveries to Contracting State Agencies
-119	581	-305	-878	-706	698	-711	Change in Storage
321,937	339,102	361,013	286,504	306,182	266,305	3,442,777	Outflow at Check 12
-19,606	-19,879	-15,555	-14,853	-12,196	-12,763	-157,485	Computed Losses (-), Gains (+)
South Bay Aqueduct							
16,715	16,670	11,132	5,854	4,447	12,393	130,938	Pumped at South Bay Pumping Plant
77	233	215	118	0	0	7,274	Inflow from Lake Del Valle (Natural)
769	1,547	2,824	5,403	4/ 4,204	0	16,066	Inflow from Lake Del Valle (Project)
0	0	0	0	0	0	0	Inflow from Lake Del Valle (Contractor's Stored)
0	0	0	0	779	1,430	3,008	Outflow, To Lake Del Valle
17,551	18,440	14,161	11,365	7,618	10,953	150,864	Deliveries to Contracting State Agencies
-10	-10	-10	-10	3/ -254	-10	-406	Computed Losses (-), Gains (+)
Lake Del Valle Operation:							
0	0	0	0	779	1,430	3,008	Inflow from South Bay Aqueduct
77	233	215	118	-304	131	22,568	Natural inflow
846	1,780	3,039	5,521	4/ 4,204	0	23,340	Releases to South Bay Aqueduct
0	0	0	0	0	0	2,601	Releases to Arroyo Valle
29	24	0	28	6	8	145	Deliveries to EBRP District
38,143	36,147	32,979	27,388	23,585	25,080	- - -	End-of-Month Storage
-1,187	-1,996	-3,168	-5,591	-3,803	1,495	-3,087	Change in Storage
-389	-425	-344	-160	-68	-58	-2,577	Computed Losses (-), Gains (+)
3/ Includes 22 AF of drain releases and 224 AF of meter error adjustment.							
4/ 2,619 AF pumped; 1,585 AF gravity.							
SAN LUIS FIELD DIVISION							
O'Neill Forebay Operation							
49,767	50,246	44,609	51,875	42,402	47,230	- - -	End-of-Month Storage
321,937	339,102	361,013	286,504	306,182	266,305	3,442,777	Inflow, California Aqueduct
29,547	67,860	98,298	164,615	193,450	192,295	1,336,400	Inflow, O'Neill P.- G. Plant
270,846	160,172	40,609	22,113	52,809	64,313	1,595,021	Inflow, Gianelli P.- G. Plant
0	0	0	0	0	0	1	Miscellaneous Outflow (Phase 1)
115	94	29	55	62	49	748	Deliveries to Dept. of Fish and Game (State)
95	77	24	45	50	40	610	Deliveries to Dept. of Fish and Game (Fed.)
0	0	0	0	0	73	73	Deliveries to Dept. of Parks & Rec. (State)
0	0	0	0	0	60	60	Deliveries to Dept. of Parks & Rec. (Fed.)
3,156	2,036	911	363	60	179	13,121	Deliveries to Fed. Customers
1,627	342	0	0	0	0	151,134	Outflow, O'Neill P.- G. Plant
6,376	74,522	243,242	241,474	323,768	255,755	2,092,832	Outflow, Gianelli P.- G. Plant
628,095	513,961	273,657	246,609	264,490	285,711	4,369,260	Outflow, Dos Amigos P.P.
2,615	479	-5,637	7,266	-9,473	4,828	-3,496	Change in Storage
19,749	24,377	12,306	22,580	26,516	23,782	250,145	Computed Losses (-), Gains (+)
San Luis Reservoir Operation							
402,117	307,487	386,781	421,206	460,177	481,655	- - -	State End-of-Month Storage
771,746	666,886	850,828	1,051,945	1,299,262	1,470,439	- - -	Total End-of-Month Storage
6,376	74,522	243,242	241,474	323,768	255,755	2,092,832	Inflow, Gianelli P.- G. Plant
270,846	160,172	40,609	22,113	52,809	64,313	1,595,021	Outflow, Gianelli P.- G. Plant
0	0	1	1	0	0	5	Deliveries to Dept. of Parks & Rec. (Fed.)
1	1	2	0	0	1	7	Deliveries to Dept. of Parks & Rec. (State)
16,854	12,928	12,073	8,437	6,020	6,828	114,503	Pacheco Tunnel Diversion
-279,588	-104,860	183,942	201,117	247,317	171,177	283,297	Change in Storage (Total)
1,737	-6,281	-6,615	-9,806	-17,622	-13,436	-99,999	Computed Losses (-), Gains (+)

**Table 22. Summary of California Aqueduct Operation**

**2000**

(in acre-feet)

Description	Jan	Feb	Mar	Apr	May	Jun
<b>SAN LUIS FIELD DIVISION (Cont.)</b>						
California Aqueduct (Pools 14 thru 21)						
Inflow, Dos Amigos P.P.(State)	173,785	203,377	245,404	258,310	294,219	415,390
Inflow, Dos Amigos P.P.(Fed. and Other)	36,864	56,780	63,673	99,237	108,090	201,608
Total Inflow, Dos Amigos P.P.	210,649	260,157	309,077	357,547	402,309	616,998
Flow into Aqueduct	0	0	0	0	0	0
Deliveries to Dept. of Fish and Game (State)	0	0	0	1	1	0
Deliveries to Dept. of Fish and Game (Fed.)	1	0	0	0	0	1
Miscellaneous Outflow (Phase 1)	1	7	8	7	0	0
Deliveries, Transfers to Fed. Customers	0	7,337	39,198	10,000	10,000	23,061
Deliveries to Fed. Customers	32,257	40,644	22,830	71,572	125,451	188,752
Outflow, Check 21 (State)	181,099	216,403	247,749	265,855	261,473	397,385
Outflow, Check 21 (Fed.)	1,718	3,176	0	306	363	0
Change in Storage	-1,169	840	459	51	-820	899
Computed Losses (-), Gains (+)	3,258	8,250	1,167	-9,755	-5,841	-6,900
<b>SAN JOAQUIN FIELD DIVISION</b>						
California Aqueduct, Check 21 to Buena Vista Pumping Plant						
Inflow, Check 21 (State)	181,099	216,403	247,749	265,855	261,473	397,385
Inflow, Check 21 (Fed.)	1,718	3,176	0	306	363	0
Total Inflow, Check 21	182,817	219,579	247,749	266,161	261,836	397,385
Kern River Intertie	0	0	0	0	0	0
Deliveries to Contracting State Agencies	48,923	105,518	103,101	77,921	81,145	188,497
Deliveries to Fed. Customers	1,718	3,176	0	306	363	0
Friant CVP Inflow	0	0	0	0	0	0
Outflow, Buena Vista P.P.	124,589	98,966	132,110	171,852	153,263	174,164
Coastal Br. Diversion	3,679	6,444	4,692	10,552	14,885	20,396
Change in Storage	-955	-226	674	-336	302	-627
Computed Losses (-), Gains (+)	-4,863	-5,701	-7,172	-5,866	-11,878	-14,955
California Aqueduct, Buena Vista P.P. to Teerink Pumping Plant						
Inflow, Buena Vista P.P.	124,589	98,966	132,110	171,852	153,263	174,164
Deliveries to Contracting State Agencies	3,364	5,574	9,037	9,910	15,152	22,327
W.R.M.W.S.D. Pumpback	0	0	0	0	0	0
Outflow, Teerink Pumping Plant	124,376	94,729	126,130	167,713	141,464	155,426
Change in Storage	-174	-194	160	96	-385	133
Computed Losses (-), Gains (+)	2,977	1,143	3,217	5,867	2,968	3,722
California Aqueduct, Teerink Pumping Plant to Chrisman Pumping Plant						
Inflow, Teerink Pumping Plant	124,376	94,729	126,130	167,713	141,464	155,426
Deliveries to Contracting State Agencies	821	964	1,925	3,162	5,922	7,993
Outflow, Chrisman Pumping Plant	119,998	91,623	121,156	160,651	132,893	144,455
Change in Storage	-17	14	-64	75	-52	-5
Computed Losses (-), Gains (+)	-3,574	-2,128	-3,113	-3,825	-2,701	-2,983
California Aqueduct, Chrisman Pumping Plant to Edmonston Pumping Plant						
Inflow, Chrisman Pumping Plant	119,998	91,623	121,156	160,651	132,893	144,455
Deliveries to Contracting State Agencies	302	654	1,088	1,731	3,582	4,200
Outflow, Edmonston Pumping Plant	118,632	91,195	120,233	158,154	127,885	140,148
Change in Storage	-105	24	12	-24	2	10
Computed Losses (-), Gains (+)	-1,169	250	177	-790	-1,424	-97
Coastal Branch, California Aqueduct						
Inflow, Las Perillas P.P.	3,679	6,444	4,692	10,552	14,885	20,396
B.M.W.S.D. Pumpback	0	0	0	0	0	0
Deliveries to Contracting State Agencies	3,831	6,646	4,681	10,685	14,862	20,108
Deliveries to Fed. Customers	0	0	0	0	0	0
Change in Storage	-33	9	-5	-5	-24	38
Computed Losses (-), Gains (+)	119	211	-16	128	-47	-250

**Table 22. Summary of California Aqueduct Operations**

**2000**

(in acre-feet)

Jul	Aug	Sep	Oct	Nov	Dec	Total	Description
							<b>SAN LUIS FIELD DIVISION (Cont.)</b>
							California Aqueduct (Pools 14 thru 21)
439,886	406,620	273,135	240,076	264,490	243,206	3,457,898	Inflow, Dos Amigos P.P.(State)
188,209	107,341	522	6,533	0	42,505	911,362	Inflow, Dos Amigos P.P.(Fed. and Other)
628,095	513,961	273,657	246,609	264,490	285,711	4,369,260	Total Inflow, Dos Amigos P.P.
0	0	0	0	0	0	0	Flow into Aqueduct
1	1	0	1	0	1	6	Deliveries to Dept. of Fish and Game (State)
0	0	1	0	1	0	4	Deliveries to Dept. of Fish and Game (Fed.)
0	0	0	15	5	1	44	Miscellaneous Outflow (Phase 1)
70,164	109,103	17,457	9,649	4,500	3,377	303,846	Deliveries, Transfers to Fed. Customers
139,407	37,175	15,086	20,622	23,067	49,476	766,339	Deliveries to Fed. Customers
426,085	377,341	239,359	213,426	231,619	225,212	3,283,006	Outflow, Check 21 (State)
0	245	3,695	5,486	4,346	2,627	21,962	Outflow, Check 21 (Fed.)
1,461	-1,291	-532	-575	-1,411	1,973	-115	Change in Storage
9,023	8,613	1,409	2,015	-2,363	-3,044	5,832	Computed Losses (-), Gains (+)
							<b>SAN JOAQUIN FIELD DIVISION</b>
							California Aqueduct, Check 21 to Buena Vista Pumping Plant
426,085	377,341	239,359	213,426	231,619	225,212	3,283,006	Inflow, Check 21 (State)
0	245	3,695	5,486	4,346	2,627	21,962	Inflow, Check 21 (Fed.)
426,085	377,586	243,054	218,912	235,965	227,839	3,304,968	Total Inflow, Check 21
0	0	0	0	0	0	0	Kern River Intertie
213,129	170,688	66,954	45,098	44,718	45,037	1,190,729	Deliveries to Contracting State Agencies
0	245	3,695	5,486	4,346	2,627	21,962	Deliveries to Fed. Customers
0	0	0	0	0	0	0	Friant CVP Inflow
177,036	177,241	156,541	156,168	177,537	172,458	1,871,925	Outflow, Buena Vista P.P.
20,951	17,509	10,289	5,283	3,243	1,961	119,884	Coastal Br. Diversion
431	13	-582	-239	142	1,116	-287	Change in Storage
-14,538	-11,890	-6,157	-7,116	-5,979	-4,640	-100,755	Computed Losses (-), Gains (+)
							California Aqueduct, Buena Vista P.P. to Teerink Pumping Plant
177,036	177,241	156,541	156,168	177,537	172,458	1,871,925	Inflow, Buena Vista P.P.
22,969	18,158	6,836	4,097	2,554	3,587	123,565	Deliveries to Contracting State Agencies
0	0	0	0	0	0	0	W.R.M.W.S.D. Pumpback
157,989	164,589	154,446	155,932	180,073	175,063	1,797,930	Outflow, Teerink Pumping Plant
79	104	92	-11	-110	51	-159	Change in Storage
4,001	5,610	4,833	3,850	4,980	6,243	49,411	Computed Losses (-), Gains (+)
							California Aqueduct, Teerink Pumping Plant to Chrisman Pumping Plant
157,989	164,589	154,446	155,932	180,073	175,063	1,797,930	Inflow, Teerink Pumping Plant
7,662	5,155	3,147	2,208	667	437	40,063	Deliveries to Contracting State Agencies
147,272	155,626	148,195	153,056	173,931	171,617	1,720,473	Outflow, Chrisman Pumping Plant
0	-33	36	-3	-3	11	-41	Change in Storage
-3,055	-3,841	-3,068	-671	-5,478	-2,997	-37,434	Computed Losses (-), Gains (+)
							California Aqueduct, Chrisman Pumping Plant to Edmonston Pumping Plant
147,272	155,626	148,195	153,056	173,931	171,617	1,720,473	Inflow, Chrisman Pumping Plant
4,579	3,760	2,449	1,283	267	39	23,934	Deliveries to Contracting State Agencies
141,668	151,517	145,041	149,363	175,152	170,933	1,689,921	Outflow, Edmonston Pumping Plant
60	-138	25	-2	90	-130	-176	Change in Storage
-965	-487	-680	-2,412	1,578	-775	-6,794	Computed Losses (-), Gains (+)
							Coastal Branch, California Aqueduct
20,951	17,509	10,289	5,283	3,243	1,961	119,884	Inflow, Las Perillas P.P.
0	0	0	0	0	0	0	B.M.W.S.D. Pumpback
20,432	17,431	10,660	5,654	3,273	2,050	120,313	Deliveries to Contracting State Agencies
0	0	0	0	0	0	0	Deliveries to Fed. Customers
-9	1	10	-3	-11	-2	-34	Change in Storage
-528	-77	381	368	19	87	395	Computed Losses (-), Gains (+)

**Table 22. Summary of California Aqueduct Operation**

**2000**

(in acre-feet)

Description	Jan	Feb	Mar	Apr	May	Jun
<b>SOUTHERN FIELD DIVISION</b>						
California Aqueduct, Edmonston Pumping Plant to Junction of West Branch						
Inflow, Edmonston Pumping Plant	118,632	91,195	120,233	158,154	127,885	140,148
Outflow, West Branch	48,124	29,202	39,986	81,599	47,424	56,008
Outflow, East Branch	70,511	61,956	80,206	76,520	80,409	84,085
Change in Storage	-3	4	0	0	5	-2
Computed Losses (-), Gains (+)	0	-33	-41	-35	-47	-57
California Aqueduct, Junction of West Branch to Pearblossom P.P.						
Inflow (Aqueduct)	70,511	61,956	80,206	76,520	80,409	84,085
Inflow (L.A.D.W.P.)	0	0	0	0	0	0
Deliveries to Contracting State Agencies	3,481	3,088	4,244	6,072	8,835	12,373
Outflow, Pearblossom P.P.	66,780	56,851	73,256	67,408	68,299	67,367
Change in Storage	268	-464	-351	464	-195	142
Computed Losses (-), Gains (+)	18	-2,481	-3,057	-2,576	-3,470	-4,203
California Aqueduct, Pearblossom P.P. to Silverwood Lake						
Inflow, Pearblossom P.P.	66,780	56,851	73,256	67,408	68,299	67,367
Deliveries (Exchange of Natural Inflow)	499	823	1,170	216	124	224
Exchange of Natural Inflow (Los Flores T.O.)	0	376	934	798	401	95
Outflow to Silverwood Lake	67,672	58,462	73,485	67,763	70,837	68,824
Change in Storage	-378	-337	768	207	-703	450
Computed Losses (-), Gains (+)	1,013	2,473	3,101	1,576	2,360	2,226
Silverwood Lake Operation						
Inflow, Project	67,672	58,462	73,485	67,763	70,837	68,824
Inflow, Natural	34	1,514	1,929	786	290	49
Deliveries to Contracting State Agencies	62	67	93	65	116	153
Recreation Deliveries	2	2	2	5	8	9
Outflow, Natural Inflow Released	11	749	687	148	13	12
Outflow, At San Bernardino Tunnel	67,431	61,487	74,177	69,213	69,891	69,002
Change in storage	919	-985	1,316	340	988	-352
Computed Losses (-), Gains (+)	719	1,344	861	1,222	-111	-49
California Aqueduct, Silverwood Lake to Lake Perris						
Inflow, SBMWD Reverse Flow	0	0	0	0	0	0
Inflow, San Bernardino Tunnel	67,431	61,487	74,177	69,213	69,891	69,002
Inflow, From 28J	0	0	0	0	0	0
Deliveries to Contracting State Agencies	66,703	61,067	74,503	69,362	69,816	64,306
Outflow to Lake Perris	843	540	531	486	1,330	4/ 4,814
Change in Storage	-126	-130	-104	73	81	-128
Operational Losses (-), Gains (+)	-11	-10	753	708	1,336	-10
4/ Includes 3,471 AF delivered to Perris by MWD to replace recreation water.						
Lake Perris Operation						
Inflow	843	540	531	486	1,330	1,343
Deliveries to Contracting State Agencies	608	501	1,556	5,403	2,096	491
Recreation Deliveries	21	15	17	11	45	45
Inflow/ Delivery	0	0	0	0	0	3,471
Change in Storage	135	247	-1,680	-5,885	-2,642	2,576
Computed Losses (-), Gains (+)	-79	223	-638	-957	-1,831	-1,702

**Table 22. Summary of California Aqueduct Operations**

**2000**

(in acre-feet)

Jul	Aug	Sep	Oct	Nov	Dec	Total	Description
							<b>SOUTHERN FIELD DIVISION</b>
							California Aqueduct, Edmonston Pumping Plant to Junction of West Branch
141,668	151,517	145,041	149,363	175,152	170,933	1,689,921	Inflow, Edmonston Pumping Plant
57,015	60,373	64,538	70,166	92,906	76,805	724,146	Outflow, West Branch
84,629	91,097	80,457	79,161	82,207	94,106	965,344	Outflow, East Branch
-12	7	3	1	2	-5	0	Change in Storage
-36	-40	-43	-35	-37	-27	-431	Computed Losses (-), Gains (+)
							California Aqueduct, Junction of West Branch to Pearblossom P.P.
84,629	91,097	80,457	79,161	82,207	94,106	965,344	Inflow (Aqueduct)
0	0	0	0	0	0	0	Inflow (L.A.D.W.P.)
14,187	14,158	11,083	8,238	4,769	3,470	93,998	Deliveries to Contracting State Agencies
68,244	73,172	66,719	67,843	74,871	88,257	839,067	Outflow, Pearblossom P.P.
-431	789	-525	474	-150	370	391	Change in Storage
-2,629	-2,978	-3,180	-2,606	-2,717	-2,009	-31,888	Computed Losses (-), Gains (+)
							California Aqueduct, Pearblossom P.P. to Silverwood Lake
68,244	73,172	66,719	67,843	74,871	88,257	839,067	Inflow, Pearblossom P.P.
233	235	431	1,067	2,202	2,795	10,019	Deliveries (Exchange of Natural Inflow)
32	41	0	0	0	0	2,677	Exchange of Natural Inflow (Los Flores T.O.)
70,472	75,160	68,889	69,435	75,627	87,937	854,563	Outflow to Silverwood Lake
-442	221	-113	78	-237	513	27	Change in Storage
2,051	2,485	2,488	2,737	2,721	2,988	28,219	Computed Losses (-), Gains (+)
							Silverwood Lake Operation
70,472	75,160	68,889	69,435	75,627	87,937	854,563	Inflow, Project
0	0	0	0	0	19	4,621	Inflow, Natural
209	203	181	118	86	105	1,458	Deliveries to Contracting State Agencies
12	14	10	6	2	2	74	Recreation Deliveries
12	12	12	11	10	10	1,687	Outflow, Natural Inflow Released
70,519	75,832	67,816	69,666	79,558	80,646	855,238	Outflow, At San Bernardino Tunnel
-779	-1,372	572	-675	-4,003	7,269	3,238	Change in storage
-499	-471	-298	-309	26	76	2,511	Computed Losses (-), Gains (+)
							California Aqueduct, Silverwood Lake to Lake Perris
0	0	0	0	0	0	0	Inflow, SBMWD Reverse Flow
70,519	75,832	67,816	69,666	79,558	80,646	855,238	Inflow, San Bernardino Tunnel
0	0	0	0	0	0	0	Inflow, From 28J
69,747	74,768	66,675	69,524	79,116	80,335	845,922	Deliveries to Contracting State Agencies
1,698	1,884	1,636	782	1,207	47	15,798	Outflow to Lake Perris
-186	135	-109	105	51	-69	-407	Change in Storage
740	955	386	745	816	-333	6,075	Operational Losses (-), Gains (+)
							Lake Perris Operation
1,698	1,884	1,636	782	1,207	47	12,327	Inflow
347	288	430	290	279	285	12,574	Deliveries to Contracting State Agencies
51	59	43	26	22	20	375	Recreation Deliveries
0	0	0	0	0	0	3,471	Inflow/ Delivery
-935	-487	-610	-957	-564	-238	-11,040	Change in Storage
-2,235	-2,024	-1,773	-1,423	-1,470	20	-13,889	Computed Losses (-), Gains (+)

**Table 22. Summary of California Aqueduct Operation**

**2000**

(in acre-feet)

Description	Jan	Feb	Mar	Apr	May	Jun
<b>SOUTHERN FIELD DIVISION (Cont.)</b>						
West Branch California Aqueduct Tehachapi Afterbay to Oso P.P.						
Inflow	48,124	29,202	39,986	81,599	47,424	56,008
Outflow, Oso Pumping Plant	48,131	29,087	39,861	81,494	47,265	55,839
Change in Storage	-7	12	-1	-1	15	-5
Computed Losses (-), Gains (+)	0	-103	-126	-106	-144	-174
West Branch California Aqueduct Oso P.P. to Pyramid Lake						
Inflow, Oso P.P.	48,131	29,087	39,861	81,494	47,265	55,839
Deliveries to Contracting State Agencies	0	0	0	0	0	0
Outflow Through Warne to Pyramid Lake	47,274	29,733	40,811	80,320	47,757	56,046
Change in Storage	845	-601	-945	1,175	-515	-279
Operational Losses (-), Gains (+)	-12	45	5	1	-23	-72
Pyramid Lake Operation						
Inflow, Project	47,274	29,733	40,811	80,320	47,757	56,046
Inflow, Natural	987	3,266	4,989	2,822	1,366	607
Inflow, Pumpback from Elderberry Forebay	55,426	22,776	17,833	55,822	68,600	77,638
Deliveries (Fish Enhancement)	0	0	0	0	0	0
Deliveries to Contracting State Agencies	0	0	0	0	0	0
Deliveries to Dept. of Parks and Rec. (State)	0	0	0	0	0	0
Outflow, Pyramid Diversion	603	2,271	3,744	2,641	1,553	1,514
Outflow, Angeles Tunnel	94,839	50,435	63,000	134,521	114,872	129,424
Change in Storage	6,058	3,233	-4,360	-2,052	-2,221	-2,374
Computed Losses (-), Gains (+)	-2,187	164	-1,249	-3,854	-3,519	-5,727
Elderberry Forebay Operation						
Inflow, Project through Castaic P-G Plant	94,839	50,435	63,000	134,521	114,872	129,424
Inflow, Natural	48	1,349	2,348	460	95	1
Outflow, Pumpback to Pyramid Lake	55,426	22,776	17,833	55,822	68,600	77,638
Outflow, Released to Castaic Lake /1	44,437	30,674	45,980	75,737	44,955	51,536
Change in Storage	-4,602	-1,286	890	3,498	2,654	547
Computed Losses (-), Gains (+)	374	380	-645	76	1,242	296
Castaic Lake Operation						
Inflow, 1/	44,437	30,674	45,980	75,737	44,955	51,536
Inflow, Natural	129	1,370	1,709	461	159	26
Deliveries to Contracting State Agencies	33,717	27,717	39,517	63,727	44,396	53,595
Deliveries to Recreation 2/	28	9	13	32	30	43
Outflow, (LADWP)	0	0	0	0	0	0
Outflow, Project to Castaic Lagoon	0	1,210	708	0	2,722	3,528
Change in Storage	11,540	3,453	7,769	14,406	-2,669	-3,024
Computed Losses (-), Gains (+)	719	345	318	1,967	-635	2,580
Castaic Lagoon Operation						
Inflow (Recreation Deliveries) /3	0	0	0	0	0	0
Inflow	0	1,210	708	0	2,722	3,528
Inflow, Non-project	0	0	0	0	0	0
Outflow	22	691	886	44	2,149	3,544
Deliveries to Recreation (State)	47	146	66	97	119	141
Change in Storage	-69	373	-244	-141	454	-157
Computed Losses (-), Gains (+)	0	0	0	0	0	0

**Table 22. Summary of California Aqueduct Operations**

**2000**

(in acre-feet)

Jul	Aug	Sep	Oct	Nov	Dec	Total	Description
							SOUTHERN FIELD DIVISION (Cont.)
							West Branch California Aqueduct Tehachapi Afterbay to Oso P.P.
57,015	60,373	64,538	70,166	92,906	76,805	724,146	Inflow
56,944	60,228	64,398	70,055	92,788	76,736	722,826	Outflow, Oso Pumping Plant
-37	22	9	3	6	-14	2	Change in Storage
-108	-123	-131	-108	-112	-83	-1,318	Computed Losses (-), Gains (+)
							West Branch California Aqueduct Oso P.P. to Pyramid Lake
56,944	60,228	64,398	70,055	92,788	76,736	722,826	Inflow, Oso P.P.
0	0	0	0	0	0	0	Deliveries to Contracting State Agencies
56,169	60,614	64,014	68,439	92,997	73,551	717,725	Outflow Through Warne to Pyramid Lake
-43	-590	-79	1,230	-877	2,025	1,346	Change in Storage
-818	-204	-463	-386	-668	-1,160	-3,755	Operational Losses (-), Gains (+)
							Pyramid Lake Operation
56,169	60,614	64,014	68,439	92,997	73,551	717,725	Inflow, Project
363	284	338	460	595	655	16,732	Inflow, Natural
87,127	118,779	101,859	52,747	59,250	64,540	782,397	Inflow, Pumpback from Elderberry Forebay
0	0	1,806	394	0	0	2,200	Deliveries (Fish Enhancement)
0	0	0	0	0	0	0	Deliveries to Contracting State Agencies
1	4	2	2	1	1	11	Deliveries to Dept. of Parks and Rec. (State)
1,651	1,622	1,447	1,148	318	328	18,840	Outflow, Pyramid Diversion
129,340	174,774	153,151	115,540	151,331	130,744	1,441,971	Outflow, Angeles Tunnel
6,268	-3,285	3,500	1,126	-3,515	4,392	6,770	Change in Storage
-6,399	-6,562	-6,305	-3,436	-4,707	-3,281	-47,062	Computed Losses (-), Gains (+)
							Elderberry Forebay Operation
129,340	174,774	153,151	115,540	151,331	130,744	1,441,971	Inflow, Project through Castaic P-G Plant
0	0	0	0	0	0	4,301	Inflow, Natural
87,127	118,779	101,859	52,747	59,250	64,540	782,397	Outflow, Pumpback to Pyramid Lake
47,246	55,921	51,995	65,789	87,053	69,973	671,296	Outflow, Released to Castaic Lake /1
-4,153	424	1,388	-3,316	4,997	-3,696	-2,655	Change in Storage
880	350	2,091	-320	-31	73	4,766	Computed Losses (-), Gains (+)
							Castaic Lake Operation
47,246	55,921	51,995	65,789	87,053	69,973	671,296	Inflow, 1/
4	0	0	8	54	82	4,002	Inflow, Natural
56,158	61,890	65,331	81,856	67,205	73,436	668,545	Deliveries to Contracting State Agencies
51	28	21	14	0	22	291	Deliveries to Recreation 2/
0	0	0	0	0	0	0	Outflow, (LADWP)
239	217	108	240	0	241	9,213	Outflow, Project to Castaic Lagoon
-6,725	-3,883	-12,176	-14,617	20,520	-2,261	12,333	Change in Storage
2,473	2,331	1,289	1,696	618	1,383	15,084	Computed Losses (-), Gains (+)
							Castaic Lagoon Operation
239	217	108	237	0	241	1,042	Inflow (Recreation Deliveries) /3
0	0	0	0	0	0	8,168	Inflow
0	0	0	0	0	0	0	Inflow, Non-project
69	128	120	150	149	126	8,078	Outflow
137	155	142	81	67	67	1,265	Deliveries to Recreation (State)
33	-66	-154	6	-216	48	-133	Change in Storage
0	0	0	0	0	0	0	Computed Losses (-), Gains (+)

1/ Includes 363,880 AF Project water and 2,658 AF of natural inflow.

2/ Includes 369 AF to Castaic Lake and 1,355 AF to Castaic Lagoon.

3/ July through December inflow included in recreation deliveries.





## Glossary

**accretion** - the water accumulated and retained within a service area.

**acre-foot (AF)** - a quantity or volume of water covering one acre to a depth of one foot; equal to 43,560 cubic feet or 325,851 gallons.

**active storage capacity** - the total usable reservoir capacity available for seasonal or cyclic water storage. It is gross reservoir capacity minus inactive storage capacity.

**afterbay** - a reservoir that regulates fluctuating discharges from a hydroelectric power plant or a pumping plant.

**alluvium** - a stratified bed of sand, gravel, silt, and clay deposited by flowing water.

**aquifer** - a geologic formation that stores and transmits water and yields significant quantities of water to wells and springs.

**average annual runoff** - the average value of annual runoff amounts for a specified area calculated for a selected period of record that represents average hydrologic conditions.

**balanced water conditions** - exist when upstream reservoir storage releases, plus other inflows, approximately equal the water supply needed to (1) satisfy Sacramento Valley and Sacramento-San Joaquin Delta in-basin needs, including Delta water quality requirements, and (2) meet export needs.

**benthic invertebrates** - aquatic animals without backbones that dwell on or in the bottom sediments of fresh or salt water. Examples: clams, crayfish, and a wide variety of worms.

**biota** - all living organisms of a region, as in a stream or other body of water.

**brackish water** - water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses. Considerably less saline than sea water.

**carriage water** - the amount of water needed above an increased export so as to not increase salinity in the Delta.

**conjunctive use** - the operation of a ground water basin in combination with a surface water storage and conveyance system. Water is stored in the ground water basin for later use by intentionally recharging the basin during years of above-average water supply.

**Decision 1485 operating criteria** - standards for operating water project facilities under Water Rights Decision 1485 regarding the Sacramento-San Joaquin Delta and Suisun Marsh, adopted by the State Water Resources Control Board, August 1978.

**Delta consumptive use** - the sum of evapotranspiration and changes in soil moisture of Delta lands and evaporation from Delta channels.

**Delta outflow index** - a calculated approximation of this seaward freshwater outflow as it passes Chipps Island near Pittsburg, beyond the confluence of the Sacramento and San Joaquin Rivers.

**depletion** - the water consumed within a service area and no longer available as a source of supply.

**dissolved organic compounds** - carbon substances dissolved in water.

**drainage basin** - the area of land from which water drains into a river; for example, the Sacramento River Basin, in which all land area drains into the Sacramento River. Also called, "catchment area," "watershed," or "river basin."

**drought condition** - hydrologic conditions during a defined drought period during which rainfall and runoff are much less than average.

**ecology** - the study of the interrelationships of living organisms to one another and to their surroundings.

**ecosystem** - recognizable, relatively homogeneous units, including the organisms they contain, their environment, and all the interactions among them.

**effluent** - waste water or other liquid, partially or completely treated or in its natural state, flowing from a treatment plant.

**environment** - the sum of all external influences and conditions affecting the life and development of an organism or ecological community; the total social and cultural conditions.

**estuary** - the lower course of a river entering the sea influenced by tidal action where the tide meets the river current.

**evapotranspiration (ET)** - the quantity of water transpired (given off), retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces. Quantitatively, it is usually expressed in terms of depth of water per unit area during a specified period of time.

**evapotranspiration of applied water (ETAW)** - the portion of the total evapotranspiration which is provided by irrigation.

**forebay** - a reservoir or pond situated at the intake of a pumping plant or power plant to stabilize water levels; also a storage basin for regulating water for percolation into ground water basins.

**fry** - a recently hatched fish.

**gross reservoir capacity** - the total storage capacity available in a reservoir for all purposes, from the streambed to the normal maximum operating level. Includes dead (or inactive) storage, but excludes surcharge (water temporarily stored above the elevation of the top of the spillway).

**ground water** - water that occurs beneath the land surface and completely fills all pore spaces of the alluvium, soil or rock formation in which it is situated.

**ground water basin** - a ground water reservoir, defined by an overlying land surface and the underlying aquifers that contain water stored in the reservoir.

**ground water overdraft** - the condition of a ground water basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average.

**ground water recharge** - increases in ground water storage by natural conditions or by human activity.

**ground water table** - the upper surface of the zone of saturation, except where the surface is formed by an impermeable body.

**hydraulic barrier** - a barrier developed in the estuary by release of fresh water from upstream reservoirs to prevent intrusion of sea water into the body of fresh water.

**hydrologic balance** - an accounting of all water inflow to, water outflow from, and changes in water storage within a hydrologic unit over a specified period of time.

**hydrologic basin** - the complete drainage area upstream from a given point on a stream.

**hydrologic region** - a study area, consisting of one or more planning subareas.