

California

DEPARTMENT OF WATER RESOURCES

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State Water Project
Water Management

California State Water Project
State Water Project Overview
January 30, 2024

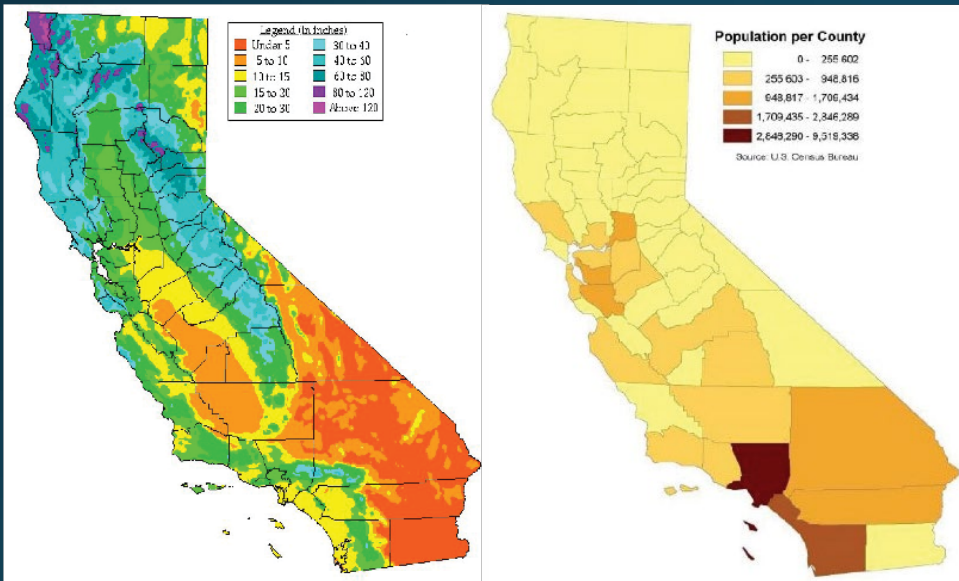


California State Water Project

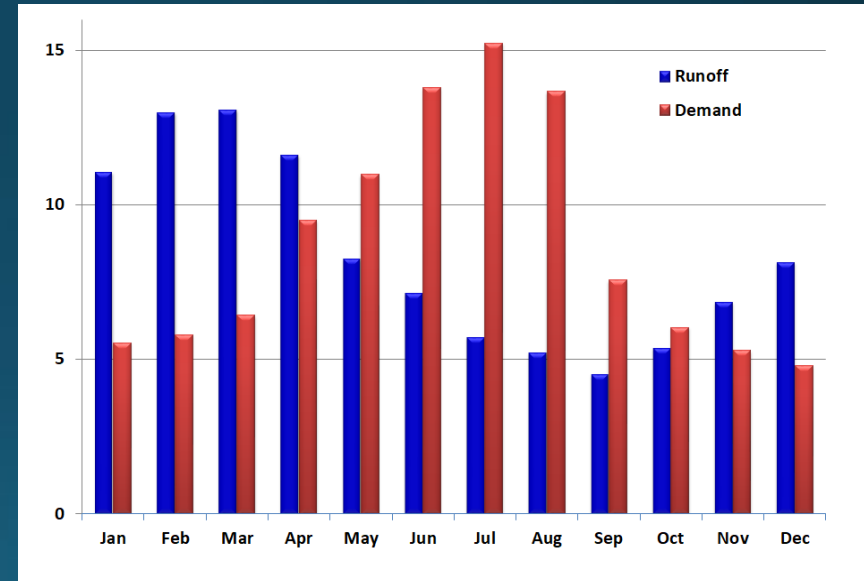
- Background
 - California Water Supply and Demand
 - California Variable Hydrology
- State Water Project
 - Water Supply Contractors
 - Project Facilities
 - Water Development
 - Delta Hydraulics

Geographic and Temporal Disparity

Rain and snow fall in the north, but the major population centers are in the south

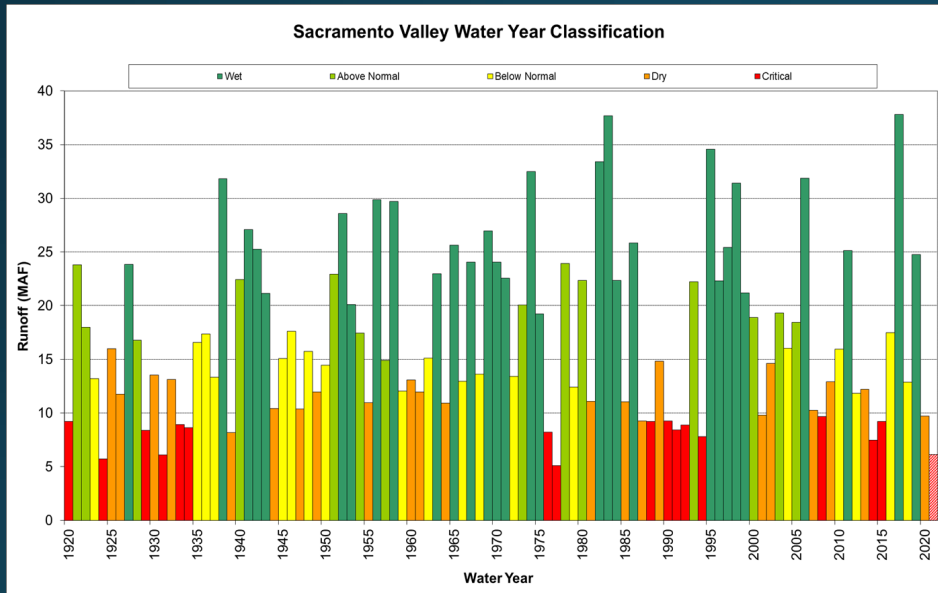


Mismatched seasonal variability between supply and demand

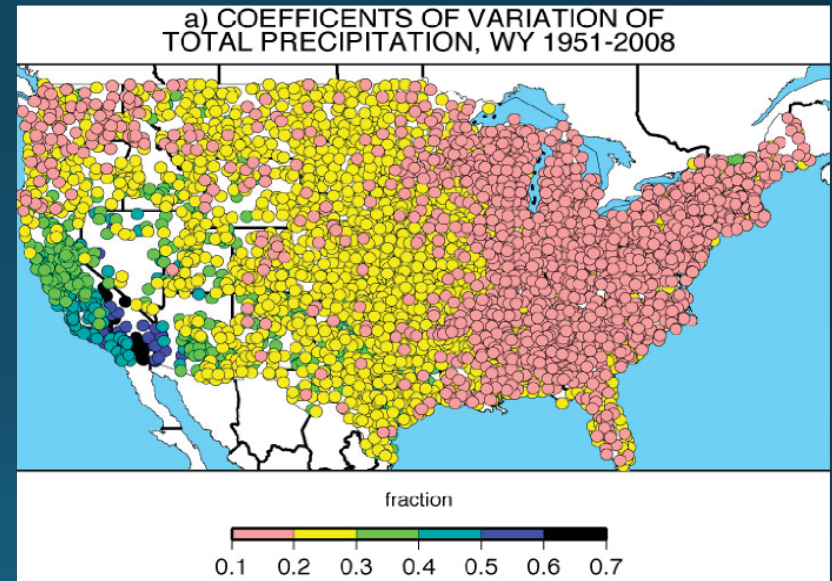


Unique California Hydrology Presents Challenges

Extreme annual variability



No other state in the nation faces such extreme variability in precipitation



Dettinger et al, 2011

Pumps and Canals Remedy Geographic Disparity



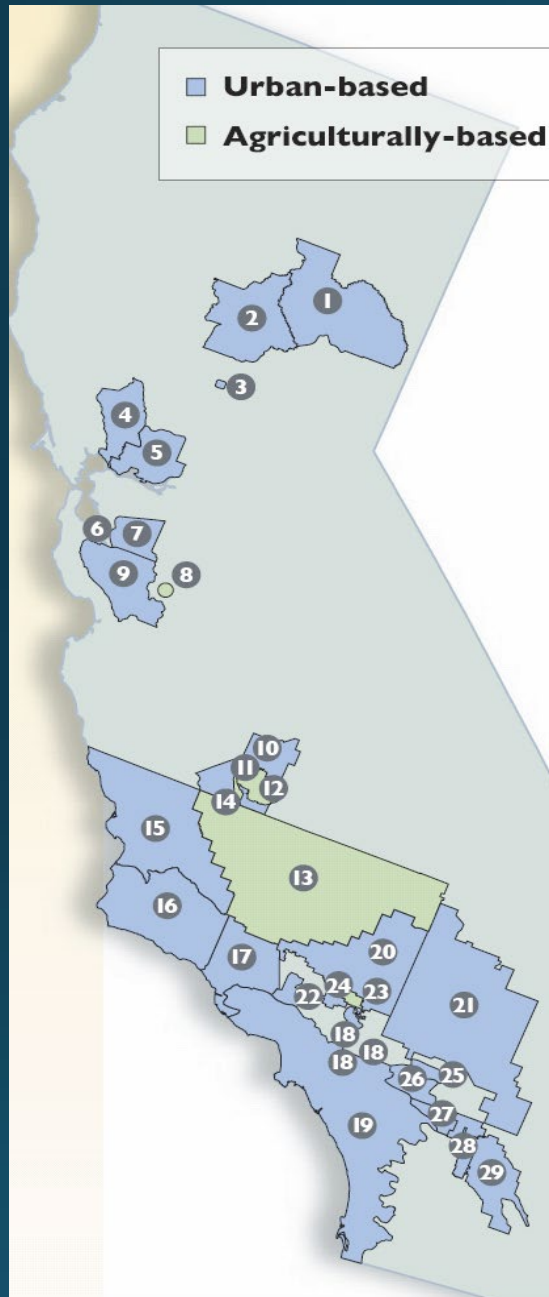
Reservoirs Remedy Temporal Imbalance



State Water Project

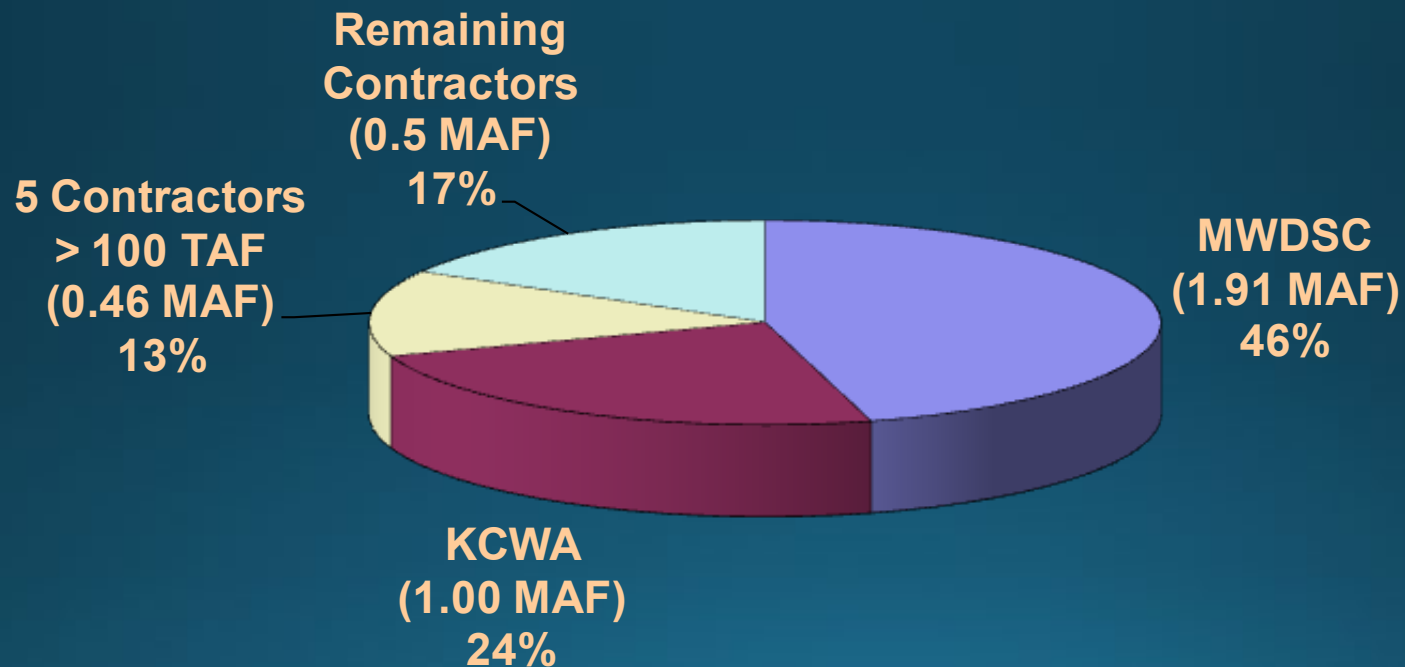
- Largest state-built multipurpose water project in U.S.
- 29 water supply contractors
- 70% urban / 30% agricultural
- 750,000 acres of crops
- 27 million people (2/3 of State's population)

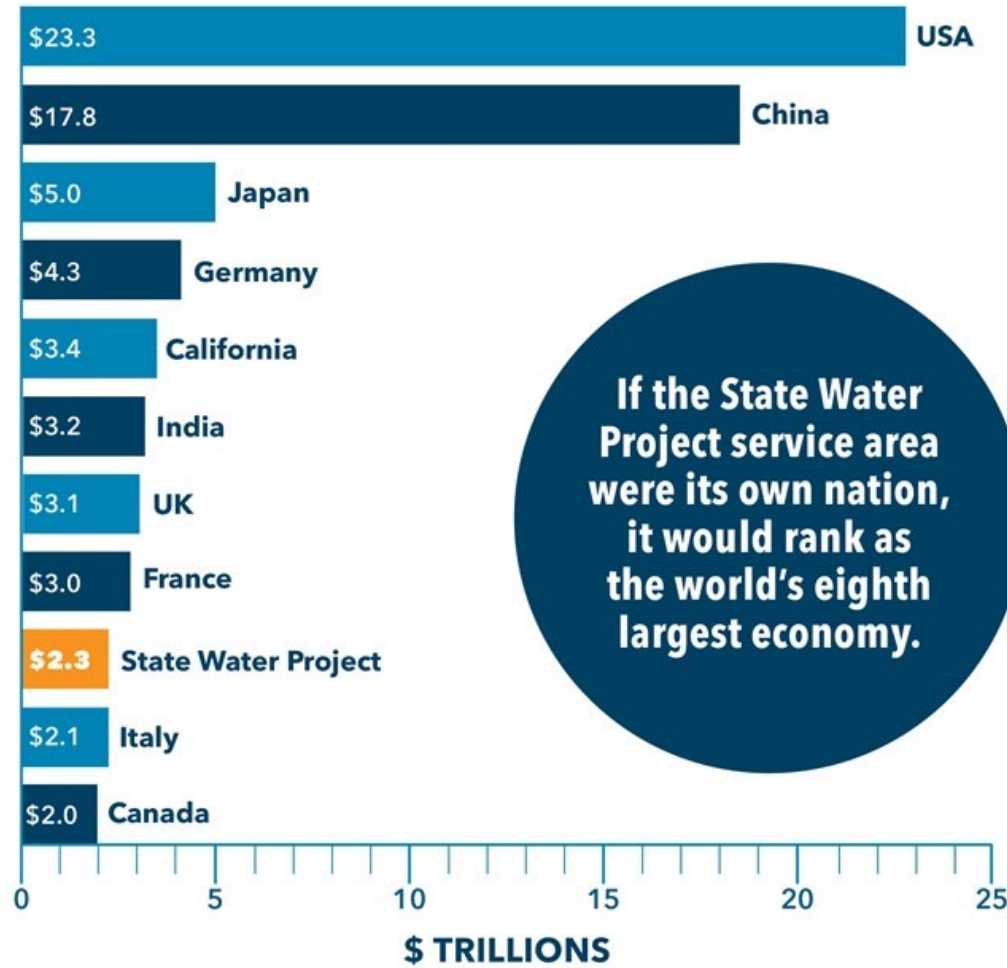




- 1 Plumas County Flood Control & Water Conservation District
- 2 County of Butte
- 3 City of Yuba City
- 4 Napa County Flood Control & Water Conservation District
- 5 Solano County Water Agency
- 6 Alameda County Water District
- 7 Alameda County FCWCD: Zone 7
- 8 Oak Flat Water District
- 9 Santa Clara Valley Water District
- 10 County of Kings
- 11 Empire West Side Irrigation District
- 12 Tulare Lake Basin Water Storage District
- 13 Kern County Water Agency
- 14 Dudley Ridge Water District
- 15 San Luis Obispo County Flood Control & Water Conservation District
- 16 Santa Barbara County Flood Control & Water Conservation District
- 17 Ventura County Flood Control District
- 18 San Gabriel Valley Municipal Water District
- 19 The Metropolitan Water District of Southern California
- 20 Antelope Valley-East Kern Water Agency
- 21 Mojave Water Agency
- 22 Castaic Lake Water Agency (Devil's Den)
- 23 Littlerock Creek Irrigation District
- 24 Palmdale Water District
- 25 Crestline-Lake Arrowhead Water Agency
- 26 San Bernardino Valley Municipal Water District
- 27 San Geronio Pass Water Agency
- 28 Desert Water Agency
- 29 Coachella Valley Water District

SWP Contract Amount "Table A" (4.18 MAF)





Economy ranking bar chart

SWP Facilities

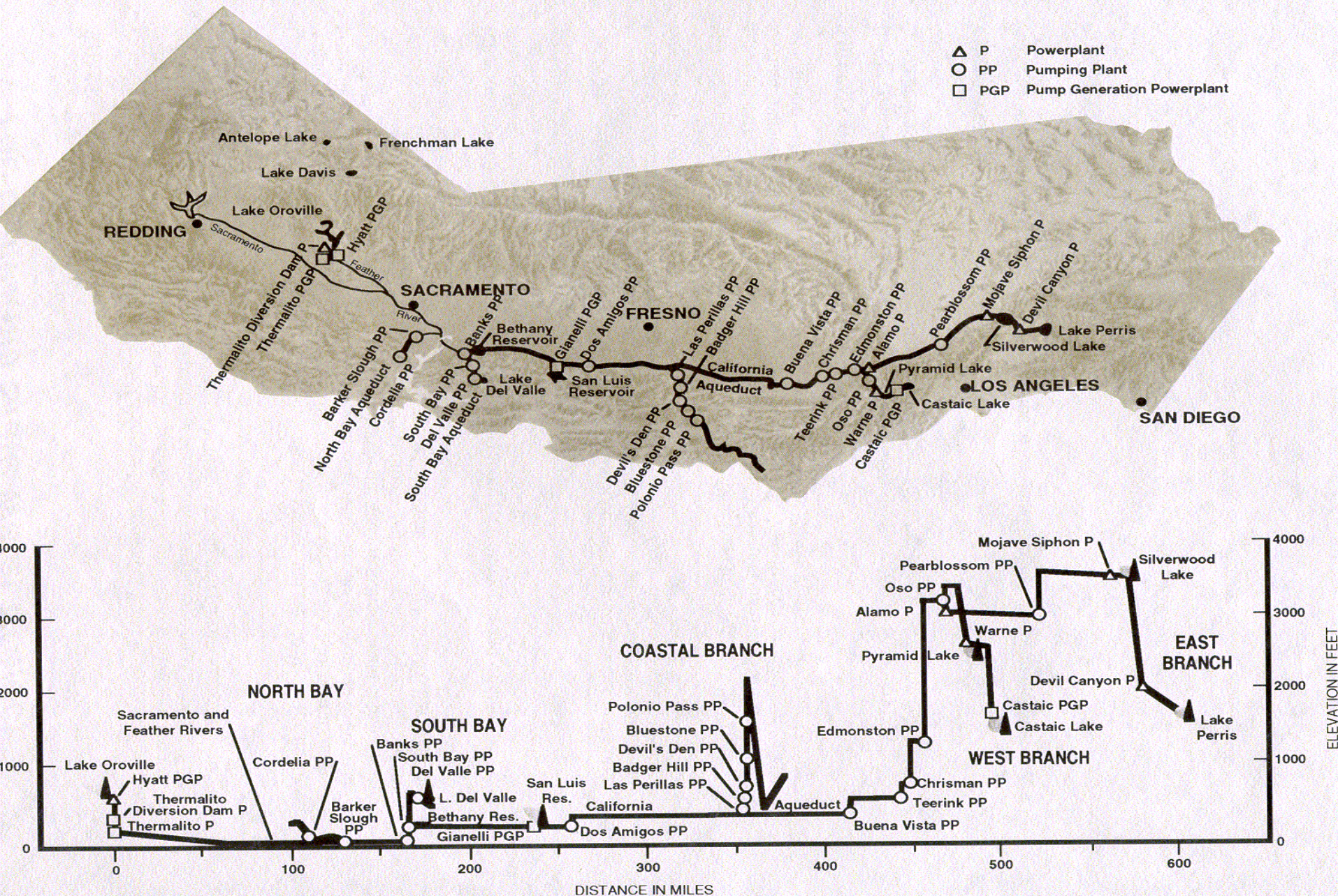
- 33 storage facilities
- 20 pumping and generating plants
- 700 miles of canals and pipelines
- Single largest power consumer in California
- Fourth largest power generator in California



Major SWP Facilities



Location and Profile of State Water Project Facilities



SWP Field Divisions

5 Field Divisions

1. Oroville FD
2. Delta FD
3. San Luis FD
4. San Joaquin FD
5. Southern FD





Oroville Complex

Main Northern Reservoir

- Reservoir holds 3.5 Million acre-feet of water
- Earth-fill dam is 770 feet high, tallest in the U.S.
- Gated emergency spillway capacity 250,000 CFS
- Largest SWP hydropower asset at 900 MW



Edmonston Pumping Plant

- Highest Pump Lift in the World at 1,926 feet
- Max Pump Rate is 4,480 cfs
- 14 – 80,000 hp (60 MW); 4 stage centrifugal pumps; 65 feet tall; 420 tons each
- 840 MW max plant load
- Largest SWP contributor to 7,500 GWh average annual pump load

SWP Water Development

- Winter/Spring: SWP reservoirs capture excess storm flows
 - Excess flows from the upper Feather River basin are diverted to storage in Lake Oroville for later release
 - Banks PP diverts excess flows from the Delta and stores them in San Luis Reservoir for later release to meet high demand period deliveries



SWP Stored Water Conveyance

- Summer/Fall: Release of previously stored water for delivery
 - Previously stored water in Oroville is released and conveyed through the Delta for re-diversion at Banks Pumping Plant for delivery
 - Previously stored water in San Luis Reservoir is released for delivery





The Delta



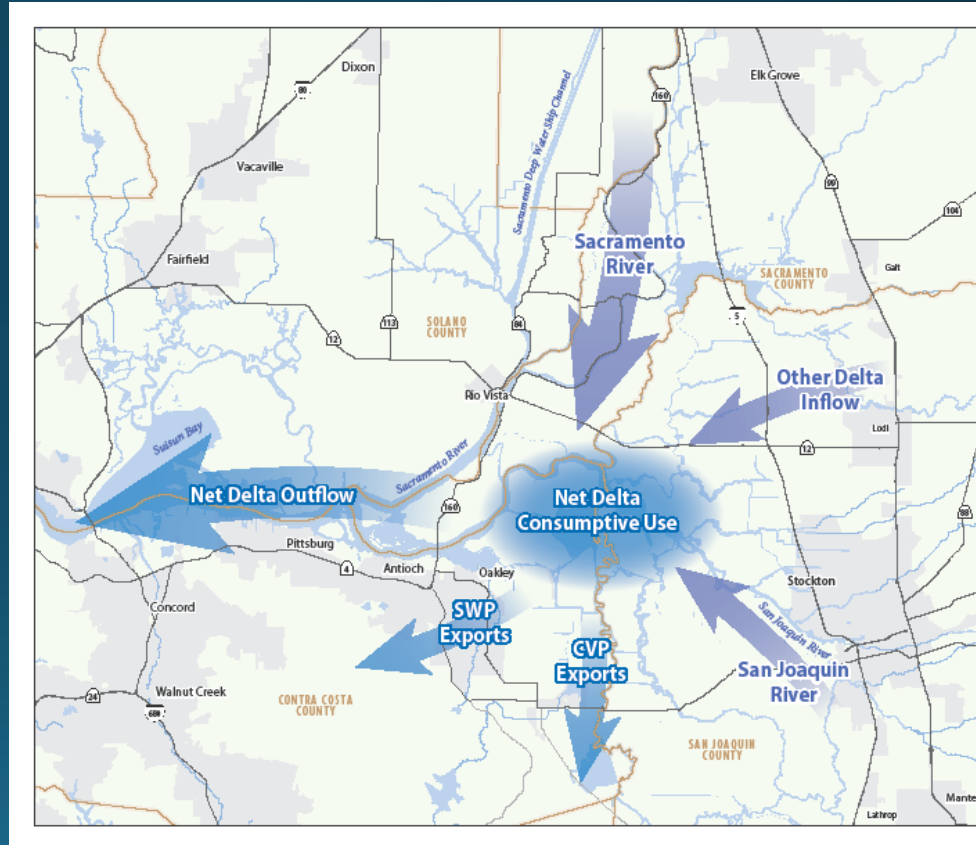
The Hub of California's Water Management System

- Rain and snowmelt from the Central Valley and the Sierra Nevada mountains runoff into the Delta
- Major SWP distribution infrastructure is located in the Delta
- SWP and the federal CVP divert water from the southern portion of the Delta to export water for use in SWP service areas



Delta Hydraulics

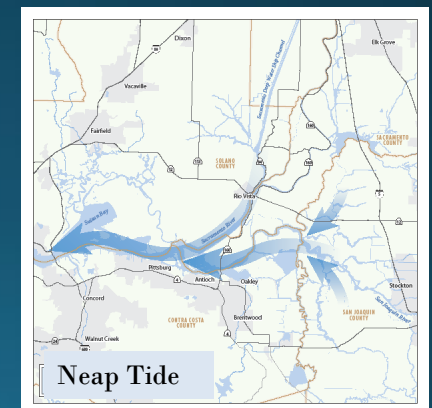
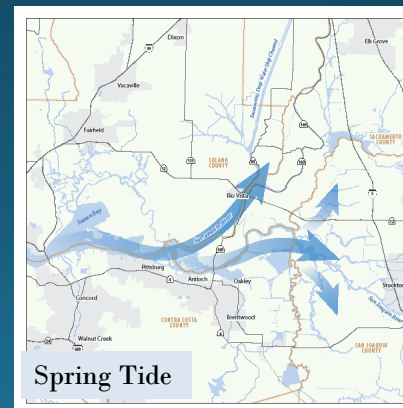
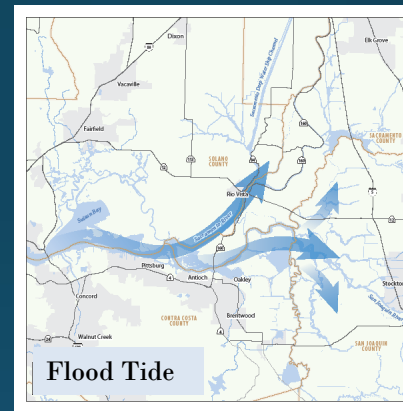
- The Delta is a complex network of over 700 miles of tidally influenced channels
- Strong forcing mechanisms drive circulation, transport, and mixing of water in the Delta:
 - Freshwater river flows from drainages to the Delta
 - Tides bringing in saltwater propagate from the Pacific Ocean through San Francisco Bay into the Delta
 - Collective effects of in-Delta agricultural diversions
 - SWP/CVP water supply facilities operate in the Delta





Salt Water/Fresh Water Tidal Interaction

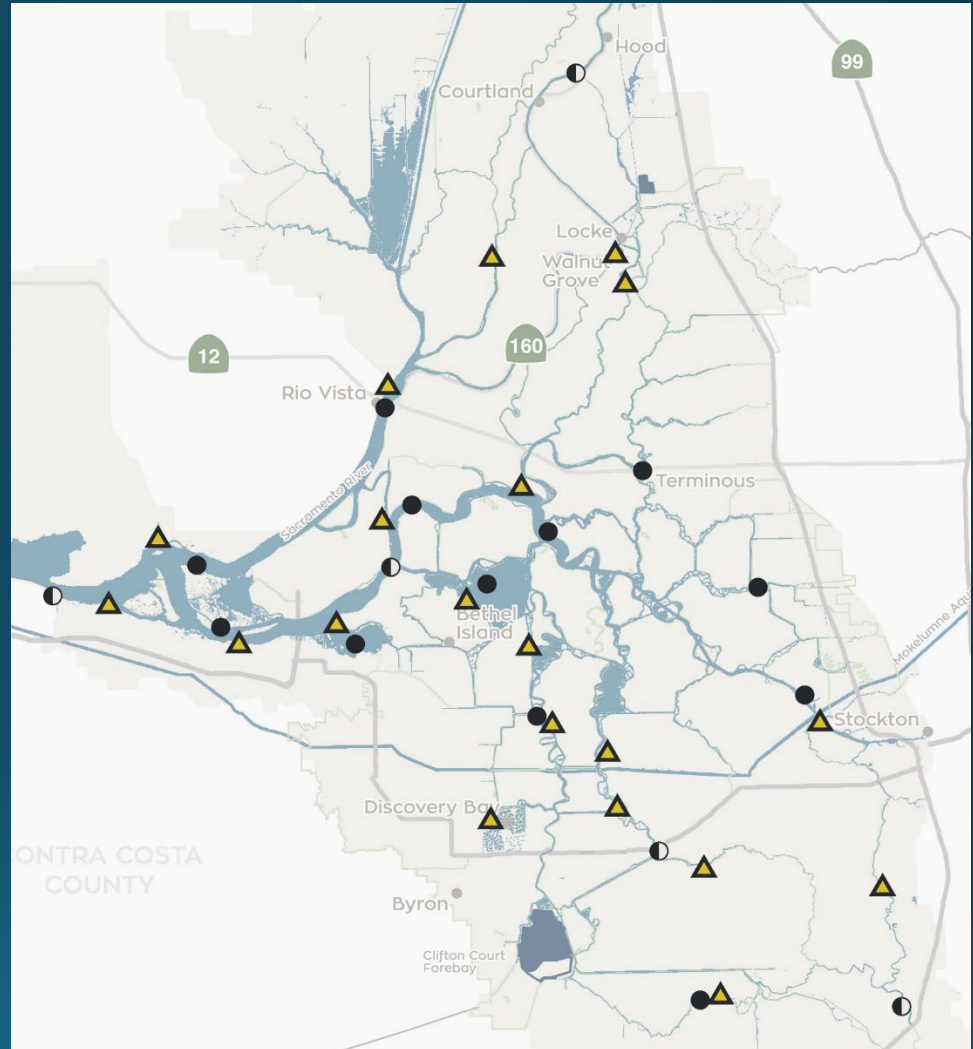
- Bi-daily Flood/Ebb Tide Cycle
 - 6 hours of flood flow followed by 6 hours of ebbing
- Bi-monthly Spring/Neap Tide Cycle
 - 7 days of average filling followed by 7 days of average draining



Delta Regulatory Requirements

- State Water Board Delta flow and salinity objectives
 - Municipal and Industrial Beneficial Uses
 - Agricultural Beneficial Uses
 - Fish and Wildlife Beneficial Uses
- Endangered Species Act
 - NMFS
 - USFWS
- California Endangered Species Act
 - California Department of Fish and Wildlife

Key Flow and Water Quality Monitoring Stations



California State Water Project

- Complex System
 - Supporting much of the economic needs of the State
 - Developed water supply and fishery are dependent on the same Delta estuary
 - This conflict requires high degree of coordination between resource agencies

QUESTIONS?

