CALIFORNIA FOUNDATION ON THE ENVIRONMENT AND THE ECONOMY

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CALIFORNIA WATER

California's water system is a complex network of natural resources and built infrastructure. It's governed by multi-jurisdictional institutions and laws that collectively facilitate the storage, delivery and use of water for the state's 40 million residents and our environmental, agricultural, and industrial needs.

Detailed below is a brief background on the natural systems, water facilities, and federal, state, regional, and local agencies that underpin California's water system. This guide also includes a glossary of key terms and laws.

WATER SUPPLY

There are two primary sources of water in California: surface water and groundwater. Each region of the state has unique geographical factors that determine the source of their water supply.

Some areas sit atop abundant groundwater reserves and can rely on aquifers for the majority of their water needs (i.e. City of Fresno). Conversely, other locations have limited groundwater and must rely on surface water more heavily (i.e. City and County of San Francisco). Other regions and cities rely on a balanced mix of groundwater, surface water, and perhaps recycled or desalinated water to provide for their needs. In recognition of looming water supply challenges, most cities are implementing plans to diversify their supplies.

In addition to surface and ground water, a small amount of fresh water is developed through desalination of California's coastal waters. There are 11 such projects operational in the state with others currently under development.

KEY PROJECTS

As a general rule, water infrastructure is designed to store and move water from the northern and mountainous parts of the state, where snow and rain naturally fall, to the drier southern and coastal areas of the state, where the majority of Californians live and imported water is necessary.

FEDERAL

The Central Valley Project (CVP) is a 400-mile network of dams, reservoirs, and canals operated by the Bureau of Reclamation since 1938. The CVP can be found throughout northern and central California.

On average it provides more than seven million acre-feet of water each year used for irrigation in the San Joaquin Valley and for urban water consumption in the counties of Contra Costa, Santa Clara, and Sacramento. CVP waters are also allocated to restore and protect sensitive ecosystems, and its dams may be used to generate hydroelectricity.

CVP facilities include Shasta Dam and Reservoir, Trinity Dam and Reservoir, Folsom Dam and Reservoir, New Melones Dam and Reservoir, Friant Dam and Reservoir, San Luis Dam and Reservoir.

STATE

The State Water Project (SWP) is 700-mile network of dams, reservoirs, canals, and pumping plants stretching from northern to southern California. The Department of Water Resources constructed and began operating the SWP in 1960. More than 27 million people rely on the SWP for drinking water. SWP waters also used to irrigate 750,000 acres of farmland.

The California Aqueduct is a lynchpin in the SWP. It conveys water from the Sacramento-San Joaquin Delta – the state's single largest surface water supply – to users in Coastal and Southern California. Other notable facilities include Oroville Lake and Dam, Edmonston Pumping Station, and Thermalito Reservoir and Dam.

REGIONAL AND LOCAL

The Colorado River provides water for six western states, Mexico, Indian tribes, and Southern California. River water is conveyed to urban users as well as irrigators in Imperial, Palo Verde and Coachella valleys. The Metropolitan Water District delivers water to urban users in Southern California.

The Los Angeles Aqueduct provides a portion of water to businesses and residents in Los Angeles. It is owned and operated by the Los Angeles Department of Water and Power. The water is collected in the Owens Valley and Mono Basin and conveyed hundreds of miles south to Los Angeles.

Hetch Hetchy Aqueduct supplies water from the Sierra Nevada to 2.4 million urban users in the counties of San Francisco, Santa Clara, Alameda, and San Mateo. The aqueduct is managed by the San Francisco Public Utilities Commission along with the Turlock and Modesto Irrigation Districts, which operate facilities within the Hetch Hetchy system.

Mokelumne Aqueduct supplies Sierra Nevada waters to users in the East Bay. The East Bay Municipal Utility operates the 91-mile aqueduct.

Carlsbad Desalination Plant is the largest desalination plant in the country. Each day it delivers enough drinking water for 400,000 people in San Diego County.

KEY AGENCIES

FEDERAL

The Bureau of Reclamation (BOR) operates 17 different water projects in the western states. In California, BOR is responsible for the Central Valley Project, which delivers seven million acre feet of water each year.

U.S. Fish and Wildlife Service (USFWS) is responsible for protecting fish and wildlife systems. Their scientists work with BOR, the U.S. Army Corps of Engineers, and California agencies to develop federal water projects. USFWS also works with the National Marine Fisheries Service to enforce the Endangered Species Act, a law that can dictate water usage from sensitive ecosystems (e.g. Sacramento-San Joaquin Delta).

U.S. Environmental Protection Agency enforces federal environmental laws designed to safeguard natural resources, including air, water, and land. It is responsible for the regulating discharges under the Clean Water Act and assuring the potability of water under the Safe Drinking Water Act.

U.S. Army Corps of Engineers (USACE) is a department within the U.S. Department of Defense that builds and manages levees, dams, and reservoirs in the United States and California. They also have responsibilities for flood management.

STATE

California Natural Resources Agency (CNRA) is the cabinet-level agency that oversees the policies and programs of fifteen different state agencies tasked with the stewardship of California's natural, cultural, and historic resources.

Department of Water Resources (DWR) is an agency within the Natural Resources agency created by the Legislature in 1956 for the purpose of managing much of California's developed water supply. It owns and operates the State Water Project, which provides water for 27 million Californians and irrigates 750,000 acres of farmland. DWR is responsible for overseeing the implementation of the Sustainable Groundwater Management Act (SGMA).

California Water Commission (CWC) is nine-member commission (appointed by the Governor) that advises the Department of Water Resources. The passage of Prop. 1 in 2014 empowered the Commission to allocate public funds for water storage projects.

California Department of Fish and Wildlife is responsible for managing the state's plants, wildlife, and fish. The department can trace its roots back to 1851 when California passed its first fish and game laws. A key modern role it plays is to monitor water quality for fish and wildlife needs. It coordinates with the State Water Resources Control Board to understand water conditions for ecosystem health.

California Environmental Protection Agency (CalEPA) is a cabinet-level agency established in 1991 that consolidated various agencies tasked with implementing California's environmental laws. Key agencies housed within CalEPA include the California Air Resources Board, the State Water Resources Control Board, and the Department of Resources Recycling and Recovery.

State Leadership

Mr. Wade Crowfoot, Secretary, CA Natural Resources Agency

Ms. Angela Barranco, Undersecretary, CA Natural Resources Agency

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Jared Blumenfeld, Secretary, CA Environmental Protection Agency

Serena McIlwain, Undersecretary, CA Environmental Protection Agency

Kristin Peer, Deputy Secretary and Special Counsel for Water Policy, CA Environmental Protection Agency

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Karen Ross, Secretary, CA Dept. of Food and Agriculture

California State Water Resources Control Board (State Board) is a five-member regulatory body (appointed by the Governor) created in 1967. The Board is responsible for the allocation of surface water rights as well as water quality. The State Board is solely responsible for allocating the surface water rights. There are nine Regional Water Quality Boards that carry out the task of ensuring the highest reasonable quality of water.

California Public Utilities Commission (CPUC) is a five-member regulatory body (appointed by the Governor) responsible for regulating the energy, water, and telecommunications sectors. It was formed in 1911 with the initial responsibility of regulating the railroad industry.

The CPUC is responsible for ensuring that the state's investor-owned water utilities (IOU) are providing the regular delivery of potable water. They also approve the water rates for IOU customers. The CPUC regulates more than 100 water IOU's, which provide services to more than six million Californians.

California Department of Food and Agriculture (CDFA) is a cabinet-level agency established in 1919 responsible for ensuring food safety, protecting against invasive species, and promoting the state's agriculture industry.

Governor's Office of Planning and Research (OPR) was created in 1970 to help facilitate long-term planning for the state. This agency supports the Governor's Office and the Cabinet by providing research and development of long term policies with inter-agency implications. OPR has responsibilities in particular for environmental issues including federal funding, developing guidelines for the California Environmental Quality Act (CEQA), environmental justice, climate adaptation and resiliency program, among other duties.

State Leadership (cont'd)

Karla Nemeth, Director, Dept. of Water Resources

Cindy Messer, Chief Deputy Director, Dept. of Water Resources

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Joaquin Esquivel, Chair, State Water Resources Control Board

Eileen Sobeck, Executive Director, State Water Resources Control Board

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Marybel Batjer, President, CPUC

Rachel Peterson, Executive Director, CPUC

Kate Gordon, Director, Governor's Office of Planning and Research

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Chuck Bonham, Director, Dept. of Fish and Wildlife

REGIONAL AND LOCAL

Beyond the federal and state agencies that oversee the management of California's water resources, there is a decentralized constellation of water system operators with varying responsibilities to manage and deliver water to end users. There are thousands of these systems, and they range from publicly to privately-owned, to systems so small they are exempt from reporting to the state.

As of June 2019, there were a total of **7,386** public water systems in the state of California. In recent years, there's been a push to consolidate systems statewide, particularly for those systems that lack the financial, technical, and infrastructural capacity to provide clean drinking water without interruption.

There are three types of water systems as classified by the State Water Resources Control Board:

1. **Community Water Systems** are regional water systems, districts, cities, counties, regulated utilities, and small water companies. There are nearly **3,000** community water systems in California.

2. **Non-Community Non-Transient Water Systems** are those established by businesses and schools to supply water for people who have regular drinking water needs, but don't necessarily live on site. There are nearly **1,500** such systems.

3. **Transient Water systems** are places where drinking water is provided to people who don't likely live or regularly spend time in the area. Examples include state and national parks, restaurants, and gas stations. There are approximately **3,000** transient water systems.

TERMINOLOGY

Acre-foot
An acre-foot is a unit of measurement of water. One acre-foot is equivalent to approximately 326,000 gallons of water. The average household in California uses between ½ - 1 acre foot of water per year.

Beneficial Use
When applying for a water rights permit in California, an applicant must demonstrate that the water will be put to "beneficial use." Delivering drinking water, irrigating crops, and preservation of ecosystem health are examples of beneficial uses.

Biological Opinion (or BiOps)
Issued by the federal and state fish and wildlife services, biological opinions assess whether an activity may threaten the existence of a species listed under the Endangered Species Act and/or cause destruction or degradation of the habitat of a listed species. As a notable example in California, biops determine how much water can be pumped from the Sacramento-San Joaquin Delta and under what conditions. As a shared resource, the state and federal biops for Delta pumping are normally aligned so that the state and federal water projects operate uniformly.

Surface water
Rivers, lakes, and reservoirs. California has hundreds of rivers as well as 1,500+ reservoirs and lakes.

Groundwater
Water located underground, also known as an aquifer. Many California communities rely entirely or primarily on groundwater to provide drinking water to residents. Approximately 85 percent of Californians receive some of their water from underground supplies. It's estimated that the state's groundwater basins can store 10 times as much water than is available in all of the state's surface water supplies.

Developed Supply
Water that is collected in the reservoirs. These waters can then be conveyed to other locations. Approximately 60 percent of California's developed supply comes from the Sierra Nevada in the form of rain and snowmelt.

Purple Pipe
These are pipes, literally the color purple, that transport treated wastewater to be used for industrial and irrigation needs. Purple pipes are separate from pipes that deliver drinking water.

Sustainable Groundwater Management Act (SGMA)
In 2014, California enacted the Sustainable Groundwater Management Act (SGMA) to regulate its groundwater supplies. It was done in response to growing concern about the overdrafting of aquifers during times of drought. In non-drought years, approximately 40 percent of California's water is supplied by aquifers. However, during droughts, this number can rise to 60 percent.

SGMA requires the formation of local agencies known as Groundwater Sustainability Agencies (GSA) that will be responsible for developing Groundwater Sustainability Plans (GSP) to regulate pumping levels and recharge groundwater basins. GSA's begin implementing the GSP's for high and medium priority basins by either 2020 or 2022, depending on whether DWR has designated the basins critically overdrafted. By 2040/42, GSA's must meet sustainability goals for their respective basins.

Proposition 218
A California constitutional amendment passed in 1996 that restricts local and regional government entities from assessing tax and fee increases on property owners without voter approval. For public water agencies, this restricts rate increases that exceed the costs of providing the service.

Rule Curves
The U.S. Army Corps of Engineers has developed rules curves to guide reservoir operations. The rule curves determine how much should be retained in the reservoir and how much should be released. There is discussion that rule curves may need to be updated as climate change affects precipitation patterns, and thus, alters the optimal operation of state reservoirs.

Forecast-Informed Reservoir Operations (FIRO)
An emerging type of reservoir operation that uses sophisticated weather forecasting to more optimally release, collect, and store water in reservoirs. For example, if a forecast projects an atmospheric river event, reservoirs in the affected area would release water ahead of the storm to ensure it has sufficient capacity to capture more precipitation than it would under historical reservoir operation procedures. Proponents of FIRO contend it can enhance water supply reliability, provide environmental benefits, and reduce the risk of flooding.

Riparian Rights
A type of water right that entitles a property owner whose property directly borders surface waters to use that water if not already appropriated.

Appropriative Rights
Another type of water right that permits the diversion of water at one point to be beneficially used at another location. California law recognizes both appropriative and riparian rights.

Voluntary Agreement
This refers to a framework in which key interests, including environmental groups, water agencies, and water users, jointly work together voluntarily to responsibly manage critical water resources in a way that enhances ecosystems while providing for human needs. Such an arrangement can provide more flexibility and “win-win” opportunities for stakeholders than a traditional regulatory process or legal outcome.