Chapter 2. Water Governance in Southern California

Water governance is a layered and fragmented system that includes public and private organizations from the Federal to the local level. Ground water and surface water resources have been traditionally managed separately, although there is an increasing understanding of their dynamic interaction (Winter et al. 1998). In addition, the management of water supply and the treatment and disposal of wastewater, although integrally connected, have traditionally been managed by different special districts or municipal departments. Our institutional frameworks for water management lag behind our more recent understanding of ground and surface water interactions and water supply and wastewater treatment and disposal, and, in general, of the need for a more integrated water management. In Southern California, these divisions are heightened by the region’s reliance on imported surface water from Northern California as well as from the Colorado River, which are managed by the Metropolitan Water District of Southern California, and on the region’s local groundwater resources, which are managed by a multiplicity of local and regional agencies. In this Chapter, we first briefly review federal agencies and their roles in water supply. This is followed by a discussion of major state agencies involved in water supply and their roles, and then focus on Southern California institutions. A final section summarizes findings.

The Federal level

Federal agencies play an important role in Southern California water supply issues. The Federal government provides the general framework for state oversight and regulation of water sources. Although 37 different federal agencies have some jurisdiction over water resources (Fiero, 2007), three federal agencies have major responsibilities for water resources (Adler, 2009): the Bureau of Reclamation is in charge of water supply; the US Army Corps of Engineers is responsible for flood protection; and water quality is regulated by the Environmental Protection Agency. One of the most influential federal regulations for water conservation policy, however, emerged from the 1992 Federal Energy Policy Act.

The 1992 Federal Energy Policy Act. The Energy Policy Act required higher water efficiency standards for faucets, showerheads and toilets. The Act mandated that as of January 1994, only water efficient faucets, showerheads and toilets be sold in the country. This change, for example, reduced the water use of toilets from the typical 3.5 to 7 gallons per flush to ultra low flow toilets (ULFTs) with 1.6 gallons per flush. Building on these federal requirements, the State of California has developed an ambitious water conservation program.
The Bureau of Reclamation (USBR) was instituted in 1902 as an agency within the Department of the Interior with the task to support the settlement of the Western territories and reclaim arid lands for agriculture. The Bureau is the Watermaster of the Colorado River and mediates the numerous water allocation disputes among the States that have riparian rights over the River, develops rural and tribal water supply projects, and maintains existing dams and improves their safety. It is also deeply involved in ecosystem restoration and supports water efficiency projects at the local level, such as projects that combine water and energy efficiency, desalination of brackish water or reclamation of impaired water. The Bureau of Reclamation manages the Central Valley Project (CVP), which through a set of dams, reservoirs, canals, aqueducts, pumps, supplies water from the Cascade and Tehachapi Mountains to Central Valley farmers through the Sacramento River and Bay Delta. California’s State Water Project, similar to the CVP, brings water from the Sierra Nevada to Southern California, and the two projects share some of their infrastructure. Today, many of the Bureau’s projects are very relevant for Southern California water supply, such as the restoration of the San Joaquin and Sacramento Rivers Delta and the Lower Colorado River ecosystem conservation programs. Any attempt by the State to ensure the reliability of the State Water Project by constructing infrastructure to bypass the Delta will likely require partnership with the Bureau. Other Bureau programs are aimed at co-financing projects, at developing feasibility studies to expand the use of recycled water, and at improving water and energy efficiency. In the future, the Bureau, because of its role in the CVP, could be a crucial partner for the State in determining the prospects of water rights transfers between agricultural and urban uses.

The US Army Corps of Engineers (USACE) is a planning agency of the Department of Defense. In Southern California, the Corps manages 11 reservoirs, some of them with the single purpose of controlling flood risks, others with the double function of water reservoir and flood control. Specifically, USACE, in agreement with Los Angeles County Department of Public Works, manages the Santa Fe Dam and 2 dams at the Whittier Narrows on the San Gabriel River and on Rio Hondo to enable groundwater replenishment operations. The Corps also manages Prado Dam on the Santa Ana River in agreement with the Orange County Water District, to provide constant water flow to spreading grounds along the Santa Ana River, as well as the San Antonio Dam, in collaboration with the Pomona Valley Protective Association, Mountain View Company and San Bernardino Flood Control District.

The Environmental Protection Agency has the task of administering and enforcing most Federal environmental pollution statutes, chief among them, the Clean Water Act and its amendments (CWA) and the Safe Drinking Water Act (SDWA). Some of EPA programs are focused on augmenting water supply. Through the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), more commonly known as “Superfund”, EPA has the goal of facilitating and regulating the cleanup of hazardous substances, and allocating liability and responsibility for those clean-ups. In most cases, hazardous substances contamination has
reached local aquifers, and EPA’s activities have been focused in cleaning up groundwater and making it available for human consumption.

In Southern California there are 26 superfund sites where EPA and other agencies are managing groundwater clean-up, some of which are providing groundwater water supply to entire communities.

EPA also has jurisdiction over groundwater quality by directly regulating injection wells, used in Southern California to protect the aquifers from sea water intrusion. It also regulates, supports, and subsidizes low impact development that has the goal of reducing runoff and increasing water percolation into groundwater basins.

EPA does not fund water conservation directly, but runs three programs that support water efficiency. CWA and SDWA provide revolving funds that finance projects and programs that improve water quality, support water recycling, and enhance water conservation (such as metering replacement). Also, EPA promotes the Water Sense Partnership. Through this Partnership, the agency labels products like plumbing fixtures and irrigation devices that use 20% less water than the average product in that category and partners with manufacturers and retailers to support their distribution. The program includes certification of programs for landscape irrigation professionals that verify professional proficiency in water-efficient irrigation system design, installation/maintenance, and auditing. EPA has a regional office with oversight over California, Nevada, Arizona, Hawaii and Pacific Territories. The office collaborates on initiatives to protect water quality.

**Water Supply Management Structure at the State Level**

Three major state agencies have jurisdiction over water issues: the Natural Resources Agency, the Environmental Protection Agency and the Health and Human Services Agency.

*California's Natural Resources Agency*

The Natural Resources Agency, whose mission is to protect natural, historical and cultural resources, hosts two departments that are vital for water resources management: the Department of Water Resources (DWR) and the Department of Fish and Game. The Department of Water Resources performs a wide array of water related functions that range from water resources planning to flood control to managing the State Water Project. DWR is responsible for three vital sources of California’s water supply: (a) the implementation of the Colorado River Quantification Settlement Agreement and Salton Sea ecosystem restoration; (b) planning and implementing actions to improve water quality in San Joaquin and Sacramento Delta; and (c) operating the State Water Project. Moreover, the Department carries out numerous tasks related to planning water usage such as providing scientific analysis in support of water management, offering guidance and assistance to local and regional organizations with water planning and engineering and planning the State water strategies. Every five years the Department issues the
California Water Plan, a policy document that includes an analysis of the current status of water supply and demand, examines future water availability scenarios and identifies strategies that guide State investments in technological innovation, infrastructures and integrated water management. It is also in charge of administering the Urban Water Management Planning Act of 1983, which requires urban suppliers to prepare and update their Urban Water Management Plans (UWMPs) every five years.

DWR also carries out important operational tasks such as managing flood control and issuing grants and loans for water supply and water quality enhancement. In addition, Assembly Bill 1881 (2006) required DWR to update the State’s model water efficient landscape ordinance and required local agencies to adopt and enforce either the model ordinance prepared by DWR or an equally water-efficient landscape ordinance by January of 2010. These local ordinances apply primarily to new development, including residential development with irrigated areas larger than 5,000 feet, and existing landscapes larger than 1 acre. The ordinances require local governments to assign water budgets to landscapes, and determine annual water allowances based on landscape area, local evapotranspiration rates, and the water needs of different plants. As a result, outdoor water use in new developments will be more water efficient than existing development. DWR is in charge of enforcing this recent requirement.

An important development for Southern California water prospects is the ongoing preparation of the Bay Delta Conservation Plan, which is expected to be open for public review in 2013. The State Water Project delivers water from the Sierra Nevada through the Bay Delta to Southern California. This method of conveying imported water to Southern California has detrimental environmental impacts on the health of the Bay Delta and its endangered species. The Bay Delta Conservation Plan is proposing a solution, or Delta fix. On July 25, 2012, Gov. Brown and federal officials unveiled the proposed solution of the Plan: a tunnel project (twin tunnels) with intakes on the Sacramento River that would bypass the Delta and pump water directly to export pumps south of the Delta. The project, in effect, a second State Water Project, is projected to cost $23.7 Billion and take 15 years to complete, with water users paying for the tunnels (California Department of Water Resources 2012).

DWR has a specific office that handles Southern California issues. Besides supporting water planning at the local level, its Southern Branch is the Watermaster of the West Basin and of the Central Basin, two of the widest aquifers that underlie the Los Angeles River and San Gabriel River plains.

DWR’s roles in water conservation are strictly related to its planning activities and to its ability to disburse funds. As the State water resource planner, DWR provides scientific and technical backing to California’s water strategies that largely rely on water conservation to balance demand and supply in the future. Moreover, through its grants and funds, the department funds pilot studies about water efficiency and water conservation projects.
Recent State Policy to Increase Water Conservation

As discussed in Chapter 1, in 2009 state agencies with water policy responsibility developed the 20 x 2020 Water Conservation Plan. The 20% by 2020 target was incorporated into the 2009 Comprehensive Water Package, making the plan targets mandatory. As part of the 2009 state legislation, regional and local water districts were required and provided incentives to enact conservation and other measures to develop “diverse regional water supply portfolios that will increase water supply reliability and reduce dependence on the Delta” (S.B. X7-7, Sect. 1, Part 2.55, Chapt. 10608 (c)). Thus, this legislation, in addition to setting conservation targets, also urges water agencies in Southern California to develop their own sources of water supply.

SB X7-7 also required urban water suppliers to report in their Urban Water Management Plans beginning with their 2010 plans, baseline daily per capita water use, their urban water use target, and compliance daily per capita water use, including technical bases and supporting data for these calculations. The preparation of UWMP now requires greater analyses of management tools and options that will maximize resources and minimize the need to import water from other regions.

In addition, California has enacted several important State policies that will reduce water consumption by replacing plumbing fixtures with more water efficient models. In 2007, AB 715 required that as of January, 2014 all water closets and urinals sold or installed in California be high efficiency toilets (HETs) using 1.28 gpf and urinals (0.5 gpf). Note the reduction in water used by these HETs with 1.28 gpf when compared to the ultra-low flow toilets (1.6 gpf) first mandated by the 1992 Energy Policy Act.

In 2010, the California Building Standards Commission adopted the new California Green Building Standards Code, CALGreen, which became effective in January, 2011. CALGreen, which requires all local governments in the State to adopt the mandatory provisions of the Code, sets water efficiency standards beyond the 1992 federal standards for all new construction and remodelings. For example, water efficient toilets are required to be high efficiency (HETs) with no greater water use than 1.28 gallons per flush. These changes in all types of indoor plumbing fixtures are calculated to reduce overall indoor water use by 20%. CALGreen also identifies two voluntary sets of standards, Tiers 1 and 2, which localities can adopt to obtain more ambitious water conservation targets of 30, 35 or 40% for new buildings (CALGreen 2010, Title 24, Part 11, Sections 304-306). CALGreen also mandates weather or soil-moisture based irrigation controllers for outdoor landscapes (CALGreen 2010, Title 24, Part 11, 4.303.1-4.304.1), and complements the State’s requirements for local water-efficient landscape ordinances.

In addition, in 2009, the State passed SB 407 which focuses on replacing the remaining inefficient plumbing fixtures in the pre-1994 building stock. SB 407 requires that after January, 2014, the water inefficient toilets, urinals, showerheads and interior faucets in any residential or commercial building built before 1994 be replaced with water-conserving ones. Also, SB 407 requires that by January of 2017, all noncompliant plumbing fixtures in single family homes be replaced by the property owner. The same requirement applies to multi-family residential and
commercial buildings but the deadline for these properties is January, 2019. In effect, this set of policies will ensure that by 2020, the building stock in California will be equipped with high-efficiency plumbing fixtures (California Urban Water Conservation Council 2010).

Integrated Regional Water Management Planning

The Department of Water Resources manages the Integrated Regional Water Management Plan Act (IRWMP), which was passed in 2002 as SB 1672. Conjunctive water management is a core concept in IRWM. It refers to the joint management of surface and groundwater resources to optimize the yield of the overall water resource. The IRWMP Act, in recognition that water supply management, water quality protection, flood control and habitat protection are interrelated across geographic and jurisdictional boundaries, goes further, and seeks to leverage multiple agencies’ resources to amplify the effects of public investments in water resources. As a consequence, SB 1672 encouraged local water agencies to institute regional water management groups and to plan programs and projects that would address water issues ranging from groundwater management to wastewater plans, and include flood protection, water recycling and water conservation elements. In addition two propositions, Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 provided $500M for projects identified in IRWMPs, and Proposition 84, in 2006, provided $1 billion to plan and implement water projects in IRWM plans. In 2008, Senate Bill X2 1 repealed and replaced the 2002 Integrated Regional Water Management Act with a 2008 IRWM Planning Act, mandated DWR to issue the eligibility criteria for funding projects and programs through Proposition 50 and Proposition 84, and to determine standard criteria of acceptability for IRWM Plans. In addition, the new Act specified that IRWM plans assess the adaptability of the water management systems in the region to climate change. Implementation funds can be substantial. In 2012, the State awarded 25 grants for a total amount of $204 M, ranging from a low of $1-3 M to a high of $25-30M to IRWM Groups to fund projects identified in their IRWMPs.

In Southern California, 7 Regional Water Management Groups (RWMG) are active (MWD, 2010c):

- Watershed Coalition of Ventura County;
- Greater Los Angeles County;
- Gateway Region;
- Santa Ana Watershed Project Authority;
- South Orange County Watershed Management Area;
- Upper Santa Margarita Planning Area; and
- San Diego Region.

Regional Water Management Groups are typically established by at least three local public agencies, at least two of which have statutory authority over water supply. These agencies join forces through a Joint Powers Agreement or a Memorandum of Understanding or other written agreement. According to the 2010 Guidelines to IRWM planning, the planning process should
reach out to a wide range of parties and provide an opportunity to participate to all appropriate local agencies and stakeholders. The IRWM initiative provides incentives for including a wide variety of water stakeholders, including representatives of local cities, water agencies and non-profit organizations (DWR, 2010).

The Department of Fish and Game also has an important role in determining California’s water supply. Although not directly responsible for water conservation, it is the agency responsible for implementing the Endangered Species Act. Charged with the task of protecting habitat quality to support all species and natural communities, the department has the responsibility for developing instream flow recommendations that are considered by the Water Board in regulatory actions related to appropriation of water and other planning activities.

**California Environmental Protection Agency**

The California Environmental Protection Agency is home to the State Water Resources Board (SWRB), responsible for allocating water rights and for protecting water quality. The SWRB has jurisdiction over the allocation of surface water rights established after 1914 and for maintaining records of all surface water usage. Also, the Board has the responsibility of overseeing water quality standards and of regulating wastewater discharges to surface water (rivers, ocean, etc.) and to groundwater. Its structure is decentralized: the task of developing and implementing water quality standards is carried out by nine Regional Water Quality Control Boards (RWCBs). The Regional Boards develop “basin plans” for their hydrologic areas, issue waste discharge requirements, take enforcement action against violators, and monitor water quality. They regulate storm water discharges from construction, industrial, and municipal activities; discharges from irrigated agriculture; dredge and fill activities and the alteration of any federal water body. The State Water Control Board is in charge of approving the plans and overseeing their implementation.

Southern California is under the jurisdiction of three RWCBs: Los Angeles RWCB that includes most of Los Angeles and Ventura counties; Santa Ana RWCB that oversees the Santa Ana River watershed across Riverside, San Bernardino and Orange counties; and, San Diego RWCB that encompasses most of San Diego County, parts of southwestern Riverside and Orange counties.

SWRB has jurisdiction over a number of grants and loans derived from the CWA and the SDWA to improve water quality, implement water recycling and protecting groundwater. Although most of them are aimed at financing infrastructures for wastewater management, a growing portion of these resources is aimed at reducing water consumption (especially outdoor residential irrigation), at containing water runoff and controlling its quality.

**California Health and Human Services Agency**

The California Health and Human Services Agency includes the Department of Public Health that is home to the Division of Drinking Water and Environmental Management. This Division is in charge of protecting drinking water quality by regulating public water systems,
water recycling projects and the use of recycled water for groundwater replenishment; and of certifying residential water treatment devices and other actions. Although its tasks mainly concern the quality of water supply, the Division runs a water conservation program that monitors public water systems’ water losses and encourages public water systems to implement structural measures (such as metering and pricing) to reduce water usage. The Division of Drinking Water and Environmental Management acts locally through 23 districts. Ventura, Orange, Riverside and San Bernardino counties each correspond to one district, while Los Angeles County is divided into four districts.

California Public Utilities Commission

Private water retailers in Southern California are also under the jurisdiction of the California Public Utilities Commission (CPUC), the state agency with oversight over privately owned companies providing services such as telecommunications, electricity, natural gas, railroads, rail transit, passenger transportation and water retail. CPUC regulates the quality of services provided and the rates private companies apply; it is committed to consumer and environmental protection, but also to fair rates of return for the services providers. The water section of the CPUC monitors and regulates water and sewer system service quality issues, provides auditing, financial and advisory services to the regulated utilities and processes rate change requests.

The influence of CPUC on water conservation is not marginal. By having oversight over rates, any decision that influences costumers’ rates and rates of return comes under its scrutiny. In its 2005 Water Action Plan, the CPUC adopted the principle of efficient use of water and set the objective of strengthening water conservation programs to a level comparable to those of energy utilities. The Commission outlined several actions to reach this goal, such as promoting metered water service, encouraging direct participation by major water utilities in the California Urban Water Conservation Council (CUWCC) and encouraging increasing conservation and efficiency rate designs.

In recent years, the Commission has approved increasing tiered rates and conservation programs such as rebates for water efficient appliances for the largest private water utilities. It has also experimented with tools to decouple water sales from revenues, in order to remove obstacles to water conservation.

The energy section of the CPUC is also partially involved with water conservation. For example, it has launched several pilot programs for energy utilities to address water conservation as a tool to save energy and reduce GHG emissions and is currently discussing a program that would fund these initiatives consistently, with a relevant stream of resources.

Institutional Complexity of California’s Water Management

It should be clear from this brief description of the state institutional framework for water management that the framework is complex, overlapping in some areas, and fragmented in others. In particular, there is a split between the management and planning roles of the Dept. of
Water Resources, and the water rights administration and enforcement roles of the Water Resources Control Board. As a recent gubernatorial commission noted, in its argument for greater integration of these functions, unlike California, in most states water planning and management and rights administration are located together. (Little Hoover Commission 2010). Another recent study (Hanak et al. 2011, 262-263) went further calling for “One California Water Department” to incorporate the planning and management functions now housed in the Dept. of Water Resources, the water rights administration handled by the Water Resources Control Board, as well as water quality administration.

Southern California Regional Water Governance: the Metropolitan Water District

Southern California’s largest water agency is the Metropolitan Water District of Southern California (MWD). The agency provides water for about 18.6 million people in a 5.2 thousand square miles area between the City of Oxnard and the US border with Mexico and includes large portions of the Ventura, Los Angeles, San Bernardino, Orange and San Diego Counties. MWD was instituted by the California legislature that passed the Metropolitan Water District Act in 1927, and was incorporated in 1928 after a ballot measure passed by its initial member communities. The District was defined as a public corporation that had the goal of building the infrastructure to transport water from the Colorado River to Southern California and to sell and deliver water at wholesale for municipal and domestic uses. Its funding was to be secured by taxes on assessed values, annexation fees, bonds and water rates. Through the years, after building the Colorado River Aqueduct (CRA), MWD has grown its service area to 5,200 sq. mi., has added the State Water Project (SWP) to its sources of water; has entered into contracts with other agencies to supply water to Southern California and covers about 41% of its service area water demand, an average of 2.1 Million Acre Feet per Year (MAFY) between 2001 and 2010. The District is now composed of 26 agencies: 15 retailers (14 cities and one municipal water district) and 11 wholesalers. Each member agency has a seat in the 37 member board, while the remaining 11 seats are allocated to the agencies with the larger assessed property values and

1 Beverly Hills, Burbank, Glendale, Los Angeles, Pasadena, San Marino, San Bernardino, Colton, Anaheim and Santa Ana (Ostrom, V., 1953)

2 Imported water is specifically reserved for residential, commercial, industrial and institutional uses. A very small quantity has been used for agriculture.

3 Taxes on assessed valuation levied by MWD to fund its investments exceed the limit of Prop. 13 and are set every year, for 2011 they were set at 0.0037%.

4 State Water Project is the infrastructure that delivers water from the Sacramento – San Joaquin Rivers Delta to Southern California. MWD has contracted 45% of its water deliveries and is bound to repay 45% of the investment. The SWP has never delivered as much water as expected and its capacity has been drastically reduced by a court order meant to protect endangered species in the Sacramento- San Joaquin Delta. At the same time, however, its contractors are committed to repay the initial investment.
assigned according to said assessed property values\(^5\). Directors are appointed by the agencies they represent and usually have a 4 years mandate that can be renewed. The votes also depend on the assessed property values: each member is entitled to one vote for each $10 million of assessed property values\(^6\) of the agency he/she represents. See Figure 2.1 for a schematic depicting the institutional layers between MWD, wholesalers and retailers.

**Figure 2.1 Imported Water Supply Organization in Southern California**

Note that some cities, such as Los Angeles, obtain imported water directly from MWD and are directly represented on the MWD Board, while some municipalities, such as Huntington Beach, and some special districts obtain imported water through intermediate wholesalers, such as the Inland Empire Utilities Agency or the Municipal Water District of Orange County, who obtain imported water from MWD. Such cities and special districts are represented on the MWD Board by their wholesalers.

\(^5\) An additional representative is assigned for each full 5% of the assessed property values, for example: Los Angeles, San Diego County Water Authority and Municipal Water District of Orange County account respectively for 19.5%, 17.9% and 16.9% of the total assessed property values of the district and are assigned 3 additional representatives each.

\(^6\) For example, in 2011 the city of Beverly Hills had an assessed valuation of $21.27 billion and was entitled to 2,127 votes.
Starting in 1960, the district has been transforming its sources of revenues and its range of influence. New functions have been incorporated in its mission and, along with providing imported water, MWD is now mandated to engage in water conservation, water recycling, groundwater replenishment and storage, watershed management, habitat restoration, and environmentally compatible community development. Since 1992, its member agencies have also agreed to maximize water conservation practices and the usage of recycled water (MWD, 2012a).

MWD is a very influential organization and its influence reverberates across the state water supply decisions and across its member agencies. With respect to its members, its most influential tools include the water rates it sets, its water allocation process in case of water shortages, and the water management incentives it provides to its member agencies. In 2001, MWD’s board restructured its rates and, in order to apply a tiered rate system and guarantee more stability to water demand, it proposed that its member agencies agree to buy a certain amount of water every year for a specific rate. Purchases exceeding a threshold were subject to a higher rate. Agencies were requested to estimate a base water demand and to commit to buy a minimum amount of water in a 10 year period (60% of the base demand x 10, between 2003 and 2012), while not exceeding 90% of the base year demand in every single year. Water purchases within 90% of the base year were subject to a Tier 1 rate, while purchases over that threshold would trigger Tier 2 rates. Entities that do not commit to the purchase order are charged Tier 2 rates when their yearly purchases exceed 60% of the base year demand (MWD, 2002). Twenty-four out of twenty six member agencies agreed to the system and are now on schedule to complete their water purchase contracts.

The linchpin of the new rate system was the new two-tiered “unbundled” water rate. Tier 1 is charged on each purchased AF and it is calculated at the average cost of water. Tier 1 recovers operations and maintenance costs, energy costs both for the Colorado River Aqueduct and the State Water Project, and the costs associated with the State Water Project contract. In addition, Tier 1 rate includes a “water stewardship” component, the revenues of which are reserved for funding water recycling projects of member agencies and conservation measures. An additional average cost is added for treatment. Tier 2 is the estimated marginal cost for acquiring new water and is based on the rates of water transfers (Figure 2.2). Two additional fixed charges are charged to the member agencies, Readiness to Serve Charge (based on each member agency’s 10-year rolling average demand) and Capacity Reservation Charge that recovers costs for peak capacity. Lower rates are established for water purchased to replenish aquifers and for a very limited agricultural program (MWD, 2012). Note also that total water prices since 2003 have increased steeply, almost doubling for both Tier 1 and Tier 2.

Figure 2.2 MWD water rates (2003 – 2011)
Rates are a source of internal struggle for MWD. With the last round of rate increases, San Diego County Water Authority, the largest member agency in the district, sued MWD, arguing that MWD rates for using its infrastructure to transport water are unfair. Another contentious issue within member agencies is the system used to allocate water to member agencies in case of drought. When a long drought reduces water availability the district is forced to ration water. In case of water shortages, the staff at MWD determines the regional shortage level and water deliveries are reduced accordingly for one year. The formula to calculate the amount of water allotted to each member agency is based on the last three years retail demand of each member, adjusted for severity of the shortage, for conservation measures adopted, and for the level of the member’s dependency on imported water (MWD 2008). The mechanism was applied during the last drought (2007 – 2011), but has stirred a lot of controversies among member agencies and is under revision (MWD, 2010a).

Since the late 1980s MWD has funded a range of water reclamation and water conservation initiatives for its member agencies. The bulk of the financial effort (about $316 million in the last 20 years) has been focused towards ground water storage. Until 2007 the district would provide imported water at a discounted price to be stored in groundwater basins or to be used instead of groundwater. In addition, MWD has also supported member agencies’ efforts to recycle water and groundwater recovery. According to its 2012 Annual Report to the Legislature, MWD sources supported local agency efforts that generated about half the recycled water and the groundwater recovered in the region during 2010-2011.

Until 2008, the District provided educational and informational support to wholesalers and retailers, supported a wide indoor residential fixtures replacement program, created a rebate programs for commercial, industrial and institutional customers; implemented water
conservation and landscape training and occasionally funded local conservation initiatives aimed at outdoor water usage. Funding for these actions came from water revenues and external sources such as US Bureau of Reclamation and the State Department of Water Resources. Member agencies and other retailers participated in MWD’s programs and tailored them to their service area, either adding funding onto existing programs or creating their own. More recently, MWD has streamlined its programs and outsourced the administration to a third party and focused on the evaluation of existing and pilot programs. Through the years the District has strengthened the relationship with the member agencies’ staff by instituting monthly meetings of the conservation coordinators and a program advisory committee of member agencies that should provide input to innovate water conservation programs.

**Figure 2.3 Metropolitan Water District and its member agencies**
MWD’s Member Agencies: Retailers and Wholesalers

Fourteen cities and one municipal water district are water retailers that buy imported water directly from MWD and sell it to households and businesses, while twelve Municipal Water Districts and one County Authority are wholesalers that buy from MWD and sell to retailers (Figure 2.3).

MWD member agencies: the retailers

The retailers are the original core agencies that funded MWD. They own extensive water pipes networks, water rights over groundwater, wells, pumps, meters, reservoirs, and, in some cases, water recycling operations. They manage the entire water supply chain in their service area. They vary in size, in their reliance on imported water and in how water management is embedded in their organizational structure. San Fernando, San Marino and Compton are small retailers both in terms of population and water demand and are also the least dependent on MWD. Santa Monica and Beverly Hills are also small in terms of water demand (although Beverly Hills has about half the population of Santa Monica), but they depend on imported water for more than 78% of their supply. For mid size cities in terms of both residents and water demand like Fullerton, Torrance and Pasadena the reliance on MWD water ranges from 30% to 64%; while for larger cities like Long Beach, Anaheim and Santa Ana imported water supplies represent between 32% and 40% of local demand. Los Angeles is by far the largest water user among the retailers and relies on MWD for 51% of its water supply.

MWD member agencies: the wholesalers

While cities are multipurpose entities, with a wide variety of functions, wholesalers are special districts, know as municipal water districts (although their jurisdictions are usually regional and do not coincide necessarily with municipal boundaries), such as the Municipal Water District of Orange County, established with the sole purpose of managing water supply. Although very influential in water supply, none of them manages groundwater directly, or manages the entire water supply chain of its area of service. They rather function as intermediaries between MWD and smaller water retailers.

Municipal water districts as well as the County Authority are allowed to acquire, control, distribute, store, reclaim and recapture any water (included wastewater) for the benefit of their service area. They have the power of eminent domain, they can charge rates for the services they provide and they can fund their investments through property taxes and a stand-by charge on real estate parcels in their areas. The representation system for municipal water districts is completely different from the representation system of the MWD and of the County Agency. According to the Water Code, Municipal water districts board members are elected by the residents of their service area. According to Section 71160 of the Water Code, upon formation municipal water districts are divided into 5 divisions and their 5 board members are elected by the residents of each division (Orange County Municipal Water District and Three Valleys Municipal Water
District are special cases). In other words they represent the retailers’ customers. MWD and the County Agency, on the other hand, have a much larger board, whose members are nominated to represent the member agencies (not the local residents).

Wholesalers are a very diverse group. They differ in the scope of their activity, their diversification of revenues, size, the percentage of water demand they supply in their service area and in how they charge their customers. Most of them own only a limited amount of main water lines and serve only wholesale customers, but two of them serve also retail customers and provide them with sewage and wastewater treatment.

Municipal water districts and the county authority are allowed to levy taxes and stand-by-charges to cover their capital costs. Most of them rely on a small percentage of the property tax levied by the counties within the limits of Prop. 13 (California water code §72090) and some levy a stand by charge up to $10.00 per parcel in their service area (Tab. 3).

Wholesalers are generally committed to water conservation strategies. As member agencies, they help shape MWD’s water efficiency programs, and they use these programs. But they also develop their own, and they apply for funding without the assistance of the regional agency. The commitment to conservation strategies varies across the region. Some wholesalers commit specific portions of their wholesaler surcharge to water conservation while others decide about conservation funding year by year. Some have recently approved water conservation plans to support their customers in meeting the SB 7x7 goals, while others leave the initiative to the retail agencies. Generally speaking they have the size, the resources and the local knowledge to develop water conservation programs that can be appealing to the local water users.

A few wholesalers (West Basin, Central Basin, Inland Empire Utilities Agency, Western and Eastern) have developed their own recycling plans and distribution lines. Those who have not acted have left the initiative to the individual retailers in their areas or to other local agencies. Typically, Municipal water districts that have developed their own recycling capability sell recycled water to their imported water customers (cities and water districts) and to individual entities like industrial plants, Caltrans, cemeteries, etc., but they also use it for groundwater replenishment. West Basin sells its purified water (about 27% of its recycled water sales, at $533 per AF (WBMWD, 2011b)) to Los Angeles County Flood District that manages the West coast barrier, a series of injection wells along the coast between the Los Angeles International Airport and the Palos Verdes Peninsula that protects the groundwater basin from salt water intrusion. Inland Empire Utilities Agency sells its recycled water to the Chino Basin Watermaster that spreads water in percolating basins owned by the Chino Basin Water Conservation District (at a $ 145 per AF rate, IEUA, 2012)).

**Groundwater, watermasters and management plans**

As explained previously, MWD provides about 41% of the water supply for its service area, the rest is provided by limited recycling operations and by groundwater. Cities and water districts own their own pumping wells and draw water to sell to their customers.
According to the Little Hoover Commission (2010, 19), the State of California, unlike other Western states, except Texas, does not regulate groundwater use at the State level, leaving it to a multiplicity of agencies to manage groundwater through different means. Because of the lack of state regulation, agencies establish mutual agreements or have to appeal to the courts to settle conflicts through adjudications. As a result, groundwater pumping in Southern California is subject to multiple and diverse rules. There are 47 groundwater basins in the MWD service area. Seventeen of them (mainly located in San Diego County) have low quality water and are too small to be used for domestic and industrial usage, while the other 30 actively supply water for urban usage. Out of these 30, twelve have been adjudicated\(^7\) by a court order, one is managed by a special district, six are un adjudicated, but managed through mutual agreements and management plans, three are under court jurisdiction, and eight are un adjudicated (generally small and used only by one entity –Figure 2-4, DWR, 2003; MWD, 2007, Appendix A).

Basins that have been adjudicated are managed by a court appointed watermaster. Watermasters administer the judgment, monitor water extraction, make sure that all the parties abide by the judgment rules and assess a fee according to the water each party extracts to cover their administrative costs. Most watermasters are very small organizations that rely on Municipal Water District or individual cities for administrative headquarters and personnel. DWR, through its local offices, acts as watermaster for the West and Central Basins. Groundwater management strategies adopted by the courts and implemented by the watermasters are quite diverse. Most basins have been adjudicated with a fixed pumping allocation above the native safe yield of the basin, if the hydrological conditions do not support the safe yield set by the judgment, recharge water, recycled or imported, must be purchased and percolated into the basin. The amount of supplemental recharge depends on annual hydrologic conditions and on the pumping activity of rights holders. Usually watermasters assess a management fee and additional charges for replenishment water, based on the amount of each party’s over pumping.

\(^7\) In some California groundwater basins, as the demand for groundwater exceeded supply, landowners and other entities turned to the courts to determine how much groundwater each party could extract. The courts study available data to arrive at a distribution of the groundwater that is available each year, usually based on the California law of overlying use and appropriation. Many of these cases have been resolved with a court-approved negotiated settlement, called a stipulated judgment that guarantees to each party a proportionate share of the groundwater that is available each year. Adjudications represent one of the strongest forms of groundwater management in California. These adjudications, in effect, result in regional groundwater management, with varying rules depending on the court ruling.
Figure 2.4 Groundwater Basins in Southern California

Status of groundwater basins in Southern California

Source: MWD 2007

Watermasters do not manage replenishment on their own, they rely on other organizations. Usually they rely on replenishment special districts that purchase water from MWD’s wholesalers and deliver it to replenishment basins. Some of these basins are managed either by the Counties or by the US Army Corps of Engineers.

The fragmented and diverse nature of groundwater management can lead to overdrafts, saltwater intrusion, and in general, an inability to plan realistically based on future projections of groundwater supplies. However, the State Water Control Resources Board and the courts are increasing their awareness of the need for regulating groundwater sources, which has led to an emphasis on conjunctive use, and, and more broadly, integrated water management efforts.
Water retailers

The retail water system in Southern California is highly fragmented. Most water service agencies don’t follow political boundaries and it is not rare that citizens of a city are served by 3 or 4 different water companies depending on where they live.

In the MWD service area, the retailers providing water to households and businesses are 215. Eighty five are cities, such as Los Angeles and Huntington Beach, 57 special districts such as the Cucamonga Valley Water District, 33 are divisions of Investor Owned Utilities (IOUs), 32 are mutual companies, 4 are county waterworks district and 4 are other institutions such as the Boy Scouts, Camp Pendleton Marine Base and universities (Figure 2-5).

Figure 2.5 Water retailers in Southern California

Cities have a more general focus, and water management is embedded in their public utilities or public works department. Special districts, on the other hand, have a specific focus, they are usually concentrated on water management. They are governed by a board elected by the residents in their service area, can levy property taxes and have fewer restrictions in making investments. Mutual companies are owned by the water users that live in their service area, they
are generally very small (less than 3,000 customers) and deliver water exclusively to their members.

IOUs in Southern California are divisions of larger companies. They have a smaller number of customers than cities and special district. They are under the oversight of the CPUC, which approves their budgets, their rates and their conservation strategies.

Water retailers are the ultimate link of the water supply chain, the agencies that have the closest relationship with the customers. Their attitudes toward water conservation are very different throughout the area. Some are very active in designing their own programs (especially large cities such as Los Angeles), some rely on the programs designed by the wholesalers and by MWD and advertise them heavily, and some have a more hands off approach. All of them, however, set rates, one of the most effective tools to encourage water conservation. Rates are also highly variable, some retailers have implemented tiered budget rate systems, that, depending of the lot size, the season and the household size, assign a set amount of water to each customer at a low rate and have inclining rates for higher water consumption, other have simple tiered-based rate and some still charge a flat rate per unit of water sold.

Other local transactions and water wholesalers

Exchange of potable water among retailers is not uncommon. Groundwater rights holders lease their rights if their pumps are not working or if their water is too polluted to be used. Neighboring agencies help each other if a pump breaks or in moments of need, large retailers sell water to smaller retailers, so potentially every water retailer is also a wholesaler. Two other water wholesalers that operate in Southern California could also be important for future water resource planning in the region: the Imperial Irrigation District, and the Covina Irrigation District. The Imperial Irrigation District supplies Colorado River water to MWD in exchange for MWD’s investments in water efficiency infrastructures, and it also supplies water to the San Diego County Water Authority. Covina Irrigation District owns and operates surface water diversion facilities on the San Gabriel River, groundwater wells in the Main San Gabriel groundwater basin, and a distribution system that enables it to sell wholesale water to water retailers in the North East Los Angeles County.

Findings

Federal Agencies Playing important roles include Bureau of Reclamation, Army Corps of Engineering and EPA. For example, the Bureau of Reclamation manages the Central Valley Project (CVP). In the future, the Bureau could play an important role in the transfer of water rights between agriculture and urban uses.

Multiple State Agencies Split Roles in Water Management. Agencies in state departments of Natural Resources, Environmental Protection and Health and Human Services split roles in water supply planning and management, rights administration and water quality control. DWR is the major state department in charge of water planning and the State Water Project (SWP). Recent influential reports call for the integration of state water management functions.

Forthcoming Bay Delta Conservation Plan Proposes Twin Tunnels to Secure the Reliability of Southern California’s Imported Water Supply. The State Water Project funnels water from the Sierra Nevada through the Bay Delta to Southern California. Using the Delta as a conduit for the SWP further threatens an already imperiled Delta. The Bay Delta Plan is proposing to construct twin tunnels to bypass the Delta, thereby reducing the Delta’s vulnerability and increasing the reliability of imported water for Southern California. With a projected cost of $23.7 Billion to be paid by user fees, this project could foreclose other water supply options for Southern California.

California Mandates Urban Water Conservation, Further Develops Standards for Plumbing Fixtures and Extends their Use Beyond New Construction. In addition to SBX7-7, the 2009 Water Conservation bill that mandated the 20 x 2020 targets of the State’s Water Conservation Plan, California has recently enacted several laws and standards that combine to replace inefficient indoor water plumbing fixtures with water efficient ones for new construction starting in 2011, and for the pre-1994 building stock starting in 2014. This combination of policies will have a significant effect on water consumption in the State.

Increasing Recognition of Need to Conduct Integrated Regional Management. The 2002 IRWM Act was followed by two bond issues passed by voters providing funds ($1.5 B) for the planning and implementation of integrated water projects. The Act requires several water agencies to join together for developing plans and projects.

MWD, Southern California’s Largest Regional Water Agency Manages Imported Water. Southern California water agencies depend to some extent, directly or indirectly on MWD’s water imports. MWD’s imports come from two main sources, the Colorado River Aqueduct, and the State Water Project, which conveys water from Northern California through the Sacramento-San Joaquin River Delta.

MWD Clients, Retailers and Wholesalers. MWD provides imported water to Southern California consumers through a more or less complex set of water agencies. The agency has 26
member agencies, which have voting rights on its policies. Some of these agencies (15) are retailers, mostly municipal utility departments, such as Los Angeles Department of Water and Power, and one special district that retails water to customers. The other 11 agencies are wholesalers, that is, they buy in bulk from MWD and sell water to groups of retailers. Typically, these wholesalers, such as the Inland Empire Utilities Agency or the Municipal Water District of Orange County, also provide other services to retail agencies, such as recycling water, or conservation rebate programs. The customers of these wholesalers could be city departments, for example, one of the clients of the Municipal Water District of Orange County is the Utility Department of the City of Huntington Beach; or they could be special districts that sell water to city residents, for example, Cucamonga Valley Water District provides water for the residents of the City of Rancho Cucamonga.

**Increasing Imported Water Prices, and MWD’s Pricing System.** From 2003 to 2011, MWD prices for both Tiers and 2 almost doubled, increases which have become controversial. MWD’s pricing system includes two tiers, with Tier 1 prices calculated on the average price of water plus maintenance, operations and energy costs; while Tier 2 charges are based on the marginal costs of acquiring new water. MWD also includes an innovative water stewardship component to fund conservation, water recycling and groundwater recharge measures of member agencies.

**Groundwater Unregulated by the State, Requires Legal Settlements or Agreements in Case of Conflicts.** The State of California, unlike most other Western states, does not regulate groundwater use at the State level, leaving it to a multiplicity of agencies to manage groundwater rights conflicts. Because of the lack of state regulation, agencies have often reverted to the courts to settle conflicts through adjudications or have made agreements among themselves. But the resulting fragmented nature of such management can lead to overdrafts, saltwater intrusion, and in general, an inability to plan realistically based on future groundwater supplies. However, the State Water Control Resources Board and courts are increasing their awareness of the need for regulating groundwater sources, which has led to an emphasis on conjunctive use, and integrated water management efforts

**MWD and Wholesalers Motivated to Increase Conservation among Member Agencies, and Alternative Sources of Supply, including Recycling.** MWD dedicates a portion of its revenues, raised through its stewardship charge, to fund conservation rebates and other best management practices for its member agencies. According to its 2012 Report to the Legislature, MWD sources also supported local agency efforts that generated about half the recycled water and the grounded water recovered in the region.
References

California Department of Water Resources. 2012. Bay Delta Conservation Plan: A Comprehensive Solution. DWR, p. 5. Fall 2012. Available at:


Metropolitan Water District (MWD) (2002) *Adopt (1) recommended water rates and charges; (2) resolutions to impose charges, for fiscal year 2002/03; (3) authorize $693,000 for the modification of the Water Information System to support the information and invoicing requirements of the new rate structure; and (4) approve changes to Metropolitan’s Administrative Code to support the implementation of the approved rates and charges*, March 12, 2002 Board Meeting Minutes 9-1

Metropolitan Water District (MWD) (2007a) *Approve fiscal year 2007/08 budget actions*, June 12, 2007 Board Meeting Minutes 8-2


Metropolitan Water District (MWD) (2010a) *Approve proposed 2010/11 fiscal year budget*, April 13, 2010 Board Meeting Minutes 8-1


Metropolitan Water District (MWD) (2012c) *Historical Water Rates Table*, available at http://www.mwdh2o.com/mwdh2o/pages/finance/finance_02.html


Municipal Water District of Orange County (MWDOC) (2011b) *Annual Budget for Fiscal Year 2011-12*, Fountain Valley


