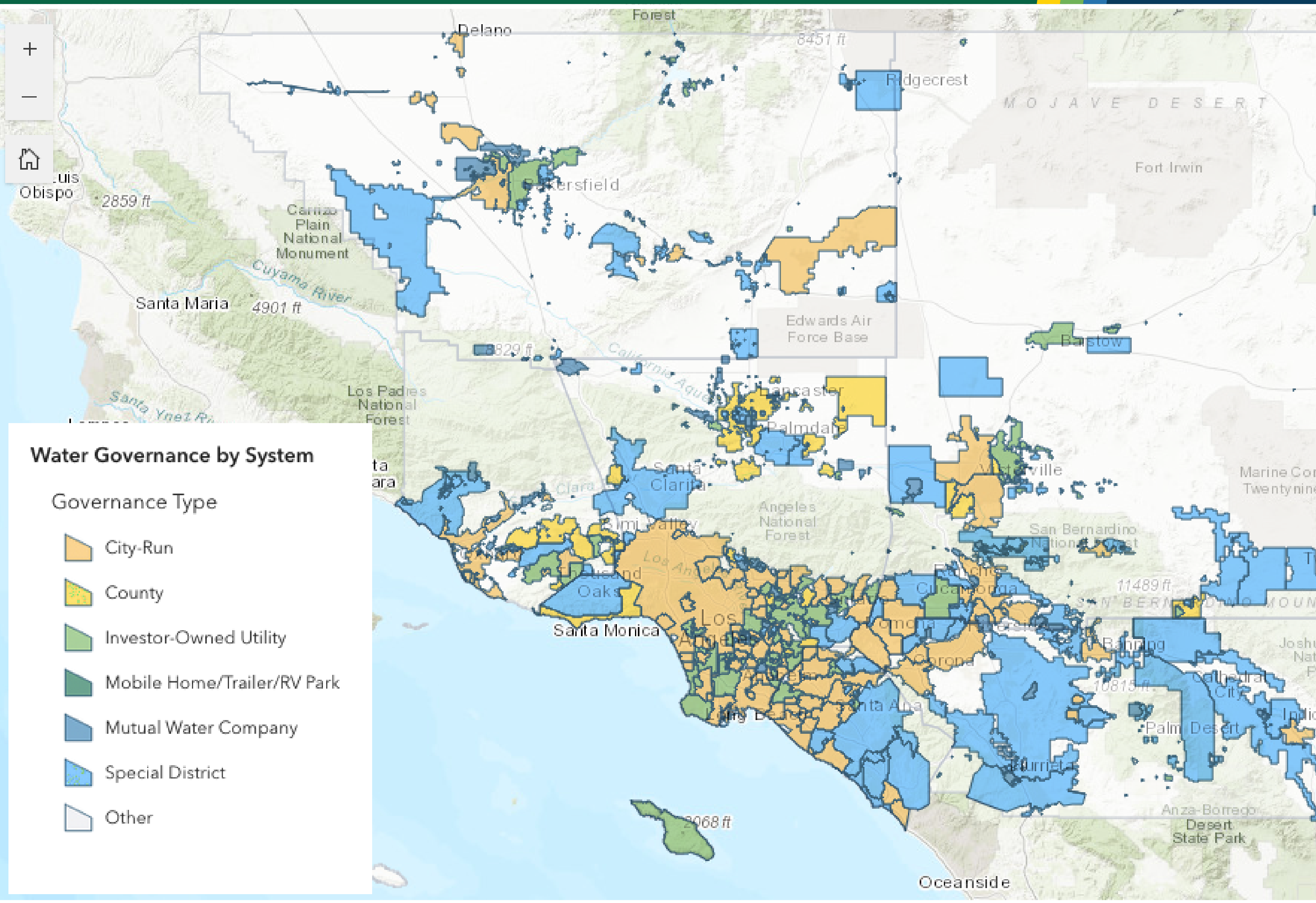
UCLA Luskin Center for Innovation

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

The 2025 Southern California Community Water Systems Atlas

INFORMING THE IMPLEMENTATION OF CALIFORNIA'S HUMAN RIGHT TO WATER



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REPORT

UCLA Luskin Center for Innovation

Informing effective and equitable environmental policy

The Luskin Center for Innovation conducts actionable research that unites UCLA scholars with civic leaders to solve environmental challenges and improve lives. Our research priorities include the human right to water, community-driven climate action, heat equity, clean energy and zero-emission transportation. We envision a future where everyone has healthy, affordable, and resilient places to live, work, learn, and play.

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We acknowledge the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (the Los Angeles basin and So. Channel Islands). As a land grant institution, we pay our respects to the Honuukvetam (Ancestors), 'Ahiihirom (Elders), and 'eyoohiinkem (our relatives/relations) past, present, and emerging.

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Cover photo: Southern California Community Water Systems Mapping Tool, drinking water system governance type

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EXECUTIVE SUMMARY

Community water systems (CWS) are the fundamental building blocks of California's water supply network. They serve on the front lines of directly providing access to drinking water and other essential water supply needs for residential, commercial, and institutional customers. These systems are essential yet face the need to adapt to climate-driven challenges such as drought and the broader need for supply diversification and resilience. Despite their critical role, many CWS face persistent barriers, including aging infrastructure, financial limitations from multiple directions, and increasingly stringent regulatory requirements. Small and under-resourced systems, in particular, often operate with limited oversight and fragmented governance, which hinders their ability to meet water quality, equity, and efficiency goals.

This report and the associated 2025 Southern California Community Water Systems Mapping Tool expand upon previous analyses conducted in 2015 and 2020 by the UCLA Luskin Center for Innovation, focusing on Los Angeles County's roughly 200 community water systems. The 2025 Southern California Community Water Systems Atlas expands the assessment of Los Angeles County's CWS and extends the scope to include five additional Southern California counties: Kern, Orange, Riverside, San Bernardino, and Ventura. Covering a total of 663 community water systems serving roughly 40% of the state's population, this comprehensive review looks across the diversity of systems in terms of size, governance, and service capacity—from small associations serving a few dozen residents to large-scale utilities serving millions. Analyses are primarily, although not exclusively, focused on Human Right to Water performance—or access to safe, clean, affordable water.

While many systems demonstrate reliable performance, some continue to face critical issues related to water quality, reliability, and affordability. Findings highlight the need for targeted oversight and sustained investment to address disparities and ensure long-term resilience, especially in response to local disasters such as the 2025 Los Angeles wildfires. The 2025 Atlas aims to support policymakers and researchers by providing a robust data resource and a clear baseline for future monitoring of community water system performance throughout Southern California.

Key Findings

Size and Governance Trends

- **Mild community water system consolidation in Los Angeles:** Compared to 2020 when there were 205 community water systems in Los Angeles (L.A.) County, there has been some degree of consolidation, with slightly fewer community water systems (n=198) recorded in 2025.
- **Water system sprawl in Kern:** Among the six counties, Kern County has significantly more water systems relative to its population than its southerly and western neighbors; it has the lowest average customer system population per water system.
- **Diversity of governance types:** CWS are very diverse in terms of governance type, with no single form consistently in the majority across the counties. County water systems

are only present in three counties—Los Angeles, San Bernardino, and Ventura. Each of the other six common water system governance types is present in all of the counties. Specifically in Los Angeles, mutual water systems are the most common, at 26%, closely followed by city-run systems at 24% and investor-owned utilities at 19.5%.

- City-run systems and special districts serve a significant amount of the population across each of the counties. Additionally, while mobile home water systems compose about 6%-15% of systems in Los Angeles, Kern, Riverside, San Bernardino, and Ventura, they serve less than 1% of the counties' population.

- **Large water systems serve the majority of the population:** Despite the high number of systems, over 90% of residents in each county are served by water systems designated as Large (10,001-100,000 customers) or Very Large (>100,000 customers).

Water Quality Trends

- **Kern County drinking water quality concerns:** Kern County recorded the highest number of Maximum Contaminant Level (MCL) violations, with 1,546 violations across 91 systems over the last 10 years—more than three times the number of the next highest county. Over 55% of its systems had MCL violations, pointing to chronic problems likely tied to agriculture, groundwater contamination, and under-resourced small systems.
- **Orange County consistently performs well:** Orange County had the fewest violations in both MCL and M&R (monitoring and reporting) categories, likely due to strong governance by agencies like the Orange County Water District and low reliance on contaminated groundwater.
- **Maximum Contaminant Level (MCL) violations in L.A. County are decreasing:** The share of water systems with an MCL violation in the past five years declined from 12% in 2020 to about 10% in 2025.
- **Groundwater quality and dependency raise a variety of equity concerns:** Kern County's 91% primary reliance on groundwater—coupled with high MCL exceedances and limited treatment capacity—places disadvantaged communities at heightened risk. Similar but less alarming trends are seen in San Bernardino and Riverside. Orange County has a very low proportion of systems primarily or exclusively reliant on groundwater, with Los Angeles nearly evenly split.
- **Reporting violations alone is insufficient:** Recurring MCL violations by the same systems over time point to the need for deeper investments in technical assistance, infrastructure upgrades, and potential consolidation of failing systems—especially in rural and disadvantaged areas.

Affordability Trends

- **Rate structures impact affordability:** The majority of systems studied (73.1%) use a "Fixed + Tiered" Rate structure. Analysis of rate structures across six Southern California counties showed "Fixed + Tiered" had higher monthly bills compared to other structures.
- **Water bills rising faster than inflation:** In Los Angeles County, average water bills at the 12 centum cubic feet (CCF) level of consumption grew from $50 in 2015 to $79.50 in 2025, an average annual increase of 4.7%, outpacing average annual inflation (3.8%).
- **Disadvantaged communities often pay higher rates:** Disadvantaged communities (DACs) and severely disadvantaged communities (SDACs) in counties including Orange, Kern, and San Bernardino often pay as much or more than non-DACs.
- **Fire suppression charges vary widely:** With inconsistent terminology, application, meter size requirements, and billing formats, the lack of standardization of fire suppression charges levied by CWS complicates efforts to assess and compare how water systems directly recover revenues for firefighting purposes.

Accessibility Trends

- **Water use is fairly consistent in winter, but varies in summer:** During the winter, residential gallons per capita per day (R-GPCD) is relatively consistent across most counties, ranging from 68.40 to 72.09 GPCD. Riverside County, however, stands out with a significantly higher average winter R-GPCD of 93. In contrast, summer water use exhibits notably greater variation across counties. Los Angeles reports the lowest average summer R-GPCD at 87.03, while Orange and San Bernardino counties report slightly higher averages of 93.4 and 95.84 GPCD, respectively. Kern and Riverside counties, however, experience much higher average summer usage, at 123.8 and 133.9 GPCD, respectively. All counties comfortably exceed the GPCD Human Right to Water and Conservation as a Way of Life indoor minimum standards for supply.
- **Modest conservation in L.A. County:** There has been further modest conservation seen in Los Angeles County compared to 2020. Los Angeles has experienced a 9% decrease in average winter and summer residential water use compared to its 2020 demand of 72.51 GPCD in winter and 99.35 GPCD in summer.
- **Drought experience and preparedness are higher in vulnerable systems:** Of the systems evaluated, 310 (46.8%) had adopted a drought preparedness or water shortage plan by 2022. However, among systems that reported shortages, the majority (70%) had such plans—suggesting that planning alone does not eliminate shortages.

1. INTRODUCTION

1.1. Atlas Overview

Community water systems (CWS) are the fundamental building blocks of California's water supply network. They serve on the front lines, directly providing access to drinking water and other essential water supply needs for residential, commercial, and institutional customers. These systems are essential, but they urgently face climate-driven challenges such as drought, which demand adaptation measures and supply diversification. Despite their importance to society, many water systems still face challenges that impede the provision of clean, safe, affordable drinking water. Many systems suffer from chronic under-investment due to low community willingness or ability to pay, which hampers efforts to replace aging infrastructure. In addition, more stringent drinking water quality standards require additional costs for treatment and operator training. Some poorly performing water supply systems operate under nominal public oversight in spatial patterns that do not fulfill environmental, efficiency, or equity criteria and do not cohere with existing administrative jurisdictions (Pierce et al. 2019). These inconsistencies give rise to system inefficiencies, low capacity, and insufficient resource bases to perform well.

Since the passage of AB 685 in 2012, which established the Human Right to Water (HRW) for all Californians, multiple state and regional efforts have focused on ensuring safe, clean, affordable, and accessible water. While this Atlas goes beyond analyzing HRW performance, it is primarily motivated by and focused on HRW outcomes.

The UCLA Luskin Center for Innovation previously conducted the first system-wide analysis of CWS in Los Angeles (L.A.) County in 2015 (Pierce et al. 2015) and published an updated analysis in 2020 (Pierce et al. 2020). This 2025 report builds on the 2020 atlas update by both updating our understanding of the current performance of L.A. County CWS and expanding analysis to encompass neighboring counties in Southern California, including Kern, Orange, Riverside, San Bernardino, and Ventura. This coverage represents 40% of the state's population.

The 2025 expansion of this analysis allows for a comparison of water system characteristics across these geographies, represents a first-time effort for analysis of CWS in the additional five counties, and enables future analyses to track performance changes from this established baseline—as has been previously done with L.A. County. As a decade of data is already available for Los Angeles County, this report primarily focuses on analyzing changes in metrics over time within Los Angeles while also providing and analyzing key contemporary characteristics in the newly added counties.

This analysis includes a comprehensive review of 663 CWS, which vary in size, geography, the types of communities they serve, and their technical, managerial, and financial capacities. This represents a threefold increase from the 205 CWS analyzed within the 2020 L.A. County analysis.

These systems range from small homeowners associations or mobile home parks serving only 25 people, such as the Royal Carrizo Homeowners Association in Riverside or the Mitchell's Avenue Mobile Home Park in L.A., to the Los Angeles Department of Water and Power, with nearly 4 million customers—and include every type and size of system in between. Further, the governance structures of community water systems vary widely, and systems are governed by at least five distinct, major bodies of state law. Adding to this complexity, smaller water systems are often exempted from some statewide water conservation, affordability, and other performance and preparedness reporting regulations. As a result, federal and state oversight and knowledge of smaller community water systems are fragmented and often limited.

As we note above, our analysis is primarily, although not exclusively, focused on and motivated by the Human Right to Water. The majority of the analyzed water systems are generally well-functioning and, with proper oversight and strategic investment, will continue to adequately serve their customers for decades to come. However, some CWS currently struggle and exhibit drinking water quality, reliability, and affordability concerns. These issues occur in diverse communities across Southern California.

The Southern California Community Water Systems Atlas and associated mapping tool are intended to improve public and policymaker understanding of community water systems and their performance within Southern California, and to provide a data resource for researchers. However, we note that this review represents only a snapshot in time. Future analysis will be required as new data become available, new challenges emerge, and systems make progress addressing challenges in holistic water supply provision across Southern California.

A NOTE ON THE IMPACTS OF THE 2025 LOS ANGELES FIRES

In January 2025, L.A. County experienced multiple fast-moving fires that began as wildland events but quickly spread into urbanized residential areas, destroying thousands of homes as well as critical infrastructure. The most affected communities were within the Palisades and Eaton fire areas, which sustained significant damage to water system infrastructure. Eleven water systems were affected by these fires—eight by Eaton fire and three by the Palisades fire.

The aftermath of the L.A. fires compounded water system issues, as smoke, ash, chemicals, and debris contaminated local water sources. As water systems struggled to maintain both fire suppression and basic services, the long-term impacts on water quality became a major concern. Residents in affected areas found their access to clean drinking water threatened—and, in some cases, halted—and the need for swift recovery efforts became clear. This highlighted the need to simultaneously design water system infrastructure that prioritizes system reliability during extreme events while also maintaining safe, reliable service in day-to-day operations.

The increased frequency and intensity of urban fires demands continued research into effective interventions to protect water systems and optimize their performance under changing conditions. We anticipate this will continue to be a major area of research for the UCLA Luskin Center for Innovation. We note that this 2025 report does not focus on fire, only briefly covering issues related to the role of financing for the everyday fire flow and firefighting obligations of CWS.

The water system-fire nexus will continue to garner more attention in the coming years. In the meantime, we refer readers to the following resources on the topic:

- A high-level overview of the impacts of the January 2025 Los Angeles fires on water systems across Los Angeles County can be found in "How have the LA Fires affected water systems in LA County? An Early Overview" published by the UCLA Luskin Center for Innovation.
- The recently released final research report for the Los Angeles County Blue Ribbon Commission, which some of the authors of the present report also contributed to, provide recommendations for bolstering community water system resiliency to and recovery from the fires.
- A June 2025 UCLA Urban Planning student report outlines expectations and current levels of wildfire preparedness for small water systems in the County.
- The UCLA Luskin Center for Innovation Fire Hub webpage contains more resources focused on the relationships between community water supply systems (CWS) and wildfires.

RELEVANT LEGISLATIVE AND POLICY DEVELOPMENTS

We also briefly note recent, relevant legislative and policy developments in this space to contextualize our analysis. These topics are covered more fully in our and colleagues' other recent reports. Starting in 2012, Governor Jerry Brown signed Assembly Bill 685 into law, confirming California's commitment to ensuring a Human Right to Water for every individual in the state because "every human being has the right to safe, clean, affordable, and accessible water." Recent developments in California's initiatives to uphold the Human Right to Water have led to progress in enhancing drinking water quality and infrastructure.

Established under Senate Bill 200, the Safe and Affordable Drinking Water Fund continues to support the State Water Resources Control Board's (SWRCB) Safe and Affordable Funding for Equity and Resilience (SAFER) Program. In August 2024, the SWRCB released the final Fiscal Year 2024-25 Fund Expenditure Plan, detailing the allocation of funds to address the needs of underperforming drinking water systems. This plan emphasizes sustainable solutions, including technical assistance, infrastructure improvements, and emergency support to ensure safe drinking water across California.

While the state commissioned the Assembly Bill 401 process and report and tracks affordability metrics at the water system level, which inform the SAFER expenditure plan, it does not provide direct affordability support to customers. Efforts to pass a statewide assistance program have seen moderate success in the state legislature, but the governor has repeatedly declined to support such a program.

Further, the SWRCB has initiated strategies, particularly in underserved regions, to increase state small water system and domestic well user resiliency during extreme water shortages and drought. This initiative includes data sharing and funding for counties to develop tailored programs offering solutions such as water sampling, consolidation, and point-of-use treatment. Additionally, in compliance with Senate Bill 552, the SWRCB, in collaboration with the California Department of Water Resources, has developed templates for Water Shortage Contingency Plans tailored for small water suppliers. These templates assist small water systems in preparing for and managing water shortages, enhancing resilience and sustainability in rural communities

After a long and contested process, the SWRCB also adopted the "Making Conservation a California Way of Life" regulation in July 2024, which has implications for per-capita water use and accessibility. This regulation sets long-term water use efficiency targets for urban retail water suppliers, promoting tailored conservation goals that consider regional differences, including those in Southern California. The initiative aims to achieve lasting water savings and adapt to climate-induced challenges.

At the local level, Los Angeles County has made commitments to the Human Right to Water progress in its *OurCounty Sustainability Plan* as well as its *County Water Plan*. Many water systems within Los Angeles, Kern, Orange, Riverside, San Bernardino, and Ventura counties have been implementing increasingly aggressive water conservation programs, especially over the last decade, and offering rebates for water-efficient appliances, such as the SoCal Water$mart program through the Metropolitan Water District of Southern California and the San Bernardino Municipal Water Department Smart Irrigation Controller Rebates.

2. DATA AND METHODS

Community water systems (CWS) vary considerably concerning water supply sources, governance types, technical, managerial, and financial capacities, demographics, and geography. This guide serves as a tool for understanding these key dimensions of community water systems.

We characterize CWS attributes by drawing from multiple sources of publicly available data. No single repository of system attributes exists, and with this report and accompanying documentation, we attempt to provide a one-stop source for accessing CWS data at one point in time. While the state continues to improve the quantity, quality, and availability of data on CWS, compiling the dataset took considerable manual effort.

We collected and analyzed data for each of the active CWS in Los Angeles, Kern, Orange, Riverside, San Bernardino, and Ventura counties about the main dimensions of the Human Right to Water: quality, affordability, and accessibility. We also collected and analyzed other metrics related to water system performance, including technical, managerial, and financial (TMF) factors, system governance, and characteristics of system populations. Table 1 shows each major data source used in this 2025 update.

TABLE 1

Summary of Data Sources

Analysis Category	Metric	Source
Governance & Population	Governance Type	"2023 California Community Water System Institutional Type Update" dataset by Kristin Dobbin
	Size	SWRCB *2024 Drinking Water Needs Assessment*
	Median Household Income	SWRCB *2024 Drinking Water Needs Assessment*
Technical, Managerial, Financial	Number of Interties	SWRCB *2024 Drinking Water Needs Assessment*
	Operator Certification Violations	SWRCB *2024 Drinking Water Needs Assessment*
	Significant Deficiencies	SWRCB *2024 Drinking Water Needs Assessment*
	Monitoring and Reporting Violations	California State Water Board's State Drinking Water Information System (SDWIS)
	Total Annual Expenses	2022 California SWRCB Electronic Annual Report
	Total Annual Revenue	2022 California SWRCB Electronic Annual Report
	Days of Cash on Hand	2022 California SWRCB Electronic Annual Report
Quality	Maximum Contaminant Level (MCL) Violations	California State Water Board's State Drinking Water Information System (SDWIS)
	Number of Sources	SWRCB *2024 Drinking Water Needs Assessment*
	Percentage of Sources Exceeding an MCL	SWRCB *2024 Drinking Water Needs Assessment*
	Presence of Constituents of Emerging Concern	SWRCB *2024 Drinking Water Needs Assessment*
Affordability	Water Rate Structures and Billing Levels for Single-Family Residential Customers	Internet Research, Email Outreach, Phone Calls
Accessibility/ Reliability	Projected Water Shortages	2022 California SWRCB Electronic Annual Report

2.1. Governance and Population

The CWS in the six Southern California counties have a variety of governance structures and serve very different customer bases. The CWS has differing vulnerabilities and capacities to cope with and respond to system and customer needs. To evaluate these capacities, we characterized each of the 663 CWS according to:

- **Governance Type:** Nearly every CWS is subject to one of eight governance structures, each of which is regulated by a distinct source of state law. California Water Code regulates special districts like irrigation districts, county water districts, and county waterworks districts, to name a few. The California Government Code regulates community services districts. California Public Utilities Code regulates public utility districts (Division 7) and private utility districts (governed by the Public Utilities Commission). Municipal water systems are often governed by local municipal codes. Finally, mutual water companies are regulated by the California Corporations Code. Understanding how many community water systems of each governance type serve Southern California communities can help us scope the potential local impacts when California policymakers change regulations about water, government, public utilities, municipal, or corporate codes. For the 2025 analysis, systems were characterized using the "2023 California Community Water System Institutional Type Update" dataset published by Kristin Dobbin. **Size of Population Served:** CWS range dramatically in terms of the populations they serve. Adding to this complexity, smaller water systems are often exempted from statewide water conservation, financial, and consumption reporting regulations. Using the system population reported in the SWRCB's *2024 Drinking Water Needs Assessment,* we categorized each CWS based on the system size breakdowns used by the U.S. Environmental Protection Agency. These categories include: Very Small (<500), Small (501-3,300), Medium (3,301-10,000), Large (10,001-100,000), and Very Large (100,000+).
- **Other Customer Characteristics:** The average median household income per CWS was also collected from the *2024 SAFER Drinking Water Needs Assessment.*

2.2. Quality

The number and type of maximum contaminant level (MCL) and monitoring and reporting (M&R) violations were compiled from the California State Water Board's State Drinking Water Information System (SDWIS) for the years 1990 to 2024. These data were reported at the CWS level and violations were analyzed over the past 5-year (2020-2024) and 10-year (2015-2024) periods for comparison with previous iterations of this analysis.

The primary way to assess water quality compliance with the Safe Drinking Water Act which community water systems are subject to is through reported primary or health-related violations, known as Maximum Containment Level (MCL) violations, the standards for which exist nationally for over 90 pollutants. Primary violations (also known as health or MCL violations) occur when systems' drinking water exceeds the MCL levels established for a given pollutant. The other major non-health related violation type is the category of monitoring and reporting (M&R) violations, in which systems fail to regularly monitor water or submit results to the relevant state agency or EPA, and public notice violations from failing to adequately alert customers of serious water quality violations or failing to produce an annual Consumer Confidence Report. While there are other obscure and rare violation types, we classify all non-MCL violations as M&R violations for the purpose of this analysis.

Additionally, we collected data on risk indicators analyzed in the SWRCB's *2024 Drinking Water Needs Assessment*. These indicators included 1) whether a CWS exceeded permissible levels for the percentage of sources exceeding an MCL; and 2) whether water systems exceeded permissible levels for the presence of constituents of Emerging Concern.[1]

2.3. Affordability

We collected data on rate structures directly and manually from individual system rate sheets, which were typically obtained directly from the water systems' websites. If rates were not available online, we contacted systems via email and phone to rate data. Collected rate sheets allowed for estimation of an average household monthly water bill based on consumption levels of 6 and 12 centum cubic feet (CCF). Six CCF provides an average family of four with sufficient indoor consumption to achieve the Human Right to Water and a modest amount of outdoor irrigation (State Water Resources Control Board 2019). Rate and billing data allowed for a comparison of rates between 2015, 2020, and 2025 for Los Angeles County based on analysis performed in previous iterations of this guide, as well as a geographic comparison of the six counties for the year 2025.

2.4. Accessibility

We used metrics from different data sources to evaluate the accessibility dimension of the Human Right to Water, which is least well-defined at the state level, and wherein reliability of supply is the most important outcome of interest. Water shortage data come from the 2022 California SWRCB electronic Annual Report (eAR), which reports whether a water system projected or experienced water shortages in the previous year and whether a system had a Drought Preparedness Plan. Additionally, since 2014, Urban Water Suppliers[2] have reported monthly water production and conservation figures to the State Water Board. These publicly available data include monthly residential gallons per capita day consumption figures on the 15th of each month. Data collected for January and July serve as metrics for sufficient, typical, and potentially excessive residential water use.and potentially excessive residential water use.

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1 Constituents of Emerging Concern encompass any physical, chemical, biological, or radiological substance or matter in any environmental media that may pose a risk to human and/or ecological health, for which there is not currently published enforceable California or federal environmental or health standard, or the existing standard is evolving or being reevaluated, and/or the presence, frequency of occurrence, source, fate and transport, and/or toxicology of which is not well understood, routinely monitored, and/or may lack analytical methods.

2 Urban water suppliers are public or private systems that provide potable water to more than 3,000 end users or supply more than 3,000 acre-feet of potable water annually (CA DWR 2016).

2.5. Technical, Managerial, and Financial Capacity

We used three key data sources to assess technical, managerial, and financial (TMF) capacity and related system performance: the 2022 California SWRCB electronic Annual Report (eAR), the SWRCB *2024 Drinking Water Needs Assessment,* and SDWIS. While these data sources continue to improve, we note that the eAR is based on self-reported data from the water systems, and many systems do not provide complete data.

To inform the financial aspect of the TMF analysis, we used 2022 eAR data regarding total annual expenses, total annual revenue, and days of cash-on-hand. We developed an average operating ratio by dividing total annual revenue by total annual expenses to identify systems operating at a loss. We were not able to obtain financial data for very small private systems, such as mobile home parks, which are typically not required to report these metrics and thus may not track the data.

To assess the technical capacity of systems, we collected data from the *2024 SAFER Risk Assessment* regarding the number of interties, operator certification violations, and significant deficiencies, which the California State Water Board defines as follows:

- **Number of Interties:** An intertie or interconnection is a connection between one or more water systems where systems can either supply or receive water from each other. The presence of interties is assumed to reduce the risk of an acute or medium-term chronic water outage by allowing water systems to switch sources, if needed.
- **Operator Certification Violations:** issued to water systems that do not have an appropriately certified water treatment or distribution operator. A lack of adequately trained water treatment or distribution operators may be indicative of larger technical and managerial risks faced by the system.
- **Significant Deficiencies:** identified by State Water Board staff or a Local Primacy Agency (LPA) during a Sanitary Survey and other water system inspections. Significant Deficiencies include, but are not limited to, defects in the design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that U.S. EPA determines to be causing or have the potential for causing the introduction of contamination into the water delivered to consumers.

For the managerial component of TMF analysis, we compiled the number and type of monitoring and reporting (M&R) violations from the California State Water Board's State Drinking Water Information System (SDWIS) for the years 1990 to 2024. These data were reported at the CWS level and violations were analyzed over the past 5-year (2020-2024) and 10-year (2015-2024) periods for comparison with previous iterations of this analysis.[3]

3 Treatment technique violations were counted as M&R violations. However, these were only found in Los Angeles County over the past 10-year period and made up a very small amount of total violations (<2%).

3. FINDINGS: THE LANDSCAPE OF WATER SYSTEM CHARACTERISTICS

Several characteristics either enable or constrain systems in their efforts to adequately serve their customers. These characteristics include system size and population served, governance structure, and technical and financial capacity. Here, we provide a summary of trends across all 663 community water systems that supply water to residents in Los Angeles, Kern, Orange, Riverside, San Bernardino, and Ventura counties.

3.1. System Size

The type of water system—both in terms of the number of connections and the governance structure—directly impacts system performance. Small water systems tend to be under-resourced, experience more water quality issues, and have less capacity to address Human Right to Water (HRW) concerns (Pierce & Gonzalez, 2017). Large water systems can capitalize on certain economies of scale in distribution and treatment to provide higher quality water and more extensive infrastructure at a lower per-unit cost (Pierce et al. 2019).

Several counties exhibit "water system sprawl," with numerous small water systems serving small populations near one another and larger systems. Orange County exhibits the most consolidated water system array of all the counties and also has the lowest number of water quality violations. Los Angeles has a relatively high level of population served per system; it stands out for having the highest number of water systems, many of which are small.

Compared to 2020, when there were 205 water systems, Los Angeles County has seen some degree of consolidation, leading to a new total of 198 systems (189 serving residential customers) with a higher average customer population served.[4] Kern also has a significant number of water systems given its total population, and has the lowest average customer system population per water system of all of the counties. Many of these small systems might benefit from consolidation with nearby systems to harness economies of scale; increase resources and technical, managerial, and financial (TMF) capacity; and improve HRW outcomes (Pierce et al., 2019; Sun et al., 2025).

Over 90% of residents in each county are served by large (10,001-100,000) or very large (>100,000) water systems. Compared to the other counties, Kern has the greatest proportion of customers served by very small (25-500), small (501-3,300), and medium (3,301-10,000) water systems.

4 The customer population served refers to the estimated number of individuals receiving water service and is distinct from the number of service connections, which typically represent physical connections (e.g., households, businesses) to the water system. This section of the report discusses only the customer population, not the number of service connections.

TABLE 2

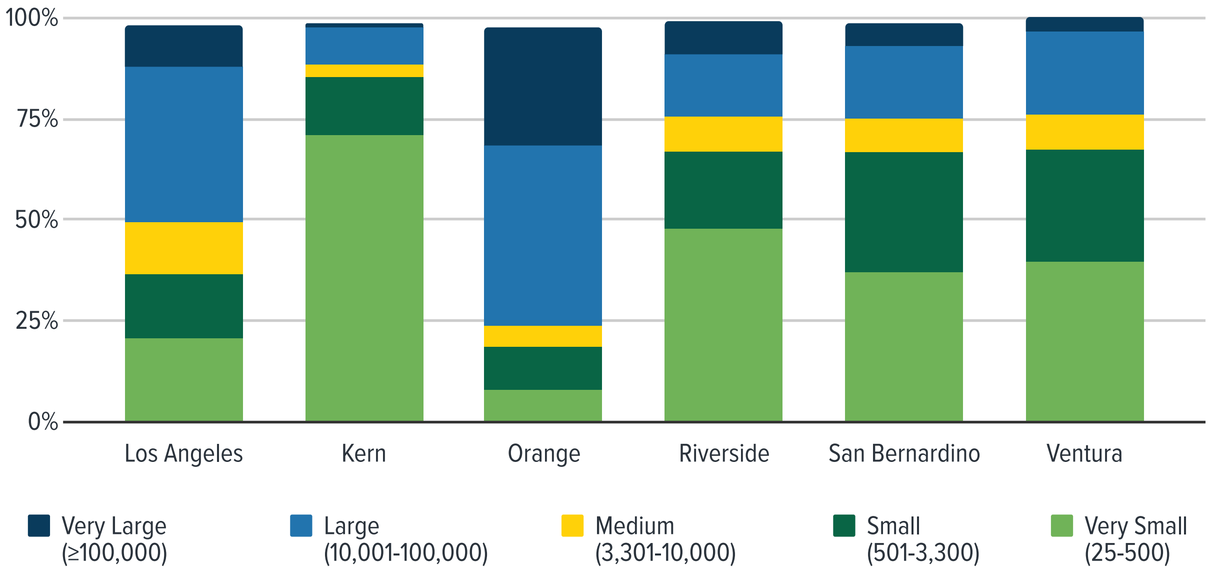
Number of Active Community Water Systems

County	Number of Systems	Average Population Served per System
Los Angeles	189	52,739
Kern	164	5,393
Orange	38	84,746
Riverside	88	27,046
San Bernardino	125	17,748
Ventura	59	13,602

The size of a community water system is determined by the number of customers it serves. Orange County has the greatest proportion of water systems that are large (10,001-100,000 customers) or very large (>100,000 customers). In Kern, Riverside, San Bernardino, and Ventura, the greatest proportion of water systems are Very Small (25-100).

FIGURE 1

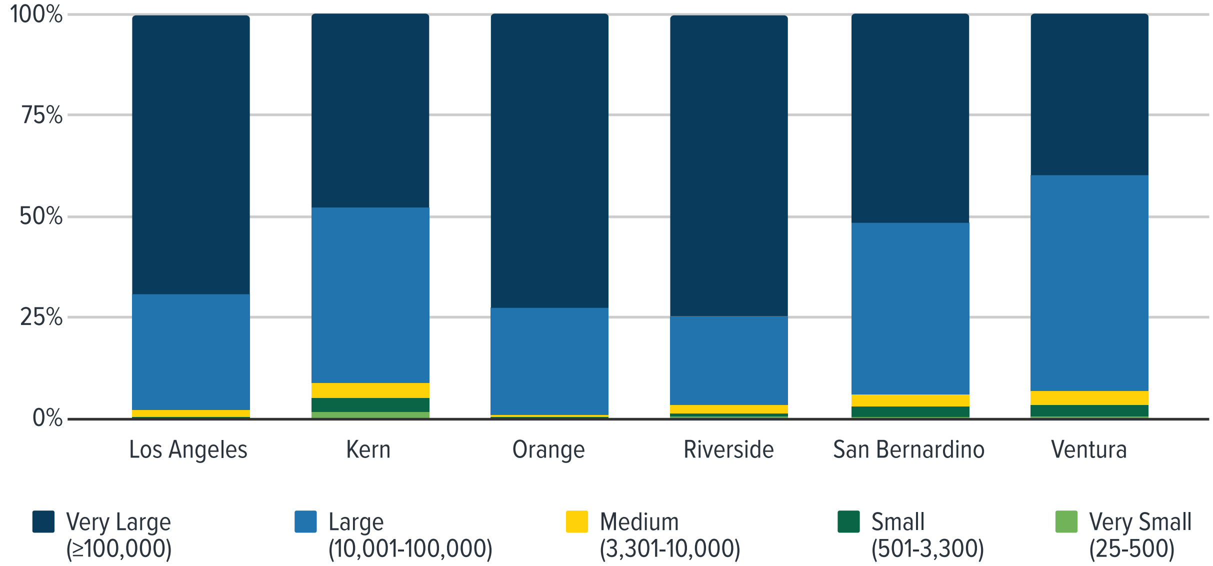
Community Water Systems by Size Category



Note: Bars do not sum to 100% because water systems with a population below 25 were excluded. This includes four systems in San Bernardino, three in Los Angeles, two in Ventura, and one each in Kern, Orange, and Riverside.

FIGURE 2

Proportion of Population Served by System Size



3.2. Socioeconomic Status

The populations served by water systems are both influenced by and, in turn, can influence the system and its performance. Variation in income and poverty levels, population density, and the share of renter versus owner-occupied housing across drinking water systems all impact water consumption patterns, relative water affordability, and accessibility outcomes.

Data on the average median household income (MHI) for a given system were gathered from the 2024 SAFER Affordability Assessment. Systems without traditional residential populations—such as year-round camps, university campuses, and prison facilities that are classified as community water systems (CWS)—were excluded from this analysis. Table 3 shows that the median household income of the counties studied ranges from $60,675 in Kern to almost double that in Orange, with large ranges in MHI in all counties.

TABLE 3

Average MHI Characteristics of County Water Systems

County	Average MHI	System with Lowest MHI	System with Highest MHI
Los Angeles	$88,569	Little Baldy ($20,691)	Kinneloa Irrigation District ($216,550)
Kern	$60,675	Rose Villa Apartments ($10,514)	Stockdale Heights Mutual Water Co. ($179,342)
Orange	$113,374	Hynes Estates Mutual Water Co. ($34,250)	Serrano Water District ($196,533)
Riverside	$69,567	Amezcua – Garcia Water ($6,038)	Glen Ivy Hot Springs ($155,077)
San Bernardino	$63,214	Gordon Acres Water Co. ($5,313)	City of Chino Hills ($145,794)
Ventura	$97,337	Cloverdale Mutual Water Co. ($36,465)	Ventura CWWD No. 17 – Bell Canyon ($202,985)

3.3. Governance Type

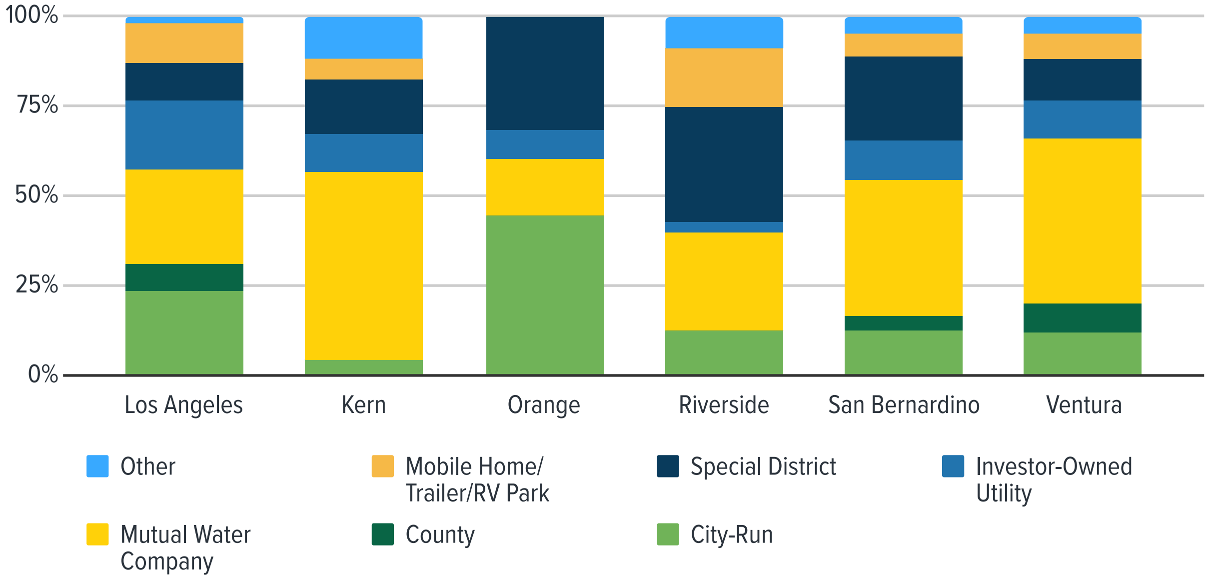
In addition to the size of a water system, the governance type of a water system determines its regulating authority and often influences its HRW outcomes and system performance. We note that governance type is also often correlated with system size. While there are dozens of sub-types (Dobbin, Fencl, and McBride, 2023), the vast majority of water systems in California can be generally categorized into seven different governance structure types: city-run systems, county-run systems, mutual water companies, investor-owned utilities, special districts, mobile home parks, and other private systems. Mutual water systems, also called nonprofit mutual water associations, as well as mobile home parks and other private systems, are frequently sized very small or small.

Each type of community water system is regulated by a different body of state law. As noted above, generally speaking, five bodies of state law regulate the formation and governance of community water systems. While water quality regulations and some state water conservation policies cut across all governance types, the lack of strong state intervention on many community water system policies and practices is partly attributable to the diversity of regulatory authority governing these systems.

Figure 3 shows the proportion of systems in each governance type. Our analysis demonstrates that the distribution of system types is highly diverse, with no single type consistently in the majority across the counties. County water systems are only present in three counties—Los Angeles, San Bernardino, and Ventura—while the other six water system governance types are present in all counties. Mutual water systems are the most common in Los Angeles, at 26%, closely followed by city-run systems at 24% and investor-owned utilities at 19.5%.

FIGURE 3

Proportion of Systems by Governance Type

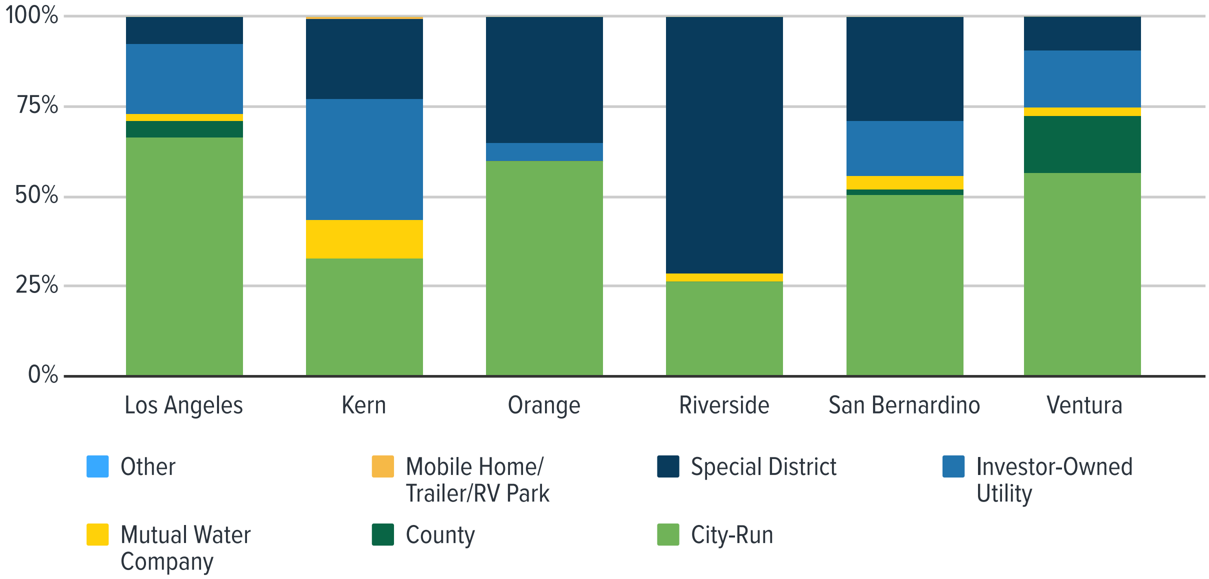


However, when accounting for the residential customer populations served by these systems, a different picture emerges. Across the counties studied, city-run systems represent a significant portion of the population served. Additionally, special districts also serve a large proportion of customers. Further, while mobile home water systems compose about 6%-15% of systems in Los Angeles, Kern, Riverside, San Bernardino, and Ventura, they serve less than 1% of the population.

In Los Angeles, 66% of customers are served by a city-run system, 38.6% of which are served by a single system (LADWP); only 2% of customers are served by the 49 mutual water companies that comprise the largest single-system governance type. This corroborates the existence of water system sprawl in the county. In other words, most residents are served by larger water systems, but there are many small water systems serving small populations in sometimes overlapping service territories.

FIGURE 4

Proportion of Population Served by Governance Type



The range of CWS in Southern California in terms of both size and governance type creates a complex landscape of regulatory authority, legal requirements, and system-level powers that, in turn, impact system operation, capacity, and HRW outcomes. Interventions to improve system performance must consider these factors to determine the appropriate actions and implementing authority

3.4. Technical, Managerial, and Financial Capacity

3.4.1. Technical Capacity

To assess the technical capacity of systems, we utilized data from the State Water Board on operator certification, the number of system interties, and the presence of significant deficiencies. Again, the presence of a certified operator is important for system performance to ensure proper system operation and address quality concerns that may arise. Interties provide redundancy and resiliency for water systems because they help to reduce the risk of a water outage by allowing water systems to switch sources. The presence of significant deficiencies is an indicator of notable defects in a system's design, operation, or maintenance identified during a regulatory site visit to the system (a "sanitary survey").

Overall, a very small proportion of systems either lacked a certified operator or had significant deficiencies. Of the 663 systems studied, 99% of systems (or 656) had treatment operators certified at a level at or above what is legally required. Two systems in Los Angeles County (1% of systems), two systems in Orange County (5%), and three systems in San Bernardino County (2%) did not have certified operators or operators at the required certification level. Only one system in Ventura and one system in San Bernardino were identified to have significant deficiencies, but a high degree of systems in Riverside were identified to have significant deficiencies (11%).

Interties can enable better sharing of water resources during droughts or other emergencies, improve overall system reliability, and reduce the likelihood of water scarcity affecting individual communities. The average number of interties per system in the counties studied ranged from 2.6 to 6.7. Ventura and Kern had an average of less than 3 interties per system, indicating that their water supply is more isolated and less connected to neighboring systems. Los Angeles had approximately 4.6 interties on average per system, indicating a moderate level of connectivity, which may offer some flexibility in managing water distribution in times of need, but still leaves room for potential improvements in inter-system collaboration. San Bernardino and Orange had the highest average number of interties at 5.9 and 6.7, respectively. This suggests that these areas have developed more extensive connections between their water systems, in turn potentially providing greater resilience against disruptions in water supply.

3.4.2. Managerial Capacity

Few robust direct measures exist to assess the managerial component of technical, managerial, and financial (TMF) capacity across large numbers of systems. Accordingly, we examined monitoring and reporting (M&R) violations as a proxy indicator of failure to comply with regulations for water quality sampling and reporting. We acknowledge that this can be a broader indicator of poor water system management, operation, and governance. This metric was also used as a measure of managerial capacity in the Office of Environmental Health Hazard Assessment's "Human Right to Water Framework" (OEHHA, 2021).

Monitoring and reporting violations are consistently more common than maximum contaminant level violations, and are commonly incurred repeatedly or multiple times per year. Between a quarter and than half the systems in each county had any reported M&R violations in the last five years (2020-2024), and there was a notable decline in M&R violations in all counties except for San Bernardino during that period. Whether that decline is due to changes in system management, regulatory practices, or reporting standards is unknown.

San Bernardino had the highest percentage of systems with M&R violations (52%) and was the only county that saw an increase in M&R violations over this five-year period compared to 2015 to 2019. Orange had the lowest percentage of systems with M&Rs (24%). The percentage of systems in Kern with M&R violations was 30%, and the systems that did have violations each had the largest number of all the counties—2.9 on average.

In Los Angeles, 27% of systems had M&R violations. Those systems, on average, had 2.4 violations. Riverside and Ventura showed similar patterns to one another, with 39% and 34% of systems with violations and an average M&R count per noncompliant system of 1.6 and 1.7, respectively.

TABLE 4

Monitoring and Reporting (M&R) Violations by County

	Total Number of M&R Violations		Percent of Systems with M&Rs		Average Number of M&Rs per Noncompliant System	
County	Past 5 Years	Past 10 Years	Past 5 Years	Past 10 Years	Past 5 Years	Past 10 Years
Los Angeles	119	280	27%	52%	2.4	2.9
Kern	147	374	30%	56%	2.9	4.1
Orange	16	35	24%	42%	1.8	2.2
Riverside	54	132	39%	57%	1.6	2.8
San Bernardino	175	281	52%	69%	2.7	3.3
Ventura	33	79	34%	58%	1.7	2.3

3.4.3. Financial Capacity

Financial capacity is a new metric in this iteration of the Community Water Systems Guide. There were limited data available despite considerable efforts made in the course of compiling the 2015 and 2020 reports. To analyze average financial capacity, we used self-reported data from the 2022 eAR (the most recent year available), calculating total annual expenses, total annual revenue, and days of cash-on-hand for the given year. To identify systems operating at a loss, we developed an average operating ratio by dividing total annual revenue by total annual expenses. However, this method is not representative of many smaller water systems in each county, such as mobile home parks, which are typically not required to report on such system metrics, and usually do not track such data because it is relatively ancillary to the water system operation (Beecher, Redican, and Kolioupoulos, 2020).

The average operating ratio of water systems was relatively consistent across the counties studied, ranging from 0.9 to 1.3—with Riverside on the low end and Ventura at the maximum. However, the California State Water Resources Control Board notes that to be self-supporting, a water system should have at least as much annual revenue as it has operating expenses, e.g., an operating ratio should optimally be equal to or greater than 1.0 (SWRCB, 2023). Riverside is the only county that falls below this ratio, at 0.9. Water systems in Orange have an average operating ratio of 1.0, placing them exactly at the self-supporting threshold. Additionally, the majority of water systems in the counties (84%-97%) have enough cash on hand to support one month of operations, but this drops by about 10% within each county when the threshold is raised to three months.

TABLE 5

Summary of Water System Technical and Financial Indicators

	Technical			Financial		
County	Systems Without Required Operator Level	Number of Systems with Significant Deficiencies	Average Number of Interties per System	Average Operating Ratio	Percent of Systems with 30 Days Cash on Hand	Percent of Systems with 90 Days Cash on Hand
Los Angeles	2	0	4.6	1.2	88%	76%
Kern	0	0	2.7	1.2	87%	77%
Orange	2	0	6.7	1.0	97%	87%
Riverside	0	8	4.1	0.9	84%	78%
San Bernardino	3	1	5.9	1.2	90%	80%
Ventura	0	1	2.6	1.3	86%	69%

4. FINDINGS: SYSTEM PERFORMANCE TRENDS

The following three subchapters evaluate trends along the three dimensions of the Human Right to Water (quality, affordability, and accessibility) to assess overall drinking water outcomes for county residents served by community water systems (CWS) across the six Southern California counties.

4.1. Quality

4.1.1. Maximum Contaminant Level Violations

The main way to assess drinking water quality compliance is through reported primary health violations, known as maximum containment level (MCL) violations, for various pollutants. Primary violations (also known as health or MCL violations) occur when a system's drinking water exceeds the MCL levels established for a given pollutant.

The data on MCL violations across the six counties over the past five and 10 years reveal clear geographic disparities and ongoing challenges in water quality compliance, particularly in the Central Valley and Inland Empire, consistent with the Water Board's *Drinking Water Needs Assessment*.

Kern County stands out with a high number of systems with violations and total violations per system. From 2015 to 2024, systems within the county recorded 1,546 violations across 91 systems—more than three times the total of the next highest county. This suggests a persistent, systemic issue with water contamination that is likely linked to the region's agricultural intensity, aging infrastructure, and a higher proportion of small or under-resourced water systems. Over the past five years, Kern has led all counties with 639 violations across 52 systems. Riverside and San Bernardino also reported notable figures (126 and 202 violations, respectively) over the same period.

Interestingly, even though Los Angeles is more urbanized and populous, it had a far lower average number of violations per system (8.3 in five years, 8.6 in 10 years) compared to Kern (12.3 and 17.0, respectively) and San Bernardino (14.4 and 17.1, respectively). This may reflect differences in oversight capacity, system size, and available funding. Larger, more regulated urban systems may have more robust compliance measures than rural or semi-rural systems.

The percentage of systems reporting MCL violations within each county further underscores these disparities. Over 10 years, more than half (55.5%) of Kern's systems had at least one violation, followed by Riverside (27.4%) and Ventura (27.1%). Orange County, by contrast, had remarkably few violations—reporting only five violations in the last decade, and only one in the last five years—demonstrating consistently high compliance.

Legislation such as the Human Right to Water Act (2012) and the implementation of the SAFER Program aim to improve drinking water access and quality in disadvantaged communities. However, progress is uneven. Rural counties like Kern, home to many disadvantaged and agricultural communities, are facing structural challenges in translating policy into practice, especially where small systems lack the technical and financial resources needed.

The persistently high average number of violations per system in Kern and San Bernardino also suggests chronic or recurring problems rather than one-off incidents. This may involve repeated failures to address contamination sources, such as known nitrate and arsenic pollution from agriculture and unregulated groundwater usage. These issues are common more broadly in San Joaquin Valley systems beyond Kern County, where groundwater serves as a primary water source but often goes untreated due to cost constraints.

FIGURE 5

Maximum Contaminant Level Violations in the Last 5 Years

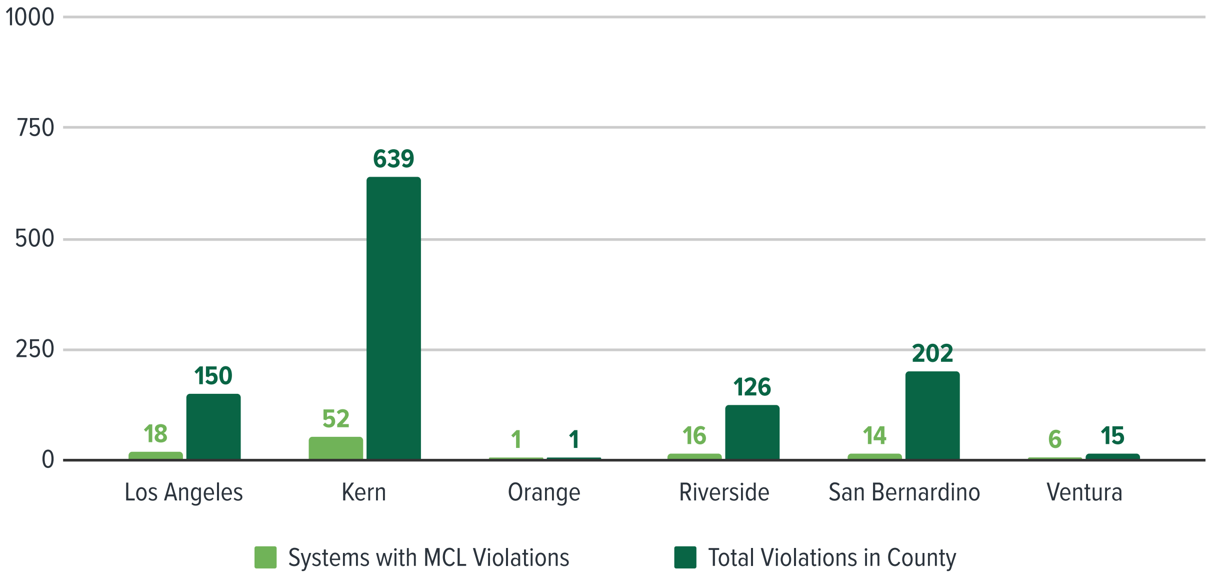


TABLE 6

Summary of Maximum Contaminant Level Violations in the Last 5 Years

County	Number of Systems with Violations	Total Violations	Average Number of Violations per Noncompliant System	Percent of Systems with Violations
Los Angeles	18	150	8.3	9.8%
Kern	52	639	12.3	31.7%
Orange	1	1	1.0	2.6%
Riverside	16	126	7.9	19.0%
San Bernardino	14	202	14.4	11.3%
Ventura	6	15	2.5	10.2%

FIGURE 6

Maximum Contaminant Level Violations in the Last 10 Years

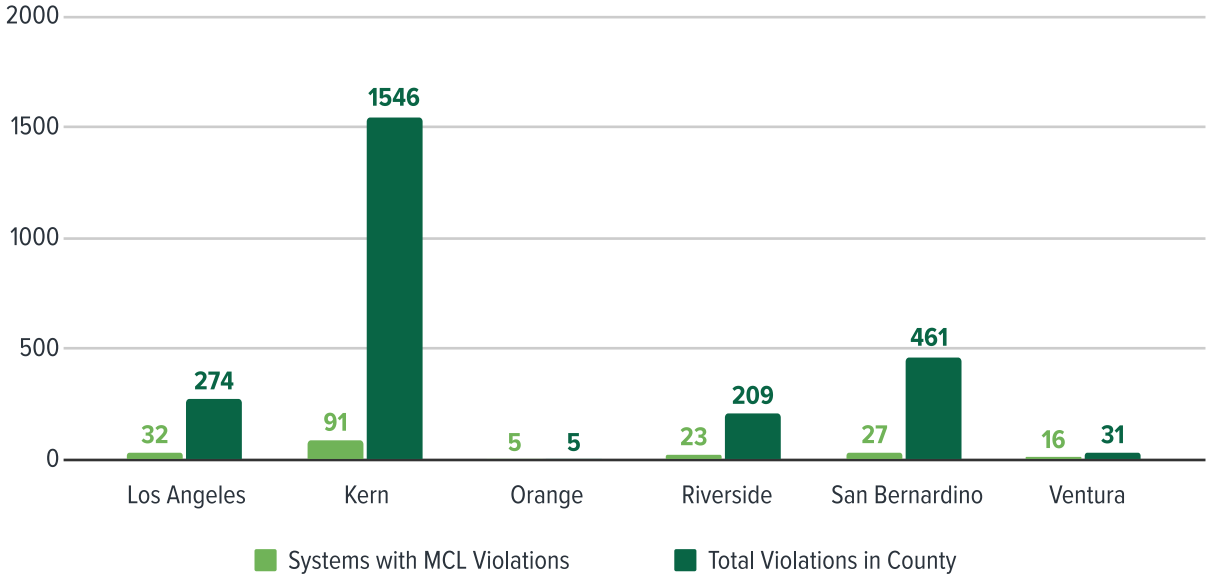


TABLE 7

Summary of Maximum Contaminant Level Violations in the Last 10 Years

County	Number of Systems with Violations	Total Violations	Average Number of Violations per Noncompliant System	Percent of Systems with Violations
Los Angeles	32	274	8.6	17.4%
Kern	91	1546	17.0	55.5%
Orange	5	5	1.0	13.2%
Riverside	23	209	9.1	27.4%
San Bernardino	27	461	17.1	21.8%
Ventura	16	31	1.9	27.1%

From a policy standpoint, the data also suggest that enforcement alone may be insufficient to address water quality issues. Even with the presence of violations on record, the same systems appear to repeatedly fall out of compliance, underscoring the need for more proactive, capacity-building interventions. Programs offering technical assistance and regional consolidation efforts, such as those funded by the State Water Board, may need further expansion. In sum, while California has made strides in identifying and publicizing violations, persistent gaps remain in addressing the root causes of water contamination, particularly those affecting more rural counties with a larger proportion of smaller CWS.

4.1.2. Los Angeles County Maximum Contaminant Level Violation Trends

The comparison of 2020 and 2025 data for Los Angeles County water quality violations shows modest but meaningful progress. The share of water systems with an MCL violation in the past five years declined from 12% in 2020 to 9.7% in 2025, which represents a decrease of 1.5 percentage points. This downward trend is also evident among systems with a single MCL violation and those with multiple violations, which declined by 1.2 and 1.5 percentage points, respectively.

While these improvements are incremental, they suggest that regulatory oversight, system investments, and/or operational changes may be having a cumulative positive effect. Given that MCL violations represent potential risks to public health, even small reductions in their frequency can have significant implications for water safety and equity, especially in communities historically burdened by poor water quality.

TABLE 8

Historical Comparison of L.A. County Water Quality Violations

	2020 (n=200)	2025 (n=184)[5]
Systems without MCL or M&R Violations in the Last 10 Years	111 (56%)	87 (47.3%)
Systems with a Violation in the Last 5 Years	25 (12%)	18 (9.7%)
Systems with 1 MCL Violation in the Last 5 Years	10 (5%)	7 (3.8%)
Systems with More Than 1 MCL Violation in the Last 5 Years	15 (7.5%)	11 (6.0%)

4.1.3. Water Sourcing and Contaminants of Emerging Concern

Further analysis of underlying water quality data, including water sourcing and quality, groundwater dependency, and contaminants of emerging concern (CECs), reveals disparities in potential water source reliability due to quality concerns. Groundwater quality remains a critical concern for urban water systems across California, particularly in regions with a long history of industrial and agricultural activity. Both the U.S. Environmental Protection Agency (EPA) and the State of California require community water systems to monitor and report water quality, with contaminant thresholds established through MCLs that account for health risks, detectability, treatability, and cost considerations. While these issues can be and are usually addressed, this adds considerable cost and may cause actual delivered water quality compliance issues, such as MCL violations.

Analysis of recent data from the State Water Resources Control Board *2024 Drinking Water Needs Assessment* shows that contamination of active groundwater sources continues to

5 L.A. County has 189 residential-serving community water systems, but five of these are not included in SDWIS, and we therefore do not have data on MCL and M&R violations for those systems. Therefore, 184 are included in this table.

present a significant challenge across the six Southern California counties studied. Five of these counties have water systems that primarily rely on groundwater sources where contaminant concentrations exceed regulated MCLs (pretreatment). Furthermore, all six counties include systems dependent on groundwater with constituents of emerging concern—contaminants that are not yet regulated but pose potential risks to human or ecological health and could eventually incur MCL violations if not treated.

Groundwater reliance and source contamination burdens vary across the region. Kern County exhibits the highest incidence of reliance on contaminated groundwater, with 45% of systems dependent on sources exceeding MCLs, resulting in its higher proportion of systems with actual delivered water MCL exceedances. San Bernardino County ranks a distant second, with 18% of systems affected. No water systems in Orange County primarily rely on a groundwater source that exceeds MCL levels. Additionally, Orange and Los Angeles show the greatest number of systems impacted by constituents of emerging concern, affecting 24% and 25% of their systems, respectively.

TABLE 9

Reliance on Contaminated Groundwater Across Counties

County	Percent of Systems with Groundwater as a Primary Source	Percent of Water Systems with the Majority of Water Sources Exceeding MCL Levels (Pretreatment)	Percent of Water Systems with 25% or Greater Water Sources Having CECs
Los Angeles	47%	13%	25%
Kern	91%	45%	6%
Orange	16%	0%	24%
Riverside	77%	13%	11%
San Bernardino	78%	18%	12%
Ventura	44%	8%	7%

Beyond quality concerns, the quantity and reliability of groundwater sources also influence accessibility and long-term water security. Reliance on groundwater could hardly vary more widely among the counties: 47% of systems in Los Angeles use groundwater as a primary source, compared to 91% in Kern, 16% in Orange, 77% in Riverside, 78% in San Bernardino, and 44% in Ventura. Based on these findings, Kern, Riverside, and San Bernardino were identified as areas of particularly high groundwater reliance—where both the quality and availability of groundwater pose significant challenges to sustaining safe, reliable drinking water supplies.

4.2. Affordability

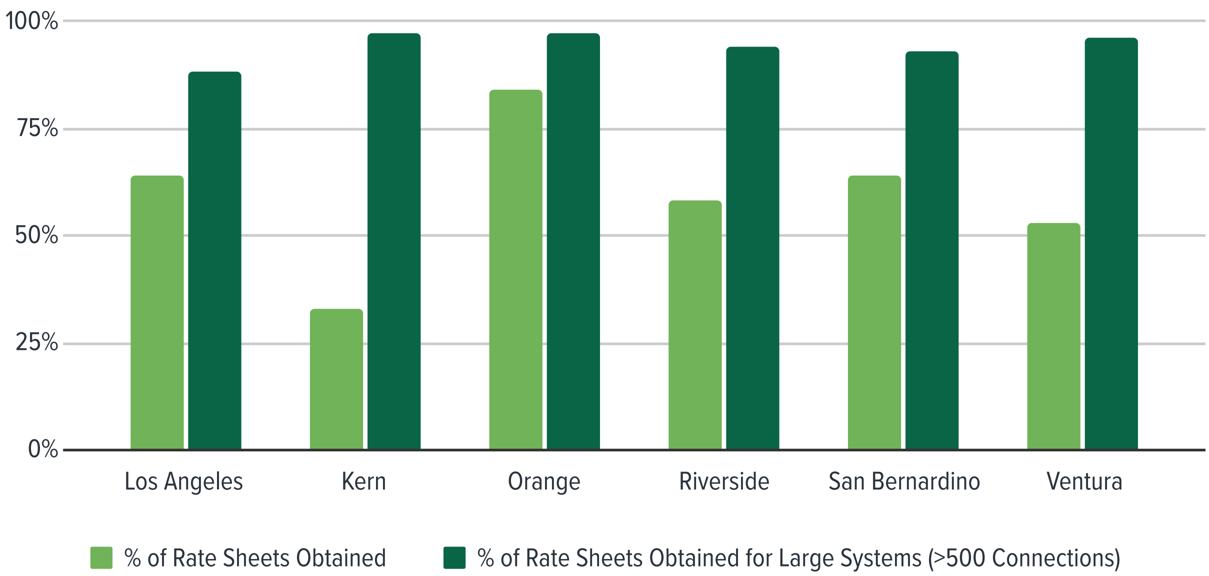
This affordability analysis focuses on the cost of an average household water bill based on 12 hundred cubic feet (HCF) of monthly consumption for each of the counties studied, and offers comparisons to the previous 2015 and 2020 analyses of community water systems (CWS) in Los Angeles County.

4.2.1. Rate Sheet Data Collection and Complexities

Data on rate structures and estimated household water bills were drawn from collected rate sheets. Some rate sheets were publicly available on water system websites. Where rate sheets were not available online, we emailed and followed up with phone calls.

FIGURE 7

Percent of Rate Sheets Obtained for All Systems and Large Systems



Overall, we successfully obtained rates for the majority of systems with 500 or more connections. However, obtaining rate data for smaller systems proved a challenge, especially in Kern, where two-thirds of water systems have fewer than 500 connections.

One of the main challenges in collecting data on water rates is the lack of accessibility and standardization across utilities. For example, investor-owned utilities regulated by the California Public Utilities Commission are legally required to publish their rates, which include detailed rate schedules, charge structures (e.g., tiered rates or fixed fees), and any rate changes over time. These requirements support transparency and public accountability. In contrast, city- or county-owned utilities and municipal systems are not subject to the same regulations, though they often still provide rate information online or upon request. Smaller private utilities, including mobile home parks and unregulated privately owned systems, are not required to publish their rates, often making email or phone outreach necessary to obtain the data.

Available rate information also varied widely in format, which posed challenges during our review. For example, some utilities use a fixed-rate structure, where customers pay a uniform charge each billing cycle regardless of usage. While this simplifies billing, it does not promote conservation and may create a free-rider effect. However, we found that most utilities used a rate structure that combines a fixed charge (often covering capital costs) with a tiered rate that increases with usage, encouraging conservation by making higher consumption more expensive. In reviewing rate sheets, fixed charges were generally easy to identify, though some included surcharges that were either not clearly reflected in the fixed rate or ambiguously listed. In such cases, we made informed judgments about the true fixed cost to the customer. For instance, the East Orange Water District's capital costs were paid through property taxes rather than through a customer water bill, so we excluded what would otherwise appear as a surcharge from the fixed-rate calculation.

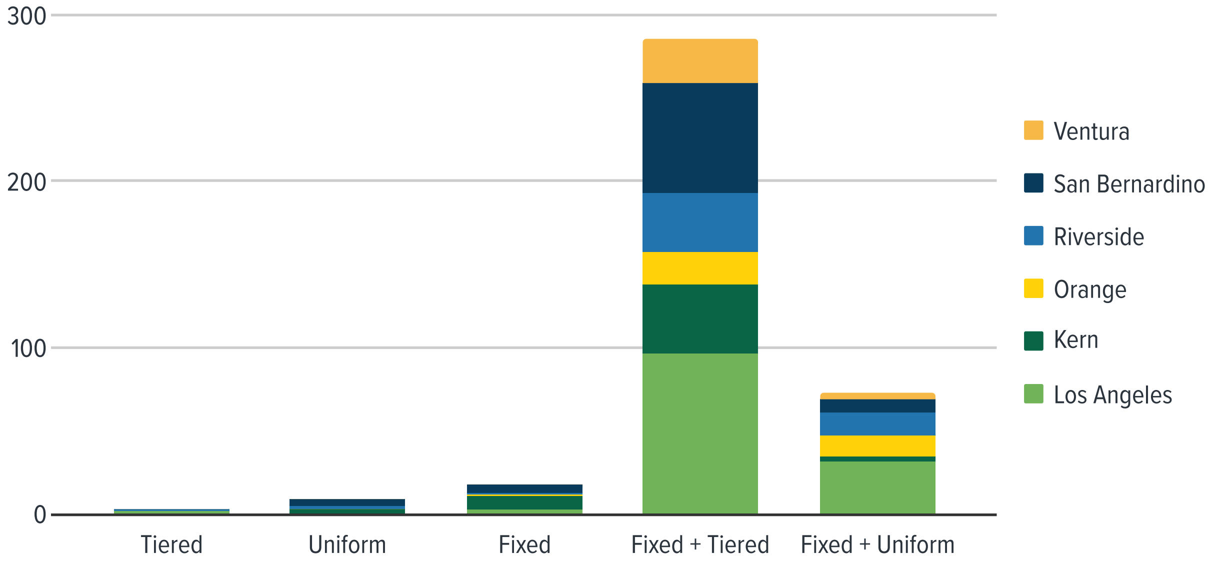
TABLE 10

Water System Rate Structures

Rate Structure	Description	Number of Systems	Percent of Collected Rate Sheets
Tier	A tiered rate for water service is a pricing structure where the cost per unit of water increases as a customer's usage rises. This encourages conservation by charging higher rates for higher levels of consumption.	4	<1%
Uniform	A uniform rate for water service charges the same price per unit of water regardless of how much water a customer uses.	10	2.5%
Fixed	A fixed-rate charges customers a set fee regardless of how much water they use. Fixed rates are typically charged to cover basic services and capital costs (like meter maintenance).	18	4.6%
Fixed + Tier	This structure charges customers a flat fee to cover basic service costs, plus an additional charge based on water usage, with the price per unit increasing in steps as usage increases. This setup ensures stable revenue for the utility while encouraging conservation by making higher water use more expensive.	285	73.1%
Fixed + Uniform	This rate structure charges customers a flat service fee, plus a consistent price per unit of water used, regardless of how much they consume. This approach provides predictable revenue for the utility while keeping the cost per unit stable for all levels of usage.	73	18.7%

FIGURE 8

Community Water System Rate Structures



Another challenge was the interpretation of tiered water rates, where tiers were based not on standardized water usage levels, but rather calculated based on several factors—such as household size, daily water use allowances, irrigable property area, plant evapotranspiration factors, and other region- or household-specific variables. In most cases, utilities provided both the tier water use range (e.g., 0-10 HCF of water for the first tier) and the corresponding price for each tier. However, in some instances, only the tier prices were available without specifying the water use range. Figure 9 shows an example of this. In these cases, the first tier often represented an indoor water budget based on household size. For our analysis, we assumed an average single-family household size of four. The second tier typically included an outdoor water budget (in addition to the indoor water budget), factoring in plant evapotranspiration rates, irrigable property area, and other region-specific considerations. Depending on the service area, each of these factors can vary. Without precise region-specific data or details about the distribution of households across different factors, we gathered data on average factors for a given county in certain cases. Any tier beyond the second was generally determined by the total indoor and outdoor water budget allocations.

Generally, rate sheets and variable water use ranges are used in a hundred cubic feet (HCF) or centum cubic feet units (CCF), both of which are equivalent to 748 gallons of water. However, in a handful of cases, other units such as $/CGL (centum gallons) were used, which required us to convert to $/HCF to allow for direct comparison across systems.

FIGURE 9

Santa Margarita Water District's Tiered Water Rates (Resolution No. 2023-08-04)

POTABLE AND RECYCLED WATER RATES

The rates for both potable and recycled water services are comprised of two components: (1) a Fixed Base Charge; (2) a Commodity Charge. The Commodity Charge is billed per one hundred cubic feet (CCF) of water, where each CCF is equal to 748 gallons.

Water Budgets and Tiered Rates

Single-Family Residential customers are given an indoor and an outdoor water budget (together the "Total Indoor and Outdoor Water Budget" or "TWB"). The standard indoor water budget is calculated as follows:

- Single-Family Residential indoor budget = household size (assumed to be 4 persons with variances available for larger households) **X** 55 gallons per person per day **X** number of days in the billing cycle ÷ 748 conversion factor (conversion factor to calculate budget in CCF)

The outdoor water budget is calculated using three factors: (1) the size of the irrigable landscape area per parcel; (2) actual daily plant water loss to the atmosphere ("evapotranspiration"); and (3) a "plant factor" that reflects the water needs of specific types of plants and irrigation efficiencies established pursuant to guidelines provided by state law.

- Single-Family Residential outdoor budget = irrigable area (square footage per parcel) **X** evapotranspiration for billing cycle (actual daily plant water loss) **X** plant factor ÷ 1,200 (conversion factor to calculate budget in CCF)

Single-Family Residential customers are billed on a tiered basis, depending on the amount of water used in each billing cycle. The tier breakpoints are set forth below.

Single-Family Residential Tier Allocation

Tiers	Tier Allocation
Tier 1	Indoor Budget
Tier 2	Up to 100% of Total Indoor and Outdoor Budget (TWB)
Tier 3	101% - 200% of TWB
Tier 4	>200% of TWB

4.2.2. Water Rate Structure Trends

As shown in Figure 8 and Table 10, we came across five main categories of water rates: Tier, Uniform, Fixed, Fixed + Tier, and Fixed + Uniform. Of these, a Fixed + Tier rate structure was the most common across all counties, followed by a Fixed + Uniform rate structure. This finding implies that most water systems across Southern California use a rate structure that charges customers to collect revenue for both capital and water use costs, with only a handful of systems using a rate structure that solely charges customers for water use or capital costs. Based on our review of data and notes, the systems that used either a Fixed-, Uniform-, or Tiered-rate structure generally had fewer than 300 connections, operated with a single well, were Mobile Home Parks or HOA-owned water systems (such as Dogwood Blue Canyon Improvement in Ventura County), or allocated a certain amount of water to each connection. This is with the exception of the cases of Edwards Air Force Base-Main Base and the Pine Cove Water District, where both are larger systems (>1,000 connections).

FIGURE 10

Average Monthly Bill by Rate Structure (12 HCF)

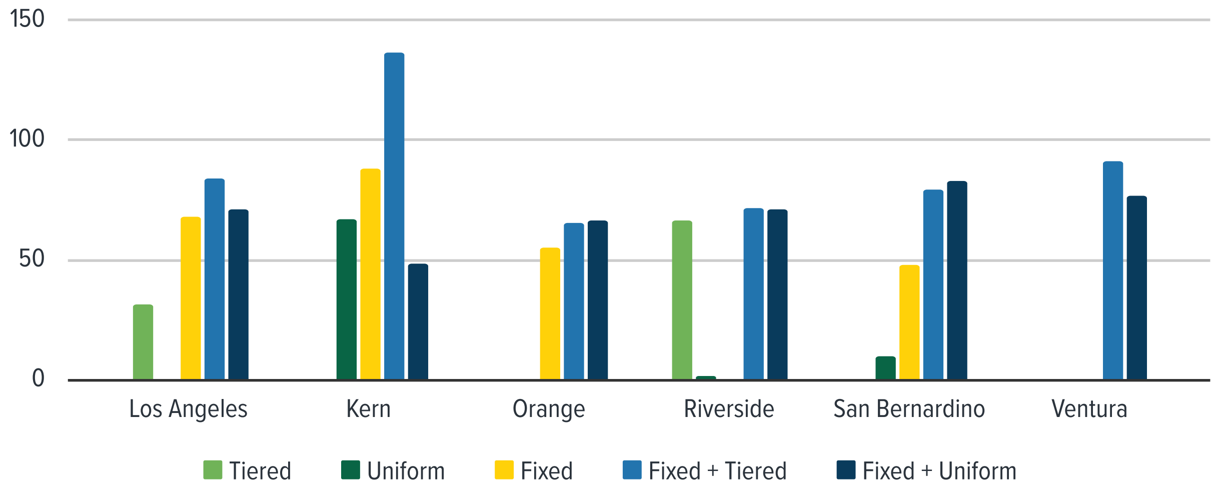


Figure 10 presents the average monthly household water bills—based on 12 HCF of water use—grouped by rate structure type across six Southern California counties. The data reveal a clear pattern: rate structure design is a major determinant of affordability outcomes. Missing bars indicate that not all rate structure types were present in every county.

The most commonly used rate structure, Fixed + Tier, consistently generates some of the highest average bills across counties. This structure includes both a fixed service charge and a tiered volumetric rate, which means households not only pay a baseline fee but also face increasing costs as consumption rises. This dual-cost model tends to raise monthly bills, particularly in counties where water supply reliability issues or regulatory compliance costs are high—such as in Kern and Ventura. In contrast, simpler rate structures such as Uniform-only and Tier-only generally produce lower average bills. However, this trend is not universal across all counties. For example, San Bernardino's extremely low average bill under a Uniform-rate structure ($1.23/month) is a statistical anomaly, driven by a very small number of systems with unusually low costs or flat-fee billing models—likely not representative of broader affordability conditions.[6]

6 In Riverside County, we recorded one system (Sharondale Mesa Homeowners Association) as charging a monthly fixed rate of $0.00 due water fees being included in monthly homeowners association fees. Furthermore, of the two Uniform rate structures in Riverside County (Riverdale Estates and Glen Ivy Hot Springs), only Riverdale Estates, a mobile home park, charged a low monthly water bill to its customers. Similarly in San Bernardino County, of the four systems using a Uniform rate structure, only one (Rocky Comfort Mutual Water Company, a small water system) charges a monthly water bill to its customers, potentially explaining a low monthly bill rate.

An unexpected finding appears in Kern County, where the Fixed + Uniform structure results in the lowest average bill among all rate types in the county. This likely reflects the influence of a small number of systems with atypically low charges. These systems may benefit from inexpensive groundwater sources, municipal subsidies, or shared infrastructure that keeps operating costs—and, therefore, water rates—low. However, the limited number of systems using this structure in Kern suggests the result should be interpreted with caution.

Overall, Figure 10 reinforces a key takeaway: Rate structures that combine fixed charges with volumetric pricing tend to lead to higher effective customer bills at modest consumption levels, especially when paired with conservation-oriented tiering. While these models offer revenue stability for utilities, they can disproportionately impact affordability for low- and moderate-income households—particularly in counties where groundwater management, infrastructure investment, or fragmented service areas drive costs upward. Conversely, while Uniform or Tier-only models can result in lower bills, they may pose sustainability challenges if not carefully calibrated with utility revenue needs.

4.2.3. Monthly Water Rate Trends

FIGURE 11

Average and Median Monthly Rates for 6 and 12 HCF of Water

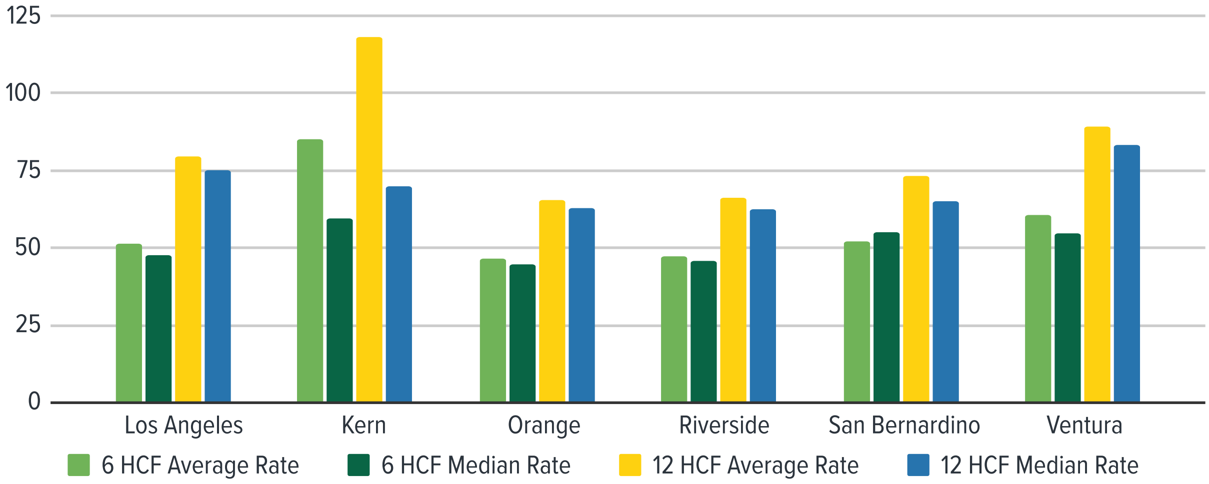


Figure 11 compares average and median monthly household water bills for 6 HCF and 12 HCF of usage, with statistical outliers in Kern and Los Angeles counties with very high water bills removed from the dataset. This filtering ensures the values reflect representative system-level patterns and are not skewed by a few extreme cases. Even with outliers excluded, the figure reveals significant differences between average and median bills in several counties—most notably Kern and Ventura—especially at the 12 HCF usage level. This suggests a broad underlying variation in rate structures and pricing strategies, not simply the influence of high-cost outlier systems. In Kern, for example, the average bill at 12 HCF remains nearly $118, while the median is meaningfully lower, reflecting a bimodal rate landscape where a high number of systems impose much higher charges than others.

These differences may be driven by: 1) variability in fixed charges and tier thresholds; 2) differences in infrastructure needs or groundwater compliance costs; and 3) diverse governance structures (e.g., small public districts vs. municipal vs. private systems).

By contrast, Riverside and Orange counties show relatively close alignment between average and median bills for both 6 and 12 HCF. This suggests greater consistency in pricing, potentially due to more centralized rate-setting, fewer very small systems, or more widespread use of Uniform rate structures. The increase in bills from 6 to 12 HCF across counties also illustrates how rate design influences consumption costs. In counties like Kern and Ventura, the steeper increases point to stronger tiering effects or higher marginal rates at elevated consumption levels, which can disproportionately affect larger or multigenerational households.

In sum, Figure 11 demonstrates that meaningful affordability challenges persist at a structural level, especially in counties with fragmented water governance or diverse system types. It underscores the need for more standardized affordability safeguards, particularly for households with moderate-to-high essential water needs.

4.2.4. Monthly Bills Across Disadvantaged Communities (DACs)

Figures 12 and 13 together illustrate a structural challenge in water affordability: Disadvantaged communities are not only numerous across Southern California's water system landscape, but in some cases, they face disproportionately high costs. Figure 12 reveals that in several counties—particularly Kern, Ventura, and San Bernardino—systems serving disadvantaged communities (DACs) and severely disadvantaged communities (SDACs) make up roughly half or more of the water systems represented in the collected rate sheets. In Kern County, SDAC systems comprise the largest share of the total, highlighting the extent to which very low-income communities are embedded within the region's water infrastructure. These systems are often smaller and more fragmented, operating with limited technical, managerial, and financial (TMF) capacity, which exacerbates their vulnerability to high per-customer costs.

FIGURE 12

Community Water Systems Serving Non-DACs, DACs, and SDACs, Based on Collected Rate Sheets

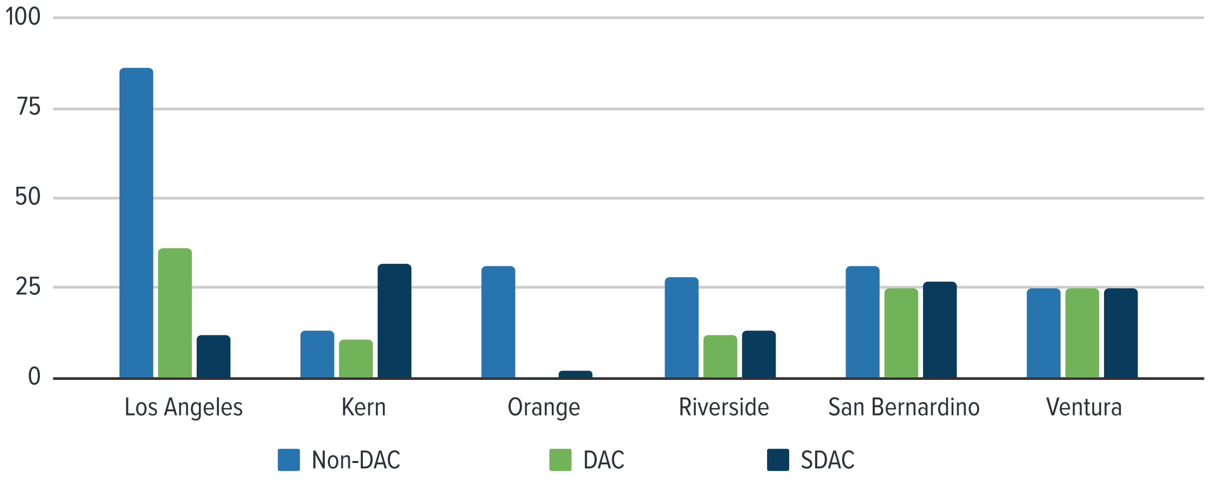


FIGURE 13

Average Monthly Bill (12 CCF) for Non-DAC, DAC, and SDAC Water Systems

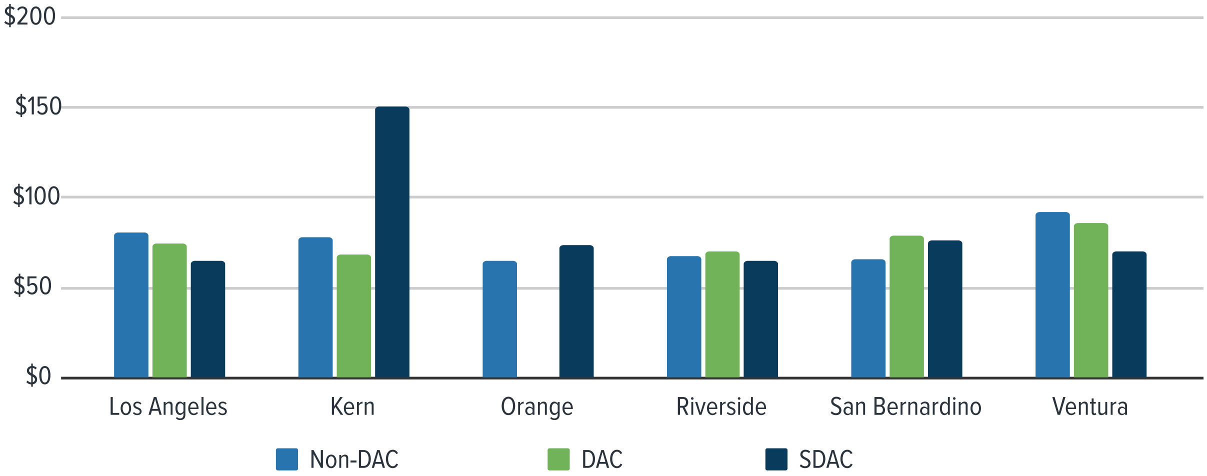


Figure 13 underlines this concern by showing that disadvantaged and severely disadvantaged communities are not consistently paying lower water bills than their non-disadvantaged counterparts—and in some cases, are paying more. Most notably, in Kern, the average monthly bill for SDAC systems exceeds $145 for 12 HCF of water—the highest across all counties and community types. Similarly, in Orange and Riverside, SDAC systems show higher average bills than both DAC and non-DAC systems, raising concerns that affordability protections are either not being implemented or are insufficient to offset systemic cost burdens.

The intersection of system size, governance structure, and rate design appears to be a key driver of these disparities. Many SDAC systems in Kern, Ventura, and San Bernardino operate independently or are overseen by special districts with limited economies of scale and less access to capital for infrastructure investment. This often leads to higher fixed costs per household and the use of Fixed + Tier rate structures that penalize higher usage, regardless of whether that usage reflects discretionary or essential needs. Moreover, since renters in multifamily housing often lack direct access to water bills, affordability protections—where they exist—may not be reaching the most vulnerable households.

Together, Figures 12 and 13 underscore the need for targeted interventions in both policy and practice. To address these inequities, rate design reforms must be paired with stronger transparency requirements, state-supported affordability programs (such as statewide Low Income Rate Assistance, or LIRA), and technical assistance for under-resourced systems. These figures challenge the assumption that disadvantaged communities are being protected through existing rate structures and clarify that water affordability must be proactively built into utility governance rather than treated as a downstream consequence of cost recovery. Without structural changes, the most vulnerable communities will continue to bear the highest water burdens—a situation exacerbated by rising utility service costs.

TABLE 11

Comparison of 12 CCF Water Bill Cost for Communities in Los Angeles County, 2020 and 2025

	2020	2025	Percent Increase
DAC	$64.31	$74.61	16.01%
SDAC	$61.72	$64.63	4.71%
Non-DAC	$62.57	$81.08	29.58%

Table 11 shows the increase in average monthly water bills for DACs, SDACs, and non-DACs in Los Angeles County between 2020 and 2025, demonstrating better protections for lower-income customers. Interestingly, water systems serving DACs saw a 16% increase, while systems serving SDACs experienced only a 5% increase, both much lower than the nearly 30% rate of increase for non-DACs.

Even with some indication of low-income customer protection, from a Human Right to Water perspective, our affordability findings suggest continued cause for concern. Overall, bill levels continue to rise above the rate of inflation. While the rate of change for DACs and SDACs has been lower than for non-DACs since 2020, the fact that DACs and SDACs are both more numerous in the system landscape and simultaneously subject to higher or comparable rates indicates a structural affordability crisis. California law guarantees affordable access to safe and clean water, but without expanded low-income assistance programs, rate structure reform, and transparency in rate-setting, these inequities will persist or worsen. Intentional policy interventions are thus needed to prevent vulnerable communities from bearing the highest water burdens in the county and more broadly statewide.

4.2.5. Historical Rate Trends in Los Angeles County

As this report is the third iteration of analysis in Los Angeles County, we were able to analyze historical trends in affordability. Table 12 compares rates for 12 HCF of water in Los Angeles County in 2015, 2020, and 2025, revealing a steady and substantial increase in average monthly bills. The average rate rose from $50.00 in 2015 to $63.27 in 2020, and then to $79.50 in 2025, a 59% increase over 10 years. Although the minimum rate remained relatively stable between 2020 and 2025 (from $25.71 to $24.96), the maximum rate jumped dramatically from $134.07 in 2020 to $231.49 in 2025, indicating widening disparities in what customers are paying across different water systems. These findings, alongside earlier data showing rising bills for DACs and SDACs, suggest water affordability is becoming an escalating crisis in the region.

TABLE 12

Comparison of Water Rates for 12 HCF in Los Angeles County

	2015	2020	2025
Number of Systems with Rate Sheets Collected	115	117	134
Average Rate	$50.00	$63.27	$79.50
Minimum Rate	$12.08	$25.71	$24.96
Maximum Rate	$184.50	$134.07	$231.49

Several factors likely contributed to these trends. As discussed earlier, the COVID-19 pandemic placed financial strain on both utilities and low-income households, which may have resulted in rate increases to recover lost revenue. In addition, drought resilience investments, infrastructure upgrades, and compliance with water quality mandates may have pushed operational costs higher. The increase in the number of systems with collected rate sheets, from 115 in 2015 to 134 in 2025, reflects improved data coverage, but may also include more small- or high-cost systems that elevate the countywide average. The extremely high maximum rate represents Southern California Edison on Catalina Island, which is a small system with limited economies of scale, facing unique sourcing challenges.

TABLE 13

Increase in Water Rates Compared to Inflation

	2015	2020	2025
Average Los Angeles County Water Rates (12 HCF)	$50	$63.27	$79.50
Annual Percent Increase in Los Angeles County Rates, Last 5 Years	-	5.3%	5.1%
Average Annual Inflation Percent, Last 5 Years	-	2.7%	3.8%

Table 13 compares water rates in Los Angeles over time against average annual inflation for 2015, 2020, and 2025. Ultimately, the data reveal that water rates are indeed rising faster than inflation. From 2015 to 2025, Los Angeles water rates increased from $50 to $79.50, with an average annual increase of 5.1% between 2020 and 2025, well above the average inflation rate of 3.8% during the same period. From an affordability perspective, these findings are concerning. When water rates rise faster than inflation, they consume a growing share of household income, especially for low-income households, worsening affordability gaps.

FIRE-RELATED RATES

In the wake of recent wildfires in Los Angeles County, concerns have emerged about the preparedness of local water systems to support fire suppression efforts. To delve into this topic, we reviewed rate sheets for billing rates related to fire suppression. However, we encountered several challenges in identifying and interpreting these rates due to inconsistent terminology and unclear definitions.

The most common terms we found were "Fire Protection" or "Fire Service" rates—charges that apply in addition to a customer's general water rate, typically for services like fire sprinklers, hydrants, or private fire connections. These terms were often used inconsistently. In some cases, the fire rate applied only to private entities such as commercial or residential customers, suggesting that fire suppression was treated as an optional, billable service. In other cases, public buildings and even fire departments were subject to private fire service rates.

Further complicating matters, the required meter size for fire service varied widely between systems, ranging from as small as three-quarters of an inch to as large as 2 inches or more. Some systems applied a single umbrella fire rate, while others split charges across multiple categories, such as separate fees for hydrant installation and sprinkler usage. In instances where no fire-specific rate was found in the rate sheets, our review of municipal codes indicated that fire suppression costs were often embedded in property taxes. However, the codes rarely disclosed the amount paid or what specific services were covered.

This lack of standardization across water systems poses a serious barrier to improving resilience as wildfire risk increases. Without consistent, transparent, and equitable fire suppression rate structures, communities—especially those at high risk of wildfires—may face uncertainty in both the availability and affordability of critical fire protection services. It also complicates planning and policy efforts aimed at ensuring reliable water access for emergency response across jurisdictions.

TABLE 14

Count of Systems with Fire Rates

	Los Angeles	Kern	Orange	Riverside	San Bernardino	Ventura
Fire Sprinkler Charge	25	13	3	0	10	3
Hydrant Meter Rate	10	3	3	7	12	1
Fire Protection/Fire Service	96	18	17	20	32	17
Temporary Hydrant or Fire Suppression Meter	20	2	1	0	1	0
Pressure/Power/Elevation Zones	7	0	1	7	0	1
Number of Systems with Fire Rates	158	36	25	34	55	22
Percent of Systems with Fire Rates	83.60%	21.95%	65.79%	38.64%	44.00%	37.29%

4.3. Accessibility

Accessibility is the third dimension of the state's Human Right to Water, but remains the least well-defined and tracked, and is beginning to be operationalized in policy. Research and policy efforts by the Water Justice Team at the Department of Water Resources, and especially the related implementation of Senate Bill (SB 552; 2021) which is in progress, represent by far the most substantial oversight and support for accessibility in the state. We note that, as is further detailed in Sun et al. (2025), SB 552 implementation is carried out at the county level. Associated with SB 552 efforts, some counties, such as Los Angeles, have also developed small water system-focused efforts and working groups.

Due to data constraints across all six counties' systems, accessibility is interpreted here as water systems' performance in ensuring a reliable, sufficient supply to all customers, while also not facilitating excessive demand by a system's customers. To evaluate accessibility, we assessed two factors: the level of average household water use, which reflects the interaction of supply and demand, and the presence of drought preparedness measures, which reflect system supply efforts for reliability.

4.3.1. Average Household Water Use

There are two concerns regarding water quantity usage levels by households. On one hand, and most importantly for the Human Right to Water, some households may not have sufficient access to meet the state's current indoor water use standard of 55 gallons per capita per day (GPCD), potentially impacting basic health and hygiene needs. On the other hand, other households may consume water at excessive rates, placing additional strain on already limited water resources both for their system and neighboring ones. Recognizing the need for more sustainable and equitable water use, the State of California formalized urban water conservation efforts through the "Making Water Conservation a California Way of Life" policy initiative, enacted through SB 606 (2018) and Assembly Bill 1668 (2018).

To evaluate excessive water use, data were obtained for the suppliers that reported monthly residential gallons per capita day consumption figures (R-GPCD) to the State Water Board; however, this only included a third of the water systems studied and typically excluded smaller, private water systems. These publicly available data include monthly residential gallons per capita day consumption figures on the 15th of each month (SWRCB, 2019d). Data were gathered for January and July, which represent typical winter and summer months, respectively, given that outdoor usage varies seasonally.[7]

7 Systems with reported R-GPCD values greater than 200 GPCD—which is approximately four times the Human Right to Water indoor use standard—were omitted as outliers due to suspected data reporting errors.

TABLE 15

System Reported Residential Gallons per Capita Day Consumption

County	Latest Average R-GPCD in January	Latest Average R-GPCD in July
Los Angeles	68.4	87.0
Kern	68.6	123.8
Orange	72.1	93.4
Riverside	93.1	134.0
San Bernardino	68.0	95.8
Ventura	67.3	107.2

As expected, overall average consumption is lower in January than in July; both months have an average greater than the minimum Human Right to Water threshold of 55 GPCD. However, a small number of systems (14) fell below the 55 GPCD threshold in both the summer and the winter. During the winter, residential GPCD (R-GPCD) is relatively consistent across most counties, ranging from 68.4 to 72.1 GPCD. Riverside, however, stands out with a significantly higher average winter R-GPCD of 93.4. In contrast, summer water use exhibits notably greater variation across counties. Los Angeles reports the lowest average summer R-GPCD at 87.0, while Orange and San Bernardino Counties report slightly higher averages of 93.4 and 95.8 GPCD, respectively. Kern and Riverside, however, experience much higher average summer usage, at 123.8 and 134.0 GPCD, respectively. Notably, Kern systems' summer residential water use nearly doubles its winter usage, highlighting the seasonal pressures on water demand in inland areas.

However, there has been an improvement in conversation seen in Los Angeles compared to the 2020 analysis. Average 2020 consumption was 72.5 GPCD in the winter and 99.4 GPCD in the summer, indicating that Los Angeles has experienced an average 10% decrease in residential water use over the two periods.

We also compared individual systems to their respective countywide averages to identify instances of potentially excessive water use, using thresholds of 150% and 200% of the countywide average as benchmarks. In January 2024, 18 systems recorded consumption levels exceeding 150% of their county's average, suggesting that wintertime overuse—whether from outdoor irrigation, inefficient indoor fixtures, or structural leaks—remains an issue for a subset of systems. However, in June 2024, only two systems exceeded the 150% threshold, highlighting the overall effectiveness of residential conservation efforts during the summer months across the counties analyzed. Notably, only three systems—City of Arcadia and City of Huntington Park in Los Angeles, and Thousand Oaks Water Department in Ventura—exceeded 200% of the countywide average in January. No systems exceeded the 200% threshold during the summer. These findings suggest that while conservation efforts are broadly successful during periods of higher water demand, certain systems continue to exhibit disproportionately high wintertime use, indicating potential opportunities for targeted efficiency improvements or outreach initiatives during the low-demand season.

TABLE 16

Systems with Excessive Residential Water Use Compared to Average

	January 2024 (Winter)			July 2024 (Summer)		
County	Systems Above Average	Systems >150% of Average	Systems >200% of Average	Systems Above Average	Systems >150% of Average	Systems >200% of Average
Los Angeles	43	7	2	14	2	0
Kern	7	2	0	1	0	0
Orange	11	2	0	3	0	0
Riverside	9	3	0	4	0	0
San Bernardino	16	2	0	4	0	0
Ventura	4	2	1	2	0	0

4.3.2. Drought Preparedness

A significant effort by urban water systems during and after the 2012–2016 drought to improve residential conservation has led to notable declines in consumption over time, with significant strides made in efficiency and reduced water use across the counties. These efforts reflect a growing institutional emphasis on sustainable resource management and demand reduction. However, challenges related to drought resilience and long-term water supply reliability persist, particularly as climate variability intensifies. Requirements for community water systems' drought preparedness projections and reporting on planning vary dramatically by system size, as detailed in Sun et al. (2025).

In 2022, the last year for which we had data, 16 (or 2.4%) of the systems studied projected that they would experience water shortages. Ultimately, 20 systems (3%) reported actual shortages over the year. However, of the systems that did experience shortages, only seven (35%) had correctly anticipated them, highlighting a gap between forecasting efforts and real-world outcomes. This discrepancy suggests that while some systems have developed better predictive capabilities, others still lack the tools, data, or methodologies needed to accurately assess water shortage risk.

The presence of formal drought preparedness or water shortage contingency plans is likely an important factor influencing system resilience. Of the systems evaluated, 310 (46.8%) had an adopted drought preparedness or water shortage plan in place by 2022. Among the systems that experienced shortages, the majority (70%) had such plans, suggesting that planning alone is not sufficient to eliminate shortages, but that it likely contributes to improved response and mitigation efforts when shortages occur. This underscores the critical role of not only having a plan but also ensuring that plans are robust, up-to-date, and actionable under evolving drought conditions.

TABLE 17

Drought Experience and Preparedness Across Systems (2022)

County	Systems with Projected Shortages	Systems with Declared Shortages	Percent of Systems with a Drought Preparedness Plan or Water Shortage Plan
Los Angeles	7	10	58.7%
Kern	2	1	22.6%
Orange	0	2	81.6%
Riverside	2	1	46.6%
San Bernardino	1	2	53.6%
Ventura	4	4	39.0%

Overall, while residential conservation measures have proven effective in reducing baseline water demand, the findings indicate that continued investments in drought forecasting, planning, and supply diversification are needed. Strengthening these areas will be essential to maintaining water security, enhancing system resilience, and ensuring equitable access to safe and sufficient water under future drought scenarios.

5. CONCLUSION

The 2025 Southern California Community Water Systems Atlas supports and informs efforts to advance the Human Right to Water (HRW) across Southern California. It does so by providing an updated assessment for Los Angeles County across three time stamps (2015, 2020, and 2025). It also expands the atlas by adding a new comprehensive baseline assessment of community water system characteristics and performance in Kern, Orange, Riverside, San Bernardino, and Ventura counties.

Building on the methodology developed in previous iterations of this analysis for Los Angeles County in 2015, the report and associated mapping tool characterize all 663 community water systems using indicators aligned with the core dimensions of the HRW—quality, affordability, and accessibility. Alongside these, it incorporates other key factors influencing system performance, including technical, managerial, and financial capacity; governance structures; and socioeconomic characteristics of system populations. Our analysis draws from a wide range of data sources, including the State Water Board, the State Drinking Water Information System (SDWIS), the State Controller's Office, and the U.S. Census, to create a holistic picture of system performance and challenges. We find some commonalities but many differences in system profiles and performance across the six counties.

As the region continues to face growing water management pressures due to climate change, the increasing frequency of natural disasters, and aging infrastructure, ongoing study and monitoring of CWS are critical, especially given their variation in size and governance. The Southern California Community Water Systems Atlas provides decision-makers with actionable insights and a foundation for tracking progress. While state-level efforts to realize the HRW are essential, this report underscores the importance of additional coordinated action at regional, county, and system levels to ensure that community populations have access to clean, affordable, and reliable drinking water.

REFERENCES

Beecher, J., Redican, K., & Kolioupoulos, M. (2020). (Mis) Classification of water systems in the United States. Available at SSRN 3627915.

California Department of Water Resources (CA DWR). (2016). 2015 Urban Water Management Plans: Guidebook for Urban Water Suppliers. Retrieved from https://cawaterlibrary.net/wp-content/uploads/2017/09/UWMP_Guidebook_Mar_2016_FINAL.pdf

California Department of Water Resources. "Drought Planning for Small Water Suppliers and Rural Communities (SB 552)." Retrieved from: https://water.ca.gov/Programs/Water-Use-And-Efficiency/SB-552

California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA). (2021). "Achieving the Human Right to Water in California: An Assessment of the State's Community Water Systems." Retrieved from: https://oehha.ca.gov/media/downloads/water/report/hrtwachievinghrtw2021f.pdf

California Open Data Portal. "Per-Supplier Water Supply and Demand." Retrieved from: https://data.ca.gov/dataset/urws-conservation-supply-demand/resource/f4d50112-5fb5-4066-b45c-44696b10a49e

City of San Bernardino Water Department. "Outdoor Rebates & Incentives." Retrieved from: https://www.sbmwd.org/259/Outdoor-Rebates-Incentives

Dobbin, K., Fencl, A., & McBride, J. (2023). "2023 California Community Water System institutional type update." Dryad, doi: https://doi.org/10.25338/B8KP92

Drinking Water, Cal. Assemb. B. 200 (2019-2020), Chapter 120 (Cal. Stat. 2019)

Pierce, G., McCann, H., & DeShazo, J.R. (2015). "Los Angeles County Community Water Systems: Atlas and Policy Guide." UCLA Luskin Center for Innovation. Retrieved from https://innovation.luskin.ucla.edu/wp-content/uploads/2019/03/LA_County_Community_Water_Systems.pdf

Pierce, G. & Gonzalez, S. (2017). "Public Drinking Water System Coverage and Its Discontents: The Prevalence and Severity of Water Access Problems in California's Mobile Home Parks." Environmental Justice 10 (5), 168-173. doi: 10.1089/env.2017.0006

Pierce, G., Lai, L., & DeShazo, J.R. (2019). "Identifying and addressing drinking water system sprawl, its consequences, and the opportunity for planners' intervention: evidence from Los Angeles County." Journal of Environmental Planning and Management, doi: https://doi.org/10.1080/09640568.2018.1530889

Pierce, G., & Gmoser-Daskalakis, K. (2020). "Community Water Systems in Los Angeles County A Performance Policy Guide." Retrieved from https://innovation.luskin.ucla.edu/wp-content/uploads/2020/03/Community_Water_Systems_in_Los_Angeles.pdf

SoCal Water$mart. "About SoCal Water$mart." Retrieved from: https://socalwatersmart.com/en/residential/rebates/general-information/about-the-program/

State Water Policy, Cal. Assemb. B. 685 (2011-2012), Chapter 524 (Cal. Stat. 2012).

State Water Resources Control Board. (2019). "Options for Implementation of a Statewide Low-Income Water Rate Assistance Program (Draft)." Retrieved from https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/assistance/docs/2019/draft_report_ab401.pdf

State Water Resources Control Board. (2024a). "State of California FY 2024-25 Fund Expenditure Plan Safe and Affordable Drinking Water Fund." Retrieved from: https://www.waterboards.ca.gov/water_issues/programs/grants_loans/docs/2024/draft-final-fy2024-25-fep-clean-version.pdf

State Water Resources Control Board. (2024b). "2024 Drinking Water Needs Assessment." Retrieved from: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2024/2024-needs-assessment.pdf

State Water Resources Control Board. (2024c). "Appendix: Risk Assessment Methodology for Public Water Systems." Retrieved from: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2024/2024risk-assessment-pws-methodolgy.pdf

State Water Resources Control Board. (2023). "Water System Financial Capacity & Community Affordability Dashboard User Guide." Retrieved from: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/afforddashboardug.pdf

State Water Resources Control Board. "Making Conservation a California Way of Life Regulation." Retrieved from: https://www.waterboards.ca.gov/conservation/regs/water_efficiency_legislation.html

State Water Resources Control Board. "Strategy for State Small Water Systems, Domestic Wells and Other Self-Supplied Communities." Retrieved from: https://www.waterboards.ca.gov/safer/ssws_dw.html

State Water Resources Control Board. "Electronic Annual Report." Retrieved from: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/ear.html

Sun, A., Samsel, A., Pasebani, A., Ren, C., Curry, C., Choi, D., Cadena, E., Blain, L., Moinpour, L., Sakandar, N., De Santos, V., Callan, W. (2025). Drought & Climate Resiliency Solutions for Small Water Systems in LA County. UCLA Department of Ubran Planning. https://ucla.app.box.com/s/48htxp08pb8j0mhm1udp0k6o4fyxt2q7

U.S. Environmental Protection Agency. "Drinking Water Dashboard Help." Retrieved from: https://echo.epa.gov/help/drinking-water-qlik-dashboard-help

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