Water Affordability in San Diego County

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Key Findings

This research brief examines how affordable water is for San Diego County residents, using multiple common metrics. It aims to help decision makers ensure all residents enjoy reasonable access to this essential resource.

How much does water cost in San Diego?

- **San Diego County water bills vary widely.** This is largely dependent on which utility is providing water: in 2023, the monthly bill for one person consuming the average amount of water varied across water agencies from $27 to $89.

How affordable is water in San Diego?

- **The way we measure water affordability matters.** Across four different methods of measuring water affordability, the number of customers deemed to face unaffordable water bills differs by as many as 2.28 million (in a region of 3.27 million people). These differences matter; how policy makers understand the magnitude and nature of water affordability challenges informs how they help households, especially those with low incomes, afford water.
- **More than three-quarters of county residents are served by water districts that impose considerable cost burdens on lower-income customers.** The Household Burden Index and Poverty Prevalence Index measure water affordability as a combination of two factors: water cost burden on a community's lowest income earners and the percent of people in poverty. We believe this metric is best because it captures affordability for those most affected by high prices. Using this metric, two of San Diego's 22 water utilities impose a very high cost burden, two a high cost burden, and eight a moderately high cost burden.
- **The price of water is just one contributor to the cost of living in San Diego.** Close to half of San Diego County water utility districts have a severe housing cost-burden for low-income renters greater than the national share; the share of low-income households with a mortgage that are severely housing-cost burdened is greater in all San Diego water districts than nationally. These households are paying more than half of their income in housing costs. 40% of low-income San Diegans are putting at least 20% of their income toward utilities, including water.

  Solutions such as affordability programs, progressive rate structures, and comprehensive cost-of-service studies can help mitigate the impact on vulnerable populations while ensuring the financial stability of water utilities.

Introduction

The price of water is high and increasing in California. Despite decreasing per-capita water use[1, 2] the average water bill grew 125% between 2003 and 2013, outpacing inflation and wage growth. While bills dropped slightly between 2014 and 2016 during the drought, they rose again in 2017 and are expected to continue to rise due to the need for water infrastructure improvements.[3, 4] Rising prices create a challenge for consumers, all of whom need water to live but many of whom may not be able to afford it.

While there is not a single widely accepted method to measure water affordability,[5] it is important to understand the magnitude of the problem in San Diego. Knowing how many people are struggling to pay for this basic need can help agencies design consumer assistance programs, motivate grant applications and creative financing, and shed light on the tradeoffs between investing in capacity and keeping rates down. Eligibility for some federal and state grants, loans, and technical assistance is dependent on meeting certain water affordability standards.[6] The affordability of water is often taken into consideration by water utilities when setting rates, which has long-term implications for the fiscal health of the water system. And of course, the affordability of water impacts community members. Unaffordable water can put households in debt and affect their ability to access safe drinking water.[7]

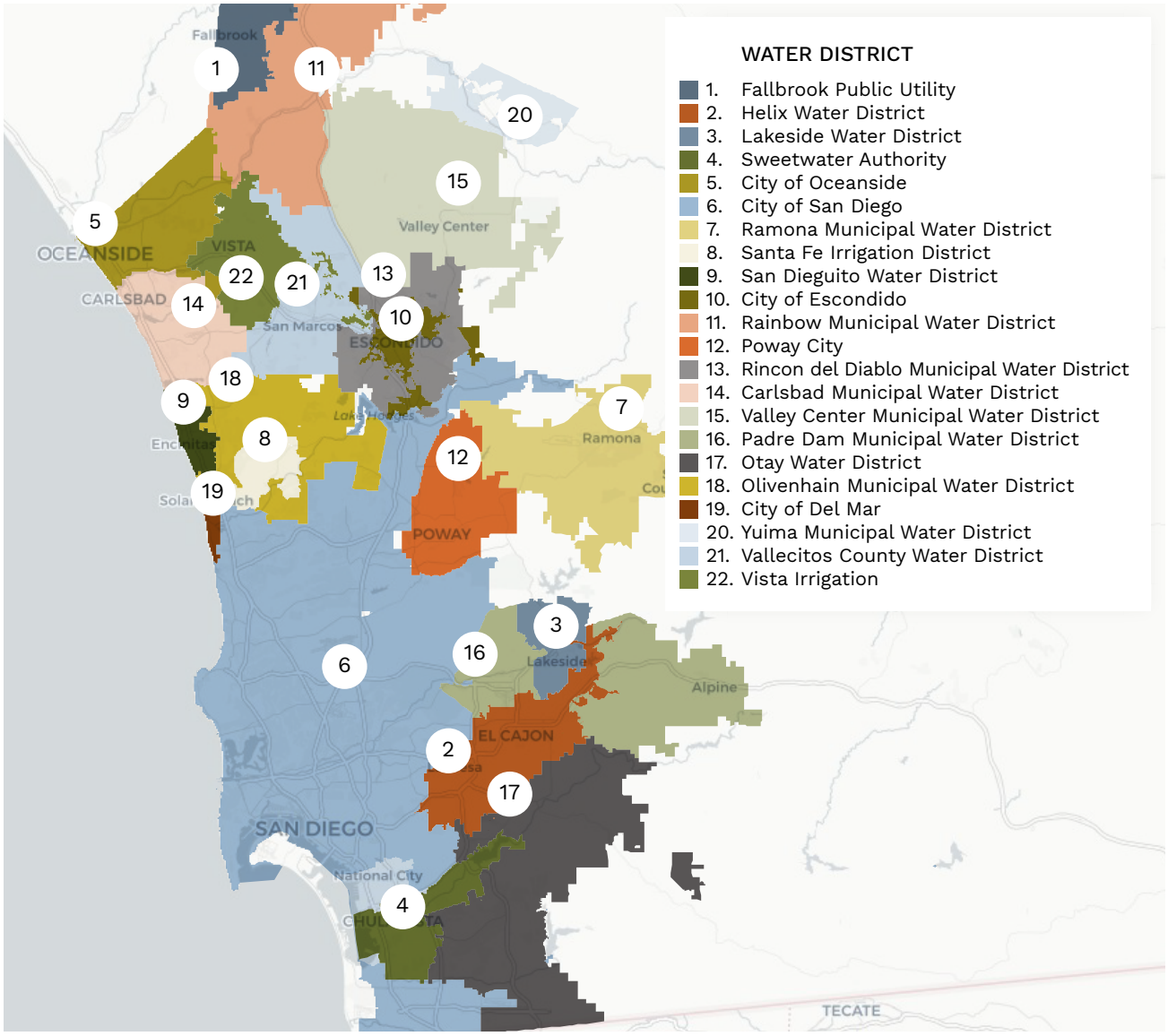
This report provides a comprehensive examination of water affordability across San Diego County. Using four metrics—including (1) California's standard for affordable water, (2) household burden and poverty prevalence indices, (3) hours worked at minimum wage to afford water, and (4) percent of income dedicated to water—we highlight the affordability challenges faced by residents and the disparities that exist among different demographic groups. Our findings aim to inform policymakers, water agencies, and community organizations working to address these issues, ensuring that all residents have equitable access to this vital resource.

How much does water cost in San Diego?

AVERAGE COST OF WATER

San Diego County residents are serviced by 22 retail water agencies, 20 of which purchase at least some of their water from the San Diego County Water Authority. (See Figure 1 for a map of water districts).[8] Each agency charges different amounts for water based on the pipe diameter used to deliver water and the amount of water used. Drinkable (or "potable") water is delivered using either 5/8-inch pipes or 3/4-inch pipes and charged per hundred cubic feet of water used monthly. These are referred to as volumetric fees, because they vary based on water usage. Water utilities in San Diego County charge between $2.65 and $8.47 for the first hundred cubic feet of water—more than a factor of three difference in rates depending on where in the county you live.

Figure 1: San Diego County public water districts



Each water utility also charges a certain base fee per month to cover, for example, debt as well as maintenance and infrastructure improvements. In 2023, the region's water utilities charged base fees between $7.94 and $69.20, a more than 870% difference between the minimum and maximum. For more information on the base and volumetric fees charged by San Diego County water utilities, see Table 5 in Appendix I: Tables.

For this section of the report, we calculate the average cost of water for a single person household using 91 gallons per capita daily (GPCD)[9] in each water district serving San Diego County residents. Table 1 shows that the average monthly potable water bill for one person ranged from $27.42 to $89.16, depending on household location. In 15 of the 22 San Diego County districts, the average water bill for a single person household was greater than the average *total household* water bill nationwide, and in four of those districts it was more than one and a half times that average.[10]

TABLE 1: AVERAGE MONTHLY POTABLE WATER BILL & HOURS WORKED AT MINIMUM WAGE FOR A ONE-PERSON HOUSEHOLD, 2023[1]

Water district	Average monthly water bill[2]	Hours worked at minimum wage[3]
Carlsbad Municipal Water District	$47.53	3.1
City of San Diego	$47.84	2.9
Del Mar	$76.59	4.9
Escondido	$75.07	4.8
Fallbrook Public Utility District	$87.28	5.6
Helix Water District	$48.70	3.1
Lakeside Water District	$27.42	1.8
Oceanside	$32.25	2.1
Olivenhain Municipal Water District	$55.55	3.6
Otay Water District	$53.60	3.5
Padre Dam Municipal Water District	$67.65	4.4
Poway	$53.91	3.5
Rainbow Municipal Water District	$89.16	5.8
Ramona Municipal Water District	$63.40	4.1
Rincon del Diablo Municipal Water District	$71.67	4.2
San Dieguito Water District	$39.02	2.5
Santa Fe Irrigation District	$64.39	4.2
Sweetwater Authority	$28.55	1.8
Vallecitos Water District	$52.73	3.4
Valley Center Municipal Water District	$72.43	4.7
Vista Irrigation District	$56.27	3.6
Yuima Municipal Water District	$54.81	3.5

[1] Water rates and minimum wage both calculated using 2023 data.

[2] For a single person at average water usage in 2023. Does not include sewer. Data are from original collection of public records.

[3] Calculations include the higher in the City of San Diego. Multiplying by the minimum wage may not equal the average monthly water bill due to rounding.

How affordable is water in San Diego?

There are several ways to assess the affordability of water in a community, taking into account both the price of water and the income residents can use toward purchasing it. This section examines several ways to measure water affordability, and what they imply for the number and share of San Diegans who may face water cost burdens.

CALIFORNIA STATE STANDARD

Several water affordability measures are based on a collective measure of community income, such as median household income. The State of California, for example, defines a water system's rates as unaffordable if the price of 600 cubic feet of drinking water (approximately 50 gallons per person, per day for a three-person household for 30 days) exceeds 1.5% of the median household income (MHI).[11, 12] Using this metric, two of San Diego's water utilities (Escondido and Fallbrook Public Utility districts, serving approximately 117,000 customers) have water rates that are unaffordable for the communities they serve.

OTHER INCOME THRESHOLDS

Some have criticized the MHI metric for setting too high a threshold for the most economically vulnerable in the community. After all, communities with high median incomes can still have a great deal of income inequality and poverty, and the metric does not reflect the impact of other necessary expenses (such as housing and energy) that are particularly salient in an area with a high cost of living such as San Diego.[13, 14]

A paper prepared for the American Water Works Association proposes two alternative metrics that jointly assess water affordability specifically for lower-income households. The household burden indicator (HBI) measures the price of total basic water services (i.e., drinking and sewer services) as a percentage of the 20th percentile of the community's household income distribution (lowest quintile income, or LQI). The poverty prevalence indicator (PPI) measures the percentage of community households at or below 200% of the federal poverty level.[15] The authors use a supplementary measure, the low-income housing burden, to capture the broader cost of living in the community. It represents the percentage of low-income renters in the community who pay more than 50% of their income for rent.

The report recommends benchmarks and a matrix to consider the HBI and PPI simultaneously to assess water burden in the community. Adapting their methodology,[16] we assess the degree of burden water bills create in each of San Diego's water districts and provide the supplementary measure of housing burden.

Using the matrix in Table 2, the two water districts deemed unaffordable by the California State standard also pose a very high burden on low-income community members since their bills total more than 3.25% (and in actuality, more than 5.25%) of the LQI and more than 35% of their communities' residents lived in families with incomes under 200% of the federal poverty level. Two water districts (serving an estimated 333,253 residents) were identified as highly burdened, eight districts serving an estimated 1.95 million were identified as moderately-highly burdened, and eight districts serving approximately 597,585 were identified as having a moderately-low burden (see Table 3). Only two water districts in San Diego County (serving approximately 118,480 customers) were identified as having a low water cost burden. Using the HBI and PPI measures together, more than three-quarters of county residents were served by water districts charging rates imposing at least a moderately-high burden on lower-income consumers.

TABLE 2: BENCHMARKS FOR COMMUNITY AFFORDABILITY OF WATER

	PPI – Percent of households below 200% of federal poverty level		
HBI – Water bills as a percent of income at LQI	>35%	20% – 35%	<20%
>3.25%	Very high burden	High burden	Moderate-high burden
2% – 3.25%	High burden	Moderate-high burden	Moderate-low burden
<2%	Moderate-high burden	Moderate-low burden	Low burden

Adapted from Raucher, R., Clements, J., Rothstein, E., Mastracchio, J., & Green, Z. (2019). Developing a new framework for household affordability and financial capability assessment in the water sector. The American Water Works Association. https://www.acwa-us.org/wp-content/uploads/2019/05/Developing-New-Framework-for-Affordability-Report-Final.pdf

TABLE 3: WATER BURDEN- COMBINED HBI & PPI, 2023

Water district	Water burden	Estimated population
Escondido	Very high burden	84,793
Fallbrook Public Utility District	Very high burden	32,300
Helix Water District	High burden	273,591
Rincon del Diablo Municipal Water District	High burden	59,662
City of San Diego	Moderate-high burden	1,400,094
Sweetwater Authority	Moderate-high burden	146,478
Vista Irrigation District	Moderate-high burden	124,680
Vallecitos Water District	Moderate-high burden	98,559
Padre Dam Municipal Water District	Moderate-high burden	94,429
Valley Center Municipal Water District	Moderate-high burden	30,402
Ramona Municipal Water District	Moderate-high burden	27,127
Rainbow Municipal Water District	Moderate-high burden	23,679
Otay Water District	Moderate-low burden	230,175
Oceanside	Moderate-low burden	171,986
Carlsbad Municipal Water District	Moderate-low burden	95,929
Poway City	Moderate-low burden	46,360
Lakeside Water District	Moderate-low burden	30,968
Santa Fe Irrigation District	Moderate-low burden	16,692
Del Mar	Moderate-low burden	3,822
Yuima Municipal Water District	Moderate-low burden	1,653
Olivenhain Municipal Water District	Low burden	81,031
San Dieguito Water District	Low burden	37,449

Water rate data are from original collection of public records, data on quintile income by census tract are from US Census Bureau. (n.d.). B19081. Mean household income of quintiles. https://data.census.gov/table/ACSDT5Y2023.B19081?q=income%20quintile&g=050XX00US06073$1400000, and poverty data by census tract are from US Census Bureau. (n.d.). S1701. Poverty status in the past 12 months. https://data.census.gov/table/ACSST5Y2023.S1701?q=poverty&g=050XX00US06073$1400000. Estimates for water district poverty and population are derived, see Appendix II: Methodology.

Raucher and colleagues supplement the HBI and PPI measures with the low-income housing burden measure to reflect the cost of other necessary expenses in the community.[17] While they recommend reporting only the percentage of low-income households[18] who are renting their homes paying more than 50% of their incomes on housing, we report those paying more than 30% and more than 50% of their incomes because they are considered cost-burdened and severely cost-burdened, respectively, by the US Department of Housing and Urban Development.[19] We report the data for both renters and those with a mortgage because housing is such a large share of the cost of living in San Diego and those with a mortgage are more likely to pay their water bill, where renters might have this utility covered in their rent.

We estimate that between 26% and 94% of low-income renters in the public water districts are considered severely cost-burdened, paying more than half of their incomes on housing. Depending on where in the county they live, between 65% and 94% of low-income renters experience some housing cost burden, paying at least 30% of their incomes on rent. And while nationally renters put a greater percentage of their income towards housing costs,[20] that was not true across San Diego. Four water utilities had a greater housing burden among low-income earners who had a mortgage than those who rented their homes (see Table 4).

The Vista, Helix, Sweetwater, Fallbrook, and Rincon del Diablo water utility districts each had both a high housing burden (with greater than the national share of severely cost-burdened renters[21]) for renters and at least a moderately-high cost burden for drinking water. All water districts had a severe housing burden for low-income mortgage holders greater than the national rate;[22] the Del Mar, Valley Center, Rincon del Diablo, Fallbrook, Helix, Padre Dam, Vallecitos, Escondido, San Diego, Vista, Ramona, Lakeside, Rainbow, and Sweetwater water utility districts also charged rates imposing at least a moderately-high burden on these customers.

TABLE 4: HOUSING BURDEN BY WATER DISTRICT, 2023

Water district	Percent severely cost burdened[1] low-income[2] renters	Percent cost burdened[3] low- income[2] renters	Percent severely cost burdened[1] low-income[2] renters	Percent cost burdened[3] low- income[2] renters
Del Mar	94.2%	94.2%	99.7%	99.8%
San Dieguito Water District	85.0%	90.9%	70.1%	83.7%
Carlsbad Municipal Water District	83.1%	89.4%	63.5%	74.9%
Vista Irrigation District	80.4%	87.7%	57.1%	73.0%
Helix Water District	79.7%	87.3%	64.2%	78.8%
Sweetwater Authority	78.3%	88.4%	48.4%	61.6%
Fallbrook Public Utility District	77.7%	85.7%	67.9%	78.1%
Poway	77.4%	85.8%	53.9%	65.5%
Rincon del Diablo Municipal Water District	76.6%	81.9%	68.1%	77.0%
Santa Fe Irrigation District	75.8%	79.3%	77.7%	81.5%
Otay Water District	74.1%	78.3%	66.7%	75.7%
Ramona Municipal Water District	73.7%	84.9%	56.6%	67.9%
Vallecitos Water District	73.2%	84.4%	60.7%	72.7%
City of San Diego	72.6%	81.7%	60.0%	75.0%
Lakeside Water District	71.5%	82.4%	55.6%	71.2%
Escondido	71.5%	77.7%	60.4%	75.9%
Padre Dam Municipal Water District	70.9%	80.7%	62.7%	79.2%
Oceanside	69.5%	79.6%	61.3%	73.5%
Rainbow Municipal Water District	63.9%	67.7%	55.4%	85.0%
Olivenhain Municipal Water District	63.3%	82.4%	63.3%	72.2%
Valley Center Municipal Water District	31.0%	57.6%	69.4%	89.5%
Yuima Municipal Water District	26.0%	64.5%	82.8%	84.0%

[1] Paying greater than 50% of income on housing.
[2] Annual household income of less than $35,000.
[3] Paying greater than 30% of income on housing.
Data on renters are from US Census Bureau. (n.d.). B25074. Household Income by Gross Rent as a Percentage of Household Income in the Past 12 Months. https://data.census.gov/table/ACSDT5Y2023.B25074?q=B25074&g=050XX00US06073$1400000. Data on mortgage holders are from US Census Bureau. (n.d). B25095. Household Income by Selected Monthly Owner Costs as a Percentage of Household Income in the Past 12 Months. https://data.census.gov/table/ACSDT5Y2023.B25095?q=housing%20costs%20&g=050XX00US06073$1400000. Estimates for water district are derived, see Appendix II: Methodology.

IMPACTS ON PEOPLE AND HOUSEHOLDS

Affordability metrics based on the median household income, lowest quintile income, poverty prevalence, and housing burden are important because they tell us how affordable water is likely to be for an entire community. They do not, however, tell us how households are affected, how many people or which people are disproportionately impacted by the high price of water in those communities. In this section, we report the number of hours a ratepayer would have to work at minimum wage to pay the average water bill and the income dedicated to water services, both in California counties and San Diego households by race.

Hours at Minimum Wage

One indication of how affordable water is in a given community is to calculate the number of hours at minimum wage a person would have to work to pay for basic services.[23] In San Diego County, residents would have to work between two and six hours, close to a work day, at minimum wage to pay for drinking water for a single individual in their homes at average water use rates (see Table 1 for the number of hours required at minimum wage to cover the average water bill for a single-person household). In 2017, a minimum wage worker would have to have worked 9.5 hours in the City of San Diego to cover both drinkable water and sewer services for the average household; hours worked ranged from four hours at minimum wage in Phoenix to 13.6 in San Francisco in the 25 largest cities in 2017.[24]

Water utilities charge different volumetric fees based on how much water is used, so calculating the average monthly water bill and the hours working at minimum wage required to cover that bill is not a simple matter of multiplying a single individual's bill by the number of people in the household. We report information on average water bills for various family sizes using the California state standard of 50 gallons per capita daily in Table 6 in Appendix I: Tables. For the average family in San Diego County (a three-person household), projected water bills range between $38.52 and $105.34 per month, or approximately 2.5 to 6.8 hours at minimum wage. These estimates are conservative both because they are lower than the average daily water usage and because they do not include the cost of sewer services. For comparison, you can find projected water bills at selected family sizes at the average water consumption in Table 7.

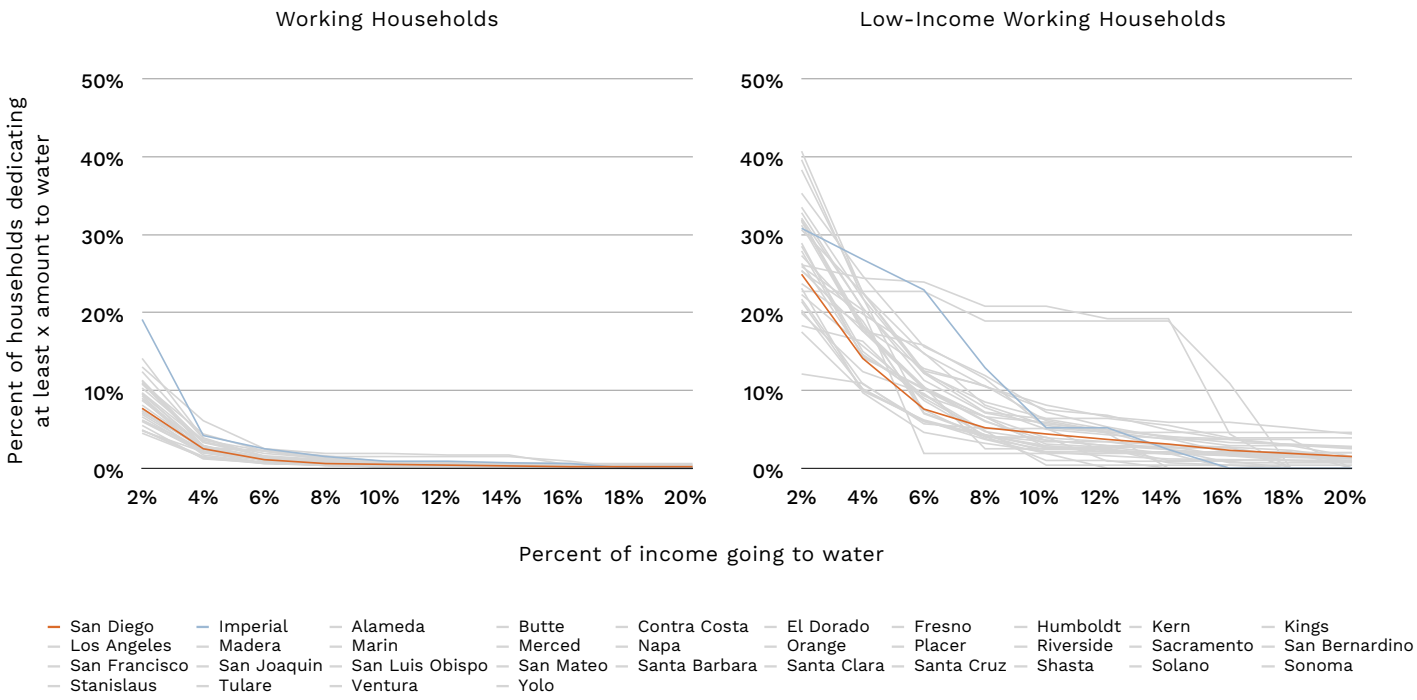
Income Dedicated to Water Services

For the remainder of this section of the report, we switch from using data on water rates collected from water districts to the annual cost of water reported by households to the US Census Bureau and calculate the IDWS,[25] or income dedicated to water services. Rather than calculating the IDWS for all households, we calculate the metric for households where at least one member of the household worked a majority of the year (for detailed methodology, see Appendix II: Methodology).

In 2023, 8% of San Diego County working households reported paying more than 2% of their annual income to water services, 3% reported paying more than 4%, and 1% reported putting more than 6% of their income toward water services. The findings are more stark when we look at the most vulnerable in our communities. One-quarter of working households in the lowest quintile income for our county were paying more than 2% of their household income toward water. Of the lowest income earners, 14% paid more than 4%, 8% paid more than 6%, 5% paid more than 8%, and 4% were putting at least 10% of their income towards their water bills. Figure 2 shows, for each share of income from 0% to 20% (horizontal axis), the share of households paying that percentage of income for water in California counties (vertical axis).

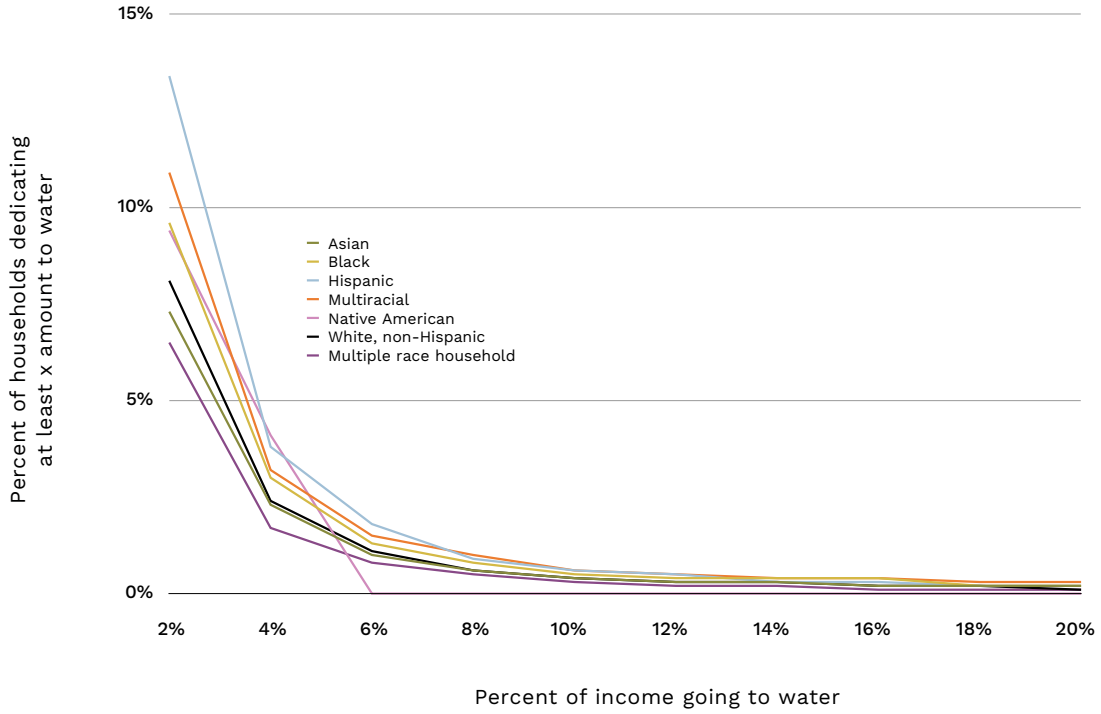
Notably, this is a measure of household water cost burden, not the absolute price of water. For example, Imperial County's water prices are close to those in San Diego County, but its households face a high water cost burden because they have substantially lower incomes. While the share of San Diego County households that are water-cost burdened hovered around the midpoint of California counties, San Diegans reported the 10th most expensive average annual water bills in 2023 (see Table 8 in Appendix I: Tables).

Figure 2: Income dedicated to water services in California counties, 2023



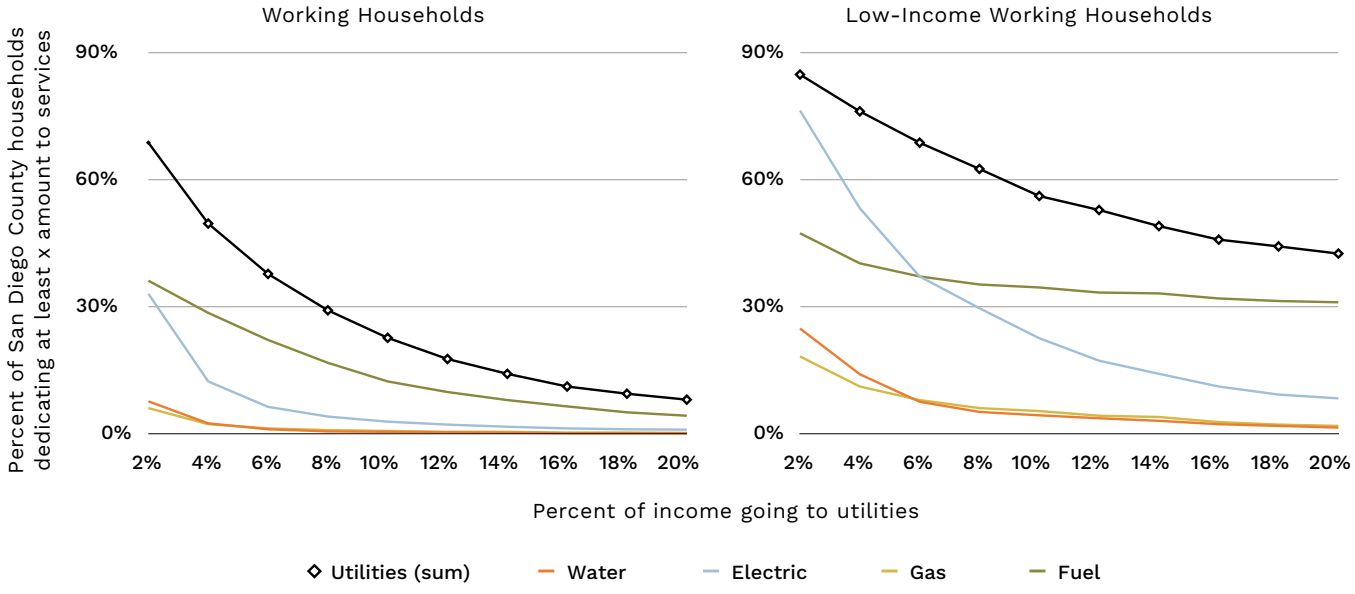
Another important consideration is how household water cost burdens are distributed across different population groups. Purchasing a home in San Diego is prohibitively expensive for most residents,[26] so there are differences by race in who is most likely to live in an owned (versus rented) home.[27] Since renters' water bills are sometimes included in their monthly rent, it is difficult to do a true equity assessment of which households are most impacted by the high price of water. We began to answer this question by assessing the income dedicated to water services by household race in San Diego County in households that (1) owned a home and (2) had at least one household member who worked more than half the year (for detailed methodology, see Appendix II: Methodology). There was a seven percentage-point difference between the percent of Hispanic households spending at least 2% of their income on water and the percent of multiple-race households doing the same. Disparities decreased as the cost burden increased, with less than 1% of households of any race paying more than 10% of their income for water. Figure 3 should not be compared to the previous figure since it includes only mortgage holders.

Figure 3: Income dedicated to water services in San Diego County in home-owning households with at least one person working a majority of the year, by race, 2023



A final consideration is the contribution of household water bills to the total cost of living in an area. In Figure 4, we present the share of annual incomes going to water, electricity, gas, fuel, and the sum of these four utilities for San Diego County households in which at least one member worked at least half the year and for those in the lowest quintile income. While electricity and fuel tend to be the most expensive utility bills, the combination of water, electric, gas, and fuel adds up. Eight percent of working households and over 40% of low-income working households are paying at least 20% of their income toward utilities; in a place where the cost of housing, food, and transportation are high, water is a necessary expense that is hard to cut back and is contributing to the high cost of living.

Figure 4: Income dedicated to utilities in San Diego County, 2023



Conclusion

Water affordability is a critical issue in San Diego County, where rising water prices, substantial income disparities, and sky-high housing prices create a burden for many households. While standard measures reflect relatively limited affordability challenges, more income-sensitive metrics indicate that more than three-quarters of county residents are served by water districts that charge rates unaffordable to lower-income customers.

Addressing the challenge of unaffordable water will require targeted policies that balance the need for sustainable infrastructure investment with equitable access to water. Solutions such as affordability programs, progressive rate structures, and comprehensive cost-of-service studies can help mitigate the impact on vulnerable populations while ensuring the financial stability of water utilities. Furthermore, as 26% to 94% of low-income residents experience severe housing cost burden within each water district, a broader understanding of how housing costs and other necessities interact with water affordability is essential for crafting effective interventions.

San Diego's water affordability crisis reflects broader trends across the nation, highlighting the need for innovative strategies that prioritize both equity and sustainability. By addressing these issues proactively, San Diego can serve as a model for other regions facing similar challenges, ensuring that access to water—a fundamental human right—remains within reach for all residents.

Appendix I: Tables

TABLE 5: SAN DIEGO COUNTY WATER RATES, FIRST 600 CUBIC FEET, 2023

Water district	Pipe diameter	Base fee	Volume fee per hundred cubic feet (HCF)					
			1 HCF	2 HCF	3 HCF	4 HCF	5 HCF	6 HCF
Carlsbad Municipal Water District	5/8-inch	$28.37	$3.92	$3.92	$3.92	$3.92	$3.92	$3.92
	3/4-inch	$38.08	$3.92	$3.92	$3.92	$3.92	$3.92	$3.92
City of San Diego	5/8-inch	$27.77	$5.50	$5.50	$5.50	$5.50	$6.22	$6.22
	3/4-inch	$27.77	$5.50	$5.50	$5.50	$5.50	$6.22	$6.22
Del Mar	5/8-inch	$44.02	$5.91	$5.91	$5.91	$5.91	$5.91	$5.91
	3/4-inch	$66.03	$5.91	$5.91	$5.91	$5.91	$5.91	$5.91
Escondido	5/8-inch	$47.30	$7.61	$7.61	$7.61	$7.61	$7.61	$7.61
	3/4-inch	$47.30	$7.61	$7.61	$7.61	$7.61	$7.61	$7.61
Fallbrook Public Utility District	5/8-inch	$60.60	$7.31	$7.31	$7.31	$7.31	$7.31	$8.06
	3/4-inch	$60.60	$7.31	$7.31	$7.31	$7.31	$7.31	$8.06
Helix Water District	5/8-inch	$28.41	$5.56	$5.56	$5.56	$5.56	$5.56	$5.56
	3/4-inch	$28.41	$5.56	$5.56	$5.56	$5.56	$5.56	$5.56
Lakeside Water District	5/8-inch	$7.94	$5.09	$5.09	$5.09	$5.09	$5.09	$5.09
	3/4-inch	$9.75	$5.09	$5.09	$5.09	$5.09	$5.09	$5.09
Oceanside	5/8-inch	$22.58	$2.65	$2.65	$2.65	$2.65	$2.65	$2.65
	3/4-inch	$22.58	$2.65	$2.65	$2.65	$2.65	$2.65	$2.65
Olivenhain Municipal Water District	5/8-inch	$36.31	$3.92	$3.92	$3.92	$3.92	$3.92	$3.92
	3/4-inch	$46.18	$3.92	$3.92	$3.92	$3.92	$3.92	$3.92
Otay Water District	5/8-inch	$34.40	$5.26	$5.26	$5.26	$5.26	$5.26	$5.26
	3/4-inch	$34.40	$5.26	$5.26	$5.26	$5.26	$5.26	$5.26
Padre Dam Municipal Water District	5/8-inch	$40.97	$7.31	$7.31	$7.31	$7.31	$7.31	$7.31
	3/4-inch	$40.97	$7.31	$7.31	$7.31	$7.31	$7.31	$7.31
Poway	5/8-inch	$28.40	$5.62	$5.62	$5.62	$5.62	$5.62	$5.62
	3/4-inch	$38.39	$5.62	$5.62	$5.62	$5.62	$5.62	$5.62
Rainbow Municipal Water District	5/8-inch	$69.20	$5.47	$5.47	$5.47	$5.47	$5.47	$5.47
	3/4-inch	$69.20	$5.47	$5.47	$5.47	$5.47	$5.47	$5.47
Ramona Municipal Water District	5/8-inch	$38.47	$6.83	$6.83	$6.83	$6.83	$6.83	$6.83
	3/4-inch	$38.47	$6.83	$6.83	$6.83	$6.83	$6.83	$6.83
Rincon del Diablo Municipal Water District	5/8-inch	$35.96	$8.47	$8.47	$8.47	$8.47	$8.47	$9.68
	3/4-inch	$45.55	$8.47	$8.47	$8.47	$8.47	$8.47	$9.68
San Dieguito Water District	5/8-inch	$26.39	$3.46	$3.46	$3.46	$3.46	$3.46	$3.46
	3/4-inch	$26.39	$3.46	$3.46	$3.46	$3.46	$3.46	$3.46
Sante Fe Irrigation District	5/8-inch	$47.24	$4.70	$4.70	$4.70	$4.70	$4.70	$4.70
	3/4-inch	$47.24	$4.70	$4.70	$4.70	$4.70	$4.70	$4.70
Sweetwater Authority	5/8-inch	$10.85	$4.85	$4.85	$4.85	$4.85	$4.85	$4.85
	3/4-inch	$10.85	$4.85	$4.85	$4.85	$4.85	$4.85	$4.85
Vallecitos Water District	5/8-inch	$37.99	$4.04	$4.04	$4.04	$4.04	$4.04	$4.04
	3/4-inch	$37.99	$4.04	$4.04	$4.04	$4.04	$4.04	$4.04
Valley Center Municipal Water District	5/8-inch	$51.70	$5.68	$5.68	$5.68	$5.68	$5.68	$5.68
	3/4-inch	$51.70	$5.68	$5.68	$5.68	$5.68	$5.68	$5.68
Vista Irrigation District	5/8-inch	$32.82	$4.99	$4.99	$4.99	$4.99	$4.99	$4.99
	3/4-inch	$43.30	$4.99	$4.99	$4.99	$4.99	$4.99	$4.99
Yuima Municipal Water District	5/8-inch	$41.05	$3.77	$3.77	$3.77	$3.77	$3.77	$3.77
	3/4-inch	$41.05	$3.77	$3.77	$3.77	$3.77	$3.77	$3.77

Data are from original collection of public records.

TABLE 6: MONTHLY WATER BILLS (AT CALIFORNIA STANDARD USAGE RATES) AND THE HOURS A RATEPAYER WOULD HAVE TO WORK (AT MINIMUM WAGE) TO PAY THOSE BILLS, 2023[1]

Typical monthly water bill[2] and working hours required to earn that amount[3], by household size

	1 Person		2 People		3 People		4 People	
Water district	Bill	Hours	Bill	Hours	Bill	Hours	Bill	Hours
Carlsbad Municipal Water District	$41.09	2.7	$48.95	3.2	$56.81	3.7	$64.67	4.2
City of San Diego	$38.80	2.4	$49.83	3.1	$62.31	3.8	$74.78	4.6
Del Mar	$66.88	4.3	$78.73	5.1	$90.58	5.8	$102.43	6.6
Escondido	$62.56	4.0	$77.82	5.0	$93.08	6.0	$110.65	7.1
Fallbrook Public Utility District	$75.26	4.9	$89.92	5.8	$105.34	6.8	$121.50	7.8
Helix Water District	$39.56	2.6	$50.71	3.3	$61.86	4.0	$73.01	4.7
Lakeside Water District	$19.05	1.2	$29.26	1.9	$39.46	2.5	$49.67	3.2
Oceanside	$27.89	1.8	$33.21	2.1	$38.52	2.5	$43.84	2.8
Olivenhain Municipal Water District	$49.11	3.2	$56.97	3.7	$64.85	4.2	$76.26	4.9
Otay Water District	$44.95	2.9	$55.49	3.6	$66.04	4.3	$76.59	4.9
Padre Dam Municipal Water District	$55.63	3.6	$70.29	4.5	$84.94	5.5	$99.60	6.4
Poway	$44.66	2.9	$55.93	3.6	$67.20	4.3	$78.47	5.1
Rainbow Municipal Water District	$80.17	5.2	$91.14	5.9	$102.11	6.6	$113.07	7.3
Ramona Municipal Water District	$52.17	3.4	$65.86	4.2	$79.56	5.1	$93.25	6.0
Rincon del Diablo Municipal Water District	$57.74	3.7	$74.72	4.8	$92.94	6.0	$112.35	7.2
San Dieguito Water District	$33.33	2.3	$40.27	2.6	$47.20	3.0	$54.14	3.5
Santa Fe Irrigation District	$56.66	3.7	$66.09	4.3	$75.51	4.9	$84.94	5.5
Sweetwater Authority	$20.58	1.3	$30.30	2.0	$40.03	2.6	$49.75	3.2
Vallecitos Water District	$46.09	3.0	$54.19	3.5	$62.31	4.0	$72.76	4.7
Valley Center Municipal Water District	$63.09	4.1	$74.48	4.8	$85.87	5.5	$97.26	6.3
Vista Irrigation District	$48.07	3.1	$58.07	3.7	$68.08	4.4	$78.56	5.1
Yuima Municipal Water District	$48.61	3.1	$56.17	3.6	$63.73	4.1	$71.29	4.6

[1] Water rates and minimum wage both calculated using 2023 data.

[2] For the family size at the California State standard for water usage of 50 gallons per person, per day in 2023. Does not include sewer.

[3] Calculations include the higher minimum wage in the City of San Diego.

Data are from original collection of public records. Multiplying by the minimum wage may not equal the average monthly water bill due to rounding.

TABLE 7: MONTHLY WATER BILL (AT SAN DIEGO COUNTY AVERAGE USAGE RATES) AND THE HOURS A RATEPAYER WOULD HAVE TO WORK (AT MINIMUM WAGE) TO PAY THOSE BILLS, 2023[1]

Typical monthly water bill[2] and working hours required to earn that amount[3], by household size

	1 Person		2 People		3 People		4 People	
Water district	Bill	Hours	Bill	Hours	Bill	Hours	Bill	Hours
Carlsbad Municipal Water District	$51.45	2.7	$57.92	3.2	$77.04	3.7	$94.82	4.2
City of San Diego	$53.81	2.4	$64.07	3.1	$92.99	3.8	$122.6	4.6
Del Mar	$82.50	4.3	$92.25	5.1	$119.73	5.8	$141.30	6.6
Escondido	$82.68	4.0	$95.91	5.0	$139.54	6.0	$175.56	7.1
Fallbrook Public Utility District	$94.59	4.9	$108.37	5.8	$145.09	6.8	$174.51	7.8
Helix Water District	$54.26	2.6	$63.43	3.3	$89.28	4.0	$110.48	4.7
Lakeside Water District	$32.51	1.2	$40.91	1.9	$64.57	2.5	$83.38	3.2
Oceanside	$34.90	1.8	$39.27	2.1	$51.59	2.5	$62.72	2.8
Olivenhain Municipal Water District	$59.47	3.2	$68.24	3.7	$92.92	4.2	$113.69	4.9
Otay Water District	$58.86	2.9	$67.53	3.6	$92.42	4.3	$113.25	4.9
Padre Dam Municipal Water District	$74.96	3.6	$87.02	4.5	$123.28	5.5	$154.23	6.4
Poway	$59.53	2.9	$68.80	3.6	$94.93	4.3	$115.44	5.1
Rainbow Municipal Water District	$94.63	5.2	$103.66	5.9	$129.09	6.6	$149.05	7.3
Ramona Municipal Water District	$70.23	3.4	$81.49	4.2	$113.25	5.1	$138.17	6.0
Rincon del Diablo Municipal Water District	$80.14	3.7	$96.89	4.8	$140.69	6.0	$176.01	7.2
San Dieguito Water District	$42.48	2.2	$48.18	2.6	$64.27	3.0	$84.04	3.5
Santa Fe Irrigation District	$69.09	3.7	$76.85	4.3	$98.70	4.9	$115.85	5.5
Sweetwater Authority	$33.40	1.3	$41.40	2.0	$64.84	2.6	$85.97	3.2
Vallecitos Water District	$56.77	3.0	$64.96	3.5	$88.01	4.0	$107.03	4.7
Valley Center Municipal Water District	$78.11	4.1	$87.48	4.8	$113.89	5.5	$134.62	6.3
Vista Irrigation District	$61.26	3.1	$69.63	3.7	$94.55	4.4	$114.47	5.1
Yuima Municipal Water District	$58.58	3.1	$64.80	3.6	$82.33	4.1	$96.08	4.6

[1] Water rates and minimum wage both calculated using 2023 data.

[2] For the family size at the California State standard for water usage of 91 gallons per person, per day in 2023. Does not include sewer.

[3] Calculations include the higher minimum wage in the City of San Diego.

Data are from original collection of public records. Multiplying by the minimum wage may not equal the average monthly water bill due to rounding.

TABLE 8: AVERAGE ANNUAL WATER COSTS BY CALIFORNIA COUNTY, 2023

Rank	County	Average Annual Water Bill
1	San Mateo County	$960.52
2	Solano County	$895.49
3	El Dorado County	$852.18
4	Santa Clara County	$844.67
5	Contra Costa County	$837.75
6	Marin County	$804.40
7	Ventura County	$796.22
8	San Joaquin County	$790.35
9	Sacramento County	$784.86
10	San Diego County	$778.81
11	San Luis Obispo County	$778.21
12	Imperial County	$777.46
13	Santa Barbara County	$746.64
14	Stanislaus County	$745.44
15	Sonoma County	$721.18
16	Placer County	$712.23
17	Santa Cruz County	$702.83
18	Alameda County	$699.45
19	San Bernardino County	$696.14
20	Napa County	$694.28
21	Riverside County	$688.80
22	Yolo County	$683.10
23	Humboldt County	$627.55
24	Kings County	$590.90
25	Fresno County	$569.67
26	Tulare County	$555.58
27	Orange County	$538.64
28	Shasta County	$526.42
29	Los Angeles County	$520.90
30	San Francisco County	$515.67
31	Madera County	$506.90
32	Kern County	$499.76
33	Merced County	$467.00
34	Butte County	$388.56

Data are from Ruggles, S., Flood, S., Sobek, M., Backman, D., Chen, A., Cooper, G., Richards, S., Rodgers, R., & Schouweiler, M. (2024). IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS. https://doi.org/10.18128/D010.V15.0

Appendix II: Methodology

DATA

Data for this project come from multiple sources, including collection of public documents, US Census Bureau tables, and US Census microdata.

Between April and June 2023, we gathered water rate and charge data from the public water utilities in San Diego County. The data were sourced primarily from official water utility websites, supplemented by direct communication with municipal representatives when online information was unavailable or unclear. This collection process included historical water rate data spanning from 2017 to 2023, enabling a comprehensive analysis of trends, such as dwelling type, rate tier, and average water bill, over the selected timeframe.

Aggregated data on population size, household income, income quintiles, poverty, and housing affordability by census tract were downloaded from the US Census Bureau.[28] Sources for specific tables are noted where they are used throughout the report.

US Census Bureau microdata were used to answer questions about household water bills in San Diego County overall and in the lowest income quintile, household water bills in San Diego County by household race, and household water bills by California County. We used 1-year data from 2023, downloaded from IPUMS USA.[29]

METHODS

Average Price of Water

Water agencies in San Diego County charge a base fee per month (to cover items such as debt, maintenance, and infrastructure improvements) as well as a volumetric fee (to cover the marginal cost of delivering the water consumed by a household). Total bills vary based on the district, the volume of water used, and the pipe diameter (either 5/8-inch or 3/4-inch). To calculate the average volumetric price of water for a single person in each of the water districts, we added the rate each district charges per hundred cubic feet of water used for the smaller pipes to the corresponding rate for the larger pipe and divided that by two. We then multiplied 91 gallons (average daily use)[30] by 30 days (per month) and then converted that to HCF (approximately 3.65 HCF per month). Finally, we added the base fee charged by the water district to the average price for the first, second, and third HCF of water and .65 of the fourth HCF of water.

California State Standard

The water districts in San Diego County do not have borders that align with census-designated boundaries, so it was necessary to estimate the median household income (MHI) in each water district. To do so, we calculated the land area where any census tract and water district in San Diego County intersected using the sf[31] package in R. Next, we calculated the proportion of the district in each intersection, the proportion of each census tract in each intersection, the estimated population of each census tract in the intersection area[32] (based on the land proportion in the intersection area), and the estimated population of each water district (by summing the proportional population estimates in each tract by district). Finally, we estimated the median household income for each water district with the following equation:[33]

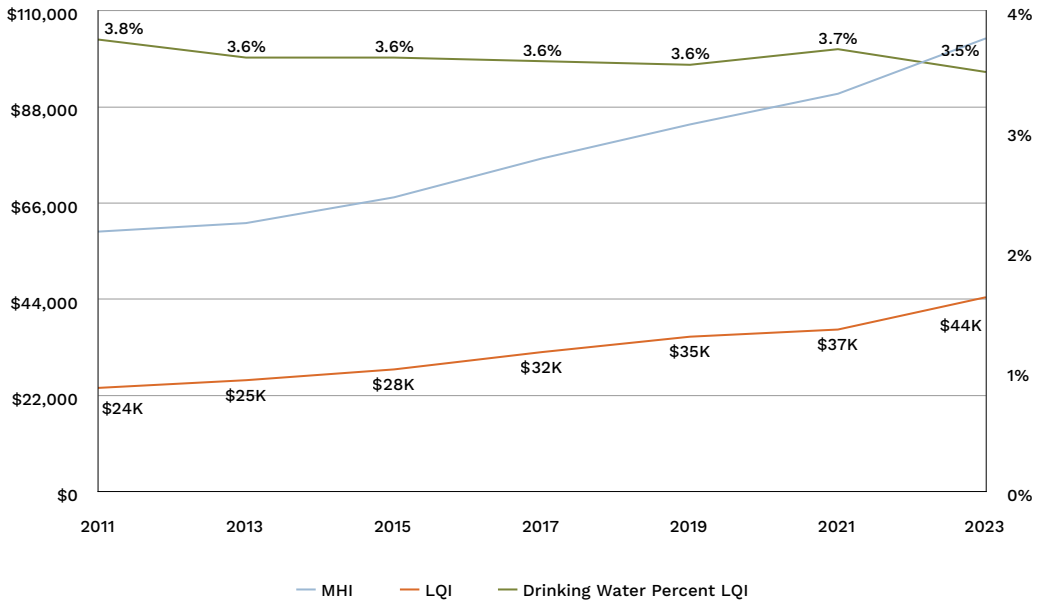
$$\sum \frac{(\text{Census tract MHI}) * (\text{Adjusted census tract population})}{(\text{Total adjusted census tracts population})}$$

Median household income was top-coded by the census bureau at $250,000. We added the base fee of water to the average price for the first through the sixth hundred cubic foot of water (the California state standard, equal to approximately 50 gallons per person, per day for a three-person household for 30 days),[34, 35] and multiplied that by 12 to estimate the annual price of six hundred cubic feet of water. We then divided that by the water district's MHI to determine the average percent of MHI spent on water annually in each water district.

Other Income Thresholds

We used the same procedure described in the previous section to estimate the lowest quintile income,[36] the proportion of the population below 200% of the federal poverty level,[37] and the average annual water bill for each water district. Raucher and colleagues' (2019)[38] original benchmarks estimated the percent of LQI that would be considered unaffordable based on the EPA standard of 4.5% of MHI for combined drinking and sewer costs. We only have data on drinking water and want to use the more restrictive California State standard of 1.5%[39] of MHI, so followed the same procedure to develop appropriate benchmarks. The median household income in San Diego County in 2023 was $103,674 and the upper limit of the lowest quintile income was $44,474. The state standard would consider an annual water bill over $1,555.11 (1.5% of the MHI) unaffordable. That was equal to 3.5% of the LQI in 2023, and as can be seen in Figure 5, a similar percentage over the last decade. Like Raucher et al. (2019), we used slightly lower thresholds than the state standard since it was based on the MHI.

Figure 5: Drinking water bill as a percentage of lowest quintile income for bills at 1.5% of San Diego County median household income, 2011 – 2023



Impacts on People and Households

Hours at Minimum Wage

To calculate the number of hours required at minimum wage, we divided the price of water by the minimum wage in 2023 ($16.30 in the City of San Diego and $15.50 elsewhere in the county). Table 1 has the number of hours required for a single person household to pay the average water bill in each of the water utility districts in San Diego County. Table 6 has the projected bills and hours required for various family sizes at the California state standard of 50 gallons per capita daily, and Table 7 has the same information for the average water consumption in San Diego County of 91 gallons per capita daily.

Income Dedicated to Water Services

Finally, to estimate the percentage of household income going to water services in California counties, we used US Census microdata. Each year, the American Community Survey asks 1% of the US population a host of questions, including "In the past 12 months, what was the cost of water and sewer for this house, apartment, or mobile home?" To ensure a fair comparison, we chose to analyze households in which at least one member of the household worked more than 26 weeks of the previous year (this prevents households impacted by long-term unemployment unduly impacting the water burden). In keeping with Patterson and Doyle's (2021)[40] methodology, we divided each household's annual water bill by their annual income and then calculated the percentage of households exceeding various thresholds (i.e., 2%, 4%, 6%, 8%, 10%, 12%, 14%, 16%, 18%, and 20%). We did this for all households in California by county, for households earning below their respective county's lowest quintile income by county, and for San Diego County by household race. For the analyses by household race, we further restricted the sample to households living in an owned home (or one that still had a mortgage) because homeowners are more likely than renters to pay a water bill and there is a difference in homeownership rates by race. To assign race to a household, we made a series of ordered decisions: first, if the household consisted of only one person, we assigned that person's self-reported race to the household. If there was more than one person in the household and everyone in the house was of the same race, we assigned their self-reported shared race to the household. If there were multiple people in the house and some reported different races than others, we assigned those households the label "multiple race household." We followed the same procedures to analyze the percentage of income dedicated to other utilities.

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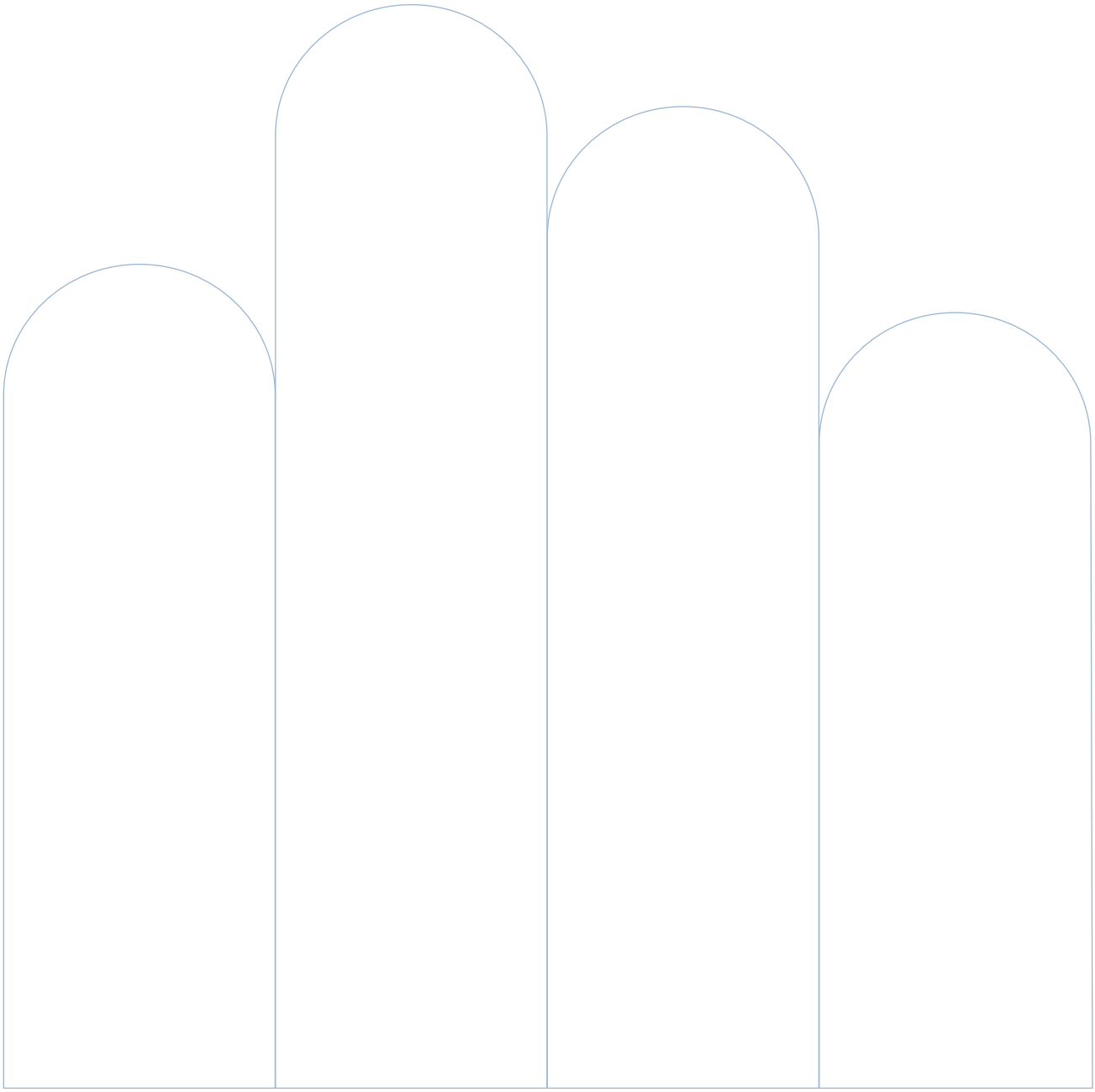

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