

MIRAGE IN THE DESERT

UTAH'S PROPERTY TAXES FOR WATER

A solution to end Utah's water waste cycle.



UTAH RIVERS COUNCIL

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UTAH'S PROPERTY TAXES FOR WATER

October 2022

PHOTO: PHOTO: E.P. KOSMICKI

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For the second year in a row, the Great Salt Lake reached record low levels because of excessive upstream water diversions and municipal water use.

Many political leaders and much of the Utah media are seeking guidance from the same handful of water lobbyists who created this wasteful water system which discourages water efficiency over the last 30 years.

Preface

For many decades, Utah water suppliers have been collecting property taxes from homes, businesses and automobiles under the pretense these taxes are essential in delivering our water supply.¹ Based on our comprehensive review of this practice inside and outside of Utah over the last 20 years, this claim is a mirage.²

Property tax revenue often makes up a larger proportion of a Utah water district's total revenues than do its revenues from water sales. This is not the case in most other western states, as this research report demonstrates. We surveyed 342 wholesale water suppliers across the American West and found that Utah is over-collecting property taxes and encouraging water waste.

Property tax collections for water act to reduce the price of water that consumers pay in their monthly water bills.³ These consumers are not just homeowners, they include businesses, schools, universities, churches and government golf courses, among other landowners.

Fiscal conservatives, economists and water experts criticize the collection of property taxes by water districts to lower the price of water, pointing to the role these tax subsidies play in making Utah's municipal water rates the least expensive in the U.S.⁴ As basic market economics dictate, cheap water prices lead to the wasting of water.⁵ The fact that taxpayers are subsidizing large exempt institutional users – who pay no property taxes – to overuse water is particularly problematic.

This water waste is more than just a theoretical impact since Utah is America's #1, highest municipal water user, per person.⁶ This very high water use is the justification used by the very same water districts overcollecting property taxes to push forward more than \$6 billion in new taxpayer spending by claiming Utah's wasteful water users are running out of water. These tax collectors are pushing the Lake Powell Pipeline and Bear River Development to deliver water to wasteful municipal water users. These same lobbyist staff members stop water conservation legislation from advancing inside Utah's statehouse.



PHOTO: E.P. KOSMICKI

Utah is America's highest per person municipal water user, because it has America's least expensive water rates through property tax subsidies.

A wealthy group of government water lobbyists have spent decades fighting water conservation legislation at the Utah statehouse including curtailing efforts to ensure that water rates reflect the full costs of water delivery in consumers' bills.

The general managers of these water districts are paid more than the Utah Governor or the Utah Attorney General but are cited by the Utah media as authority figures on water, even in the absence of science or data.

Both the Lake Powell Pipeline and Bear River Development have created immense controversy and public opposition because of their spiraling costs, myriad of impacts and questionable purpose. The state agency and water districts advancing this \$6 billion in spending have shown no interest in considering inexpensive alternatives, including phasing out property taxes for water.

The Utah Rivers Council has run property tax phase out legislation five times at the Utah Legislature since 1998. The immense lobbying power of the water districts has killed the bill each time. It is ironic that the funding for this lobbying staff time comes from the collection of property taxes by these same rich water districts.

These institutions are governed by appointed board members who have no public oversight and the names of board candidates almost always come from the water districts themselves.⁷ America was founded on the principal that there should be no taxation without representation, but no Utahn ever gets the chance to vote for the appointed board members of these water districts collecting property taxes. No critic of water district policy will be appointed to these water districts because water district staff work to ensure that only board members they recommend are appointed. This allows these agencies to implement reckless policies, most notably the wasting of water and billions in unnecessary spending.



PHOTO: SCOTT LAW

Increased water rates for large water users could substantially lower water demand.

Our analysis demonstrates that we could lower municipal water demand in the Great Salt Lake watershed by 25% by giving a tax break to Utah taxpayers.

Although the lobbyist staff managers of these water districts claim they are working hard to conserve water, they consistently stop meaningful water conservation legislation from passing. If Utah phased out property taxes for water, the amount of water saved would eliminate or defer the need for new water infrastructure spending, like Bear River Development and the Lake Powell Pipeline.

In the face of these economic realities, it is tragic to watch the decline of the American West's largest lake, the Great Salt Lake. For the second year in a row, the Great Salt Lake is shriveling to a new low water level as vast areas of dry lakebed stretch across the horizon.⁸ Sailboats rest in parking lots adjacent to floating docks now laying in the dirt where coyotes roam. On windy days, lakebed dust coats Wasatch Front cities and towns with unhealthy levels of pollutants that are making Utah's poor air quality problems even worse.⁹

If these property taxes for water were phased out, increased water rates for large water users could substantially lower water demand. Our analysis demonstrates that we could lower municipal water demand in the Great Salt Lake watershed by 25% by giving a tax break to Utah taxpayers.¹⁰ This is the very definition of a win-win scenario.

Whether Utah legislators find the ethical courage to stand up to the water district lobbyists and phase out the property tax for water or not is one of the most important questions facing the future of the Great Salt Lake.



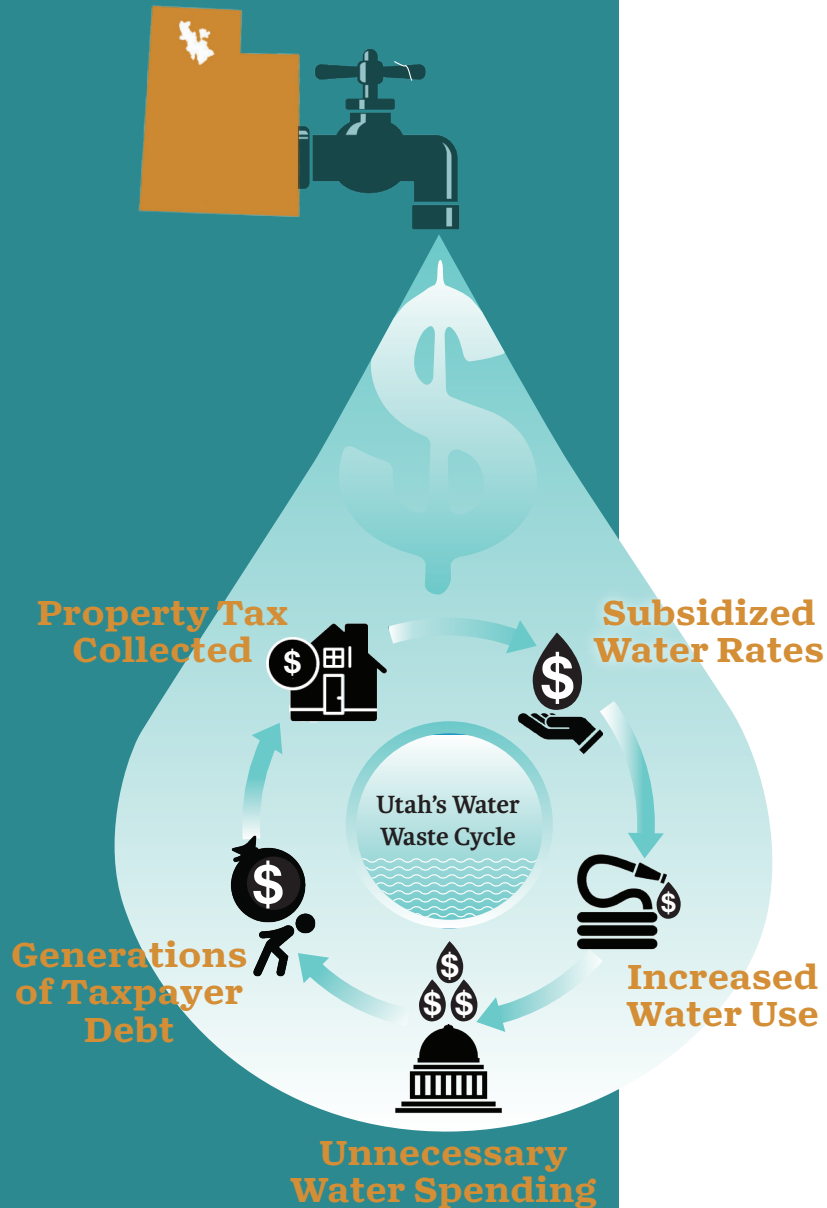
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EXECUTIVE SUMMARY

A Survey of Property Tax Collections Among Wholesale Western Water Suppliers

Utah's Water Waste Cycle

Penny Wise Pound Foolish



1. The Source of Utah's Water Troubles:

Property Tax Collections by Water Districts

Utah water conservancy districts collect property taxes from housing, businesses and automobiles. Some Utah water districts receive more revenue from property tax collections than they do from water sales.

2. Property Taxes Explain Why Utah Has America's Cheapest Water Rates

Because wholesale water rates in Utah are subsidized by property tax collections, the price of water set by cities and towns that retail water to homeowners, businesses, and government and nonprofit water users are some of the lowest water rates in the U.S.

3. Lower Water Rates Leads to Higher Water Use

These property taxes explain why Utah has America's cheapest water rates and the highest municipal water use, per person. The economic principle of supply and demand applies to water just as it does to other commodities: lower water rates leads to much higher water use.

4. Higher Water Use Means Increased Government Spending

Water use is used to predict future government spending needed to serve water users. This spending includes expenditures for new treatment plants, sewage facilities, pipelines, increased operation and maintenance costs and new water sources. That's why lowering water demand helps cities and other water suppliers defer or eliminate the need for infrastructure spending and the issuance of public debt.

5. Unnecessary Spending Leads to Generations of Debt

Unnecessary government spending places excessive levels of debt on taxpayers that has many repercussions. If a water supplier issues debt that isn't needed, taxpayers will end up absorbing the unnecessary debt burden and this may impair a community's ability to invest in other needs.

Survey of Property Tax Collections by Western Water Suppliers

Abbreviated Results & Findings

To help aid in the discussion about collecting property taxes for water, the Utah Rivers Council reviewed the fiscal year 2020 audited financial statements and bond ratings of 342 water suppliers across nine other western states – Washington, Oregon, Montana, Nevada, Colorado, California, Arizona, New Mexico, and Texas – and compared their property tax collection practices to those in Utah.

We sought to produce an apples-to-apples comparison of water districts by creating a set of criteria and only reviewing the fiscal year 2020 audited financial statements of water suppliers that met the criteria. Our criteria targeted large, wholesale water suppliers that are the most similar to Utah's major water districts – namely the Central Utah, Weber Basin, Jordan Valley, Metropolitan, and Washington County water districts.

Our review found that Utah is an outlier when it comes to collecting property taxes for water suppliers. The following trends were clearly evidenced from the 342 water suppliers studied from outside Utah:

1.

Utah was the only state – out of the ten we reviewed – where every water district surveyed collected a portion of its revenues from property taxes.

Every other state surveyed had a number of water suppliers who collected no property taxes whatsoever. Table 3 on page 33 details the total number of water suppliers surveyed in each state and the number collecting property taxes in that same state.

Property Tax Collections by Surveyed Water Suppliers, 2020

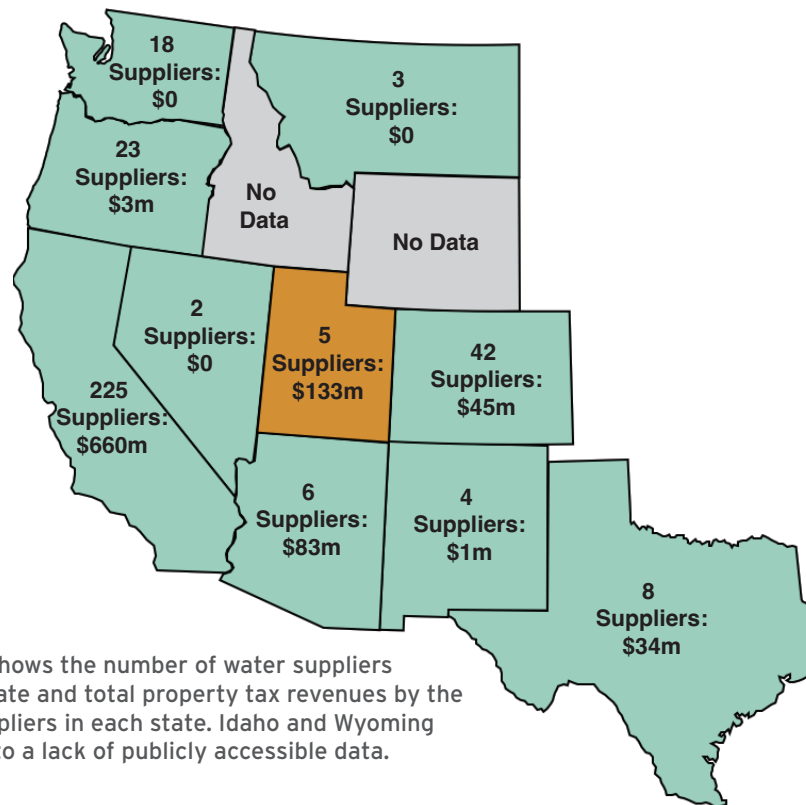


Figure 1: This map shows the number of water suppliers surveyed in each state and total property tax revenues by the surveyed water suppliers in each state. Idaho and Wyoming were excluded due to a lack of publicly accessible data.

2.

Utah water suppliers collected a much higher portion of their revenues from property taxes than water suppliers from the other nine states.

Utah water suppliers collected an average of 25% of their revenues from property taxes in 2020, whereas water suppliers in Washington, Oregon, Montana, Nevada, Colorado, California, Arizona, New Mexico, and Texas collected an average of just 9%. In some states – such as Montana, Nevada, and Washington – the surveyed water suppliers did not collect any money from property taxes whatsoever. Table 4 on page 34 shows the revenue breakdown for the surveyed water suppliers in each state.

**Water Supplier Revenue Breakdown
Utah vs. Western U.S.**

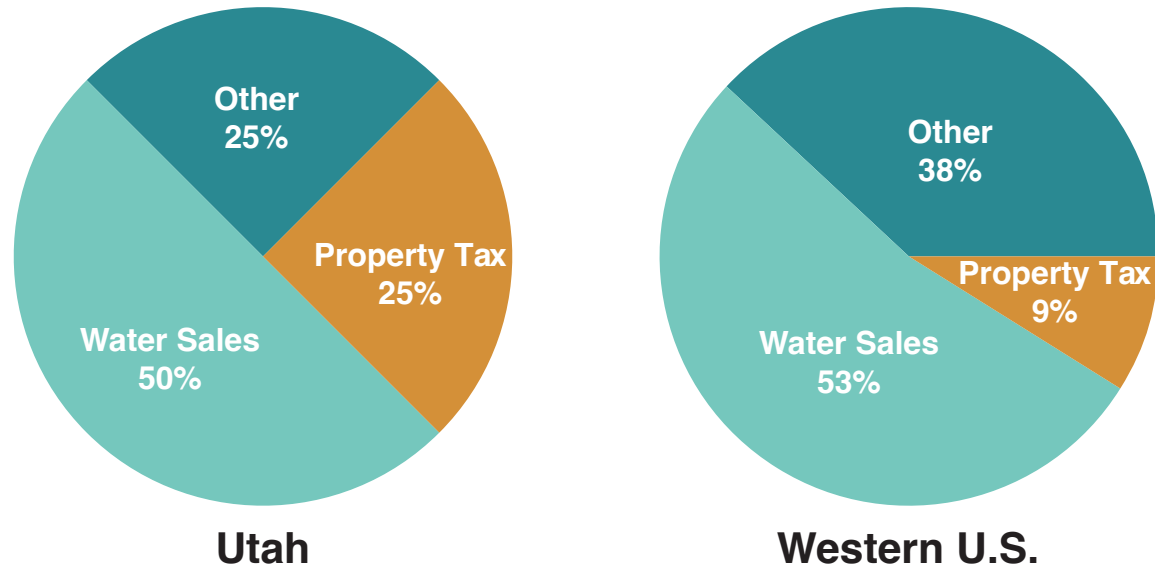


Figure 2: Utah water suppliers collected nearly three times the proportion of their revenues from property tax collections compared to the revenues of water suppliers outside of Utah in the Western U.S.

Utah water suppliers collected an average of 25% of their revenues from property taxes in 2020, whereas water suppliers in Washington, Oregon, Montana, Nevada, Colorado, California, Arizona, New Mexico, and Texas collected an average of just 9%.

3.

Utah collected an unusually large total amount of money from property taxes.

Incredibly, just five water suppliers in Utah collected more money from property taxes than 100 water suppliers in seven other western states did in 2020.

Utah's Overcollection of Property Taxes

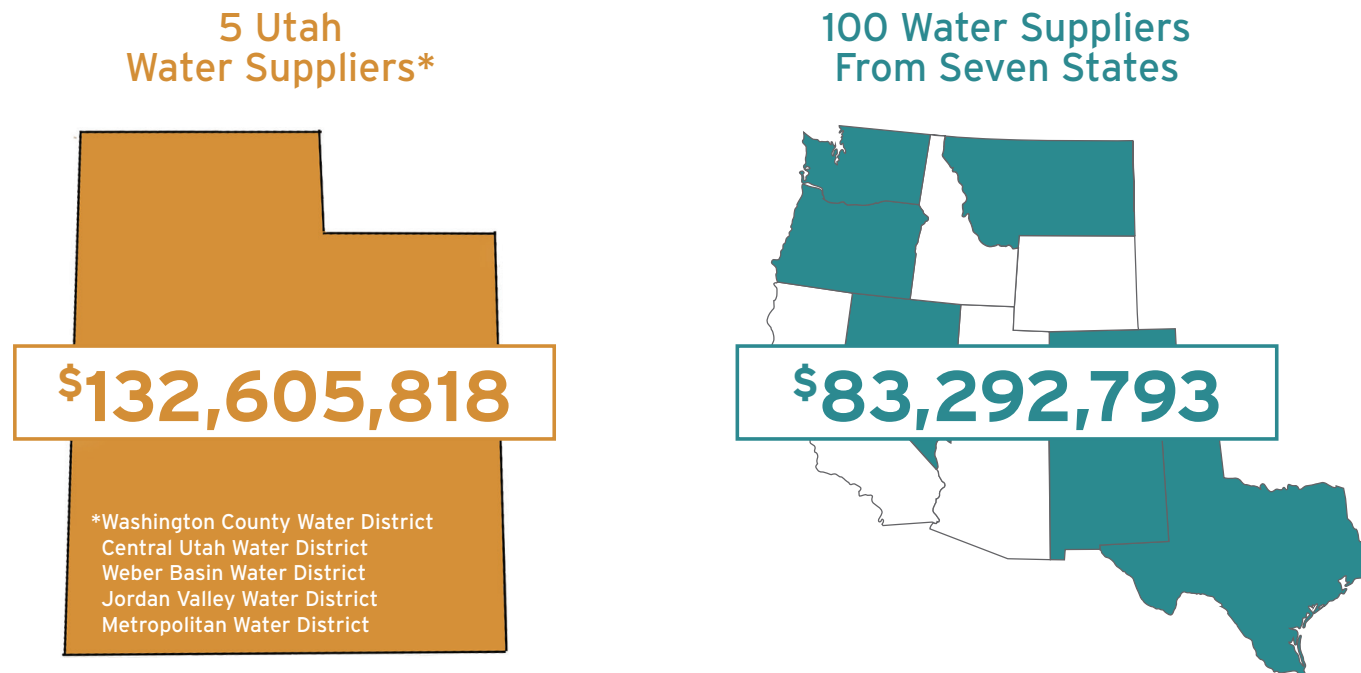


Figure 3: Utah's five largest water suppliers collected nearly \$50 million more in property taxes in 2020 than 100 of the largest water suppliers in seven other western states combined.

4. There is no clear relationship between bond ratings and property tax collections.

Utah water districts claim that property tax collections allow these agencies to receive better bond ratings, which they claim is a benefit to taxpayers. Not only is there no net benefit to taxpayers, we could not discern any correlation between property tax collections and better bond ratings.

In addition to reviewing audited financial statements, we also reviewed bond information to determine whether property tax collections have an effect on bond ratings. We used the Municipal Securities Rulemaking Board's online Electronic Municipal Market Access portal to collect data on bond ratings, bond types, and other relevant bond information.

Of the 342 total water suppliers surveyed, we found 76 water suppliers with publicly accessible bond information across every state in our study area except Montana. We tested whether the amount of money a water supplier collects from property taxes affected their bond rating in any noticeable way via two methods.

First, we converted each water supplier's bond rating to a numeric score – the details of which are shown in Table 5 on page 37 – and plotted that bond score against the percentage of their total revenues they collected from property taxes – the results of which are shown in Figure 16 on page 38.

We then tested this relationship again with a more statistically formal method of analysis known as regression. The regression analysis failed to show any significant relationship between property tax collections and bond ratings.

This makes sense, as major rating agencies regularly cite a suite of financial metrics when justifying their decision to issue a bond rating. To these rating agencies, bond ratings are most strongly determined by things like total indebtedness, economic base diversity, growth rates of earnings, population, and prior actions with bonds and debts.¹¹ In other words, a water supplier with a reliable source of revenue – such as long-term water contracts or water sales in a growing urban area – and sound financial practices can receive very high bond ratings without collecting property taxes.

Property taxes are just one of the many tools available to water suppliers to demonstrate overall financial health and secure better bond ratings, but are not inherently necessary for good bond ratings.

5.

The Public is Financially Better Off with Lower Property Tax Collections

Even if one were to pretend that a water district pays a lower interest rate for borrowing because of property tax collections, the costs to the Utah taxpayer of property tax collections greatly outweigh the benefits of less expensive borrowing.

The difference in interest rates between AA bond ratings, a common rating for Utah water districts, and A bond ratings is relatively small. From 2012 to 2022, AA rated bonds averaged an interest rate just 0.39% lower than A rated bonds.¹² This means that if a water supplier was downgraded from AA to A, the increased borrowing cost would be minimal.

To put this in terms of dollars, imagine two water districts both issue \$650 million in bonds over a 20-year repayment window. District 1 secures a AA bond rating with a 4.4% interest rate, while District 2 secures a 4.8% interest rate with their A rating. These interest rates are approximately the current rates for AA and A rated municipal bonds.¹³ Over the 20-year life of the bond, District 1 would pay about \$889 million in interest, and District 2 would pay about \$1 billion. That means that even though District 1 had the better bond rating, they ended up saving a relatively small amount of money when compared to District 2 – just \$122 million over 20 years.

Although \$122 million sounds significant, it is only \$6.1 million annually. By comparison, a water district may be collecting \$20-75 million in property taxes for each of these years.¹⁴ Taken over the 20-year period, this means taxpayers are paying a whopping \$400 million in property taxes to save \$122 million in interest. Are we really being asked to believe the property tax is being collected to save taxpayers borrowing costs? This theoretical scenario is actually quite real.

The Central Utah Water District closely resembles District 2 in the scenario above with a AA+ credit rating and \$650 million in outstanding bonds.¹⁵ The Central Utah Water District collected a whopping \$73 million in property taxes in 2020.¹⁶ Over 20 years this total balloons to a whopping \$1.46 billion in property tax collections. There simply is no scenario in which this water district will save \$1.46 billion in reduced interest rate payments as a function of a better bond rating. The taxpayers who are forced to pay taxes to the Central Utah Water District would be much better off if their property taxes were refunded. If the argument is about saving taxpayers money, there is no universe where the math benefits taxpayers.

The Central Utah Water District is not alone in failing to conduct basic math to reduce taxes for

the taxpayers the agency is supposed to serve. Each of Utah's major water suppliers – the Jordan Valley, Weber Basin, Washington County, and Metropolitan Water District – collected large amounts of property taxes (between \$10 to \$22 million) in 2020.¹⁷ These water suppliers are collecting far more money from their taxpayers via property taxes than they are saving them via reduced borrowing costs.

This begs the question, who is really benefiting from these property tax collections? It is clearly not the Utah taxpayer.

All this does not even address the fact that phasing out property taxes can greatly reduce water demand, which the American Water Works Association shows can defer or eliminate the need for new spending and borrowing.¹⁸ In other words, phasing out property taxes and charging higher prices could lead to water suppliers deferring or altogether eliminating plans for new, expensive projects – like the \$3 billion Lake Powell Pipeline or \$3 billion Bear River Development – thereby saving Utahns from having to shoulder these tremendous amounts of debt.

A wide-angle photograph of a desert landscape. In the background, a range of mountains with some snow-capped peaks stretches across the horizon under a clear blue sky. The foreground is dominated by a vast, flat, dry lake bed or salt flat, which reflects the sky and the mountains. The overall scene is hazy and atmospheric, suggesting a hot, arid environment.

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UTAH'S WATER WASTE CYCLE

How Economics Explains Why Utah is America's Most Wasteful Municipal Water User

Utah's Water Waste Cycle

Penny Wise Pound Foolish



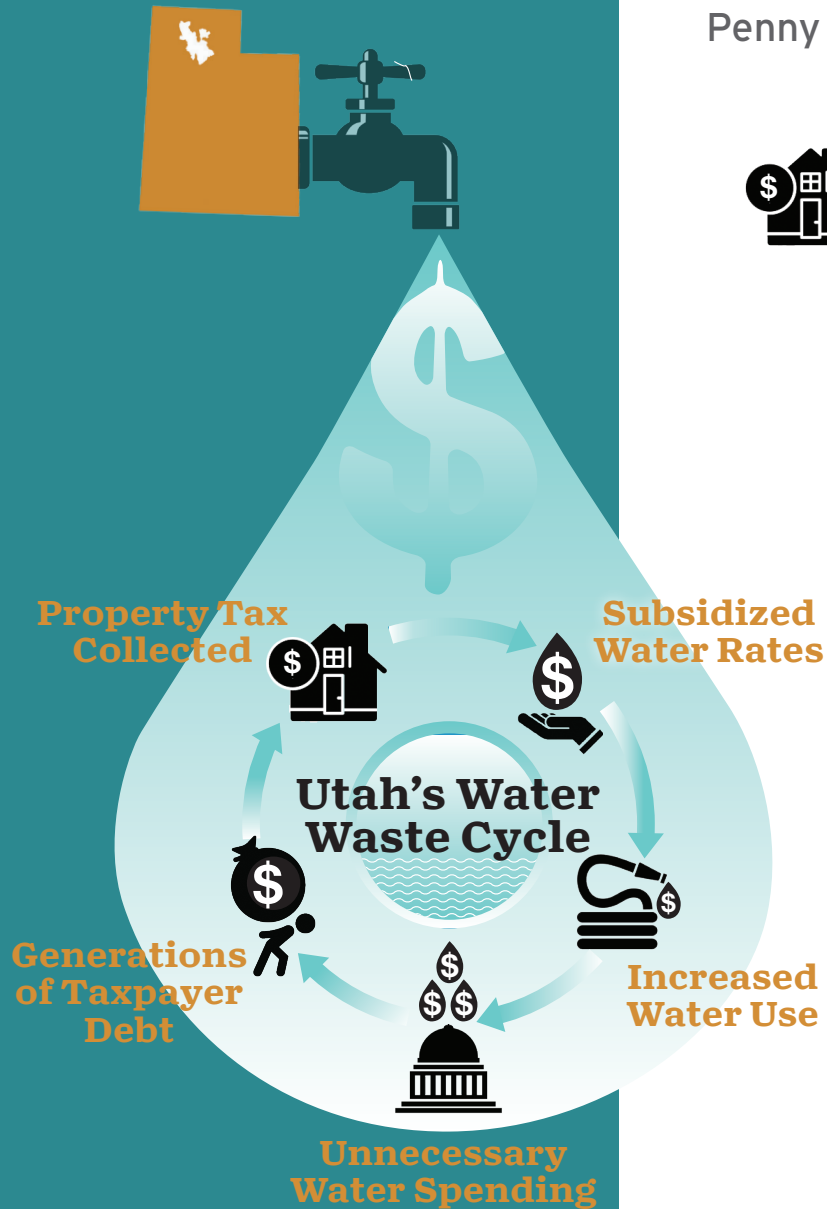
1. The Source of Utah's Water Troubles: Property Tax Collections by Water Districts

Every water wholesaler in Utah, called a water conservancy district, brings in a portion of their revenues from the collection of property taxes on housing, businesses and automobiles. These tax revenues are in addition to water sales and impact fees (a one-time fee collected on new development). The amount of property tax paid on a home, business or automobile is based on the assessed value of the property and the collection rate imposed by the water district. Some Utah water districts receive more revenue from these property tax collections than they do from selling water.

Some Utah water districts receive more revenue from property tax collections than they do from selling water.

In 1951, the Utah Legislature passed the Water Conservancy District Act which allowed the creation of independent water conservancy districts. Water districts can span a portion of a county or encompass multiple counties. The majority of water districts do not retail water to consumers, but instead deliver wholesale water to cities or other retail water suppliers. These retail water utilities then distribute and bill the water to consumers. The fact that most Utahns are billed by retail cities for the water they use leaves millions of Utahns wondering what water districts do and why they pay property taxes to them.

Few Utahns realize they pay property taxes that lower the price of water for neighboring homes, businesses, government and nonprofit institutions because of the lobbying power of these government water districts. These water districts expend vast resources to lobby the Utah Legislature about this tax policy and



to advance controversial water projects like the proposed Lake Powell Pipeline or Bear River Development.

Because Utah water districts collect a substantial portion of their revenues from property taxes, they are not as reliant on water sales to support their operations. This enables them to charge below-market prices for water. Consequently, the true cost of delivering water is not represented in the water bills of residents, businesses, government agencies and nonprofit institutions.

Several state agencies acknowledge this subsidy, including the Division of Water Resources, which admitted that water prices are being distorted, as stated in their 2010 report, *The Cost of Water in Utah*:

“...for customers, this means lower monthly water bills but does somewhat distort the true cost of water, because the property tax is collected separately.”¹⁹

The Legislative Auditor General’s Office confirmed this subsidy in their 2015 Audit, *A Performance Audit of Projections of Utah’s Water Needs*:

“Pricing water below cost prevents normal market forces from taking effect; no strong pricing signal leads consumers to use the resource efficiently. As a result, according to the most recent U.S. Geological Survey in 2010, Utah ranks highest among all the states in per capita residential water use.”²⁰

Some Utah water districts receive more revenue from property tax collections than they do from selling water.



2. Property Taxes Explain Why Utah Has America’s Cheapest Water Rates

Because wholesale water rates in Utah are subsidized by property taxes, the price of water set by cities and other retail water suppliers are some of the lowest water rates in the U.S. Legislative Auditors confirmed this finding in their 2015 Audit:

“Utah residents pay some of the lowest water prices in the nation...”²¹

The Utah Division of Water Resources noted in 2010:

“the cost to consumers of water provided by water suppliers in Utah is well below the national average and regionally one of the lowest.”²²

National media outlets have also picked up on this problem. Circle of Blue, an independent, non-partisan media organization analyzed water rates for 30 major U.S. cities in 2014, and found that Salt Lake City had one of the lowest water rates of all of the cities surveyed.²³

Water Prices in Western Cities

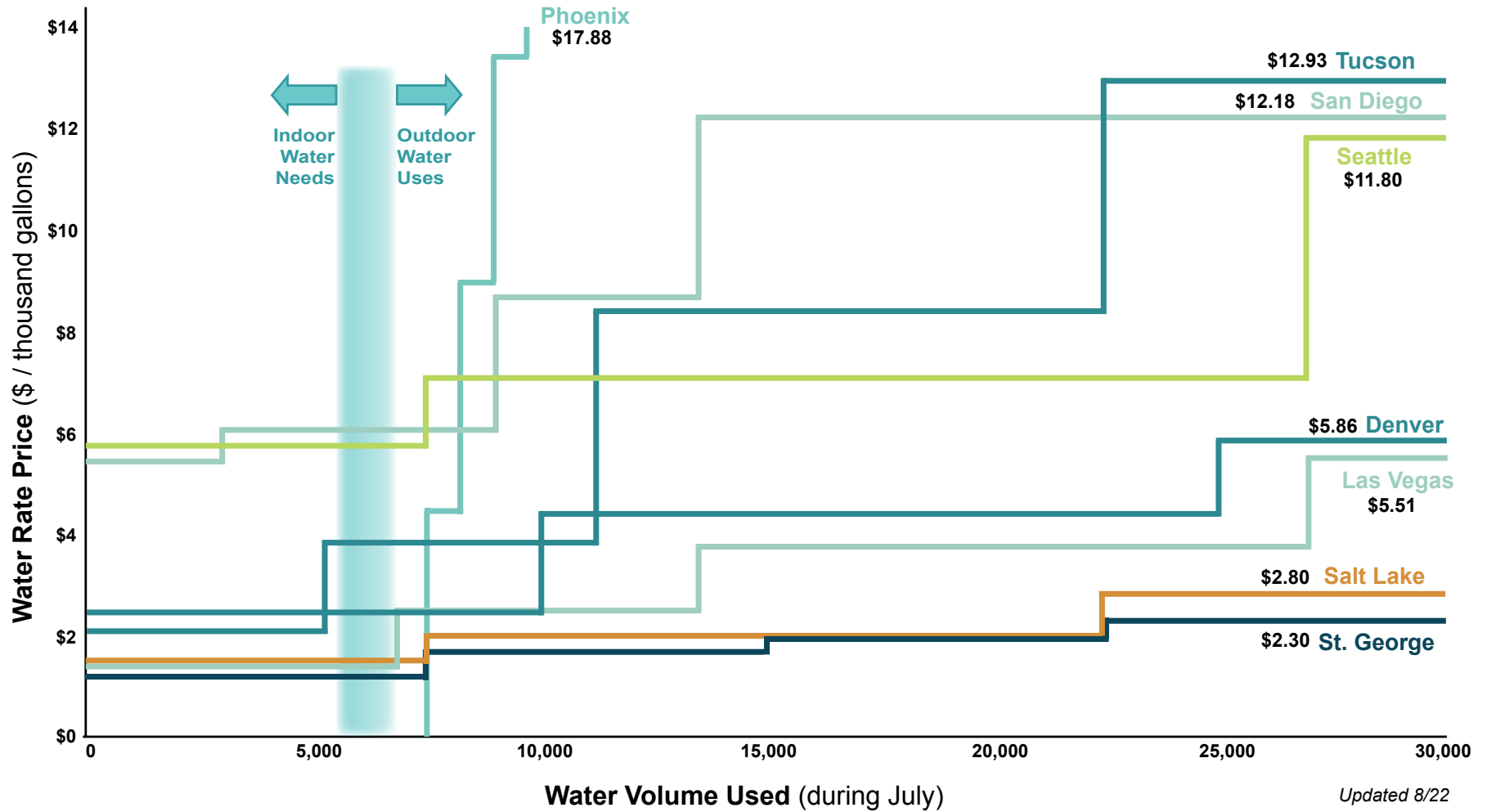


Figure 4: Utah's cities have significantly cheaper water rates because Utah water conservancy districts collect property taxes that lower the price of water for homes, businesses and government institutions.

Utah water districts don't dispute that water rates in Utah are inexpensive, but at times they misinform people about why rates are so cheap. To defend their continued collection of property taxes, some water districts have at-times created specious arguments attempting to explain why Utah has cheap water prices. Some claim Utah's low water prices are caused by our proximity to the mountains, which allows water to flow downhill to residents. Others claim that Utah's inexpensive water rates are from our low treatment and delivery costs for water.²⁴

But cities such as Denver, Reno, and Cheyenne, who have similar water treatment and delivery costs, still have a substantially higher retail cost of water to discourage water waste and save money for taxpayers in the long run.²⁵ It is clear that low treatment and delivery costs do not account for the low retail cost of water in Salt Lake City, as demonstrated by the table below.

Utah water districts don't dispute that water rates in Utah are inexpensive, but at times they misinform people about why rates are so cheap.

Water Treatment Costs vs. Retail Price of Water in Select Western Cities

Price (\$/1,000 gals)	Salt Lake City	St. George	Denver	Reno	Cheyenne
2014 Treatment & Delivery Costs	\$0.70	\$0.82	\$0.79	\$0.74	\$0.89
2014 Retail Cost of Water (20,000 gal)	\$1.78	\$1.61	\$5.50	\$2.95	\$5.01

Table 1: Water treatment and delivery costs are similar for these five Western cities, yet the cities have very different retail water costs. Inexpensive treatment and delivery costs do not correlate with inexpensive water rates for the consumer.



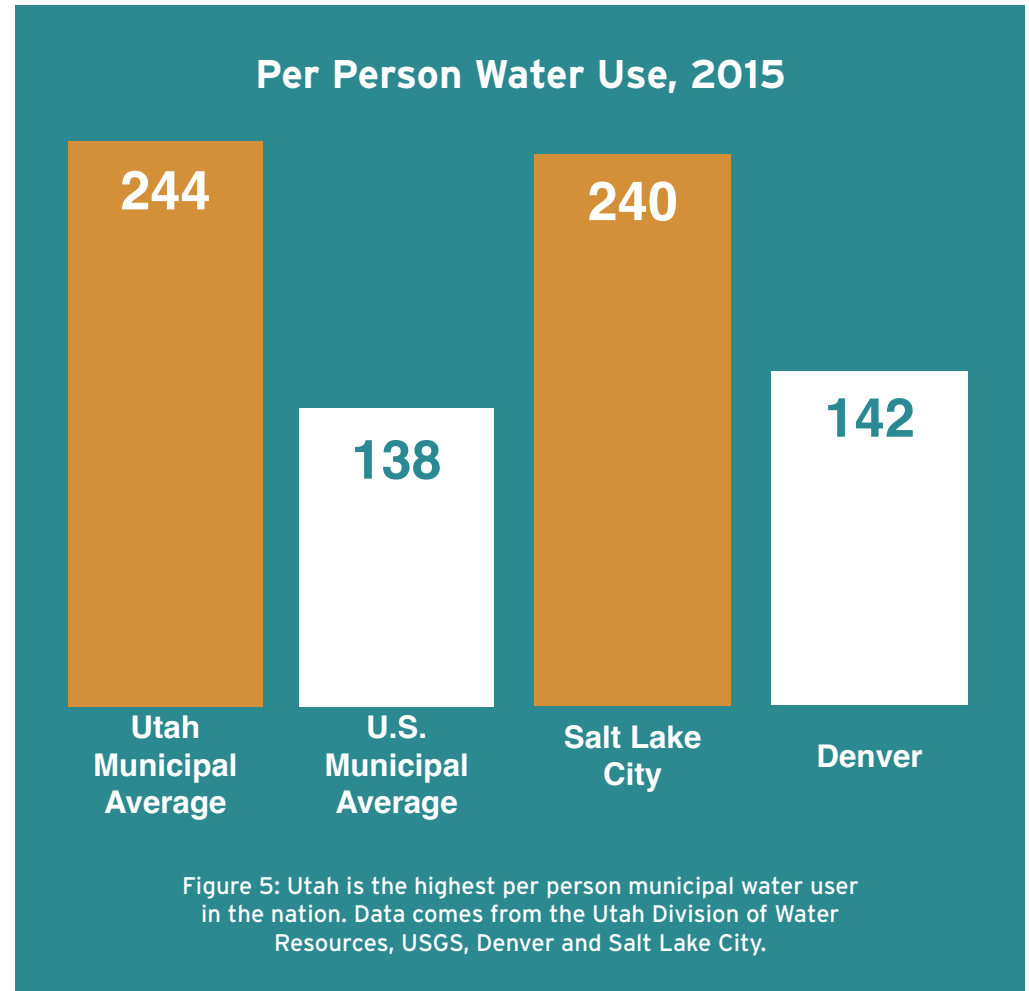
3. Lower Water Rates Mean Higher Water Use

Countless peer-reviewed studies demonstrate that the economic principle of supply and demand applies to water just as it does to other commodities in the marketplace. When the price of water goes up consumers use less water.²⁶ Conversely, when water prices decrease consumers use more water.

Property taxes collected by Utah water districts explain why Utah has America's cheapest water rates and the highest municipal water use, per person. It is ironic that one must demonstrate that the price of a commodity determines its level of consumption in conservative Utah, where most residents embrace free market principles.

With prices cheaper than many U.S. cities, Utahns use an excessive amount of municipal water. This is particularly true for exempt institutions like schools and government golf courses which may use millions of gallons of water each month but pay no property taxes and have their water rates reduced by other taxpayers.

In studies released by the U.S. Geological Survey (USGS) from 1995 to 2015, Utah has consistently ranked as America's number one highest or second highest per person municipal water users. Municipal water use includes water used by homes, businesses, and government institutions. In 1995, 2000, 2005 and 2015 Utah was the 2nd highest water user in the U.S.²⁷ In 2010 USGS data established Utah as the nation's #1 highest per person user of municipal water.²⁸





4. Higher Water Use Means Increased Government Spending

The amount of water that residents, businesses, and government institutions purchase every year is used to predict future water-related government spending needed in the future. This spending includes expenditures for new treatment plants, sewage facilities, operation and maintenance costs and new water sources.

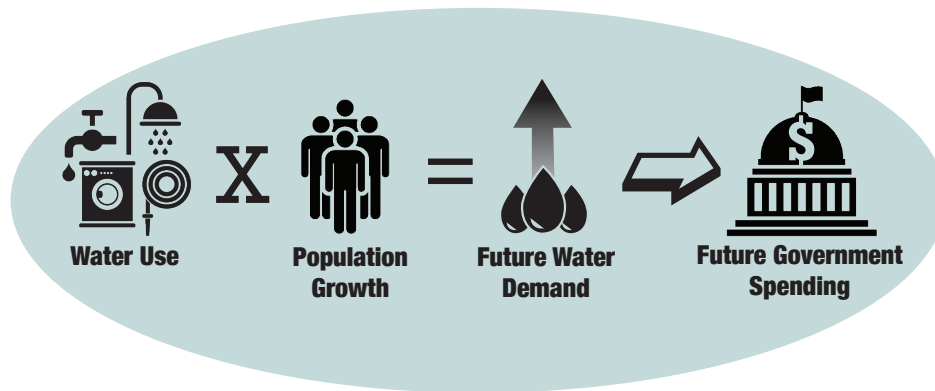


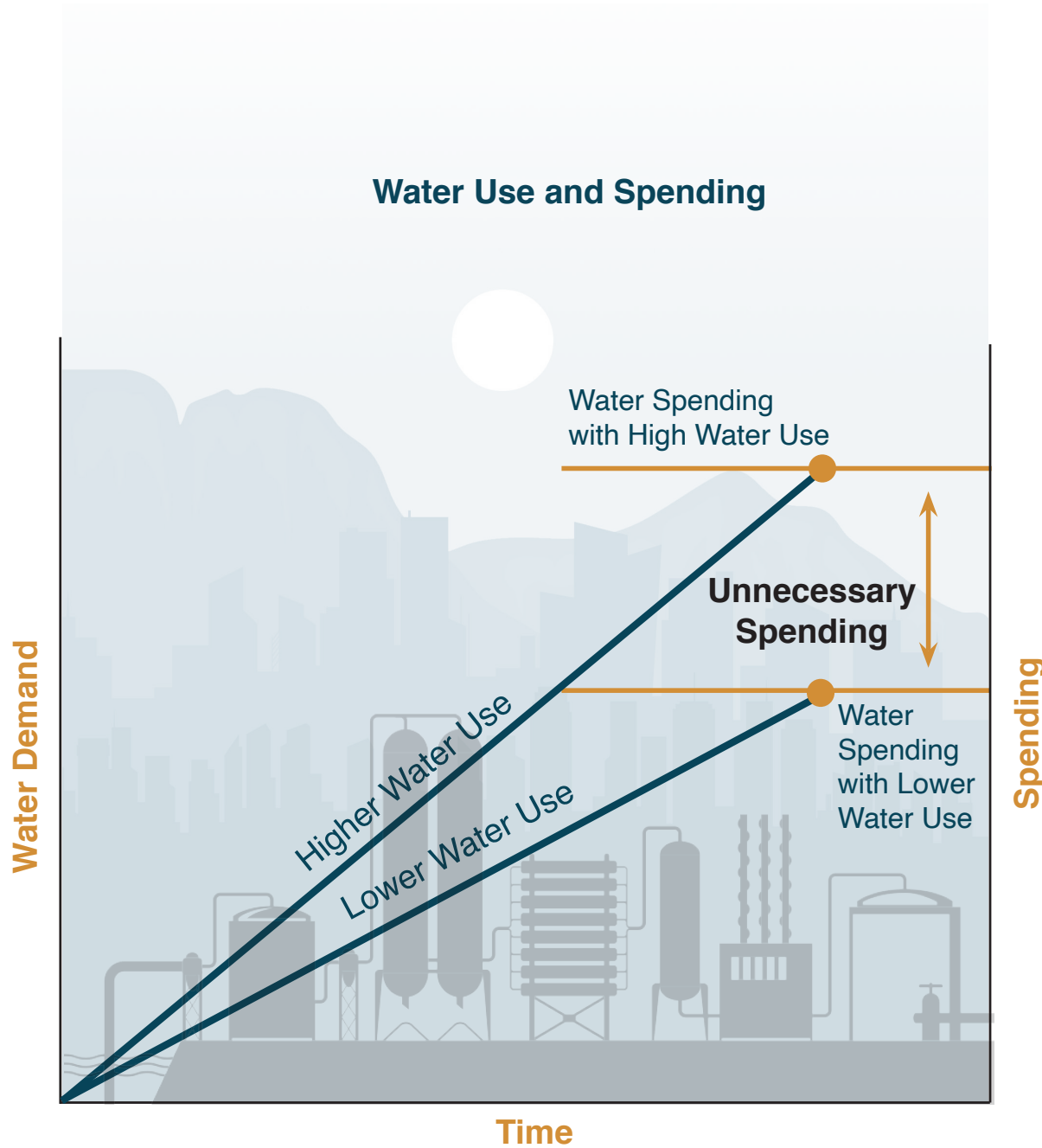
Figure 6 and Figure 7 (next page): Reducing water demand through water conservation not only saves water, it defers or eliminates the need for government spending on infrastructure including operations and maintenance, treatment costs and acquiring new water sources.

The level of future government spending is calculated by multiplying current water use by future population growth. The higher the water use, the more money local and state government will have to spend on new water infrastructure. That's why lowering water demand helps cities and other water suppliers defer or eliminate the need for infrastructure spending, such as through the issuance of public debt.

The American Water Works Association, a 137-year-old water supply information clearinghouse with 50,000 members, summarized the correlation between deferring or avoiding investment and water demand reduction in 2006:

“Over the long-term, conservation can decrease a utility’s need for new capital facilities for supply acquisition, treatment, storage, pumping, and distribution. It may also reduce the costs of operating those facilities. Deferring investment in such facilities or reducing their size can provide significant cost savings. In areas experiencing population growth, conservation can provide additional capacity to accommodate growth, resulting in a larger customer base over which to spread future capital costs.”²⁹

Spending public money unnecessarily on government-issued debt comes with risk and is referred to as “overbuilding” in the water finance sector. The additional debt caused by overbuilding can lead to increased water rates, increased property taxes and an increased risk of having a water suppliers’ bonds downgraded by rating agencies.



5. Unnecessary Spending Leads to Generations of Debt

Unnecessary government spending can place excessive levels of debt on taxpayers that can have serious repercussions. Water suppliers issue bonds to borrow capital that needs to be repaid with interest. If a water supplier issues debt that isn't truly needed, taxpayers will end up absorbing the unnecessary debt burden and this may impair or subordinate a community's ability to invest in other needs.

Case Study: The Washington County Water District is Eager to Indebt Residents with Unnecessary Debt and Large Water Rate Increases

One need look no further than the biggest spending proposal Utah – the \$3 billion proposed Lake Powell Pipeline to find an example of the Water Waste Cycle in Utah.

The Washington County Water District is on a runaway spending cycle which will have major impacts on taxpayers and water users of Washington County. The water district makes a relatively small fraction of its total revenues from selling water, and it has some of the least expensive water rates in the country. As seen in the graph below, only 25 cents of every dollar in District revenue comes from the sale of water.³⁰

2020 Washington County Water District Revenues

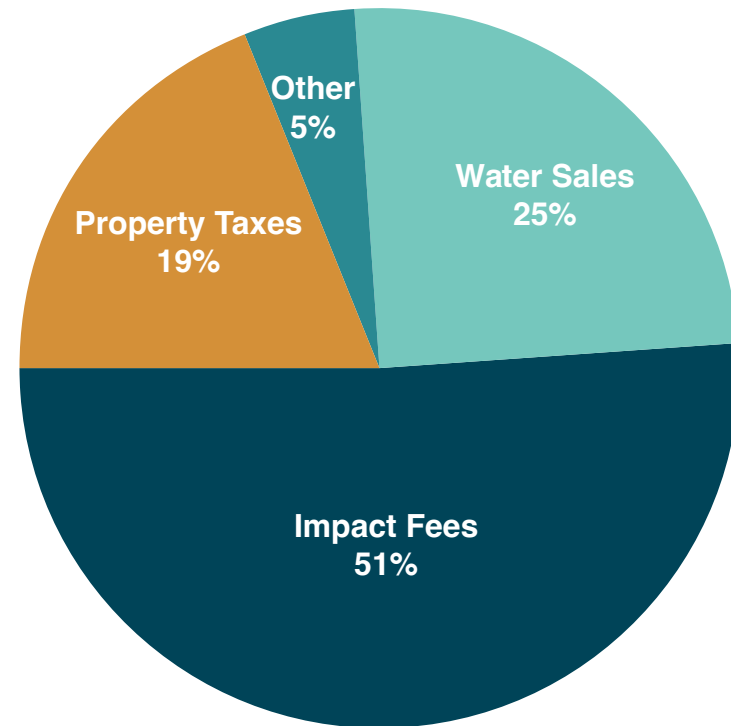


Figure 8: The WCWD makes a relatively small portion of its revenue from water sales. The vast majority comes from other sources, like property tax collections and impact fees which allows the district to charge some of the least expensive water rates in the nation.

The collection of property taxes by the District perpetuates the Water Waste Cycle by lowering the price of water and shifting the delivery costs of wasteful water users to conscientious water users.

The Washington County Water District's High Tax Collections Creates the Cheapest Water Rates in the West

Washington County has some of the lowest water rates in the American West. These low water rates do not incentivize conservation or penalize water waste. As seen in the western water price graph, St. George is home to incredibly low water rates – well below those of comparable cities. While cheap water rates sound like a good deal, these taxes subsidize the water use of large landowners and nonprofit entities that may use large volumes of water.

Washington County's Cheap Water Rates Encourage Customers to be Among the Highest Water Users in the U.S.

Washington County residents use more than twice as much municipal water as the average American, with each person using a staggering 306 gallons per day on average, according to the Utah Division of Water Resources.³¹ In other Southwestern cities, consumption is between 100-150 gallons per day per person.

Municipal Water in American West

(gallons per person per day)

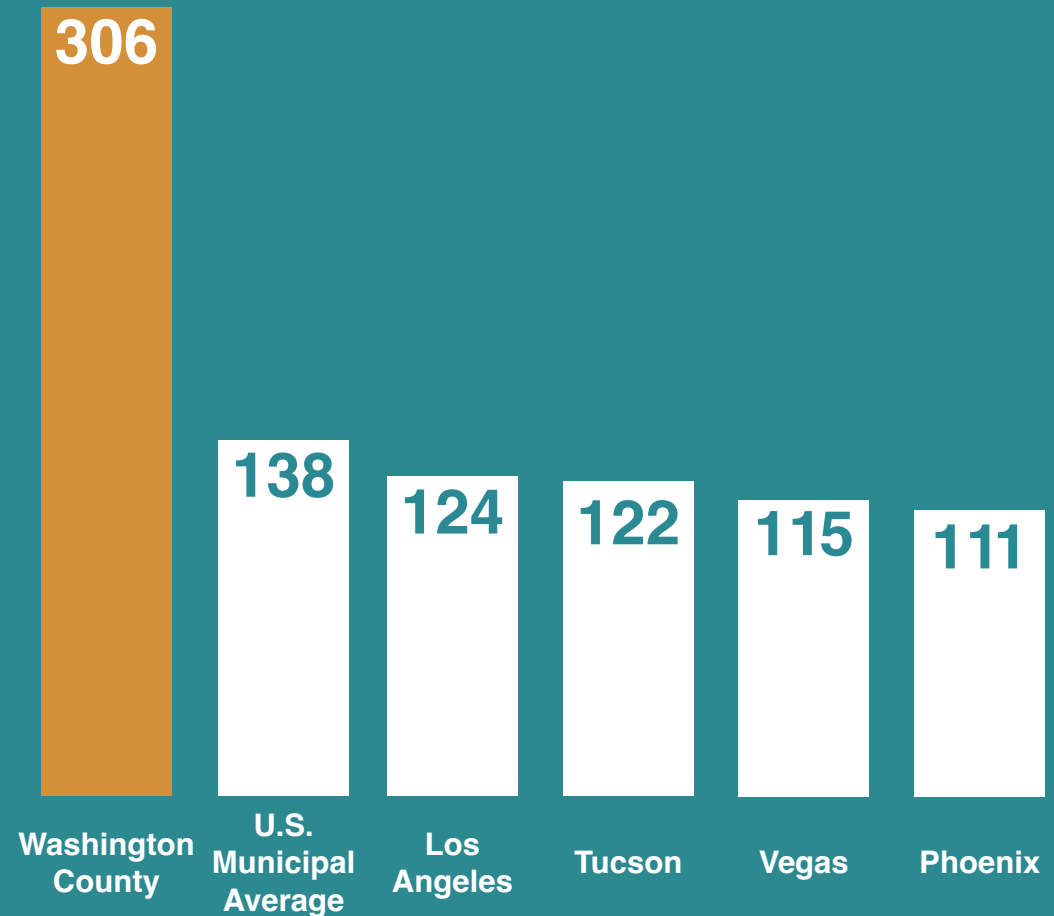


Figure 9: Washington County residents use twice as much municipal water (per person) as the average American, who use 138 gallons a day.

Washington County Water District Is Proposing the Lake Powell Pipeline, instead of Addressing its High Water Usage

The District's high water use is used to create the illusion of a future water shortage to justify spending tax dollars on unneeded infrastructure. The Lake Powell Pipeline is a \$3+ billion diversion of the Colorado River to provide municipal water to Washington County.

Over the last 15 years, \$40+ million has been spent on Lake Powell Pipeline permitting. Although inexpensive alternatives can provide Washington County and its current supply of 150,000 acre-feet of water, they are being ignored in favor of this costly spending proposal.



The Unnecessary Debt of the Lake Powell Pipeline will Require Gigantic Water Rate Increases

According to several studies, the debt from the Lake Powell Pipeline will require between 360 – 500% increases in water rates to repay.³² This long-term debt could be avoided by implementing an array of inexpensive alternatives to the Lake Powell Pipeline which both the Utah Legislature and the Washington County Water District refuse to consider.

Winners & Losers in the Water Waste Cycle

There are both winners and losers in Utah water districts' practice of collecting property taxes to lower the price of water. Laymen at first imagine that all water users benefit from lowering the price of water, but in practice larger landowners and institutional water users with large real estate holdings benefit more than most taxpayers.

Conscientious water users who lower their water use may receive some of the benefit of reduced water bills, but they will still pay property taxes on their housing, businesses and automobiles. The financial benefits of reducing water use are therefore diminished because of Utah's overcollection of property taxes by water districts.

Property taxes for water benefit entities that pay no property taxes whatsoever but use large quantities of water. Municipal golf courses, schools, universities and government buildings may use ten or twenty times the amount of water that residents and businesses use in a month, particularly in hot summer months. These exempt users pay no property taxes whatsoever and are therefore forcing Utah taxpayers to absorb the cost of these institutions' water use, which may include significant amounts of inefficient outdoor watering practices. This practice burdens community water systems with additional costs that could easily be avoided.

These large water users often greatly burden a water delivery system by using large quantities of water during periods of peak water demand, like the hottest summer months. A Griffith University School of Engineering study completed in November 2016 concludes that peak water demand has a strong correlation with costly pipe upgrades and other infrastructure needs municipalities have to cover.³³ Delivering water during periods of peak demand to these exempt users places additional costs on cities than delivering water during winter months.

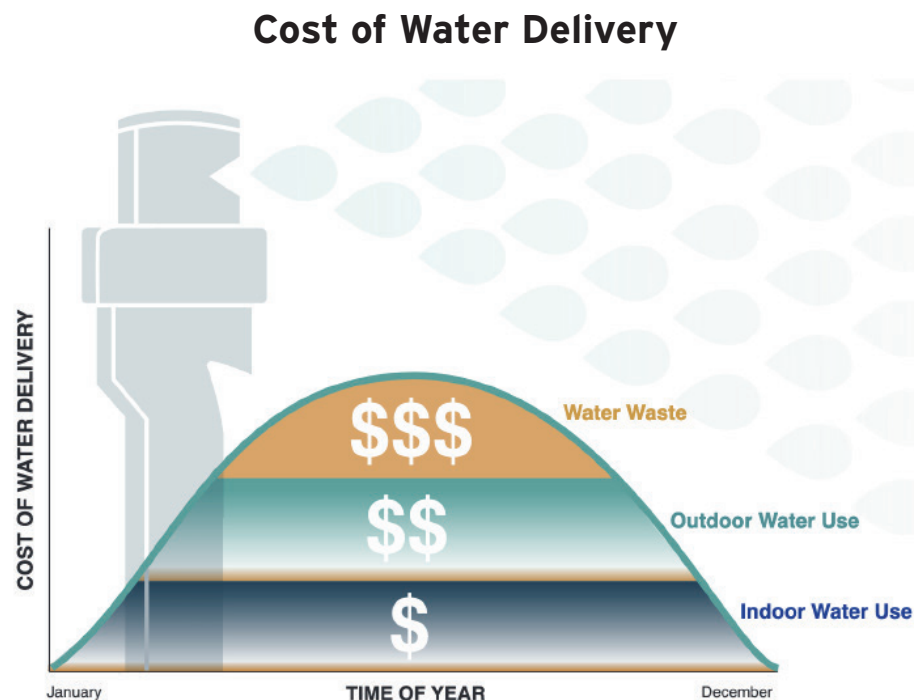


Figure 10: In general, water costs more to deliver during the peak of the summer irrigation season than it does for indoor water use throughout the rest of the year.

Winners: Wealthy Landowners & Government Institutions Who Waste Water

According to the water use records of Salt Lake City Public Utilities, 11 of the 20 biggest water users in Salt Lake City are non-taxed institutions, collectively using millions of gallons of water each month.³⁴ These non-taxed institutions do not pay the full cost of their water use and have less financial incentive to use water efficiently.

A separate analysis by an economist at the University of Utah found that this university alone uses more than 10% of the total water used in Salt Lake City on an annual basis, although the university pays no property taxes.³⁵

Top 20 Water Users in Salt Lake City in 2014

Source: Salt Lake City Department of Public Utilities

Entity	Gallons	Acre-Feet
Tesoro	336,457,880	1,033
Chevron	253,412,676	778
U of U*	88,148,808	271
Tesoro	112,393,500	345
U of U*	133,221,044	409
Mt. Dell Golf Course*	97,469,636	299
Airport Golf Course*	88,148,808	271
Tesoro	113,681,040	349
Utah Power	113,681,040	347
Glendale Golf Course*	84,082,640	259
Dept of Veterans Affairs*	93,843,332	288
U of U*	86,120,232	264
Bonneville Golf Course*	63,332,412	194
Meadow Gold Diaries	65,320,596	200
Grand America Hotel	75,619,808	232
U of U*	62,875,384	193
U of U*	49,160,804	151
U of U*	61,635,200	189
Pinnacle Highlands	38,440,468	118
7 Peaks Water Park	34,746,096	107

**This entity is tax exempt*

Table 2: List of top 20 Salt Lake City water users from 2014. Some 11 of the top 20 water users in Salt Lake City are tax-exempt users, meaning they pay no property taxes whatsoever. Their water use is heavily subsidized by homeowners and businesses who are paying for their high water use in the property tax bills.

In 1995, Utah Governor Michael Leavitt coined the phrase “Make the Users Pay” to represent the idea that no water user should be granted a free ride to waste water through the property tax for water. Gov. Leavitt was the first Utah governor to express strong interest in phasing out the property tax for water in preference to embracing free market economics for water. Since then, every sitting Utah Governor has expressed support for phasing out the property tax except for Governor Spencer Cox.

Losers: Low-income Residents Who are Burdened by Regressive Tax

Low-income residents are disproportionately burdened by property taxes for water because of how little water they use. In 2014, University of Utah researcher Dr. Robin Rothfeder completed an exhaustive study examining tens of thousands of water use records. He discovered that low-income families use just a small fraction of water compared to the water used by high-income households.³⁶ Low-income residents use most of their water inside the home, whereas higher income families use most of their water on lawns or other outdoor landscapes. The study demonstrated that households in lower income zip codes use far less water, and they use very little water for outdoor use compared to households in higher income zip codes.

Indoor vs Outdoor Water Use by Income and ZIP Code

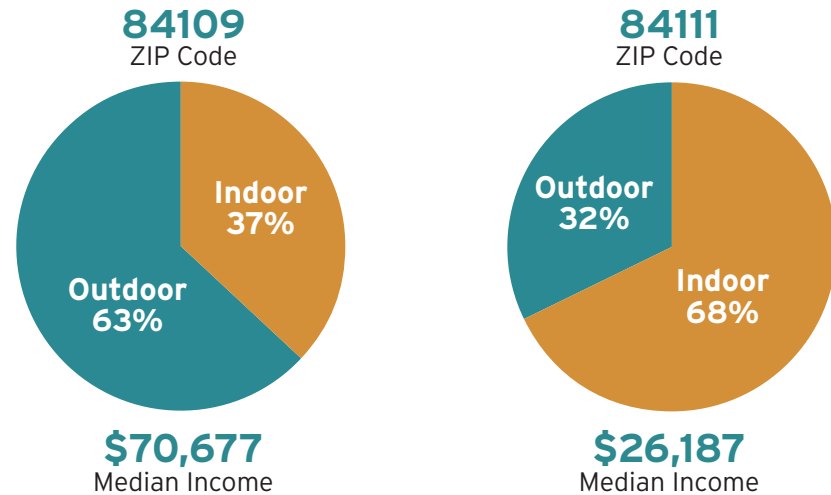


Figure 11: There is a notable difference between the water used indoors and outdoors for a low-income family and a higher income family.

In our current system, Utah is forcing low-income residents to pay for the water use of higher income residents and tax-exempt water users such as governmental and nonprofit institutions. Phasing out property taxes for municipal water use would address this inequity while extending our water supply.



Figure 12: One high income household in SLC uses as much water in the summer as the annual water use of two low income households.

Finally, low water rates may seem beneficial for those living in poverty until one examines the regressive nature of these property taxes. Property taxes unfairly burden low-income families because these payments make up a much larger percentage of their total income than property tax payments do for higher income families.³⁷ This concept is referred to in economics as a regressive tax.



MIRAGE IN THE DESERT **SURVEY RESULTS & METHODOLOGY**

Utah is Unique in the American West by over collecting Property Taxes

Survey Results & Methodology

Summary

In 2001, the Utah Rivers Council surveyed fifty four water suppliers in eleven Western states to determine the degree to which western water suppliers collect property taxes, and whether those tax collections affect their bond ratings.³⁸ One of the research objectives was to determine the veracity of the claim by Utah water lobbyists that property tax collections are essential to receiving good bond ratings.³⁹ That 2001 study found that water suppliers in Utah collected property taxes more frequently than in any other western state surveyed and that property tax collections did not have a significant effect on bond ratings.

In 2022, the Utah Rivers Council once again conducted a survey of western state water suppliers to produce a more up-to-date picture of the role that property taxes play in water suppliers' revenue streams and to revisit the prevalence of property tax collections by wholesale water suppliers.

Our updated review analyzed the audited financial statements of 342 water suppliers across the Western United States and found that Utah was the only state where every water supplier surveyed collected at least some amount of their revenues from property taxes. Many water suppliers outside Utah did not collect any revenues from property taxes whatsoever.

Additionally, our review found that property tax collections by Utah water suppliers account for a much larger percentage of their revenue streams than they do for water suppliers from other western states. Finally, we found that just five water suppliers in Utah collected an astonishingly large total amount of money from property taxes – more than the sum total of 100 water districts' property tax collections in seven other western states.

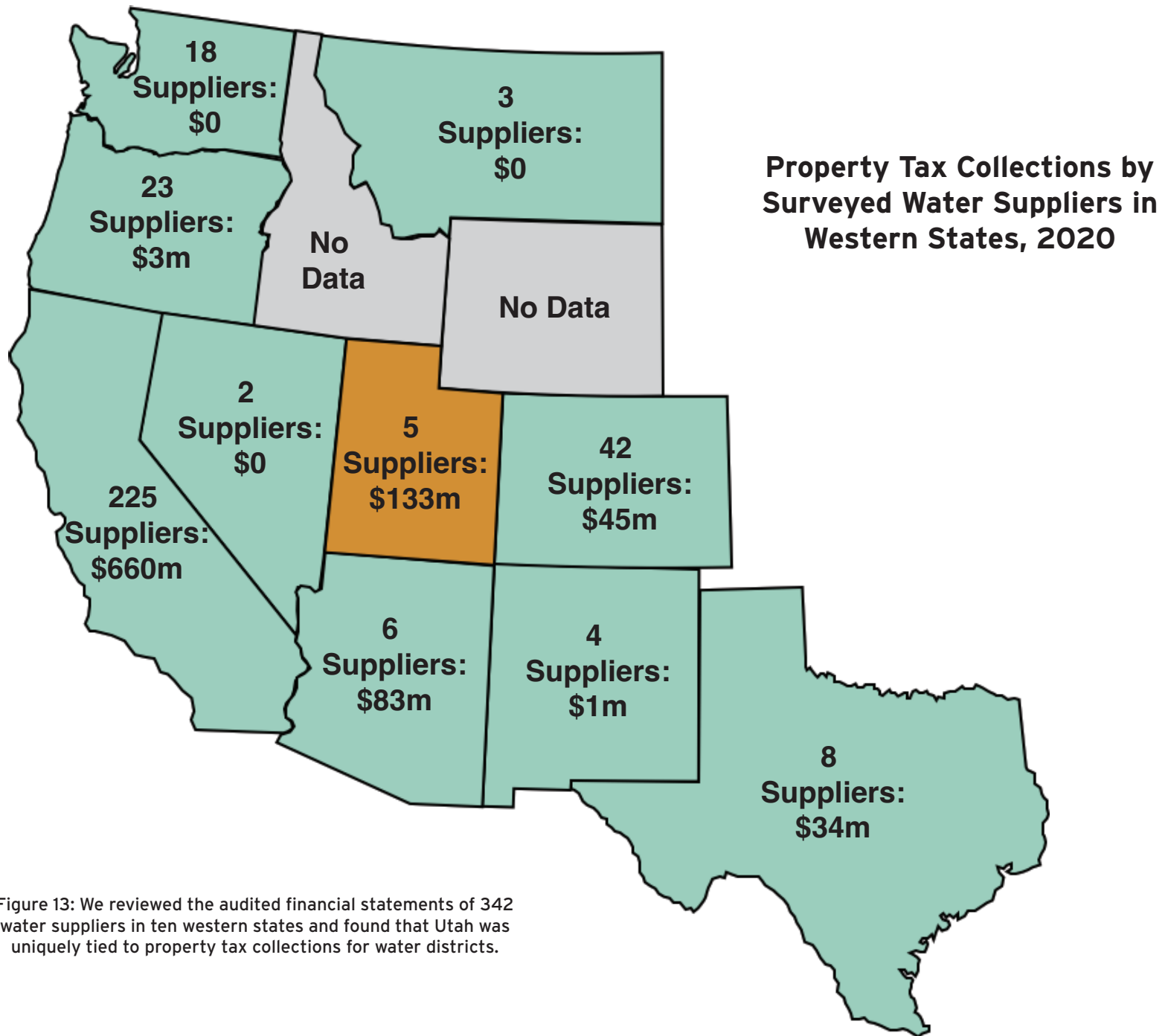


Figure 13: We reviewed the audited financial statements of 342 water suppliers in ten western states and found that Utah was uniquely tied to property tax collections for water districts.

Methodology

In this 2022 research study, we exercised special care to ensure a high quality of data collection.⁴⁰ Consideration was taken to eliminate or minimize errors that could appear from self-reported or unchecked data. We also designed the survey to eliminate or minimize bias in sample collection by following several standards.⁴¹

Firstly, we decided to collect water suppliers' financial data from their 2020 audited financial statements rather than have them self-report the data, as was the case in 2001. This approach has the dual benefit of eliminating self-reporting errors and ensuring that all collected data has been independently verified by a qualified third party, giving us high confidence in the quality of the data.

Secondly, to minimize bias in sample collection, we established criteria to produce the most apples to apples comparison of water suppliers and then collected data from every water supplier that met the criteria. This ensured we were making fair comparisons between the water suppliers we collected data from. Below is the list of criteria used to produce an objective comparison and a short explanation of why it was employed.

1. Reliable Data

The water supplier has a publicly-accessible audited financial statement for fiscal year 2020. These financial statements are the vehicles we used to collect data for each water supplier.

2. Minimum Population Size

The water supplier delivers water in a county with at least 125,000 residents. The goal of this survey was to compare large, urban, primarily municipal water suppliers to each other. Therefore, we sought to exclude small, rural water suppliers who most likely supply agricultural water. We found that county population size was the most consistent and simplest way to distinguish these suppliers from each other and chose the threshold of 125,000 residents as this population size is the cutoff for 1st and 2nd Class Utah counties.⁴²

3. Wholesale Provider

The water supplier sells water wholesale to retail providers. This criterion was employed to distinguish large, urban water wholesalers from smaller, niche urban water suppliers who retail water to a small subset of an urban area. Most urban Utahns receive water from one of four large water conservancy districts, who mostly wholesale water to smaller retail water suppliers. This survey aims to compare the large, wholesale water suppliers to each other, not a large wholesale water supplier to a small retail water supplier.

4. Not a City

This criterion effectively serves the same purpose as criteria 3, but covers a different classification of local government. Since cities typically purchase water from large wholesalers, they are most similar to the niche, retail water supplier described above, not the large wholesalers who are the target of this survey. Cities may also collect property taxes for non-water delivery purposes, which, if included in the comparison, would muddle the data.

5. Public Entity

The water supplier is a quasi-governmental entity, not a private entity. This criterion serves to distinguish private water suppliers from large wholesalers.

The specific financial data collected from the water supplier's financial statements included revenues collected from property taxes, revenues collected from water sales, and total revenues. Bond ratings were collected from the Municipal Securities Rulemaking Board's online portal EMMA (Electronic Municipal Market Access).⁴³

Data were collected from 342 water suppliers across the ten western states of Colorado,⁴⁴ New Mexico,⁴⁵ Oregon,⁴⁶ Montana,⁴⁷ Nevada,⁴⁸ California,⁴⁹ Washington,⁵⁰ Texas,⁵¹ Arizona,⁵² and Utah.⁵³ We sought to collect data from water suppliers in Wyoming and Idaho as well, but were prevented from doing so either due to a lack of qualifying counties⁵⁴ or a lack of publicly accessible audited financial statements.⁵⁵

It should also be noted that in addition to the qualifying water suppliers in Utah, we also collected financial information on all other water suppliers with audited financial statements – even those in counties with populations less than 125,000. This was done to get a holistic view of Utah's water suppliers, regardless of population.

We established criteria to produce the most apples to apples comparison of water suppliers and then collected data from every water supplier that met the criteria. This ensured we were making fair comparisons between the water suppliers we collected data from.

Survey Results

Our review of 342 western water suppliers’ financial statements identified that Utah water suppliers are consistently collecting property taxes more frequently than their peer water suppliers outside the state. All Utah water districts we surveyed collect property taxes, whereas many water suppliers outside Utah did not collect property taxes. Table 15 details the number of water suppliers surveyed in each state and the share of those suppliers that collected some amount of revenue from property tax collections in fiscal year 2020.

Occurrence of Property Tax Collections

State	# of Suppliers Surveyed	# of Suppliers Collecting Ptax	% of Suppliers Collecting Ptax
Colorado	42	28	67%
California	225	121	54%
Arizona	6	3	50%
Oregon	23	9	39%
New Mexico	4	1	25%
Texas	8	1	13%
Montana	3	0	0%
Nevada	2	0	0%
Washington	18	0	0%
TOTAL	331	163	49%

Utah (large suppliers)	5	5	100%
Utah (all suppliers)	11	11	100%

Table 3: Total number of water suppliers surveyed in each state and proportion of those suppliers that collected at least some of their revenues from property taxes.

Utah is the only state we surveyed where every single water supplier received a portion of their revenues from property tax collections. This held true when we exclusively examined the water suppliers who met our survey criteria set out in the methodology section (titled here as “large suppliers”) and even when we expanded our survey of Utah water suppliers to any that had publicly accessible financial statements (titled “all suppliers”). In every case, Utah’s water

suppliers always collected at least a portion of their revenues from property taxes.

This is a unique phenomenon and is not repeated in any other state we surveyed. Every other state has at least a number of water suppliers, if not the vast majority, that did not collect property taxes. In fact, Utah has the same number of water suppliers that collected property taxes as Washington, Nevada,

Montana, New Mexico, Texas, and Oregon combined. Even Colorado – who has the second highest percentage share of water suppliers collecting property taxes behind Utah – still has a total collection rate 33% lower than Utah.

Utah’s water suppliers also collect more money from property taxes (as a percentage of their total revenues) than water suppliers in any other state. Table 2 demonstrates this numerically.

Breakdown of Water Supplier Revenue Streams

State	Property Tax Revenue	Water Sales Revenue	Other Revenue	Total Revenue	% Rev. Ptax	% Rev. Water Sales
Arizona	\$82,781,008	\$165,798,642	\$118,548,980	\$368,528,269	22%	45%
Colorado	\$44,576,022	\$131,627,829	\$25,258,236	\$201,462,087	22%	65%
California	\$659,774,109	\$3,684,079,931	\$1,690,611,412	\$6,034,465,452	11%	61%
Oregon	\$3,404,088	\$105,821,609	\$13,838,815	\$123,064,512	3%	86%
Texas	\$34,082,100	\$267,744,337	\$1,382,499,653	\$1,684,326,090	2%	16%
New Mexico	\$1,230,583	\$154,170,845	\$93,711,191	\$249,112,619	0%	62%
Montana	\$-	\$2,249,273	\$2,959,255	\$5,208,528	0%	43%
Nevada	\$-	\$248,479,610	\$125,908,121	\$374,387,731	0%	66%
Washington	\$-	\$155,837,245	\$127,834,601	\$283,671,846	0%	55%
TOTAL	\$825,847,910	\$4,915,809,321	\$3,581,170,264	\$9,324,227,134	9%	53%
Utah (large suppliers)	\$132,605,818	\$259,221,558	\$131,981,393	\$131,981,393	25%	49%
Utah (all suppliers)	\$139,141,755	\$264,791,276	\$137,106,158	\$137,106,158	26%	49%

Table 4: Total revenues of surveyed water suppliers in each state. Other revenue consists of things like impact fee collections, direct staff services to residents, and - in cases where the water supplier is also a sewage district - wastewater fees.

As can be seen from Table 2, Utah's water suppliers receive an average of 25% of their revenues from property tax collections.⁵⁶ This is true when examining both sets of survey data for Utah (one where only large water suppliers are included and one where all water suppliers are included).

Most other western states do not come close to Utah in the percentage of revenues their water suppliers collect from property taxes. California water suppliers collected just 11% of their revenues from property taxes, while water suppliers in Oregon, Texas, New Mexico, Montana, Nevada, and Washington collected somewhere between 0% and 3%. Only two states come close to Utah's revenue share from property tax collections: Colorado with 22% and Arizona with 22%. When taken together, water suppliers outside Utah collect roughly 9% of their revenues from property taxes, significantly less than Utah's 25%. Figure 16 highlights this discrepancy graphically.

Water Supplier Revenue Breakdown Utah vs. Western U.S.

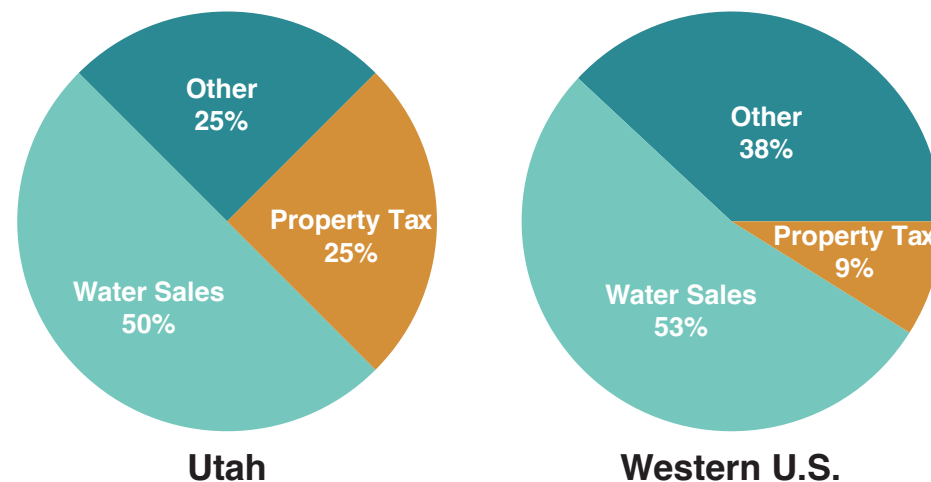


Figure 14: Utah water suppliers collected nearly three times the proportion of their revenues from property tax collections compared to the revenues of water suppliers outside of Utah in the Western U.S.

Finally, it is also true that Utah's water suppliers collect uniquely large total amounts of money from property taxes. For example, during fiscal year 2020, five Utah water suppliers collected a little over \$132 million from property taxes. Over that same time period, 100 water suppliers in Colorado, Oregon, Texas, New Mexico, Montana, Nevada, and Washington collected just around \$83 million.

Overcollection of Property Taxes in Utah vs. Other States



Figure 15: In 2020, just five water suppliers in Utah collected more money from property taxes than 100 of the largest water suppliers from seven other western states did.

Total Property Tax Collections in Utah vs. Other States

When compared to other western states, Utah's water suppliers stand out when it comes to property taxes. More water suppliers in Utah collect property taxes than in any other western state surveyed, and water suppliers in Utah collect property taxes at dramatically higher amounts, both when measured as a fraction of a water supplier's revenues and as the total number of dollars collected.

Property Taxes and Bond Ratings

Utah proponents of property tax collections for water claim that property taxes allow them to receive higher bond ratings and lower their cost of borrowing.⁵⁷ These claims have often either lacked empirical support or relied on anecdotal evidence, usually brought up in lobbying presentations before legislative committee at the Utah statehouse and without data.

We sought to examine the relationship between property tax collections and bond ratings for Western water suppliers. We analyzed empirical evidence to statistically test whether a clear relationship exists between property tax collections and bond ratings. It is important to note that the major ratings agencies of Fitch, Moody's and S&P evaluate a range of factors in assigning bond ratings including but not limited to levels of indebtedness, revenue stream size, debt service coverage ratios, security of water sales/contracts, water supply relative to water demand, among a range of other drivers for rating decisions.

Empirical Examination of Water Supplier Bonds and Property Taxes

Of the 342 total water suppliers surveyed, 76 were found to have publicly accessible bonds and bond ratings. These 76 water suppliers cover every state in the survey except Montana, making them a fairly representative subset of the larger survey of suppliers.

Bond ratings among these water suppliers varied both in the actual grade of the bond and by the rating agency who issued that grade (i.e. S&P, Fitch, and Moody's). To compare across different agencies, ratings were standardized and assigned a score, as shown in Table 3.

Standardization of Bond Ratings

Score	Moody's	S&P	Fitch
7	Aaa	AAA	AAA
6	Aa1	AA+	AA+
5	Aa2	AA	AA
4	Aa3	AA-	AA-
3	A1	A+	A+
2	A2	A	A
1	A3	A-	A-

Table 5: Ranking and comparison of bond ratings among the three major rating agencies.

In this setup, higher scores correspond to better bond ratings, with a score of seven equaling the highest rating (AAA) and a score of one equaling the lowest rating found in the data (A-). In the event that different rating agencies gave different ratings to the same water supplier, preference was first given to S&P, then Moody's, then Fitch to determine the score. Using this scoring system, we were able to plot the percentage of revenues received from property taxes against bond ratings to visualize their relationship.

Share of Revenues from Property Taxes vs. Bond Ratings

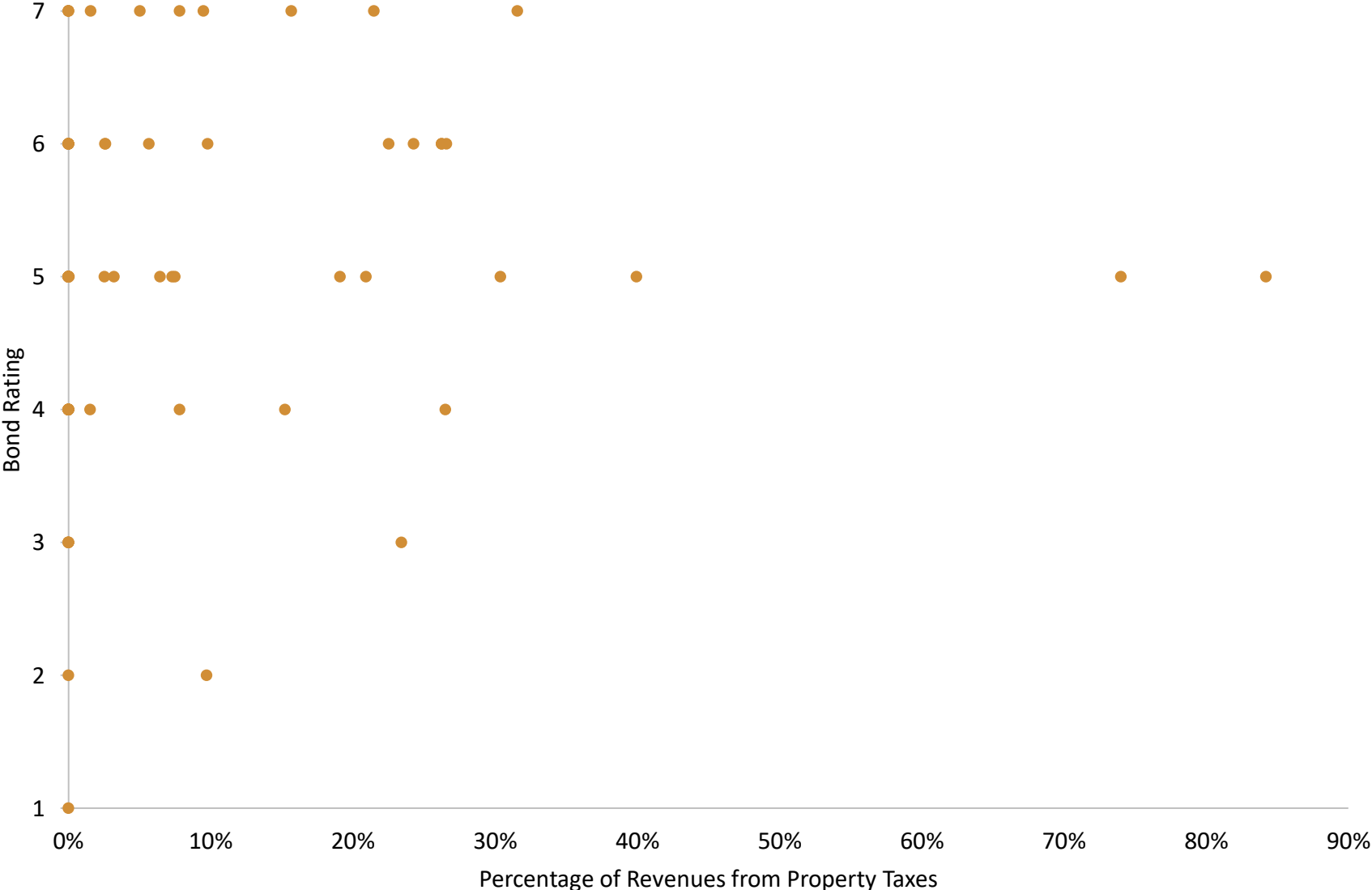


Figure 16: There is no clear correlation between the share of revenues a water supplier collected from property taxes and a water supplier's bond rating.

As can be seen in Figure 18, there is no obvious relationship between the percentage of a water supplier's revenue stream that comes from property taxes and those receiving higher bond ratings. Some water suppliers managed to receive very high bond ratings (score 6 or above) with little or no property tax collection, while other suppliers received the same ratings with relatively high property tax collections (30% to 40% of revenues). From this plot alone, it appears that relative amounts of property tax collections do not have a measurable benefit on receiving higher bond ratings.

We can further test this observation with regression analysis, a commonly used tool to determine through a statistically significant way whether a relationship exists between two variables. We are interested in determining whether a clear relationship exists between the share of a water supplier's revenue stream that comes from property taxes and that water supplier's bond rating. Therefore, we do not need to describe a causal relationship between these two variables (i.e. we don't need to prove whether more property tax collections cause bond ratings to increase or decrease), but rather simply need to examine whether these two variables are correlated. If we find that these variables are not correlated, it will provide good evidence to suggest that no causal relationship exists between the variables.⁵⁸ This is because causation almost always implies correlation.⁵⁹

In other words, we do not need to use a complex form of regression analysis to test for a causal relationship between our two target variables, but rather can first rely on a simpler form of regression analysis to test for correlation. If no correlation is found, we can stop our analysis and have high confidence that no significant causal relationship exists between the variables. The simple model we use to determine whether a water supplier's share of revenues collected from property taxes is correlated to their bond ratings is as follows:

$$\hat{y}_i = \beta_o + \beta_{ptax} + \varepsilon_i$$

where \hat{y}_i is the dependent variable (bond ratings), β_o is the intercept, β_{ptax} is the independent variable (the percentage share of revenues generated from property taxes), and ε_i is an error term. Running this model produces the following results.⁶⁰

Results of Regression Analysis

	<i>Dependent variable:</i>
	Bond Rating
Percent of Revenues Collected from PTax	1.237 (0.973)
Constant	4.873*** (0.169)
Observations	76
R ²	0.021
Adjusted R ²	0.008
Residual Std. Error	1.301 (df = 74)
F Statistic	1.617 (df = 1; 74)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Table 6: The regression analysis failed to find any significant relationship between the independent variable (percent of revenues collected from property taxes) and the dependent variable (bond ratings).

Figure 21 demonstrates that our independent variable (percent of revenues from property tax) does not have a statistically significant relationship with our independent variable (bond ratings). Or, put simply, our regression analysis failed to find any significant correlation between the amount of property tax a water supplier collects and the bond rating they receive. This, coupled with the jumbled relationship shown between these variables in Figure 21, provides good evidence that the share of revenue collected from property taxes does not significantly influence a water supplier's bond rating.

This finding is supported by statements from major rating agencies, who regularly cite a suite of financial metrics when justifying their decision to issue a bond rating. To these rating agencies, bond ratings are most strongly determined by things like total indebtedness, economic base diversity, growth rates of earnings, population, and prior actions with bonds and debts.⁶¹

Collecting property taxes is just one of the many tools – like long term water contracts, responsible debt management, etc. – available to bond-seekers to demonstrate overall financial health and secure better ratings.

Take, for example, the case of the Truckee Meadows Water Authority in Nevada. In 2020, this supplier collected 89% of its revenues from water sales and 0% from property taxes, a trend that roughly continues today.⁶² In 2022, Fitch gave this supplier a AAA rating, citing the “improved unemployment rate” in the supplier’s service area, the affordability of its water rates “for the vast majority of its customers,” its “very low operating cost burden,” and “manageable capital needs.”⁶³ In other words, Fitch gave this large water supplier the highest bond rating because it has a secure source of income (water sales in a large urban area) and manages its expenses well. It did not need to collect property taxes to receive a high rating.

Our regression analysis failed to find any significant correlation between the amount of property tax a water supplier collects and the bond rating they receive.

General Obligation Bonds: A Financial Red Flag for Water Projects

Aside from ratings, there are other important features of municipal bonds that merit discussion. To further explore bonding practices by western water suppliers, we collected basic information on the types of bonds water suppliers in the American West tend to issue.

Municipal bonds are broken into two main categories: general obligation bonds and revenue bonds.⁶⁴ General obligation bonds are backed by all the financial resources at the bond issuer's disposal, meaning that the bond issuer can use revenues from property taxes, water sales, sewer rates and/or impact fees to make debt service payments.⁶⁵

Revenue bonds, on the other hand, are typically issued to acquire cash for new capital projects and are backed only by the specific revenues identified for that project.⁶⁶ For example, a water supplier may issue a revenue bond to raise capital for a new water recycling plant and then use the revenues generated by the water sales from that plant to meet their debt service obligations on the bond.

Of the 76 bond-issuing water suppliers surveyed, the vast majority, approximately 94%, issued revenue bonds. Only five water suppliers were identified as issuing at least one general obligation bond. Those water suppliers are the Central Utah Water District (UT),⁶⁷ Weber Basin Water District (UT),⁶⁸ Security Water District (CO),⁶⁹ Central Colorado Water District (CO),⁷⁰ and Irvine Ranch Water District (CA).⁷¹

Most western water suppliers issued bonds to raise cash for new capital projects, projects which they expect to generate revenue via water sales. Since consumers always need to purchase some minimum amount of water and since water sales are typically purchased by retail water suppliers via long-term contracts, water sale revenues are fairly stable. This means that water suppliers can usually meet their debt service obligations on the issued bond.

The exception to this would be if the water supplier pursued a bond on a financially questionable water project, or a project where the forecasted water demand is much higher than actual water demand. Projected water demand can exceed actual water demand either by conducting bad demand forecasting during the design phase of the project or by failing to take into account how increased water rates will reduce actual water demand.

As any consumer knows, the more expensive a product becomes, the less of it people buy. The same is true of water. As water rates increase, the consumption of water decreases. Depending on the size of the rate increases, these consumption decreases can lower water use enough to entirely eliminate the need for a new water project.

If debt is incurred for a new project and the projected demand was much higher than actual demand (because the increase in water rates resulted in lower water demand), the water supplier may have a difficult time raising sufficient revenues from water sales to meet their debt service obligations. Through the lens of economics this would mean the water for the project was not needed. In these cases, the

water supplier may look to supplement their revenues with tax collections to ensure they can meet their debt service obligations, thereby opting to issue a general obligation bond rather than a revenue bond. Or, alternatively, the water supplier may later issue a refunding general obligation bond to replace a previous revenue bond.

Issuing revenue bonds instead of general obligation bonds provides a sort of ‘financial sanity check’ for proposed projects. Projects where the water is truly needed will generate enough revenue via water sales to pay for its own debt, thereby allowing the water supplier to issue a revenue bond. Projects where the water isn’t truly needed won’t generate as much revenue via water sales. This will make the water supplier bring in other sources of revenue like property taxes to meet debt service obligations, thereby creating the need for a general obligation bond.

Take for example, the case of the Security Water District in Colorado. In 2012, the district issued a voter-approved general obligation bond to pay for their share of the newly proposed Southern Delivery System project, a massive \$800 million water conveyance project. In the ballot measure approving the bond, the district stated that it intended “the bonds be paid from net revenue cash flows generated from tap fees and water system rates,” or, in other words, from water sale revenues.⁷² However, rather than issue a revenue bond and depend solely on those water revenues, the district opted to issue a general obligation bond and included an unlimited property tax. They did this to ensure that they could meet their debt service obligations on the bond in the event that water demand was not as large in the future as they originally projected.

Despite these two sources of revenue, S&P rated the bond a relatively low “A,” citing questions over the stability of the water sales revenue (i.e. the district’s water demand projections).⁷³ It turns out S&P fears were justified, as total water consumption in the district decreased approximately 30% from 2012 to 2020, despite the Southern Delivery System project being completed in 2016.⁷⁴

This water demand decline did not appear out of nowhere, but rather was a result of the water district’s decision to raise water rates to pay for the Southern Delivery System debt. According to a 2009 report by the district, they realized that they would not generate enough money with their existing, very low water rates of approximately \$1 to \$3 per 1,000 gallons to pay for their share of the new project’s debt.⁷⁵ Starting in 2011, they began increasing their rates, a practice which has continued nearly every year since.⁷⁶ By 2022 the district’s rates more than tripled to between \$5 and \$11 per 1,000 gallons, depending on the amount of water used in a month.⁷⁷ These rate increases lowered demand so much so that the additional water from the Southern Delivery System project likely was not needed at all by the Security Water District.

As demonstrated by the Security Water District, paying for new water projects with general obligation bonds should raise a ‘financial red flag,’ as it likely indicates the project cannot support itself with its own revenues. This should be particularly concerning for Utahns, as Utah’s water districts are currently allowed by law to issue general obligation bonds with voter approval for any proposed project⁷⁸ and are even allowed to issue general obligation refunding bonds without voter approval.⁷⁹

The Public is Financially Better Off with Lower Property Tax Collections

Clearly, property tax collections by water districts are not necessary for high bond ratings. But even if one was to pretend that a water district pays a lower rate for borrowing because of property tax collection, the benefits to the Utah taxpayer of lower property tax collections greatly outweigh the costs of more expensive borrowing.

Figure 19 shows the 10-year historical interest rates associated with AA and A rated municipal bonds in the United States.⁸⁰ AA rated bonds (brown line) have had slightly lower interest rates than A rated bonds (dark blue line). However, the difference in interest rates between these bond ratings are very small. From 2012 to 2022, AA rated bonds averaged an interest rate just 0.39% lower than A rated bonds did.⁸¹ This means that if a water supplier was downgraded from AA to A the increased borrowing cost would be minimal. This same relationship holds true for AAA to AA rated bonds, which had a gap of only 0.40% from 2012 to 2022.⁸²



PHOTO: SCOTT LAW

The Great Salt Lake is shrinking in the face of climate change and upstream water diversions by America's most wasteful municipal water user - urban Utahns. Lowering municipal water use could help keep more water in the Great Salt Lake, if the saved water is dedicated to the Lake instead of being pumped into the ground.

Interest Rates for AAA, AA, and A Rated Municipal Bonds, 2012-2022

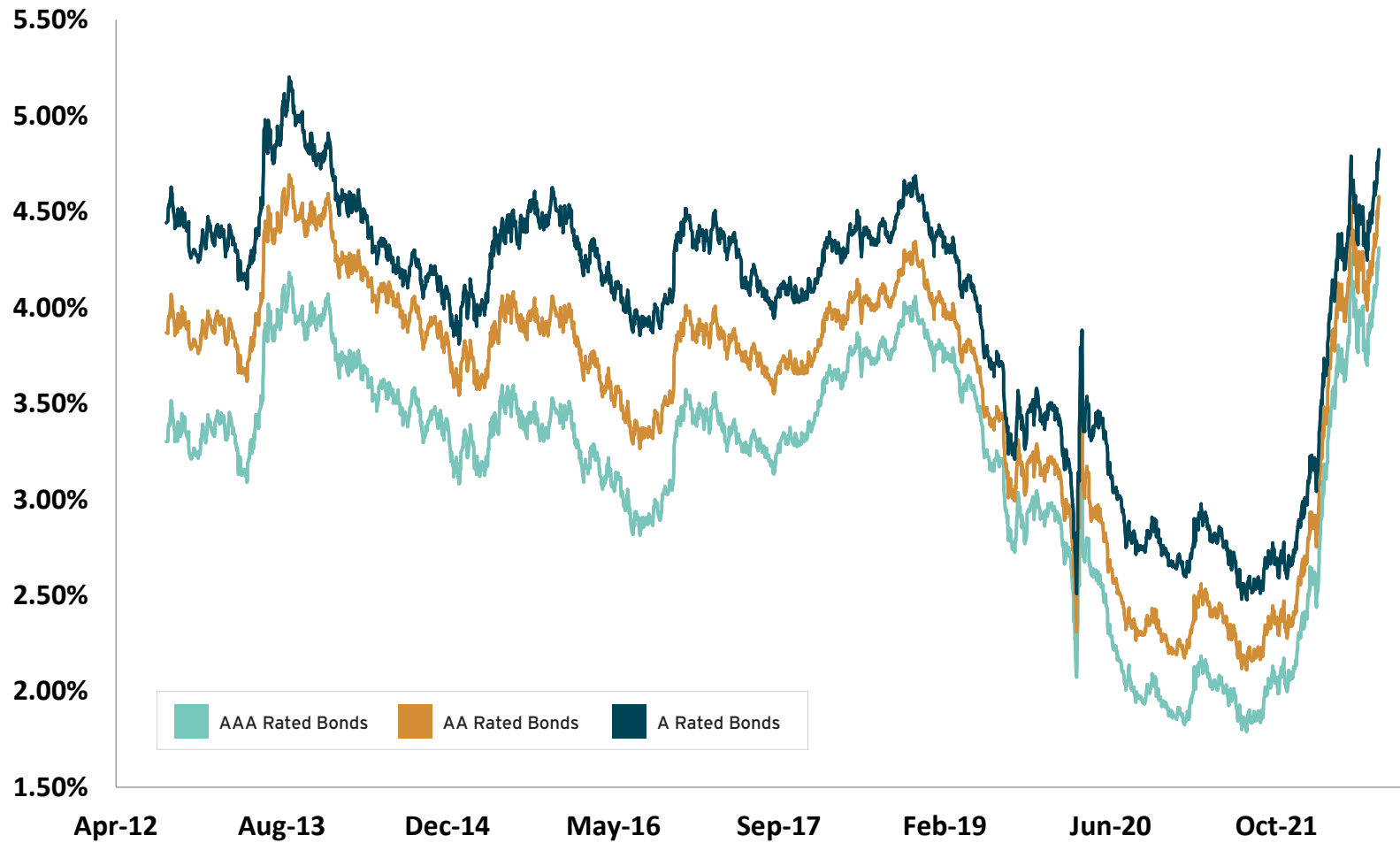


Figure 17: AAA rated bonds have had slightly lower interest rates over the past 10 years when compared to AA rated bonds, which in turn have had slightly lower interest rates than A rated bonds. The interest rate difference between AAA rated bonds is just 0.40% lower than AA rated bonds, and the interest rate difference between AA rated bonds and A rated bonds is 0.39%.

To put this in terms of dollars, imagine that two identical water districts (District 1 and District 2) each issue a \$650 million municipal bond with a 20-year repayment window. District 1 has a AA credit rating and is able to secure their bond for a 4.4% interest rate, while District 2 secures a 4.8% interest rate with their A rating. These interest rates approximate the current rates for these municipal bonds.⁸³ Over the 20-year life of the bond, District 1 would pay about \$889 million in interest and District 2 would pay about \$1 billion. That means that even though District 1 had the best bond rating, they ended up saving a relatively small amount of money when compared to District 2 – just \$122 million over 20 years, or \$6.1 million annually. Table 4 summarizes these results numerically.

Total Interest Payments and Savings by Bond Rating

Score	Total Interest Payments over 20 Years	Dist. 1 Savings Over Life of Bond (20 Years)	Dist. 1 Annual Savings
District 1 (AA)	\$889 million	\$122 million	\$6.1 million
District 2 (A)	\$1 billion	n/a	n/a

Table 7: Difference in total interest payments for the same bond by two water suppliers with two different bond ratings. The overall savings for a water supplier with a AA bond rating compared to a supplier with an A bond rating is small, about \$6.1 million per year.

At first, saving \$6.1 million per year sounds substantial. But, consider that most water districts in Utah collect far more money each year in property taxes. The Central Utah Water District – which closely resembles District 2 in the scenario above with a AA+ credit rating and \$650 million in outstanding bonds – collected \$73 million in property taxes in 2020.⁸⁴

If the Central Utah Water District honestly wants to save taxpayers money, phasing out the property taxes could save taxpayers \$73 million each year – and the district could pay the extra ~\$6 million in interest payments for a net \$67 million saved for Utah taxpayers. Even if the district split the middle and lowered property tax collections to just \$35 million, taxpayers would still be far better off.

The Central Utah Water District is not alone in failing to conduct basic math to reduce taxes for the taxpayers their agency is supposed to serve. All of Utah's major water suppliers – the Jordan Valley, Weber Basin, Washington County, and Metropolitan Water District – each collected large amounts of property taxes (between \$10 to \$22 million) in 2020.⁸⁵ These water suppliers are collecting far more money from their taxpayers via property taxes than they are saving them via reduced borrowing costs.

This begs the question, who is really benefiting from these property tax collections? It is clearly not the Utah taxpayer.

All this does not even address the fact that phasing out property taxes can greatly reduce water demand, which the American Water Works Association shows can defer or eliminate the need for new spending and borrowing.⁸⁶ In other words, phasing out property taxes and charging higher prices could lead to water suppliers deferring or altogether eliminating plans for new, expensive projects – like the \$3 billion Lake Powell Pipeline or \$3 billion Bear River Development – thereby saving Utahns from having to shoulder these tremendous amounts of debt.

Can Phasing Out Property Taxes Really Lower Water Demand?

In the Western U.S., many cities have found that forecasts of future water needs are erroneous because they ignore the role of economics in determining consumer demand. Both Los Angeles and Tucson have demonstrated that reducing water use by embracing the market economics of water can successfully defer or eliminate the need for new water infrastructure spending.

Los Angeles Department of Water and Power has had great success in deferring infrastructure spending by reducing water demand through increasing water rates. A report published in 2018 by the Alliance for Water Efficiency showed a decrease in water demand to levels similar to those seen in the late 1970's, after implementing tiered water rates and conservation programs in 1992.⁸⁷ This reduction in total water use occurred despite a city population that increased by more than half a million people over 2 decades.⁸⁸

This reduction in water demand saved Los Angeles a whopping \$11 billion in water infrastructure spending through cost savings in water supply, treatment, and pumping.⁸⁹ The Alliance for Water Efficiency states that Los Angeles' total savings from reducing demand could be nearly twice the original \$11 billion if avoided storm water and wastewater costs were to be included.⁹⁰

The report also notes that although Los Angeles water rates have increased over the years, customer bills are 27% lower than what they would've been as an outcome of the \$11 billion in marginal costs savings realized through reduced water demand.⁹¹ Los Angeles' success story has demonstrated the importance that water pricing has on water demand.

Los Angeles Water Use and Population, 1970-2016

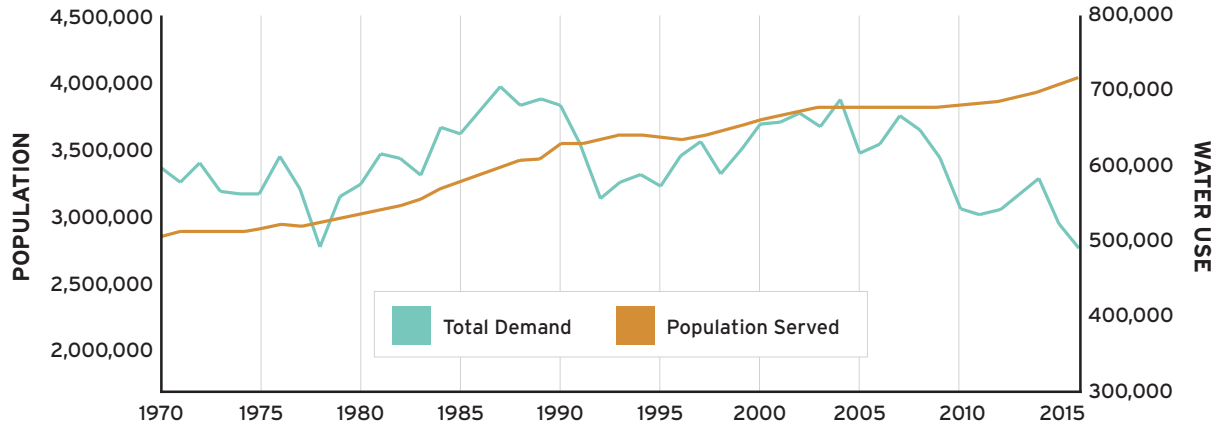


Figure 18: This graph represents the decoupling of total water demand and population served by LADWP. Decoupling describes the relationship between an increasing population, and a decreasing total demand (AFY).

Tucson Population vs Water Demand

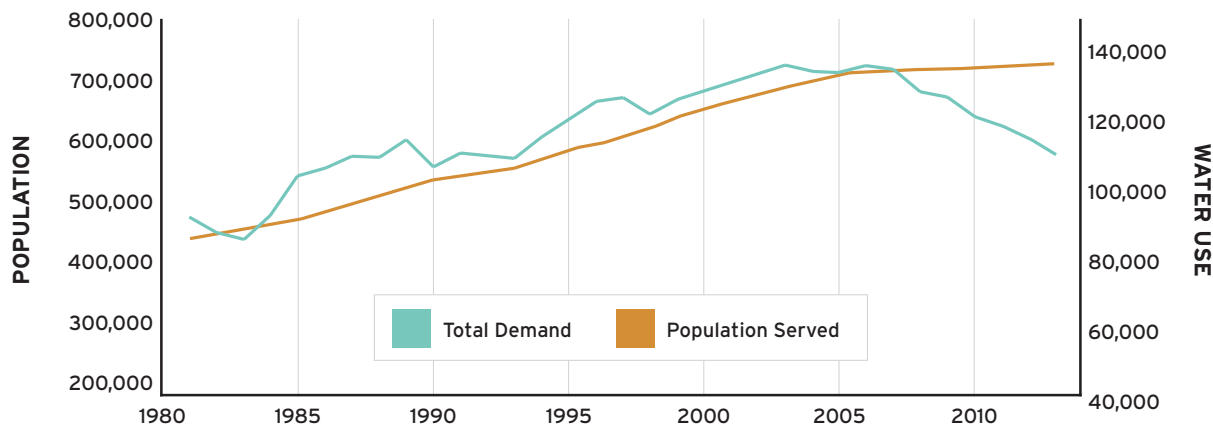


Figure 19: Since 1989, the population of Tucson has increased, but water use has decreased due to the implementation of tiered water rate structures, education, and incentives. In many cities across the western U.S., water use has been decreasing while the population has been steadily increasing.

A separate report released by the Alliance for Water Efficiency in 2017 found that Tucson, Arizona saved over \$380 million by deferring the need to build more water infrastructure.⁹² Tucson implemented water conservation measures in 1989, and has been working diligently to reduce water use through tiered water rates, education, and incentives.⁹³ Despite population growth of an additional 290,000 people between 1980 and 2015, Tucson reduced its water use to that of levels seen in the late 1980's.⁹⁴ This water use reduction has led to a decline in annual water production by 23% since 2005.⁹⁵

If conservation efforts had not been implemented, Tucson residents would have had to bear the burden of the \$380 million in added costs.⁹⁶ The study noted:

“Tucson customers pay water and wastewater rates that are at least 11.7% lower than they would have been if Tucson residents had not decreased per capita water use and lowered overall demand.”⁹⁷

Without the reduction of Tucson's water production, the city would have had to develop two new major water system projects, which would have included developing a new recycled water supply and a new water transmission expansion, costing over \$155 million combined.⁹⁸ According to the Alliance for Water Efficiency, “both of these projects were deferred and may be avoided entirely because of the impact of conservation on total supply.”⁹⁹

The Solution: Property Tax Relief Will Increase Utah's Municipal Water Supply, Break the Water Waste Cycle

Phasing out property taxes for water would mean Utah residents would pay only for the water they use and no individual or institution would get a free ride on the backs of taxpayers to waste water. Phasing out these taxes would also extend our water supply while utilizing the free market to save water and make water pricing transparent and equitable.

Phasing out property taxes on water would also help reduce government spending on new water infrastructure including delivery systems, treatment plants and the need for importing new water sources. Removing the property tax would thereby avoid large future rate increases by delaying or eliminating the need for expensive new water sources, like Bear River Development and the Lake Powell Pipeline. In other words, phasing out property taxes for water is the simplest water conservation measure Utah can take, and it would be very popular with taxpayers.

Phasing out property taxes for water would mean Utah residents would pay only for the water they use and no individual or institution would get a free ride on the backs of taxpayers to waste water.

An economic model created by researchers at the University of Utah demonstrates how much water could be saved if property tax collections by water suppliers were phased out.¹⁰⁰ The result of such a phase out would be much lower usage of outdoor water with no loss in total revenue to water suppliers. The researchers found that if water suppliers stopped collecting property taxes and replaced these lost revenues by raising outdoor water rates, consumers would use less water and water suppliers would be no worse off financially.

Two key principles are at the heart of this model. The researchers surmised that if property tax collections by water suppliers were eliminated, any lost revenue could be offset by an increase in outdoor water rates. This design feature was built into the phaseout model to ensure that these water rate increases did not harm fixed or low-income individuals, most of whom are using much less water outside their homes than more affluent water users. Focusing the required increase in water rate revenues on outdoor water use also could ensure that the largest water users pay a more equitable portion of their water demand. As described earlier in this report, delivering the peak outdoor water use in the summer months is often the most expensive water to deliver, and large landowners should pay for the entire cost of their water use in their water bill.

This design feature also the benefit of working to address the biggest use of water in Utah's cities – outdoor water used on grass landscapes. Outdoor water uses are typically non-essential, ornamental water uses, and the most prolific outdoor water users tend to be high-income individuals with large lawns.¹⁰¹ Raising rates on these water uses discourages consumers from wasting water, particularly on ornamental grass that isn't actually utilized other than for decoration.

The driving idea behind the researcher's model is represented in Figure 22. This model was developed to demonstrate that Utah could save billions of gallons of water if water users are charged solely based on the amount of water they consume.

Property Tax Phaseout Model Concept

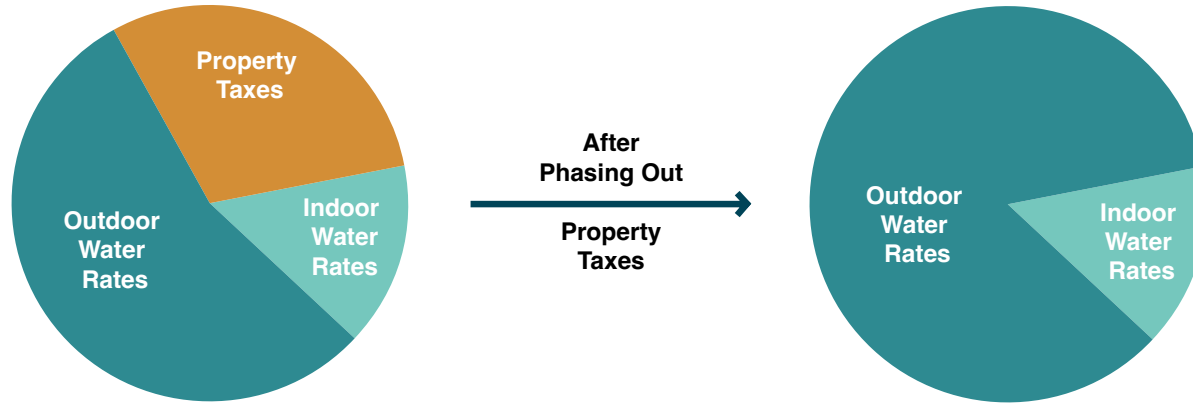


Figure 20: A Master’s student joined economists at the University of Utah to create a revenue neutral model to phase out property taxes without impacting indoor water rates, thereby avoiding impacts to lower income households. Phasing out property taxes for water by transferring future water rate increases to outdoor water use ensures that wealthier households and government institutions must pay the entire cost of their water use in their water bill.

After establishing the theoretical and mathematical viability of their model, the researchers sought to prove it using real world cities. They collected monthly water delivery volumes and water rate revenue totals for a number of large, Wasatch Front water suppliers to see what effect their phase out model would have on those water suppliers water rates and consumption levels. This monthly water delivery data was used to calculate the portion of water being used indoors by all consumers of a given city versus the amount of water being used outside by those same consumers during the irrigation season. The results of their analysis can be found in Table 5.

Results of Researcher’s 2011 Modeling

City	Average Price Increase	Demand Reduction
South Jordan City	31%	13%
Sandy	36%	14%
Herriman	40%	15%
Salt Lake City	43%	16%
West Jordan City	77%	25%
Bluffdale	80%	26%

Table 8: Results of the researcher’s model. Increasing outdoor water rates in lieu of collecting property taxes would result in significant water use reductions across the Wasatch Front/ Great Salt Lake Watershed. Results based off data collected in 2011.

As Table 5 shows, phasing out property tax collections and replacing the lost revenue with revenue generated from increased outdoor water rates substantially reduces total water use. This analysis shows just how powerful a tool the free market can be for conservation and suggests that implementing such a policy statewide could free up significant quantities of water for other important uses – like slowing the desiccation of the Great Salt Lake.

Another perk of the researcher's model is that it has the potential to reduce water suppliers' costs. Water suppliers are required to build their water systems to accommodate times when consumers are using maximum amounts of water, known as "peak demand."¹⁰² A water system may only reach its peak demand a handful of times per year, yet water suppliers must still deliver water on these days. This means that they have to build their systems with oversized pipes, large water treatment plants, etc., which quickly becomes expensive. By reducing peak demand, water suppliers can reduce the size and capacity of their new infrastructure, thereby reducing their overall costs.

Peak demand is most often reached in the summer, when consumers are using large amounts of water outdoors to irrigate their lawns and gardens. Figure 23 shows how summer water demand – driven mostly by outdoor water use – is typically the most expensive water to deliver for water suppliers.

Cost of Water Delivery

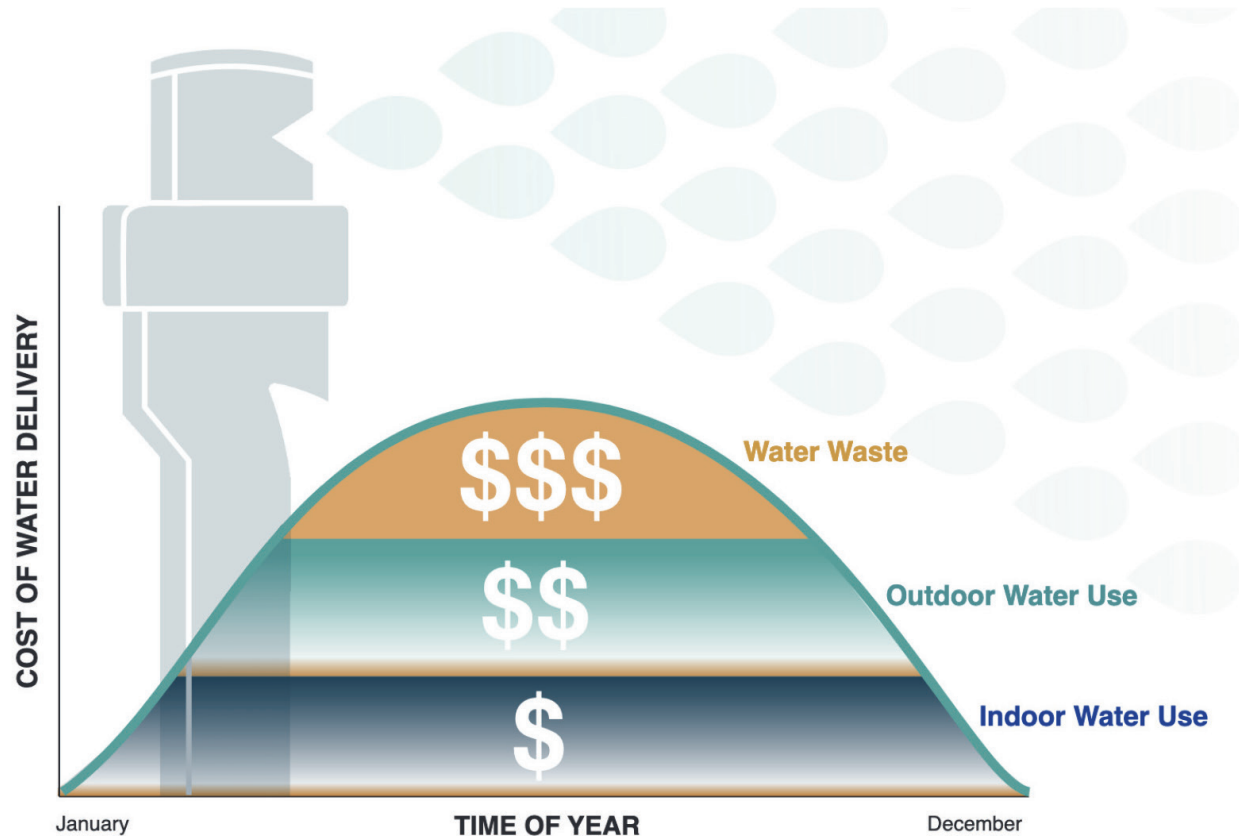


Figure 21: In general, water costs more to deliver during the peak of the summer irrigation season than it does for indoor water use throughout the rest of the year.



MIRAGE IN THE DESERT

APPENDIX A

Survey Data of Western Water Suppliers

State	Water Supplier Name	Revenue (\$)			Revenue (%)		Bonds
		Property Tax	Water Sales	Total	Property Tax	Water Sales	
Arizona	Central Arizona	\$82,233,000	\$164,105,000	\$364,889,000	23%	45%	F: AA / M: Aa2 / S&P: AA+
Arizona	Forest Lakes Water District	\$310,990	\$349,000	\$1,461,836			
Arizona	Diamond Valley Water District	\$-	\$640,000	\$754,200	0%	85%	
Arizona	Quail Ridge Water District	\$-	\$129,744	\$132,312			
Arizona	Highland Pines Water District	\$234,998	\$310,898	\$563,702	42%	55%	
Arizona	Mayer Water District	\$-	\$264,000	\$727,219			
California	Alameda County Water District	\$11,899,000	\$113,492,000	\$152,403,000	8%	74%	M: Aa1 / S&P: AAA
California	Biggs-West Gridley Water District	\$-	\$-	\$3,885,558	0%	0%	
California	Butte Water District	\$-	\$-	\$685,028	0%	0%	
California	Lake Madrone Water District	\$167,166	\$37,650	\$346,497	48%	11%	
California	Western Canal Water District	\$-	\$-	\$1,828,130	0%	0%	
California	Castle Rock County Water District	\$16,311	\$50,064	\$79,510	21%	63%	
California	Contra Costa County Water Agency	\$757,256	\$-	\$760,073	100%	0%	
California	Contra Costa Water District	\$4,219,921	\$139,459,465	\$164,205,402	3%	85%	F: AA / S&P: AA+
California	Diablo Water District	\$-	\$10,967,106	\$11,905,099	0%	92%	S&P: AA-
California	Broadview Water District	\$-	\$-	\$37,662	0%	0%	
California	Farmers Water District	\$-	\$-	\$1,095,521	0%	0%	
California	Firebaugh Canal Water District	\$-	\$1,106,802	\$5,279,689	0%	21%	
California	Free Water County Water District	\$-	\$-	\$55,918	0%	0%	
California	Fresno Slough Water District	\$-	\$-	\$148,560	0%	0%	
California	Garfield Water District	\$-	\$-	\$579,675	0%	0%	
California	International Water District	\$-	\$-	\$184,729	0%	0%	
California	Kings River Water District	\$-	\$49,830	\$279,504	0%	18%	
California	Liberty Water District	\$49,343	\$-	\$57,371	86%	0%	
California	Malaga County Water District	\$-	\$899,733	\$1,823,871	0%	49%	
California	Mercy Springs Water District	\$-	\$-	\$361,927	0%	0%	

California	Mid Valley Water District	\$-	\$-	\$64,073	0%	0%	
California	Panoche Water District	\$-	\$216,276	\$22,806,444	0%	1%	
California	Pinedale County Water District	\$-	\$1,391,313	\$1,429,225	0%	97%	
California	Pleasant Valley Water District	\$-	\$-	\$171,288	0%	0%	
California	Raisin City Water District	\$-	\$-	\$59,311	0%	0%	
California	Tri Valley Water District	\$807	\$-	\$206,723	0%	0%	
California	Westlands Water District	\$-	\$2,691,434	\$240,625,075	0%	1%	F: A+ / S&P: AA
California	Widren Water District	\$-	\$-	\$246,748	0%	0%	
California	Hydesville County Water District	\$-	\$292,536	\$297,767	0%	98%	
California	Jacoby Creek County Water District	\$-	\$24,337	\$28,782	0%	85%	
California	Bard Water District	\$10,661	\$985,500	\$2,040,755	1%	48%	
California	Palo Verde County Water District	\$2,872	\$188,523	\$713,752	0%	26%	
California	Seeley County Water District	\$-	\$371,314	\$371,314	0%	100%	
California	Winterhaven Water District	\$8,863	\$105,526	\$125,216	7%	84%	
California	Antelope Valley-East Kern Water Agency	\$33,548,467	\$35,311,266	\$85,701,437	39%	41%	
California	Berrenda Mesa Water District	\$48,828	\$1,644	\$19,799,477	0%	0%	
California	Buttonwillow County Water District	\$-	\$298,377	\$303,264	0%	98%	
California	Cawelo Water District	\$-	\$-	\$21,068,002	0%	0%	
California	Greenfield County Water District	\$36,979	\$2,105,548	\$2,851,342	1%	74%	
California	Henry Miller Water District	\$100,662	\$-	\$4,819,235	2%	0%	
California	Indian Wells Valley Water District	\$-	\$3,853,655	\$11,172,673	0%	34%	S&P: AA
California	Kern County Water Agency	\$46,509,949	\$130,770,571	\$222,417,914	21%	59%	M: Aa3 / S&P: AA
California	Kern Delta Water District	\$4,705,420	\$-	\$21,153,210	22%	0%	
California	Kern-Tulare Water District	\$-	\$-	\$9,380,268	0%	0%	
California	Lebec County Water District	\$46,119	\$428,841	\$622,224	7%	69%	
California	Lost Hills Water District	\$580,684	\$-	\$20,506,948	3%	0%	
California	Mettler County Water District	\$43,354	\$31,854	\$2,672,649	2%	1%	
California	Olcese Water District	\$-	\$128,138	\$152,414	0%	84%	
California	Quail Valley Water District	\$39,215	\$102,877	\$150,763	26%	68%	

California	Rand Communities Water District	\$25,535	\$362,299	\$391,927	7%	92%	
California	Tehachapi - Cummings County Water District	\$8,673,121	\$993,639	\$12,795,432	68%	8%	
California	Tejon-Castac Water District	\$-	\$2,961,936	\$2,961,936	0%	100%	
California	West Kern Water District	\$-	\$18,942,938	\$19,882,429	0%	95%	
California	Devils Den Water District	\$5,884	\$-	\$11,781	50%	0%	
California	Dudley Ridge Water District	\$-	\$-	\$6,959,228	0%	0%	
California	Green Valley Water District	\$24,751	\$-	\$25,478	97%	0%	
California	Kings County Water District	\$1,663,225	\$-	\$5,247,921	32%	0%	
California	Crescenta Valley County Water District	\$-	\$12,415,902	\$12,894,251	0%	96%	S&P: AA-
California	Green Valley County Water District	\$-	\$275,581	\$354,422	0%	78%	
California	La Habra Heights County Water District	\$786,447	\$4,218,201	\$5,239,303	15%	81%	
California	La Puente Valley County Water	\$282,812	\$1,382,190	\$4,727,396	6%	29%	
California	Orchard Dale Water District	\$-	\$2,485,708	\$5,437,276	0%	46%	
California	Pico Water District	\$-	\$3,444,577	\$4,397,761	0%	78%	
California	Rowland Area County Water District	\$424,009	\$13,031,186	\$27,703,874	2%	47%	S&P: AA-
California	San Gabriel County Water District	\$-	\$5,472,157	\$9,979,144	0%	55%	
California	Valley County Water District	\$340,902	\$19,566,198	\$25,125,949	1%	78%	
California	Walnut Valley Water District	\$1,156,821	\$37,179,934	\$44,639,922	3%	83%	S&P: AA+
California	West Valley County Water	\$4,689	\$205,912	\$250,491	2%	82%	
California	Santa Clarita Valley Water Agency	\$58,495,072	\$74,762,259	\$159,245,898	37%	47%	
California	Chowchilla Water District	\$223,532	\$-	\$17,666,495	1%	0%	
California	Clayton Water District	\$-	\$-	\$296,792	0%	0%	
California	Gravelly Ford Water District	\$129,087	\$-	\$352,250	37%	0%	
California	Madera Water District	\$-	\$-	\$2,732,991	0%	0%	
California	Root Creek Water District	\$-	\$1,958,945	\$2,833,343	0%	69%	
California	Triangle T Water District	\$-	\$-	\$3,468,047	0%	0%	
California	North Marin Water District	\$60,726	\$18,194,168	\$24,329,928	0%	75%	
California	Stinson Beach County Water District	\$996,407	\$730,154	\$1,855,208	54%	39%	
California	Ballico-Cortez Water District	\$8,912	\$-	\$29,710	30%	0%	

California	Celeste County Water District	\$494	\$-	\$1,049	47%	0%	
California	Centinella Water District	\$-	\$-	\$90	0%	0%	
California	Country Club County Water District	\$-	\$18,400	\$18,423	0%	100%	
California	Delhi County Water District	\$105,117	\$1,118,370	\$1,272,839	8%	88%	
California	Eagle Field Water District	\$-	\$-	\$332,000	0%	0%	
California	Grassland Water District	\$16,892	\$146,748	\$3,732,717	0%	4%	
California	Hilmar County Water District	\$68,560	\$605,424	\$765,266	9%	79%	
California	Merquin County Water District	\$211,677	\$-	\$676,745	31%	0%	
California	North Dos Palos Water District	\$-	\$6,851	\$6,851	0%	100%	
California	Pacheco Water District	\$-	\$-	\$2,591,276	0%	0%	
California	San Luis Water District	\$-	\$-	\$25,049,263	0%	0%	S&P: A+
California	Santa Nella County Water District	\$45,628	\$578,465	\$3,630,737	1%	16%	
California	South Dos Palos County Water District	\$6,705	\$45,776	\$56,859	12%	81%	
California	Stevinson Water District	\$4,751	\$8,360	\$681,305	1%	1%	
California	Turner Island Water District	\$-	\$-	\$1,183,748	0%	0%	
California	Marina Coast Water District	\$-	\$11,652,404	\$13,085,473	0%	89%	S&P: AA-
California	Monterey Peninsula Water Management District	\$-	\$-	\$7,097,211	0%	0%	
California	San Ardo Water District	\$-	\$78,190	\$108,585	0%	72%	
California	San Lucas County Water District	\$-	\$80,744	\$80,744	0%	100%	
California	Circle Oaks County Water District	\$23,943	\$253,247	\$284,078	8%	89%	
California	Congress Valley Water District	\$119,890	\$-	\$146,736	82%	0%	
California	Spanish Flat Water District	\$-	\$170,846	\$170,846	0%	100%	
California	East Orange County Water District	\$1,389,682	\$4,437,961	\$7,912,439	18%	56%	
California	El Toro Water District	\$557,200	\$12,742,287	\$16,714,076	3%	76%	
California	Irvine Ranch Water District	\$30,438,000	\$48,405,000	\$141,682,000	21%	34%	S&P: AAA
California	Laguna Beach County Water District	\$3,159,812	\$10,390,310	\$15,855,857	20%	66%	
California	Mesa Water District (Orange)	\$-	\$35,549,537	\$38,118,859	0%	93%	
California	Moulton-Niguel Water District	\$21,310,466	\$29,477,587	\$67,480,939	32%	44%	F: AAA / S&P: AAA
California	Orange County Water District	\$29,988,171	\$-	\$191,407,681	16%	0%	F: AAA / S&P: AAA

California	Santa Margarita Water District	\$15,708,950	\$39,157,529	\$77,234,183	20%	51%	
California	South Coast Water District	\$2,880,640	\$18,557,210	\$24,975,313	12%	74%	
California	Trabuco Canyon Water District	\$964,056	\$3,593,924	\$6,594,842	15%	54%	
California	Yorba Linda Water District	\$1,951,834	\$27,708,546	\$36,594,076	5%	76%	
California	Alpine Springs County Water District	\$-	\$707,591	\$712,386	0%	99%	
California	McKinney Water District	\$164,744	\$75,692	\$262,411	63%	29%	
California	Meadow Vista County Water District	\$316,651	\$891,357	\$2,207,520	14%	40%	
California	Midway Heights County Water District	\$49,541	\$387,191	\$670,000	7%	58%	
California	Placer County Water Agency	\$1,140,713	\$36,810,171	\$73,098,597	2%	50%	M: Aa2 / S&P: AAA
California	Sierra Lakes County Water District	\$228,867	\$857,384	\$1,136,033	20%	75%	
California	Olympic Valley Public Service District	\$20,710	\$1,948,490	\$2,533,585	1%	77%	
California	Cabazon County Water District	\$65,226	\$1,365,963	\$1,717,554	4%	80%	
California	Coachella Valley Water District	\$1,962,408	\$73,768,053	\$96,672,086	2%	76%	
California	Desert Water Agency	\$31,278,189	\$34,934,870	\$78,312,598	40%	45%	S&P: AA
California	Fern Valley Water District	\$710,304	\$785,043	\$1,535,485	46%	51%	
California	High Valleys Water District	\$306,723	\$218,867	\$579,299	53%	38%	
California	Home Garden County Water District	\$-	\$980,188	\$1,016,142	0%	96%	
California	Idyllwild Water District	\$345,989	\$1,380,196	\$1,799,069	19%	77%	
California	Temescal Valley Water District	\$52,800	\$7,560,731	\$11,170,563	0%	68%	
California	Mission Springs Water District	\$1,240,042	\$11,100,492	\$15,165,636	8%	73%	
California	Pine Cove Water District	\$184,523	\$692,226	\$1,230,039	15%	56%	
California	Pinyon Pines County Water District	\$-	\$44,758	\$51,682	0%	87%	
California	Rancho California Water District	\$42,514,410	\$25,721,678	\$125,125,349	34%	21%	
California	San Geronio Pass Water Agency	\$28,915,524	\$5,035,859	\$37,010,830	78%	14%	
California	Chiriaco Summit Water District	\$-	\$186,642	\$332,702	0%	56%	
California	Del Paso Manor Water District	\$-	\$2,002,844	\$2,044,091	0%	98%	
California	Florin County Water District	\$-	\$3,551,327	\$3,748,835	0%	95%	
California	North Delta Water Agency	\$-	\$-	\$1,411,552	0%	0%	
California	Omochumne - Hartnell Water District	\$155,676	\$-	\$358,779	43%	0%	

California	Rio Linda-Elverta Community Water District	\$95,154	\$2,624,104	\$3,951,972	2%	66%	
California	Sacramento County Water Agency	\$-	\$53,678,473	\$89,203,305	0%	60%	S&P: AA-
California	Sacramento Suburban Water District	\$-	\$41,771,834	\$48,548,960	0%	86%	S&P: AA+/A-1
California	Apple Valley Foothill County Water District	\$-	\$140,145	\$164,444	0%	85%	
California	Apple Valley Heights County Water District	\$-	\$375,486	\$537,214	0%	70%	
California	Arrowbear Park County Water District	\$-	\$476,120	\$532,673	0%	89%	
California	Bighorn-Desert View Water Agency	\$202,511	\$983,719	\$2,309,405	9%	43%	
California	Crestline Village Water District	\$250,330	\$2,752,371	\$3,306,669	8%	83%	
California	Crestline-Lake Arrowhead Water Agency	\$5,332,654	\$1,592,998	\$8,278,568	64%	19%	
California	Cucamonga Valley Water District	\$-	\$46,556,712	\$85,834,077	0%	54%	S&P: AA+
California	East Valley Water District	\$-	\$17,560,067	\$27,179,063	0%	65%	F: AA- / S&P: AA-
California	Hesperia County Water District	\$509,601	\$19,171,569	\$25,601,104	2%	75%	
California	Hi-Desert Water District	\$1,691,373	\$5,490,720	\$11,117,763	15%	49%	S&P: AA-
California	Joshua Basin Water District	\$529,943	\$3,139,118	\$7,671,579	7%	41%	
California	Juniper-Riviera County Water District	\$152,918	\$126,768	\$322,514	47%	39%	
California	Mariana Ranchos County Water District	\$-	\$435,402	\$549,364	0%	79%	
California	Mojave Water Agency	\$40,929,770	\$10,279,547	\$55,303,857	74%	19%	F: AA / S&P: AA
California	Monte Vista Water District	\$1,744,762	\$19,571,509	\$23,287,437	7%	84%	S&P: AA
California	Running Springs Water District	\$-	\$2,093,201	\$2,238,631	0%	94%	
California	San Bernardino Valley Water District	\$179,050	\$1,146,863	\$3,549,059	5%	32%	S&P: AAA
California	Thunderbird County Water District	\$-	\$191,040	\$227,908	0%	84%	
California	Twentynine Palms County Water District	\$-	\$3,181,606	\$5,463,016	0%	58%	
California	Victorville Water District	\$907,732	\$20,832,028	\$37,822,480	2%	55%	
California	West Valley Water District	\$2,363,571	\$17,698,440	\$33,135,354	7%	53%	
California	Yucaipa Valley Water District	\$3,619,887	\$10,515,859	\$15,448,435	23%	68%	F: AA / S&P: A+
California	Borrego Water District	\$69,902	\$2,555,394	\$4,299,638	2%	59%	
California	Canebrake County Water District	\$17,533	\$39,074	\$77,715	23%	50%	
California	Cuyamaca Water District	\$-	\$98,025	\$98,045	0%	100%	

California	San Diego County Water Authority	\$12,941,819	\$565,784,174	\$662,851,832	2%	85%	
California	Vallecitos Water District	\$2,725,026	\$21,520,738	\$48,041,273	6%	45%	F: AA+ / S&P: AA+
California	Wynola Water District	\$25,295	\$95,672	\$122,157	21%	78%	
California	Central San Joaquin Water Conservation District	\$54,656	\$-	\$3,095,731	2%	0%	
California	Linden County Water District	\$44,666	\$434,175	\$504,432	9%	86%	
California	North San Joaquin Water Conservation District	\$315,408	\$6,089	\$365,335	86%	2%	
California	Oakwood Lake Water District	\$-	\$730,068	\$730,489	0%	100%	
California	Stockton-East Water District	\$480,855	\$23,944,358	\$28,423,572	2%	84%	
California	Garden Farms Community Water District	\$38,070	\$100,021	\$199,730	19%	50%	
California	Shandon-San Juan Water District	\$-	\$-	\$500,166	0%	0%	
California	Estrella-El Pomar-Creston Water District	\$-	\$-	\$103,003	0%	0%	
California	Canada County Water District	\$41,248	\$-	\$42,148	98%	0%	
California	Coastside County Water District	\$1,459,917	\$12,881,120	\$14,738,976	10%	87%	
California	Mid Peninsula Water District	\$398,900	\$13,272,044	\$15,854,601	3%	84%	S&P: AA
California	North Coast County Water District	\$1,062,855	\$8,739,153	\$14,554,482	7%	60%	S&P: AA
California	Westborough County Water District	\$342,030	\$2,804,612	\$4,054,373	8%	69%	
California	Carpinteria Valley Water District	\$-	\$10,306,401	\$14,281,043	0%	72%	S&P: AA-
California	Goleta Water District	\$-	\$19,460,809	\$33,420,491	0%	58%	M: A1 / S&P: AA
California	Montecito Water District	\$-	\$8,984,393	\$20,768,940	0%	43%	S&P: A+
California	Aldercroft Heights County Water District	\$18,200	\$302,574	\$320,863	6%	94%	
California	Purissima Hills Water District	\$1,206,167	\$6,428,623	\$8,657,056	14%	74%	
California	San Martin County Water District	\$-	\$183,699	\$224,536	0%	82%	
California	Santa Clara Valley Water District	\$30,168,369	\$265,181,936	\$308,607,882	10%	86%	F: AA+ / M: Aa1
California	Central Water District	\$122,933	\$1,110,345	\$1,262,953	10%	88%	
California	San Lorenzo Valley Water District	\$808,641	\$10,865,193	\$12,547,798	6%	87%	S&P: AA
California	Scotts Valley Water District	\$1,021,685	\$3,480,851	\$7,891,253	13%	44%	
California	Soquel Creek Water District	\$-	\$13,449,024	\$24,282,906	0%	55%	S&P: AA
California	Bella Vista Water District	\$2,657,086	\$3,610,051	\$8,026,911	33%	45%	
California	Burney Water District	\$-	\$1,634,465	\$1,639,791	0%	100%	

California	Cottonwood Water District	\$-	\$555,876	\$567,097	0%	98%	
California	Tucker Oaks Water District	\$-	\$21,676	\$36,876	0%	59%	
California	Maine Prairie Water District	\$65,051	\$-	\$1,036,557	6%	0%	
California	Forestville Water District	\$169,422	\$1,045,929	\$1,294,534	13%	81%	
California	North Bay Water District	\$-	\$-	\$30,000	0%	0%	
California	Rains Creek Water District	\$-	\$103,820	\$137,202	0%	76%	
California	Russian River County Water District	\$-	\$516,265	\$571,896	0%	90%	
California	Sonoma County Water Agency	\$-	\$45,484,953	\$50,905,463	0%	89%	S&P: AAA
California	Sonoma Mountain County Water District	\$7,061	\$82,077	\$89,579	8%	92%	
California	Sweetwater Springs Water District	\$-	\$2,600,582	\$3,596,374	0%	72%	
California	Timber Cove County Water District	\$-	\$302,316	\$579,099	0%	52%	
California	Valley of the Moon Water District	\$-	\$6,637,018	\$6,810,514	0%	97%	
California	Windsor County Water District	\$-	\$5,585,350	\$6,468,644	0%	86%	
California	Del Puerto Water District	\$-	\$-	\$14,851,709	0%	0%	
California	El Solyo Water District	\$-	\$-	\$766,951	0%	0%	
California	Oak Flat Water District	\$-	\$-	\$598,583	0%	0%	
California	Patterson Irrigation District	\$-	\$6,133,412	\$8,807,483	0%	70%	
California	Rock Creek Water District	\$-	\$-	\$65,125	0%	0%	
California	Western Hills Water District	\$-	\$1,340,430	\$3,839,931	0%	35%	
California	Angiola Water District	\$-	\$-	\$6,817,105	0%	0%	
California	Atwell Island Water District	\$-	\$-	\$216,244	0%	0%	
California	Lewis Creek Water District	\$-	\$-	\$136,123	0%	0%	
California	St. Johns Water District	\$-	\$-	\$176,694	0%	0%	
California	Tea Pot Dome Water District	\$-	\$87,547	\$1,414,739	0%	6%	
California	Vandalia Water District	\$21,948	\$5,952	\$476,585	5%	1%	
California	Camrosa Water District	\$657,475	\$9,046,692	\$20,513,027	3%	44%	S&P: AA
California	Meiners Oaks County Water District	\$171,176	\$1,333,008	\$1,726,777	10%	77%	
California	Pleasant Valley County Water District	\$276,785	\$-	\$3,977,144	7%	0%	
California	United Water Conservation District	\$2,849,770	\$12,793,332	\$36,412,481	8%	35%	S&P: AA-

California	Ventura River County Water District	\$48,973	\$2,279,756	\$2,423,786	2%	94%	
California	Dunnigan Water District	\$-	\$-	\$1,837,847	0%	0%	
California	Metro Water District of Southern California	\$146,276,614	\$1,187,997,767	\$1,539,864,782	9%	77%	M: Aa1 / S&P: AAA
Colorado	Ute Water	\$7,960	\$19,008,177	\$25,242,004	0%	75%	S&P: AA
Colorado	Colorado River	\$4,317,000	\$1,817,000	\$8,643,000	50%	21%	
Colorado	West Divide	\$39,232	\$77,028	\$119,757	33%	64%	
Colorado	St. Vrain & Left Hand	\$413,438	\$128,728	\$3,731,664	11%	3%	
Colorado	South Eastern Colorado	\$8,546,317	\$10,606,973	\$20,516,462	42%	52%	
Colorado	Botswick Park	\$263,012	\$48,651	\$727,576	36%	7%	
Colorado	Central Colorado	\$17,273,019	\$3,010,828	\$20,506,426	84%	15%	S&P: AA / M: A1
Colorado	Dolores	\$1,074,769	\$3,084,358	\$6,060,323	18%	51%	
Colorado	Lower South Platte	\$631,502	\$301,780	\$1,269,813	50%	24%	
Colorado	North Fork	\$77,955	\$-	\$124,650	63%	0%	
Colorado	San Luis Valley	\$170,582	\$662,286	\$1,395,549	12%	47%	
Colorado	Southwestern	\$1,593,812	\$-	\$1,951,498	82%	0%	
Colorado	Upper Gunnison River	\$1,325,725	\$340,401	\$1,625,164	82%	21%	
Colorado	Upper Yampa	\$2,564,147	\$330,110	\$3,201,571	80%	10%	
Colorado	Lower Arkansas Valley	\$2,431,194	\$973,457	\$4,043,639	60%	24%	
Colorado	Pueblo	\$-	\$-	\$2,042,272	0%	0%	
Colorado	Clifton	\$-	\$6,189,446	\$6,781,491	0%	91%	S&P: AA-
Colorado	East Larimer County	\$-	\$7,045,478	\$7,259,249	0%	97%	S&P: AA
Colorado	Little Thompson	\$-	\$10,488,390	\$10,584,619	0%	99%	S&P: AA-
Colorado	Pinewood Springs	\$244,623	\$283,898	\$636,622	38%	45%	
Colorado	West Fort Collins	\$-	\$1,323,340	\$1,347,850	0%	98%	
Colorado	Central Weld County	\$-	\$6,817,427	\$6,938,049	0%	98%	S&P: AA
Colorado	Left Hand	\$-	\$11,436,094	\$11,710,413	0%	98%	
Colorado	Longs Peak	\$-	\$1,299,327	\$1,384,167	0%	94%	
Colorado	North Weld County	\$-	\$13,278,380	\$13,568,617	0%	98%	S&P: AA
Colorado	Pine Brook	\$330,038	\$781,106	\$1,144,132	29%	68%	

Colorado	Cherry Creek Village	\$70,808	\$1,008,954	\$1,107,021	6%	91%	
Colorado	Southgate	\$-	\$1,619,093	\$1,637,913	0%	99%	
Colorado	Willows	\$986,685	\$4,966,216	\$6,039,395	16%	82%	
Colorado	Blue Mountain	\$119,985	\$118,944	\$240,929	50%	49%	
Colorado	Brook Forest	\$223,983	\$143,975	\$391,539	57%	37%	
Colorado	Hidden Valley	\$86,696	\$80,704	\$224,614	39%	36%	
Colorado	High View	\$10,182	\$1,206,330	\$1,225,558	1%	98%	
Colorado	Lookout Mountain	\$549,378	\$669,837	\$1,398,142	39%	48%	
Colorado	Meadowbrook	\$168,681	\$1,433,760	\$1,834,557	9%	78%	
Colorado	The Valley	\$-	\$4,411,326	\$4,755,339	0%	93%	
Colorado	Wheat Ridge	\$-	\$5,277,372	\$5,306,652	0%	99%	
Colorado	Forest View	\$76,086	\$570,399	\$654,661	12%	87%	
Colorado	Park Forest	\$154,647	\$503,796	\$679,773	23%	74%	
Colorado	Security	\$824,566	\$5,999,887	\$8,499,450	10%	71%	S&P: A
Colorado	Stratmoor Hills	\$-	\$1,504,119	\$1,969,095	0%	76%	
Colorado	Saint Charles Mesa	\$-	\$2,780,454	\$2,940,872	0%	95%	
Montana	Lockwood Area/Yellowstone	\$-	\$1,849,056	\$4,136,573	0%	45%	
Montana	Tri-County	\$-	\$161,565	\$184,951	0%	87%	
Montana	North Central Montana	\$-	\$238,652	\$887,004	0%	27%	
Nevada	Souther Nevada Water Authority	\$-	\$145,992,532	\$258,785,095	0%	56%	S&P: AA
Nevada	Truckee Meadows Water Authority	\$-	\$102,487,078	\$115,602,636	0%	89%	M: Aa2 / AA+
New Mexico	Eldorado Area	\$1,230,583	\$3,421,560	\$5,106,045	24%	67%	
New Mexico	Alto Lakes	\$-	\$839,180	\$2,104,644	0%	40%	
New Mexico	Anthony	\$-	\$2,665,331	\$2,861,553	0%	93%	
New Mexico	Albuquerque-Bernalillo WUA	\$-	\$147,244,774	\$239,040,377	0%	62%	S&P: AAA / M: Aa2 / Fitch: AA
Oregon	Rockwood Water	\$-	\$8,865,870	\$10,594,414	0%	84%	M: Aa3
Oregon	Burlington	\$134,129	\$205,259	\$364,148	37%	56%	
Oregon	Corbett	\$173,536	\$543,768	\$776,433	22%	70%	
Oregon	Lusted	\$107,126	\$422,002	\$823,799	13%	51%	

Oregon	Pleasant Home	\$-	\$242,753	\$412,626	0%	59%	
Oregon	Valley View	\$349,943	\$342,192	\$718,031	49%	48%	
Oregon	Tualatin Valley	\$-	\$66,198,211	\$74,702,183	0%	89%	
Oregon	Raleigh Water District	\$-	\$741,539	\$910,543	0%	81%	
Oregon	West Slope	\$-	\$3,515,801	\$3,661,708	0%	96%	M: A1
Oregon	Boring	\$-	\$530,330	\$627,324	0%	85%	
Oregon	Clackamas River	\$-	\$13,099,982	\$13,933,985	0%	94%	S&P: AA-
Oregon	Colton	\$-	\$315,953	\$339,935	0%	93%	
Oregon	Lake Grove	\$-	\$1,146,436	\$1,213,758	0%	94%	
Oregon	Palatine Hill	\$-	\$984,667	\$1,066,288	0%	92%	
Oregon	Rivergrove	\$-	\$862,405	\$1,157,687	0%	74%	
Oregon	Mapleton	\$-	\$190,411	\$209,612	0%	91%	
Oregon	Marcola	\$12,675	\$118,660	\$139,887	9%	85%	
Oregon	Rainbow	\$1,540,790	\$1,688,175	\$3,530,488	44%	48%	
Oregon	River Road	\$1,029,800	\$1,509,556	\$2,616,338	39%	58%	
Oregon	Santa Clara	\$-	\$2,208,481	\$2,288,412	0%	97%	
Oregon	Shangri La	\$55,750	\$85,031	\$141,857	39%	60%	
Oregon	Heceta Water	\$339	\$1,165,294	\$1,277,403	0%	91%	
Oregon	Suburban East Salem	\$-	\$838,833	\$1,557,653	0%	54%	
Texas	Red River Authority	\$-	\$5,414,765	\$6,874,511	0%	79%	S&P: A-
Texas	Brazos River Authority	\$-	\$49,468	\$69,265	0%	71%	S&P: AA+
Texas	Guadalupe-Blanco River Authority	\$-	\$43,603,806	\$58,998,716	0%	74%	S&P: AA+
Texas	Lower Colorado River Authority	\$-	\$29,700,000	\$1,042,700,000	0%	3%	S&P: A
Texas	Lower Neches Valley Authority	\$-	\$27,742,293	\$38,322,131	0%	72%	S&P: AA-
Texas	San Antonio River Authority	\$34,082,100	\$91,712,074	\$128,644,433	26%	71%	S&P: AA-
Texas	San Jacinto River Authority	\$-	\$22,038,638	\$108,585,742	0%	20%	S&P: AA-
Texas	Trinity River Authority	\$-	\$47,483,293	\$300,131,292	0%	16%	S&P: AA
Utah	Jordan Valley	\$22,409,925	\$58,420,899	\$85,371,825	26%	68%	S&P: AA+ / F: AA+
Utah	Central Utah	\$73,550,521	\$130,392,614	\$276,535,689	27%	47%	S&P: AA+ / F: AA+

Utah	Weber Basin	\$10,393,665	\$30,745,980	\$42,815,512	24%	72%	S&P: AA+ / F: AAA
Utah	Washington County	\$13,444,962	\$17,254,796	\$70,332,269	19%	25%	S&P: AA
Utah	Metro Water	\$12,806,745	\$22,407,269	\$48,753,474	26%	46%	S&P: AA+
Utah	Central Iron County	\$1,890,611	\$887,286	\$3,848,751	49%	23%	
Utah	Emery	\$839,720	\$1,420,096	\$2,441,857	34%	58%	
Utah	Kane County	\$952,826	\$1,466,272	\$3,135,484	30%	47%	S&P: AA
Utah	Roy	\$146,001	\$-	\$2,986,922	5%	0%	
Utah	San Juan County	\$502,191	\$254,302	\$801,277	63%	32%	
Utah	Uinta	\$2,204,588	\$1,541,762	\$4,016,129	55%	38%	
Washington	Coal Creek	\$-	\$4,106,999	\$8,853,221	0%	46%	
Washington	Covington	\$-	\$14,122,562	\$14,684,393	0%	96%	M: Aa3
Washington	Highline	\$-	\$16,564,150	\$16,908,608	0%	98%	
Washington	King County No. 125	\$-	\$3,660,406	\$3,703,601	0%	99%	
Washington	Northeast Sammamish	\$-	\$2,276,309	\$6,536,362	0%	35%	S&P: AA+
Washington	North City	\$-	\$7,223,801	\$7,706,486	0%	94%	M: Aa3
Washington	Sammamish Plateau	\$-	\$16,766,461	\$34,338,659	0%	49%	S&P: AAA
Washington	Skyway	\$-	\$2,587,583	\$9,313,070	0%	28%	S&P: AA
Washington	Soos Creek	\$-	\$10,099,962	\$43,749,542	0%	23%	
Washington	Lakewood	\$-	\$14,497,702	\$15,069,279	0%	96%	S&P: AA
Washington	Valley	\$-	\$3,323,212	\$3,469,373	0%	96%	S&P: A+
Washington	Alderwood	\$-	\$39,939,177	\$93,623,548	0%	43%	M: Aa2 / S&P: AA+
Washington	Highland	\$-	\$1,293,369	\$1,293,369	0%	100%	
Washington	Olympic View	\$-	\$3,122,067	\$6,163,736	0%	51%	S&P: AA
Washington	Whitworth No. 2	\$-	\$5,047,040	\$5,981,149	0%	84%	
Washington	Liberty Lake No. 1	\$-	\$5,777,794	\$6,731,153	0%	86%	
Washington	North Perry Avenue	\$-	\$4,821,632	\$4,914,693	0%	98%	
Washington	Whatcom County No. 7	\$-	\$607,019	\$631,604	0%	96%	

A wide-angle photograph of a desert landscape. In the background, a range of mountains with some snow-capped peaks stretches across the horizon. The middle ground is a vast, flat, light-colored desert floor. In the foreground, a mirage is visible, showing a distorted, inverted reflection of the mountains and sky on the ground, creating the illusion of water. The sky is a pale, hazy blue.

MIRAGE IN THE DESERT

APPENDIX B

References

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