

H2Know: The Public-Private Water Show

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A Look at the Distribution and Rights of Water in the U.S. and Abroad

The human species is quickly ushering the planet into a precarious future. Beyond the realm of personal lives, domestic differences, and foreign affairs, the stability and predictability of Earth's climate is changing before our very eyes. States like California, Alabama, and Georgia are experiencing record droughts, with little expectation of the water returning. While in other states such as Louisiana, Florida, and New Jersey continue to victim to modern severe storm systems as hurricanes devastate towns and cities alike. However local these issues may seem record droughts and severe storms are actually just a small part of a larger global system.* This can be seen in the droughts occurring in regions of South America and Africa, and in the severe storms that have devastated entire countries like the Philippines and Japan.

The quintessential element that ensures the success of the global system is water. Water embarks on a never ending cycle, one that begins in the oceans and doesn't end until it has evaporated into the sky, been blown around as atmosphere by wind, and then falls as precipitation before finding its way back home to the ocean, being used, frozen, transpired, and stored along the way. This system is known as the hydrologic cycle and the above explanation of the process shows the entanglement of all water around the world, from the ocean to the rivers

* The larger global system referred to is actually just Earth's Climate. On Earth, the climate is broken up into five different groups known as Tropical, Dry, Mild, Continental, and Polar. These five groups combine to form a stable climate that has supported life from the simplest bacteria to the human race. Protecting all living things from the heating power of the sun is the atmosphere. The Oxygen we breathe makes up a small fraction of the atmosphere as it is mostly composed of Nitrogen. As populations expand more Carbon Dioxide is being introduced into the atmosphere which is currently causing a greenhouse effect causing the planet's mean temperature to rise causing a chain reaction of other events.

that feed them, and the rain clouds that ultimately feed the rivers. Despite being a singular body, water has varying residence periods based on its location within the cycle. For example, when water enters the ocean it stays there for an average of 3,000 years compared to only staying in the atmosphere for up to nine days.¹

Water is such a crucial element of the global system because of the sheer abundance of it on our planet, and the fact that it is a fundamental requirement in sustaining life. Water accounts for 70% of the planet's surface whether it be saline or fresh. With an astonishing 97% considered saline and only 3% considered fresh. Of the 3% considered fresh around 2% is locked up as glacial ice in both the North and South poles. Leaving less than 1% of water that is actually accessible for human use after accounting for the presence of atmospheric water as well. Almost all of the water considered to be accessible is found underground with less than 0.1% being found on the surface. These surface waters form our lakes, streams, and rivers.²

The United States is rather fortunate in the fact that while, “most of the earth's surface fresh water is locked up in ice, the Great Lakes account for an astonishing 20 percent of what's left.” It also helps that the fourth largest watershed in the world, the Mississippi-Missouri River, is located in the heart of the country, stretching around 5,970 km or about 3,710 miles. The river begins in Lake Itasca Minnesota and ends when it exits Louisiana and enters the Gulf of Mexico. The National Park Service emphasizes the immense volume of water found within the Mississippi-Missouri watershed when they state that it “covers about 40% of the lower 48% states” meaning that over 18 million Americans rely on its water.³

Despite the abundance of surface water here in the United States, 51% of the nation's population, and 99% of those living in rural communities rely on groundwater as their means of access to drinking water.⁴ However, groundwater's use does not end there with three times more

water being extracted for agricultural use than for the public supply every year. One of the main issues with this overconsumption or *mining* of groundwater is that it plays a vital role in the hydrologic cycle. For one as the water percolates through the soil it is filtered by the natural bacteria and other microbes that live in the soil. It also serves as an intermediate storage stage between the air and the surface, with some reserves, also known as aquifers, having a residence time of 100 years while others take up to 10,000 years to move onward in the cycle.¹ These times vary by the depth and size of the aquifer as well as the rate of recharge. The rate of recharge is associated with the amount of water that enters the aquifer versus the amount of water that is taken out. When the recharge of an aquifer is equal to the amount of water that taken out of one it is known as a steady state and is functioning in a sustainable fashion. However, when the rate of recharge falls below the amount that is taken out the aquifer it enters into a transient state, which can be detrimental not only to the aquifer, but to everyone relying on its water.

Water use in this country is shaped around two fundamental principles that determine individual rights to water rather than one coherent recognition of water as a public good. The first principle is rooted in a philosophy that predates the United States (U.S.) and is known as the Riparian Doctrine. The Riparian Doctrine promotes a system based on “reasonable use,” and what is “reasonable” is defined by the state. The other law that is used to determine an individual’s right to water is known as the Prior Appropriation Doctrine, and is used all over the western side of the country. Contrary to the Riparian Doctrine, which holds landowners responsible for their neighbor’s livelihood, Prior Appropriation states “first-in-time-first-in-right.” This claim means that as long as a landowner can prove ownership first, there is no limit to the amount of water to be used, in fact they can even sue neighbors if they believe too much water is being used by them. The ideology behind the two are so immensely different because of

how different the two landscapes are in regards to water accessibility. After all, it is on the East Coast that the Great Lakes and the Mississippi-Missouri River watershed can be found. In fact, almost every major city on the eastern side of the country is located by either a river or a lake, cities such as Philadelphia, New Orleans, and Chicago are examples. This is fundamentally different than the cities of the west coast which rely heavily on groundwater and water transfers to keep thirst from their cities, examples are cities like Denver, Las Vegas, and Los Angeles.

The need for water transfers here in the U.S. has borne a water market. A place where the price of water will be determined by supply-demand, turning one of the life's most precious resources into a commodity to be bought and sold. It is known that 60% of the human body is composed of water and this water needs to be constantly turned over by consuming more of it. Since the population is only supposed to grow in the coming decades, the demand for water will have correlative growth. Therefore, the supply will further dwindle as the demand increases shifting the water market into a highly profitable one. So as the nation's aquifers continue their transition from a steady-state into a transient one what will happen to the price of water? Currently, the American people pay an average of \$1.50 per 1,000 gallons of water, but what will happen as aquifers continue to dry up and access becomes a problem, as it already is in western cities all over the U.S.? Will the American people be willing to pay more for something that is required to sustain life or is water a natural right bestowed upon all who are living?

Either way, the days of people digging a well and drawing water with a bucket have long since passed and a more modern approach has been used for centuries. The approach is utilitarian and promotes the belief "that actions are right insofar as they promote the greatest happiness for the greatest number."⁴ Unfortunately by condoning that mindset we are approaching an irreversible threshold. Too many people measure, "the natural world in terms of things that can

be used to increase human happiness.”⁴ While rooted in the same mindset two branches have sprouted using varying approaches to the original philosophy both of which do not quite recognize water as a public good, one that needs to be protected as such.

U.S. Utilitarianism:

In short, utilitarianism revolves around the expectation of service and calls for a moral sentiment that promotes the well-being of the majority. Bureaucratic utilitarianism goes one step further with the assumption that, “the key to success was a conservationist ethic, a “wise use” philosophy” would be the best way to approach the system. Agencies such as the U.S. Forest Service and the U.S. Fish and Wildlife Service are examples. In fact, founder of the U.S. Forest Service and father of conservation, Gifford Pinchot, firmly believed, “that resources should be managed to promote the greatest amount of happiness for the greatest number *for the longest amount of time.*”⁴ Understanding the words above in italics is crucial when thinking about the possible effects to the hydrologic cycle. What Pinchot meant by *for the longest amount of time* is that the people of today must not only think, but act for the people of tomorrows. We must plan for our children and their grandchildren. For our friends our neighbors.

Individualistic utilitarianism, however, takes a more microeconomic approach, and “allows for individuals to make their own choices” in an open water market. Today this approach can be seen as private companies continue to buy out public systems and buy up local water supplies. This privatization of local water supplies turns the public’s water into the company’s profit thus removing “happiness” and longevity from the equation altogether. All that matters is whether or not the investment (the public water supply) is going to be profitable each quarter. However, private companies are able to bring one thing to the table that most bureaucratic

(public) companies cannot. The initial investment. After all, it requires deep pockets to tear up ancient piping and update the systems with the infrastructure needed for the future. Often it is the latter that resonates with decision makers.

The public approach, while lacking the funds, has “the transparency and documentation” that the people have grown accustomed, and while “approximately 85 percent of Americans are presently served by thousands of publicly owned and locally operated water systems” aging infrastructure continues to be a reoccurring issue.⁵

Although the two are fundamentally different approaches to the same philosophy, they both stem from the American expectation of service. According to the United States Geological Survey (USGS), Americans use 80-100 gallons of water a day at their home alone most of which is used to flush the toilet. Unfortunately, this expectation of service is becoming a global phenomenon as developing countries aim to become more like developed countries such as the U.S. Technology has given the world access to information and has brought with it the requirement of the industrialized man to maintain access to certain amenities and possess certain rights. Nonetheless, as the world’s population continues to expand from current 7.3 billion inhabitants to 9.7 billion by 2050, as predicted by the United Nations, access to amenities and natural resources are going to be driven into a highly competitive environment.⁶ This can be observed as many of Earth’s resources are already poorly distributed globally both through inefficient market mechanisms and natural distribution with fresh water being the emphasis of this paper.

In the United States alone the population, according to the United States Census Bureau, is predicted to rise by 80 million people by 2051 bringing the total to 400 million people.⁷ So before this foreshadowed demographic change becomes a reality it is essential that we decide

whether a bureaucratic or individualistic approach to utilitarianism is in the best interest in sustaining future generations. While a bureaucratic approach certainly has its flaws, such as a lack of funding and a slow rate of change, an individualistic approach inevitably opens up the world to a water market by promoting use and consumption. Enabling these companies to turn a hefty profit.

In an attempt to enhance profit margins these private businesses and corporations choose to ignore the necessary conservation efforts that scientists say are required to maintain a homeostatic environment for the future. After all, is reproduction not an action of all organisms that secures the survival of the species? As has everything else in this world, this proposed question needs to be reevaluated into a more modern and humane approach. For is not simply enough to survive, humankind dreams of a future in which they thrive. Therefore, the question must evolve into two parts. As the population on this planet soars, is reproduction alone enough to ensure our survival or must actions be taken in the now, by present humans in order to ensure the species not only continue to live but have the opportunity to thrive as it has in the past? Moreover, if the latter proves to be of more importance is it a viable option to allow utilitarianism to be left up to individual and private group interests, or is the monitoring and distribution of life's essential resource a right of the commons that requires protection?

Both approaches to utilitarianism are currently practiced here in the U.S. According to the Environmental Protection Agency (EPA), the public sector manages approximately 155,000 water systems, and provide water to 87% of the U.S. population. These public water systems are divided into three separate categories. The first is community water systems (CWS) and are named as such because they supply water to the same population year-round. Some examples include municipalities and sub-divisions. CWS are the most common form of water systems here

in the U.S. and according to the EPA, 82% of the population receives water from just 8% of all CWS facilities. That means that, “over 286 million Americans get their tap water from a community water system.”⁸ The next category is referred to as a Non-Transient Non-Community Water System (NTNCWS) and is similar to CWS in the fact that they regularly supply water, however, these systems only provide water for around six months out of the year. These systems are often disconnected from the surrounding public’s supply, with examples that include schools, factories, and hospitals. The final category is referred to as Transient Non-Community Water Systems (TNCWS). These systems, “provide water in a place such as a gas station or campground where people do not remain for long periods of time”⁹

Although the public water sector supplies water to so many people here in the U.S., a reoccurring theme is present in almost all of them. An aging infrastructure composed of rotting and broken pipes lie beneath the soil, sidewalks, and streets. According to the American Water Works Association (AWWA), “our buried drinking water infrastructure was built 50 or more years ago” and “in some older urban areas, many water mains have been in the ground for a century or longer.”¹⁰ A lack of attention to these buried pipes has led to a high percentage of the issues surrounding our drinking water. For while the water may be clean upon exiting a water treatment facility, upon entering the pipes where it can encounter organic contaminants and is often lost to leaks or complete breaks in the piping. The water that remains is subject to the leaching of naturally occurring elements such as arsenic and radon or to the corrosion of the lead based pipes from which they travel in. In addition to organic contaminants such as Nitrates, biological buildup in the piping can introduce microorganisms into the water. Each one of these scenarios can be potentially detrimental to human health.¹¹ There are two key issues that circumnavigate the aging infrastructure. One is that the pipes are unseen and until the water

becomes contaminated people often pay little mind to where their water comes from. The second issue surrounding the aging infrastructure in the U.S. is an overall lack of funding. Across the United States, CWS rely heavily on either state and/or federal grants, or on the public's willingness to pay in order to come up with the funds needed to update their water systems. Both of which are generally met with opposition.

The federal and individual state governments tend to stay away from the infrastructure issues in not only in fear of disappointing election donors but also because they too lack the funds necessary to fix the problem. The public's opposition comes from fear of the immediate hit to their wallets. However, we rapidly approaching a point where the people may not have a choice. According to the AWWA, "the cost of repairing and expanding U.S. drinking water infrastructure will top \$1 trillion in the next 25 years, an expense that likely will be met primarily through higher water bills and local fees."¹²

Publically run water systems do more for the community than just provide safe water. They also provide stable jobs and are more invested in the communities that they support since most of the employees live locally. Since they are locals, they realize that they, their families, and their neighbors are using and consuming the very water they treat and are likely to pay closer attention to any issues that may occur. Therefore, while the infrastructure is most certainly aging, public employees keep a keen eye on the quality of water. These publically run systems pride themselves on being accountable, affordable, and equitable.

Contrary to publically managed water systems are privately owned ones. Private water systems, also known as, "for profit water companies, own only about 10 percent of water systems, most of which serve small communities."¹³ This is because the corporations eager to invest in water supplies are meeting firm opposition in larger localities. The above figure is a

result of a 7% decrease in water privatization over the last 7 years as “an ongoing nationwide trend toward public ownership of water systems” has proven to be successful.¹³ The private water systems that are still functioning provide water for around 12% of the U.S. population, of which as mentioned previously are largely small communities. These companies often show up when public water systems are in dire need of an updated water infrastructure and are lacking the funds essential to do so. These companies offer a solution that at first glimpse will not cost the public a thing, other than the obvious signing over of their water supply. After all these companies are after a profit. According to a study done by the Food and Water Watch, private water companies charge an average of 59% more than their public counterparts once they have acquired the water supply. Therefore, even though the people avoided the initial blow to their pocket by agreeing to higher taxes, these companies make up for it on the backend with increased utility rates, and on top of that now own the local water supply. In addition, these companies behind their enchanting disguise really have no real interest in the community, as most of them are run by multinational companies. This lack of stake in their consumers leads to an inevitable decrease in jobs; a lower overall quality of water distributed, and often results in local urban sprawl because again all these companies care about is profit. According to the U.S. Center for Disease Control and Prevention, private water systems are prone to outbreaks of microscopic parasites such as *Cryptosporidium* and *Giardia* as well as bacteria such as *E. Coli*.¹⁴ Not to mention the non-organic contaminants such as Arsenic and gasoline. This overall lack of care has caused the EPA to attempt “to make a difference by encouraging and providing incentives to water managers to achieve compliance” essentially bribing these companies to adhere to their policies and keep the water supply safe for the people in the community.¹⁵

However, not all private water companies are regulated by the EPA. Private companies that choose to buy up ground water supplies and bottle it are subject to the Food and Drug Administration (FDA), because once owned by a private entity the water it is no longer property of the commons and is instead considered a non-public source. This water is then mined from the ground from which it has been stored for hundreds of years and distributed around the globe. Nationwide we are talking about billions of gallons annually are being robbed from not only surrounding communities, but future generations. Not to mention the water is being removed from its natural place in the hydrologic cycle at rates too great to be recharged. Devastating the global system one bottle at a time. Unfortunately, these private companies can't assume all of the blame because today, "Americans purchase more water-nearly all of it in plastic bottles-than beer, juice, or coffee."¹¹ Only, further proving how the American expectation of convenient access to natural resources has created the room for a water market to exist and considering that the U.S. is *water rich*, this market often ignores national borders just as the hydrologic cycle does. In fact, as of 2010 "most experts now place the size of this commercial water market at somewhere between \$500 billion and \$600 billion per year worldwide."¹¹ The presence of such an extensive water market emphasizes the devastating effects that the human species is having on the global system. These negative effects are not caused by a unified push towards bettering the species instead; they are a direct result of an infinitesimal fraction of the population hustling to make a profit. These very few are referred to as water barons which create fuel in the form of water transfers that are bound to be the source of the upcoming centuries water wars. Just as the wars of the 19th and 20th centuries were fought over oil and gas, the new resource to be owned and distributed at any cost is without a doubt fresh water.

Evolution of the Public Trust Doctrine

Part I:

This leads us to the paramount question in regards to the privatization of water, what responsibility does the U.S. government or any government for that matter have to protect the natural rights of its citizens? The Ancient Romans, to whom were one of the models of our founding fathers, believed “that water, like air, is incapable of private ownership.” This ideology dates back to around 530 AD and was rooted in the belief that, “the resource [water] belongs to everyone and therefore can be owned by no one.”¹⁶ With these statements, the public trust doctrine was born and outlined just said responsibility. The public trust doctrine provides that the overall well-being of the people is undoubtedly a responsibility of government, and essentially one of its fundamental roles. While this concept may seem to be an ancient relic of the past, it should be understood that the total volume of fresh water on the planet has not changed all that much since its birth. Fast forward from 530 AD to 1215, when the English adopted their own version of the public trust doctrine, when they signed the Magna Carta, which limited the overall power of the kings. While to most the Magna Carta is known as the document that finally provided protection to the citizens from illegal imprisonment and the protection from overbearing taxes or fines from the crown, in 1647 additions to the document also held the government accountable to, “administer, protect, manage and conserve fish and wildlife.”¹⁷ Ultimately giving the king control over private interests in regards to navigable water.

In 1776, our founding fathers leaned heavily on a concept that long predated the American Revolution as they established a country founded by the people, for the people.

Something that had yet to be done around the world. However, when drafting the nation's constitution in 1787 they left out the concept of "unalienable rights" they had written about in the Declaration of Independence. Instead, they decided to only mention the people's right to life, liberty and to pursue happiness leaving far too much room for interpretation by future generations.

While Congress has chosen to remain absent in the establishment of true public trust doctrine they have created several enactments that protect the people. Such enactments include the Wild and Scenic Rivers Act of 1968 (WSRA), Clean Air Act of 1970 (CAA), the Clean Water Act of 1972 (CWA), and the Safe Drinking Water Act of 1974 (SDWA). However, these actions were only taken after a century of Supreme Court rulings such as the one in 1842 that reaffirmed the Magna Carta's, "public trust responsibilities for fish and wildlife," and the one in 1892 which declared that, "the 'Sovereign Lands' of a state are held in trust by the state for all present and future generations." The latter led to the eventual creation of the National Park Service (NPS) in 1916 by one of the most powerful environmentalists in U.S. history, President Theodore Roosevelt.

Evolution of the Public Doctrine

Part II:

This action by Roosevelt was groundbreaking because it provided that while the U.S. government did, in fact, have control over the navigable waters, it also had the obligation to protect this country from the overdevelopment of current generations for the overall well-being of future ones. Half a century later examples can be seen in the protection of landscapes from the old growth forests of Olympic National Park in the most northwestern part of our country to the

mangrove forests of Everglades National Park in the southeast. These landscapes have been coined as “assets of the commons.” A privilege of not just the living, but of those yet to come.

Once again, though water is not stationary. In fact, it constantly resists human interference by leaching through soils, evaporating into the sky, and flooding dammed regions. It is bulky, heavy, and the world’s best solvent. This means that when humans introduce new contaminants it is nearly impossible to contain them. Examples of water’s diversified effects on local ecosystems and the use of the public trust doctrine can be seen in the case of Mono Lake in California.[†] In the end, the court ruled that “the state may authorize water diversions that impair public trust values” because the economic needs “outweigh” environmental values. In addition to the incident in Mono Lake, another example can be seen in Flint, Michigan where high levels of lead have been detected. The lead was leached from the pipes that distributed the water. Nearly everyone who drank the city tap water has been exposed to the lead. Lead removes the ability for the blood to transport oxygen to important organs, such as the heart and brain, and eventually leads to the poisoning of the entire body. Children are significantly more susceptible to such poisoning than adults because their organs are still developing and growing, therefore they require more oxygen. While the local and state government had knowledge of the water’s contamination they failed to alarm the public in fear of a panic and legal repercussions.

These examples show how the U.S. interpretation of the public trust doctrine falls short of being efficient. While the founding fathers chose not to mention “inalienable rights” in the U.S. Constitution, Alexander Hamilton made it clear when writing the Federalist papers that

[†]Mono Lake’s head waters were diverted to Los Angeles (LA) based on the law of prior-appropriation. This led to a decrease in the water levels of the lake and an increase in salinity, which ultimately led to the destruction of the ecosystem. In the court proceedings that followed the public trust doctrine was drawn upon to determine a balance of “economic needs against environmental values.”¹⁶

promoted the constitution that these rights were ones of the natural world and were almost obvious rights when they wrote that:

“The sacred rights of mankind are not to be rummaged for among old parchments or musty records. They are written, as a sunbeam in the whole volume of human nature, by the hand of Divinity itself, and can never be erased or obscured by mortal power.”¹⁸

Yet the examples of Mono Lake, California, and Flint, Michigan prove just the contrary. If these matters continue to be left up to the courts, rummaging among old and musty records is exactly what they will do in search of precedents. If the natural right to access safe water is left up to the courts, “water rights holders have no reasonable expectation that their rights will be free of such regulation and control.”¹⁶ When evaluating the modern water laws of the riparian doctrine of the east and prior-appropriation doctrine of the west it becomes abundantly clear that the right to water varies by state. While some blame can be placed on the American expectation of service. The utilitarian mindset needs to be solidified as one that promotes the overall wellbeing of the public. Especially since 87% of Americans rely on the public water supply. By holding their utilities to the standards of being affordable, accountable, and equitable, these systems lose the luxury of ignoring all of the necessary attributes associated with delivering such a vital resource. The people must also be responsible and sensible in their actions and adhere to the conservation efforts often pushed by modern environmentalists. Unfortunately, most environmental movements often must wait until a travesty has already occurred before gaining the support of the majority. While environmental remedies are certainly essential to securing a hospitable future for all, being proactive and ahead of the time is just as important. The public cannot wait for others to save them from despair. Together as a whole we must stand for what is right. Demand what is naturally ours. The founding fathers clearly stated that it is the duty of the government to create a country where its citizens are not only represented, but a country where

citizens have access to life, liberty, and the pursuit of happiness. This access begins with outlining natural rights in the form of an expansion of the public trust. Access to clean and cheap water is the right of people no different from the necessity of clean air. Jefferson and Hamilton thought them obvious, but the dollar sign and instant gratification blind today's Americans. Congress can no longer leave the definition of natural rights up to the court. As Americans, we must set an example for the rest of the world, and not allow these rights to vary by state but set an American standard. This calls for more than an individual response, but rather a systematic one where the economy addressed in a holistic manner to prevent a total market crisis or collapse.

It is not enough for the federal government to protect just the navigable waters. The population of fish and the quality of water have changed dramatically since 1842. Times change. In 1842 there were only 26 states (Michigan being the 26). California wouldn't join the union for another eight years, yet according the LA Times in 2016, the state has the eighth largest economy in the world.¹⁹ Both politicians and environmentalists alike need to get with the times and join together to find a viable solution that ensures that water remains a public good, not a commodity.

Thoughts for the Future

One option that constantly emerges as a solution circumnavigating the utilitarian approach to water service is to allow privatization and promote public-private partnerships (PPP). This solution places the capitalist agenda above all. According to United Water, a private water company, PPP's "are contractual arrangements that enable municipalities to outsource the management and operation of their water and wastewater systems."²⁰ This means that these

private companies buy the utility, fix up the infrastructure a bit, and then sit back and watch as the profits roll in. If the profits do not yield a satisfactory margin, layoffs and the cutting of corners are usually the solution. Then in an effort for these private companies to sell more of their product (the water), they often promote urban sprawl and development in order to ensure an increase in demand.

However, as the cost of updating the infrastructure continues to rise, PPP's are likely to increase in numbers based on need, and as long as small towns are left out on their own to solve their infrastructure problems these private companies will continue to have a market. However, what happens when a big city decides to go private. Atlanta, Georgia is a great example of a cities' hope of recovery being met by empty promises. The city had to sit back and watch as their water problems only got worse after entering into an agreement with a private company, United Water. United Water is a subsidiary of the French owned water company Suez, one of the biggest multinational water companies in the world. The agreement between these two was only reached after the company played politics, as all private companies do, by corrupting legislative officials and drawing out the legal process with appeals. The company no doubt was hoping to turn a hefty profit as it "gained 1.5 million customers" (the population of the city) after its purchase of Atlanta's public water systems.²¹ When these companies first appear there is often a great need for their service and the public becomes overwhelmed with their false promises as "the cities, in particular, are left out in the cold to figure out how to design these contracts and how to protect their interests."²¹ It took Atlanta a little over 4 years before the people decided they had had enough and terminated their agreement returning the water to the public. In fact, "after suffering through the United Water period, citizens were willing to pay for the promise of

improved water and service,” both of which fell substantially short under United Water’s control.²¹

Other towns and cities should look to Atlanta as a sign of what could happen when they sell control of their water supply to a private company. Unlike Atlanta, they should not wait until it is too late to take control of their own water because in the end, it will always come out of their pocket, and at least by taking the initiative they never risk the chance of losing their water as a public good. While water may appear to be free in this country, minus bottled water, the infrastructure used to transport it is certainly not, and a quick fix by a private water company is not a viable solution to an ailing water infrastructure system. What it does promise is their loss of control of life’s most precious resource and inevitably higher rates. Even if this public-private partnership appears to benefit the public because in the end why else would a private company invest its money in the utility if they were not expecting a profit. Truly innovative companies have looked at Atlanta and figured out a superficial counter-intuitive option that appears to protect their control of their water. This comes in the form of making the company open for investment, only broadening the horizon of individual profit.

In America today there are ten publically traded water utility companies most of which are in the northeast (the most water rich region of the country). These publically traded companies allow those in the public with the means to invest to capitalize on the sale of their water supply, however far too often the profits do not stay local. One of the publicly traded companies American Water Works has seen its stock price jump over 300% since 2008 moving from \$20.28 a share to \$74.55 in 2016, yet the average price paid by the locals that live around their water systems has not changed.²² In fact, the CEO of American Water Works, Susan Story, pulls in over \$1.4 million a year in stock holdings alone.²³

Not all PPP's are bad. As mentioned numerous times throughout this paper water is a part of a grander global system and according to the World Bank, "PPPs are a viable option in developing countries" because most of them lack an original infrastructure or have a population that is demanding of service. However, even though "65 countries have embarked on water PPPs during the last two decades" 24 of them have "reverted to public management, and several contracts were terminated early following conflicts between the parties." If PPPs are not suitable for the 37% of devolving countries that have tried them what makes them suitable for the American people? When considering that only, "five international water companies account for about 80 percent of the water PPP in developing countries" at what cost will the American people be willing to lose their water for foreign profits?²⁴

So if even PPP's are not a good alternative to complete privatization of the water supply that will mean that the federal and state governments, which will inevitably raise taxes. Which is bound to meet opposition because according to the Internal Revenue Service (IRS) 60% of Americans pay taxes out of fear, not as a civic duty. At some point, however, the American people will need to understand that they are paying for services that are bound to increase their overall health and well-being.

By accepting their responsibility, the American people will have to invest in solving the infrastructure problem through an increased tax rate along with possibly higher rates for water, all of which will ultimately add up to pennies on the day. However, by taking this radical approach the question of what each citizen's civic duty is will be raised. Questions such as what is their moral obligation to the welfare of their fellow Americans? This question is rooted in the foundation of humanity. It is in this foundation that human beings have been able to separate themselves from all other life on this planet.

In trying times, the people must turn to the past and observe how passion and unity can create change. By raising the public salience on such matters and standing together future generations will not have to worry about the fate of their water supply as far too many of the modern age have to. It will take collaborative and continuous pressure from everyone to raise the salience of environmental issues, in particular water, and place it on the forefront of the political agenda. These issues are not for the courts to rule on. It is up to the legislative and executive branches to come up with a solution that can transcend time. Without a doubt, obstacles will arise in the future, but why must we wait until they solidify before we take action and alter the course. The enactment of the Clean Water Act and Safe Drinking Water Act are great examples of the federal government demanding that states hold themselves to a higher standard because in the end while one may be a Californian or a Floridian we are all Americans. In response to the public's outcry, the CWA and SDWA were drafted by Congress and eventually signed by President Richard Nixon. In order to enforce the regulatory standards instated by the CAA, CWA, SDWA Nixon created the EPA. Similar actions need to be taken in order to specify what being an American really means. By expanding on the public trust doctrine and setting a higher standard for the states, future generations stand a chance at thriving just as every other generation has before them.

Just as the public holds both private and public utilities accountable for their service, the people too must come to an understanding that they also have a responsibility to the land, to their neighbors, and to the overall health of the global system. What happens here in the U.S. undoubtedly affects other countries, just as what happens in localities effect the state, and in turn what happens in the states effects the entire country. Preemptive knowledge is going to be the key to success. Therefore, an education of the masses must take place. The public must

understand that every living being has a *water footprint*, which is the “total water impact of everything we do and everything we own or consume.” Understanding this will be crucial because beyond the obvious water uses in the home most of the water used around the world is for industry and agriculture. What that means is that a large portion of our *water footprint* is in the form of *virtual water*, which is “the total amount of water that it takes over the full life cycle to produce a given product or service.”¹¹

According to the U.S. Department of Agriculture’s Economic Research Service, “agriculture is a major user of ground and surface water in the U.S., accounting for approximately 80 percent of the Nation’s consumptive water use and over 90 percent in many Western states.”²⁵ Most of the crops grown with the water claimed by Prior Appropriation is converted into feed for livestock. The livestock also require their own water. In addition, the process that transports the developed livestock from the farm to the grocery store and ultimately to the dinner plate requires water. This means that large volumes of water are being exported through feed and other agricultural products for private gain at the public expense.

All the water used from seed to plate make up *virtual water*, that in turn accounts for our overall *water footprint*. While human beings may be willing to make an exception for water conservation when it comes to their food, but what then of the industry? A company like Intel “uses approximately 8 billion gallons of water per year” because products such as the semiconductor microchips that they create “need to be washed four hundred times in the process of manufacturing” and most of that water is “in fact much cleaner than the water we humans routinely drink.”¹¹ It is going to require a collaborative acknowledgment and recognition of our *water footprint* in order for the public to begin the process towards petitioning the government for change. Without an educated public, America will fall deeper into the cornucopian realm

where technological advancement is the only solution to maintain the public's hold on their water supply for it is a public good. An educated public will put pressure on legislators to create a way to maintain the people's access to clean and cheap water. This navigation of the policy process must be a collaborative initiative in order to prevent the already invested private industry from delaying a change in order to squeeze out every last dollar.

Restoring Access to Life's Most Necessary Component

Water does not just fall as rain to quench life's thirst, but also to cleanse the soul. Upon meeting the surface this rain either drains directly into the nearest stream, lake, or river, or it leaches through the soil into underground reservoirs protected from anthropogenic effects. However, just as coal, oil, and other minerals have been mined from their ancient burial grounds so is a resource so vital that life as we know it cannot exist without it. It is a resource so crucial in sustaining life, that the National Aeronautics and Space Administration (NASA) is "searching for water in the solar system and beyond" in order to detect the presence of microorganisms and other possible living beings beyond Earth.²⁶ Water on this planet is vastly different than the water being searched for by these scientists, in fact our planet appears as a true blue marvel among the stars. The water on the surface makes up less than a percent of what is available for use. With 97% of all water being saline and a bulk of the freshwater available being frozen in the polar caps, humans rely heavily on the water found in the underground reservoirs of the Earth to keep up with the growing population's demand for more.

A debate over who will control the distribution of the available water has been going on for decades, and since water rights here in the United States vary by state, each municipality

faces its own unique dilemma. The Riparian Doctrine of the East and the Prior Appropriation Doctrine of the West are no longer sufficient legislation in regards to protecting individual water rights. As the populations continue to grow a clear victor of the debate will need to be named. The people need to decide now whether they are willing to pay on an open market for something that is so vital in sustaining life, for it cannot be a public good and an amenity. The underlying issue in the debate is no doubt the aging infrastructure that makes up a majority of American water systems. Can public managed water systems overcome the financial burden of updating their systems or are private companies needed to provide the initial capital? If the latter is the chosen course, are the people willing to lose control of their natural right to water and replace said right with a company intending to turn a profit?

In the end, people need water. 60% of the human body is composed of water. Life is water. The founding fathers made it clear that life, liberty, and the pursuit of happiness was the right of every American. A right so obvious that the words were never even penned to parchment because they were assumed to be only natural. Unfortunately, the judicial branch lives and judges by what has been done in the past, and in rare instances, after a long drawn out appeal process do they create a new one. For this reason, the legislative and executive branches need to get involved. Make it known that cheap and safe water is the right to all Americans. This can be achieved by expanding on the public trust doctrine. The protection of navigable waters is no longer enough. The protection of captivating landscapes is no longer enough. It is the inalienable rights of the American people that require protection. Setting a federal standard that holds all states up to the American standard. For far too long have the people lived in the shadows of giant corporations. While the Magna Carta may have taken the power away from the English king, the

American political system has made it possible for the people to be subject to countless financial kings. Ones that exploit and condemn the masses for the profit of a few.

A history of unfulfilled promises has forced private companies into entering public-private partnerships, where the people appear to still have control. In these partnerships, private companies invest in the infrastructure and help in management while still allowing for the public to remain in control. In some of these partnerships, the public sector has the option to void the contract if they feel the private company is not living up to expectations.[‡] Some companies even open up their water system to public trading, but this inevitably puts more money in the pockets of company executives.

Rather than allowing a capitalist market to control a public good, the nation's water supply, the federal government needs to intervene and make it clear what right, if any, the American people have in their water supply. This can be done by creating new legislation similar to the CWA and SDWA of the 1970's or by taking the interpretation of the public trust doctrine out of the court system.

This can only be achieved if the public continues to educate themselves for only then can salience on the issue continue to grow. By pushing the issue of water management onto the political agenda, elected officials will be forced to take action. In order to form an effective coalition, the citizens of the U.S. need to become consciously aware of their *water footprint* and its impacts on the hydrologic cycle. In the end, standing together can produce results, but it is ultimately up to policymakers to be proactive rather than reactive because if they wait until the public goes thirsty the people will no longer be asking but demanding a change in the status quo.

[‡] This clause is present in most public-private partnership contracts as a means for the private companies to avoid being liable for anything that may go wrong with either the infrastructure or water quality.

Notes:

1. Information on the various stages of the Hydrologic Cycle and tables that break down amount of water per stage, rate of flow per stage, and residence time per stage provided by the Center for Science Education at: <http://scied.ucar.edu/longcontent/water-cycle>
2. Water distribution around the globe provided by United States Geological Survey at: <http://water.usgs.gov/edu/pdf/earthwherewater.pdf>
3. National Parks Service has lots of great information not only on the parks they protect, but also on various water sheds including the Mississippi-Missouri River watershed. Information was found at: <https://www.nps.gov/miss/riverfacts.htm>
4. The Ground Water Foundation's goal is to connect people, communities, and businesses by educating them on how a sustainable future can be achieved. Information used was found at: <http://www.groundwater.org/get-informed/basics/groundwater.html>
5. Water Ethics: Foundational Readings for Students and Professionals. Edited by Peter G. Brown & Jeremy J. Schmidt. Published by Island Press. 2010.
6. United Nations provides a population estimate for 2050 at: <http://www.un.org/en/development/desa/news/population/2015-report.html>
7. United States Census Bureau provides an estimate for the U.S. population by 2051 at: <http://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf?>
8. Environmental Protection Agency release paper on distribution of U.S. water systems at: <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100N2VG.PDF?Dockey=P100N2VG.PDF>
9. Environmental Protection Agency describes the various U.S. water systems at: <https://www.epa.gov/dwreginfo/information-about-public-water-systems>
10. Buried No Longer: Confronting America's Water Infrastructure Challenge. American Water Works Association. Found at: <http://www.awwa.org/Portals/0/files/legreg/documents/BuriedNoLonger.pdf>
11. The Future of Water. Steve Maxwell. American Water Works Association. 2011.
12. New Report Highlights Staggering Costs Ahead For Water Infrastructure. Patrick Crow. Quoting the American Water Works Association. Article found at: <http://www.waterworld.com/articles/print/volume-28/issue-4/departments/washington-update/new-report-highlights-staggering-costs-ahead-for-water-infrastructure-by-patrick-crow-washington-correspondent.html>
13. The State of Public Water in the United States. Food & Water Watch. 2016. Found at: https://www.foodandwaterwatch.org/sites/default/files/report_state_of_public_water.pdf
14. Center for Disease Control and Prevention provides information on private water systems at: <http://www.cdc.gov/healthywater/drinking/private/>
15. National Association of Water Companies highlights the federal regulations they adhere to and why at: <http://www.nawc.org/government-affairs/federal-regulations.aspx>

16. The Public Trust Doctrine in the Water Rights Context: The Wrong Environmental Remedy. Roderick E. Walston. 1982.
17. The Public Trust Doctrine. Ed Owens. Natural Resource Protective Association. 2001. Found at: <http://www.nrpa.com/resources/public-trust-doctrine>
18. The Farmer Refuted. Alexander Hamilton. 1775. Found at: <http://press-pubs.uchicago.edu/founders/documents/v1ch3s5.html>
19. Mansunaga, Samantha. "We're No. 8: California near Top of World's Largest Economies." Los Angeles Times. Los Angeles Times, 02 July 2015. Web. 22 Dec. 2016. <<http://www.latimes.com/business/la-fi-california-world-economy-20150702-story.html>>
20. Private company explaining public-private partnerships found at: <https://unitedwater.com/uwppp.aspx>
21. Thirst Fighting the Corporate Theft of our Water. Alan Snitow, Deborah Kaufman, & Michael Fox. Published by John Wiley & Sons, Inc. 2007.
22. Stock analysis of American Water Works provided by: <http://www.marketwatch.com/investing/stock/awk/historical>
23. Salaries of the top executives for American Water Works provided by: <http://www1.salary.com/AMERICAN-WATER-WORKS-CO-INC-Executive-Salaries.html>
24. Public-Private Partnerships for Urban Utilities: *A Review of Experiences in Developing Countries*. Phillippe Marin. World Bank. 2009. Found at: <http://documents.worldbank.org/curated/en/984921468182666780/pdf/530170PUB0Tren101Official0Use0Only1.pdf>
25. Irrigation & Water Use. United States Department of Agriculture Economic Research Service. Found at: <https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use.aspx>
26. Website provides links to various findings of water in the Solar system and the vast difference between water here on Earth and other places in space: <https://www.nasa.gov/content/searching-for-water-in-the-solar-system-and-beyond>