

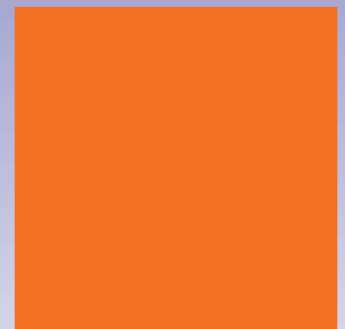
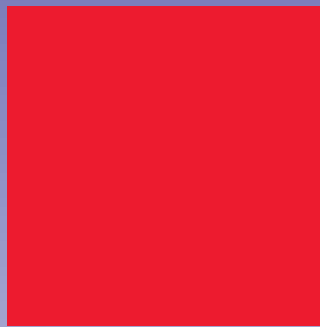


K-STATE
Research and Extension

Keep the Tap Flowing: *How Should Kansans Manage a Declining Water Resource?*

*A Deliberative Forum Issue Guide for
the Future of the Ogallala Aquifer*

Community Discussion Guide



Keep the Tap Flowing: How Should Kansans Manage a Declining Water Resource?

A Deliberative Forum Issue Guide for the Future of the Ogallala Aquifer

What is the purpose of a deliberative forum?

Citizens can openly discuss complex issues that affect the community in a deliberative forum. In this setting, participants have a structured format to discuss their opinions and concerns about a topic. Through the deliberative process, participants learn how the issue affects others and reconsider their own beliefs. A deliberative forum encourages community members work together to better understand and define the present issue, identify community priorities, and acknowledge potential actions for moving forward.

How is this issue guide used?

This issue guide does not have the answer for how to manage water resources in Kansas, nor does it attempt to provide solutions. Instead, it presents four

perspectives — called approaches — to begin the discussion about this topic. Each approach is rooted in different priorities and comes with its own set of advantages and trade-offs. While many angles for discussing this issue exist, these approaches are meant to serve as starting points that assist participants in addressing the question: How should Kansans manage a declining water resource?

To begin the discussion, this issue guide presents the following approaches to extend the life of the aquifer:

1. Independently manage existing water usage.
2. Create localized partnerships to enhance conservation
3. Governmental regulation for water usage and conservation.
4. Treat water rights as a free-market good.

Keep the Tap Flowing: How Should Kansans Manage a Declining Water Resource?

Introduction

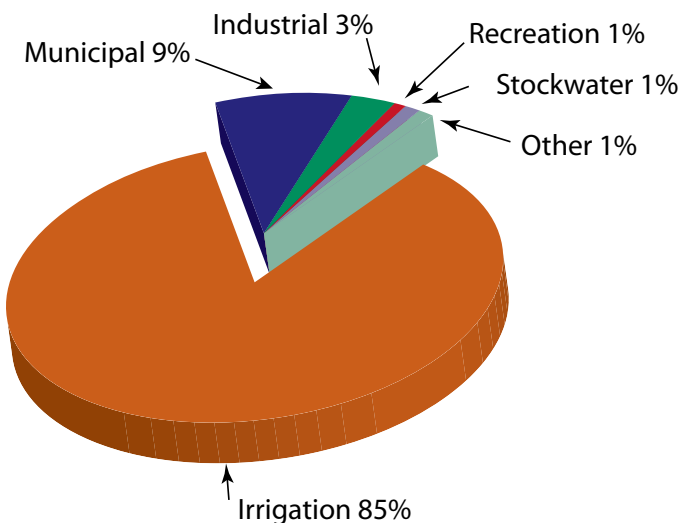
As a vital resource for sustaining life, water is an integral component of our daily lives. Water is essential to maintain health and hygiene. For instance, on average, it takes 2 gallons of water per minute to take a shower, 3 gallons to flush a toilet, and 25 gallons to wash a load of laundry.

Yet despite frequent use, it is often difficult to conceive how much water we regularly consume. According to the United States Geological Survey, the average human uses between 80 and 100 gallons of water each day — that is around 35,000 gallons of water per year.

But dependence on this resource extends beyond individual and domestic purposes. Water is crucial to the function of our industries and agriculture. With all uses combined, Kansans use 1.6 trillion to 1.9 trillion gallons of water annually, for everything from irrigation and power generation, to transportation and recreation (Figure 1). Water for these uses comes from a variety of sources within the state, such as rivers and streams; however, for those in western and central Kansas, the majority of the water supply is drawn from underground aquifers.

An aquifer is a body of permeable rock or sediment that is saturated with water. These natural underground systems are capable of holding large amounts of extractable groundwater.

Figure 1. 1990–2008 Averaged Water Use by the Use Made of Water (Kansas Department of Agriculture).



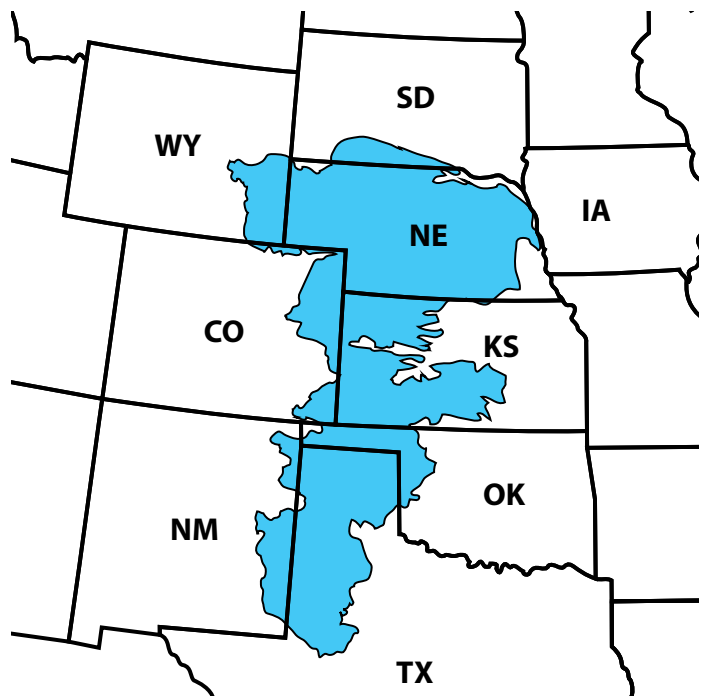
Seven aquifers underlie Kansas, the largest of which is the High Plains. In Kansas, this extensive system consists of a set of interconnected aquifers, including the Great Bend aquifer, the Equus Beds, and the most expansive of them all, the Ogallala Aquifer. Because the Ogallala is the primary and most dominant unit composing the High Plains Aquifer (about 80 percent), we use the terms High Plains and Ogallala interchangeably throughout this guide.

The High Plains Aquifer

The High Plains Aquifer is the largest freshwater aquifer in North America and one of the largest in the world, holding nearly 965 trillion gallons of water. This system covers 174,000 square miles, and spans parts of eight different states, including: South Dakota, Nebraska, Wyoming, Colorado, Kansas, Oklahoma, New Mexico, and Texas (Figure 2.). Around 30,500 square miles of the aquifer underlie Kansas, or the equivalent to 17.5 percent of the total system.

The aquifer is crucial to the sustainability and economy of the High Plains region, providing 81

Figure 2. Ogallala Aquifer (NRCS, USDA).



percent of its water supply. Annually, about 94 percent of the aquifer's total withdrawal is used for irrigation in the High Plains. Because more than a quarter of all irrigated land in the United States is within the Ogallala, this system is simultaneously providing 30 percent of the nation's total groundwater used for irrigation.

Specifically, within Kansas, the High Plains Aquifer provides 70 percent of the water that is used each day. Furthermore, as the main source for all water uses in the western third of the state, the Ogallala accounts for two-thirds of the state's agricultural economic value.

As explained by Kansas Governor Sam Brownback at his 2011 Economic Summit, "Without Ogallala water, agriculture and all of its related businesses could not be sustained, manufacturing could not continue, recreational opportunities would diminish, and the towns in the area would cease to exist."

This dependency suggests that without the resources of the Ogallala, Kansans would be in a daunting predicament.

Historical and Legal Background

Like other natural resources, water within Kansas belongs to and is protected for the people of the state. This does not mean, though, that citizens are entitled to unlimited water use, or even acquire water rights through land ownership.

In 1945, the state legislature passed the Kansas Water Appropriation Act (KWAA). This act identified that all water resources within Kansas would be regulated by the state, with the intent of ensuring beneficial use for all inhabitants. Accordingly, a permit was required to have water rights. The prior appropriation doctrine guided the act, following the concept of "first in time, first in right," meaning that those who put water to beneficial use first, held priority. Rights approved before June 28, 1945 — the date of the policy's enactment — were grandfathered in as "vested" water rights, giving them equal senior priority. During this time, the state approved nearly all of the wells that had been drilled.

In the 1950s and 1960s, advancements in technology expanded the capabilities for large-scale pumping from the aquifer, primarily for irrigation. This newfound efficiency, along with the belief that the aquifer had an infinite supply of water, provoked the extensive extraction of water resources. During

the 1960s and 1970s, the authorization and construction of too many wells resulted in the over-development of the aquifer.¹ Over-allocation, combined with technological efficiency, allowed water users to mine the resource according to the rights they were given. This mining resulted in drastic declines in the aquifer's water levels.

During this time, researchers also revealed that the aquifer was slow to recharge, making it a finite resource that once depleted, could take 6,000 years to replenish.

In 1978, the KWAA was amended, requiring that a permit must be obtained from the chief engineer of the Division of Water Resources before drilling a water well and necessitating water rights for all nondomestic uses in the state. With this modification, the state more closely evaluated the development of new water rights.

Water Rights in Kansas

Under the framework of the KWAA, water rights are attained when individuals or entities gain entitlement to put water to beneficial use, such as irrigation, recreation, and water power. In addition, the chief engineer must determine that new water appropriation would not impair existing water rights or unreasonably affect the public interest.

The amount of water available for use by rights holders, where it can be used, where it is diverted from, its priority date, and how fast it can be pumped are all established as part of the permit, with use based on the prior appropriation doctrine. The seniority of a water right is perpetual, even if it is transferred through generations or sold.

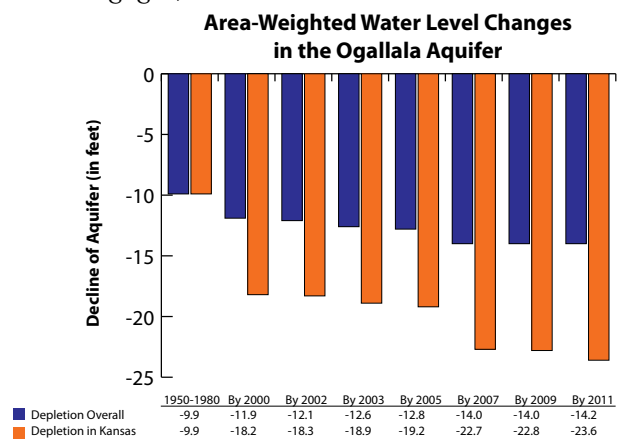
All uses, with the exception of water directed solely toward domestic purposes, require a permit. As long as a stakeholder meets the associated criteria — including the submission of annual water use reports — their water rights are considered a "real property right." A water right provides the right to use water, without impairing a more senior right, when water is available. It is not ownership of the water, which belongs to the citizens of Kansas.

Aquifer Depletion in Kansas

Between 1950 and 2011, the Kansas portion of the Ogallala Aquifer lost more than 80 trillion gallons of its supply - the equivalent of 8 percent of

¹ *Sophocleous, 2012*

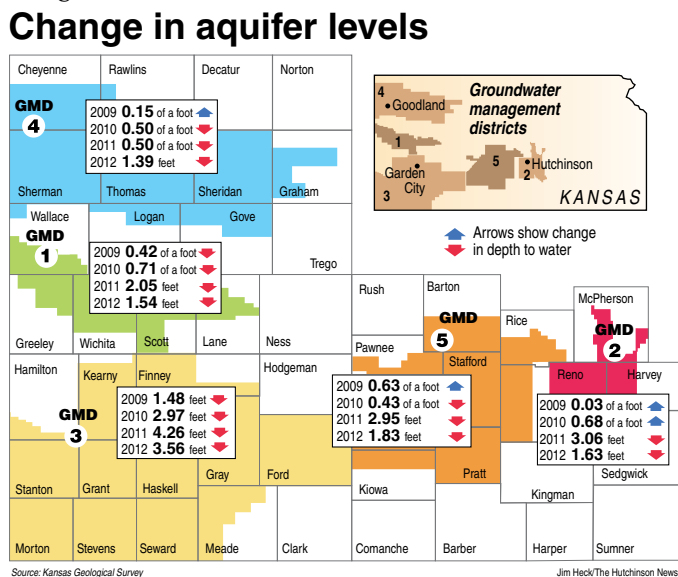
Figure 3. *Aquifer depletion in Kansas and Ogallala Aquifer (ne.water.usgs.gov).*



the entire aquifer. The decline of water levels in the Ogallala Aquifer is steadily — and in some places, rapidly — exceeding the annual recharge (Figure 3). As a system that requires precipitation for replenishment, the Ogallala recharges less than 1 inch during an average year in western Kansas.

Recently, depletion has been exacerbated by the extreme drought that has plagued Kansas. In 2011, the dry conditions increased pumping from the aquifer, causing levels to drop by more than 2 feet in four of the five groundwater management districts², with the greatest drop (4.26 feet) occurring in Groundwater Management District #3 (Figure 4).

Figure 4. *Change in aquifer levels for each groundwater management district, 2009–2012*



² Five local districts in western and south-central Kansas that manage groundwater resources

In 2012, as the drought persisted, water levels throughout the groundwater management districts dropped an additional 1.39 to 3.56 feet.

According to the Kansas Geological Survey, water level declines during this 2-year time frame were the largest recorded since the measurement process began.

Dry conditions in Kansas continued in 2013, most dominantly in the central and western parts of the state, which experienced extreme and exceptional drought (Figure 5).

Looking Forward

As a resource that has been around for as long as we can remember, it is difficult to imagine living without the Ogallala. Based on past water level declines and certain pumping assumptions, the Kansas Geological Survey projected an “estimated usable life” map depicting the number of years the aquifer could support a level of withdrawals. For a well on every quarter section, pumping 400 gallons per minute for 90 days, projections indicate large portions of the Ogallala Aquifer had anywhere from fewer than 25 years to more than 100 years, depending on the geographical features of the aquifer. In some places, such as parts of Greeley, Wichita, and Scott counties, the aquifer already cannot support that level of pumping (Figure 6). As a result, conserving and extending the High Plains Aquifer is outlined as one of the state’s goals in the *2014 Kansas Water Plan*.

Given the potential for changes in precipitation patterns, the increased pumping during drought conditions and our dependency on the Ogallala water for all uses in western and south central Kansas, it is time to discuss how we can keep the tap flowing.

A Deliberative Discussion

A deliberative forum discussion, unlike a debate or public hearing, offers an organized format for conversations on complex issues (in this case, water in the Ogallala). In a community forum, participants gather to discuss their opinions and concerns about the topic. Through this facilitated conversation, participants reconsider their own beliefs, and learn how the issue affects others. During this discussion, community members work together to better understand and define the present issue, identify community priorities, and acknowledge potential actions for moving forward.

Approach #1

Independently Manage Water Usage

Approach Summary

Allow Kansans to continue water usage according to their water rights, leaving conservation efforts to the individual. This prevents short-term economic consequences in the region, while providing individuals with the freedom to identify personal conservation goals.

When it comes to water needs, one size definitely does not fit all (Figure 7). Individuals, industries, agriculture, and other entities all require different amounts of water for unique purposes, from providing for our schools and growing crops, to constructing and transporting the products we use.

This approach to water use allows various use allocations and argues that use and conservation of the aquifer should be determined by individual values, capabilities, and choices. For some, this may mean cutting back on overall water use or redirecting the resource toward more efficient use, while for others, it may mean maintaining current practices (Figure 8). Through this perspective, water rights holders and users have the freedom — within their legal boundaries — to use their resource how they choose.

Water Rights in Kansas

Like other natural resources, water within Kansas belongs to and is protected for the people of the state. In Kansas water rights are attained when individuals or other entities are granted a permit

to a water right for a beneficial use, such as irrigation, recreation and water power. In granting a permit,

Figure 7. Water use by type of use, per Kansas county (Kansas Department of Agriculture).

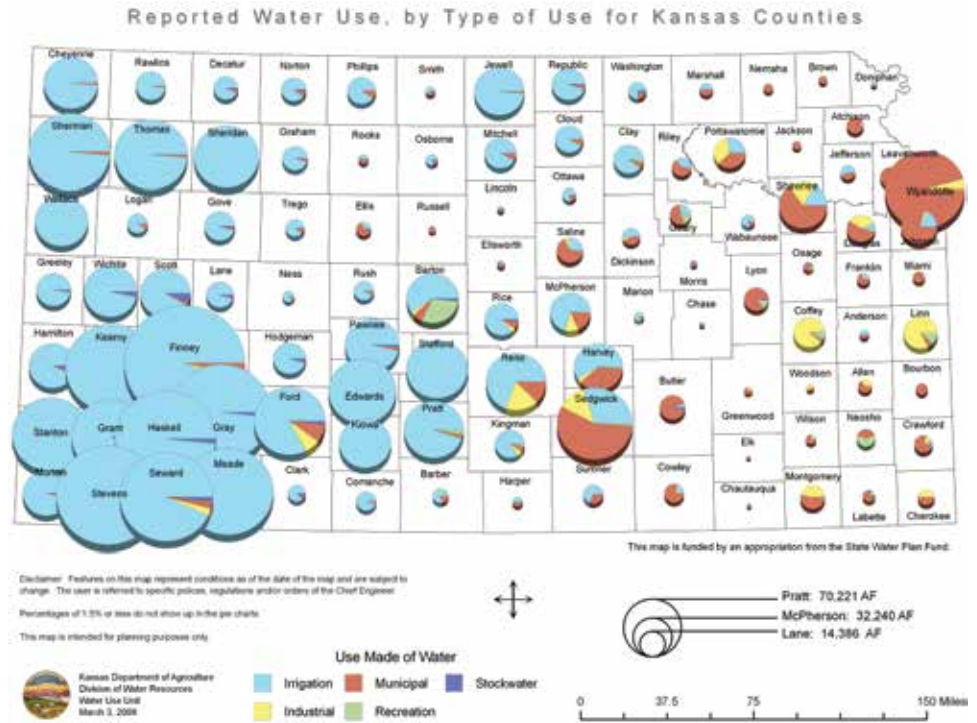
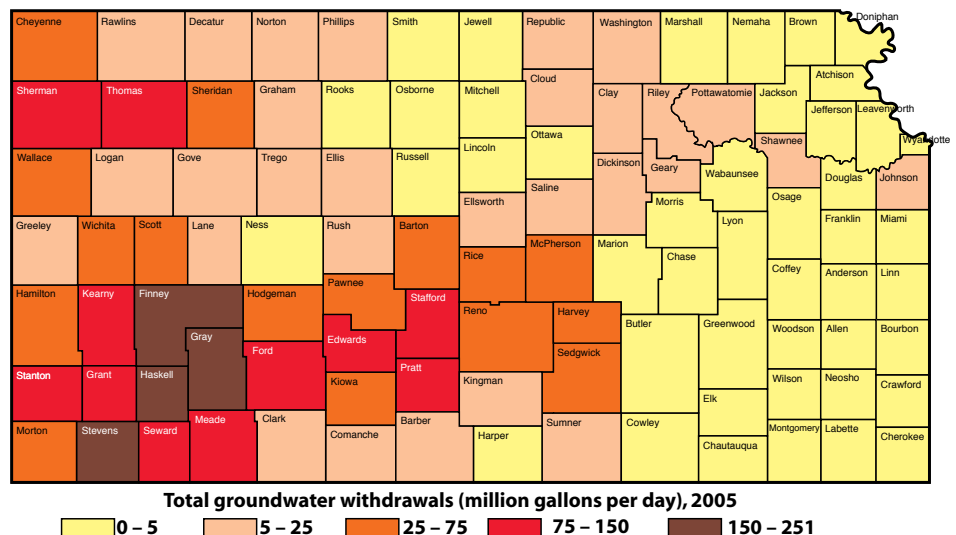


Figure 8. Groundwater withdrawals by county (U.S. Geological Survey).



the chief engineer must determine that a new water appropriation would not impair existing water rights or unreasonably affect the public interest.

The amount of water available for use by rights holders, where it can be used, where it is diverted from, its priority date, and how fast it can be pumped are all established as part of the permit. Use is also based on the prior appropriation doctrine, which means that if there is a shortage of water, the earlier permit holders have priority. Furthermore, the seniority of a water right is perpetual, even if it is transferred through generations or sold.

All uses, with the exception of water directed solely toward domestic purposes, require a permit. As long as a stakeholder meets the associated criteria — including the submission of annual water use reports — their water rights are considered a “real property right” and are permanent, allowing the right to use water, when it is available and not impairing a more senior right.

Individuals supporting the continuation of this approach assert that those who have legally obtained water rights, and in some cases have held these rights for generations, should be able to continue using their resource without interference. Advocates support the notion that once the right is secured, the allocation of water should be that person’s to use.

Economic Impact

Through its extensive contributions to agriculture (the largest industry in Kansas), the Ogallala Aquifer is a vital component to the Kansas economy. As explained by the Kansas Department of Agriculture, the counties that lie above the Ogallala account for about two-thirds of the state’s agricultural economic value. For instance, studies suggest that one inch of irrigation water for corn yield, produces more than \$100 million for the Kansas economy.³

According to Bill Golden, an agricultural economist at Kansas State University,⁴ history shows implementing restrictions on water use for the benefit of conservation impacts the economy in the short-term. Specifically, decreasing the amount of water available would likely cause an initial decline in production and supply, consequently decreasing

overall profits for the state and producers until stability is regained.

Advocates of this approach reason that individual maintenance could prevent personal or statewide economic setbacks that could otherwise result from policy changes to the existing water system. Independently managing water usage enables rights holders to maintain the economic status quo by using water when it is necessary, and conserving (if they choose) as the opportunity arises.

Fairness, Freedom, and Flexibility

Because water rights holders have different water needs for different uses, enforcing conservation has the potential to be tougher on certain groups than others. Independent management of water resources is fair, because it asks all Kansans to do what they can to help, without requiring participation in conservation efforts.

This inclusive approach suggests that all Kansans can play a role in extending the life of the aquifer,

The Approach in Action

Independent management can take many forms. Those who choose to maintain usage can continue using their resource, while those who want to conserve could consider the following options.

For Individuals. The ways to cut back on domestic water use are plentiful, from fixing leaky appliances to turning off water when it is not being used. At home, consider installing water-efficient faucets, toilets, and shower-heads, decreasing the amount used to water lawns, and only running the dishwasher and washing machines for full loads. Being conscious of our water use can go a long way.

For Industries. Conservation capabilities may differ by industry; however, most can consider locating and repairing leaks, installing water efficient equipment, minimizing water used for cleaning purposes, reusing treated wastewater when possible, and educating employees about conservation.

For Agriculture. Those in the agriculture industry could consider using more efficient irrigation equipment, deficit irrigating, irrigating fewer acres, and/or planting crops that require less water.

³ *Kansas State Research and Extension, 2012 Report to the Legislature*

⁴ http://www.kwo.org/Ogallala/Rpt_BackgroundInformation.pdf

whether they hold water rights or not (*Approach in Action*).

As evident by the lingering Kansas drought, precipitation is not a guarantee. This means that at times, conservation efforts may need to be postponed in order to sustain production. Those in favor of this approach appreciate the flexibility associated with independent management because it allows

individuals, industries, and other entities to implement usage and conservation goals that best suit individual capabilities.

In summary, this approach prioritizes the freedom of individual management and suggests that water rights holders and users should be able to determine how much of their water allocation is used and where it is directed.

A Closer Look

Why should we move in this direction?

- Water rights holders are allowed to maintain and use what is legally theirs.
- The economy will not suffer from temporary setbacks that could otherwise result from policy changes to the existing water system.
- This approach is fair because it does not target particular groups to change habits, but rather, asks all Kansans to do what they can to help.
- Individuals, industries, agriculture and other entities have the flexibility to identify and implement usage and conservation goals that best suit individual capabilities.

What concerns does this approach present?

- Without collaborative changes in our use, the aquifer will likely continue to be depleted, limiting the resource for future generations.
- Conservation efforts may become contingent on the current weather or market conditions, with the level of precipitation or the price of crops dictating how and when water is saved. This could cause people trying to conserve water to abandon efforts to save in exchange for the short-term benefit of water use.
- Individual decisions to conserve have limited benefits for a common pool resource, such as the Ogallala Aquifer that is heavily overdeveloped.
- As the aquifer becomes more depleted impacting senior water rights, impairment claims and litigation will increase, with many junior wells likely getting turned off. This could be a harsh economic impact.
- If conservation is not enforced, extending the life of the aquifer would depend on the ability and willingness of people to act selflessly and hold themselves accountable. The temptation will be great for some water users to take a “free ride” on the self-restraint of others and use more than their fair share.

Approach #2

Create Localized Partnerships to Enhance Conservation

Approach Summary

Promote the development of local conservation plans, enabling communities and regions to cooperatively design their own water management efforts. This cooperative approach enables stakeholders to set and achieve conservation goals, while allowing for input from all who are affected.

Individual conservation has the capability to reduce water use; however, this approach suggests that extending the life of a resource as expansive as the Ogallala is going to require a group effort. Working collectively promotes accountability and enables stakeholders to create conservation goals that can exceed individual capabilities. Localized partnerships facilitate such collaboration and allow water rights holders to cooperatively establish management plans that are beneficial to themselves and their communities. For some, this may mean partnering to reduce water use within localized areas. However, water use policy coalitions may involve stakeholders throughout entire counties or regions.

Kansans attracted to this approach believe water rights holders should design their own water management plans, putting control into the hands of those directly involved. These advocates also support the idea that conservation of the Ogallala should be shared among many individuals, rather than leaving the responsibility to a few.

Local Planning and Participation

Approaching conservation from the local level gives stakeholders the authority to develop plans that are specific to the vision, needs and capabilities of the local

region. Through collaborative conversations, community members can have an influential voice in the process, and as a result, the capability to dictate their own guidelines. This collaborative effort suggests water users who are willing to conserve will not be forced into blanket regulations that are unmanageable or too restrictive for individual needs, but rather, those that are tailored to collective capabilities.

Unlike approaches that target groups or particular individuals to conserve, localized partnerships enable stakeholders to “share the shortage.” Dispersing agreed usage among a widespread party of willing participants rather than a few can reduce economic disparities arising from differing individual efforts.

In addition, localized planning sessions have the potential to not only develop community plans, but to also generate new or improved action steps. Collectively discussing the issue in a community setting allows unique goals or solution steps to surface that without discussion may otherwise go unheard.

Advocates of this approach believe that collaborative discussion and collective efforts can make conservation of the aquifer an attainable goal.

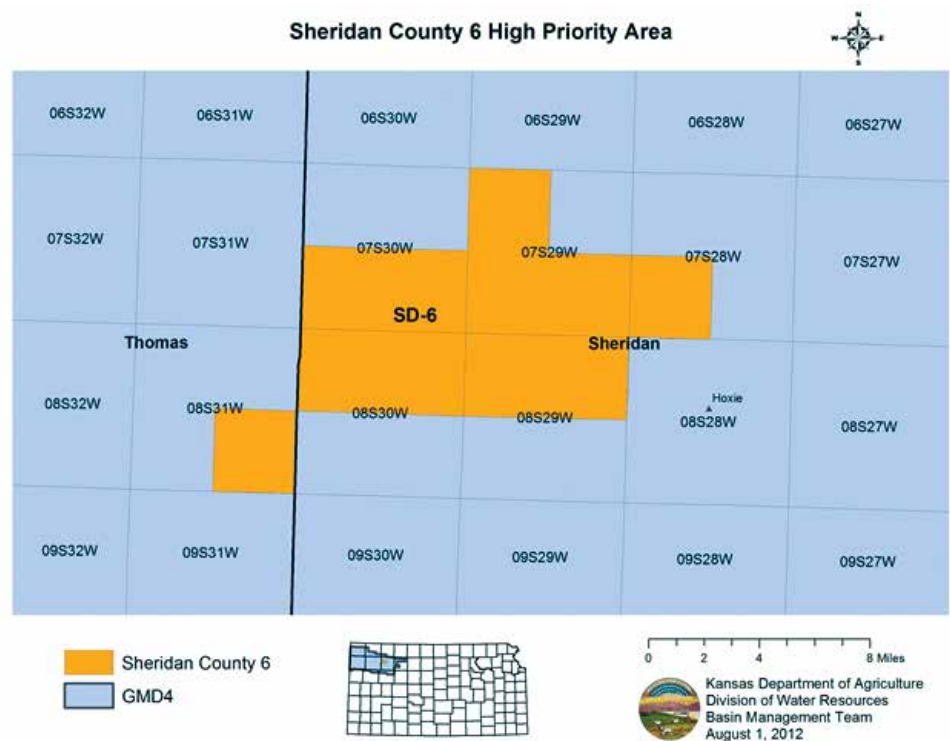


Potential for State Enforcement

Within localized partnerships, community members can work together to regulate one another's conservation efforts and develop systems that hold one another accountable for doing so. In some cases, however, localized partnerships could seek the assistance of the state to ensure legalized enforcement of the management plan.

For instance, in April of 2012, Kansas Governor Sam Brownback signed SB 310, which provided the legal backing for statewide Local Enhanced Management Areas (LEMA). This example of a localized partnership enables community members to work within their groundwater management district to design water management

Figure 9. Sheridan 6 Local Enhanced Management Area.



The Approach in Action

Water rights holders in western Kansas are putting the impact of localized partnerships to the test.

Through one example of a collaborative effort, the state's first Local Enhanced Management Area (LEMA), community members in the Sheridan 6 High Priority Area have agreed to reduce water usage by about 20 percent over the next 5 years — saving almost 10 billion gallons of water.

This plan was initiated and developed by stakeholders in the high-priority area — which includes parts of Sheridan and Thomas counties — as a response to declining groundwater levels in the aquifer. Through this cooperative partnership, participants worked with their groundwater management district to develop a management plan acceptable for each stakeholder's needs. Doing so left control in the hands of the group, rather than external sources.

In April of 2012, LEMAs gained legal backing when Kansas' Governor Brownback signed bill

SB 310. This bill supports LEMA efforts by making mutually agreed-upon goals mandatory on implementation. This means local communities can propose conservation plans within a groundwater management district, and if approved and ordered by the chief engineer, have enforceable measures to ensure accountability.

Furthermore, once a LEMA proposal is created, the chief engineer only has three options: approval, rejection, or return with suggestions. Suggested changes, however, are only recommendations and cannot be enforced. As a result, participants in the LEMA may not get exactly what they want, but they will not be forced into restrictions that they do not want.

The conservation efforts of the Sheridan 6 LEMA began on January 1, 2013 and will run until December 31, 2017. At this time, participants will have the option to renew, modify, or end the LEMA agreement.

plans. However, once these plans (LEMAs) are approved and ordered by the chief engineer, they have enforceable measures. Those in favor of this approach appreciate the flexibility, yet power of conservation enforcement. By allowing either community members or the state to ensure adherence to the management efforts, those who agree to conserve will

be required to do so, and as a result, will be of benefit to the aquifer.

In summary, this approach views local control as the foundation for collaborative conservation, and suggests that the creation of new water management regulations should be left in the hands of those directly involved.

A Closer Look

Why should we move in this direction?

- Local partnerships enable stakeholders to have an influential voice in the process by determining what works for them, rather than being forced into changes developed externally.
- Collaborative goals do not place the burden on one group or entity to make a change, but rather, allow individuals to “share the shortage” by dispersing efforts among a party of willing and able participants. Accordingly, cooperative partnerships allow a variety of water rights holders — within a groundwater management district — to be involved.
- Group efforts require and enhance discussion about the aquifer, providing the setting for new conservation solutions or goals to surface.
- Once a plan is agreed upon and implemented, participants are held accountable for upholding the agreement for the life of that plan, thereby ensuring conservation of the aquifer.

What concerns does this approach present?

- Pressure to join the partnership or agree to conservation restrictions could cause local disputes or force entities to make sacrifices that stretch their resources too thinly.
- Having a widespread impact on the aquifer may require the creation of multiple partnerships across an extensive space, leaving sustainability to the willingness of large groups to work together.
- Agreeing on a management strategy is often time consuming, requiring a prolonged series of meetings and discussions to develop a plan.
- Extending the life of the aquifer depends on decreasing water use over time. Can local policies have lasting impacts, or will they be rooted in temporary efforts?

Approach #3

Allow the State Government to Regulate Water Usage and Conservation

Approach Summary:

Allow the Kansas state government to regulate conservation when conditions warrant it, or when citizens request it. This approach can establish responsible regulations that are fair to those involved, while preserving the water supply for the common good of present and future Kansans.

The majority of water consumed by Kansans may be coming from the same aquifer, but that does not make finding common ground on water policy any easier. This approach suggests that because varying opinions and values can make collaborative decision-making challenging, usage and conservation regulations should be established by a third party.

Allowing the state government to manage conservation can accommodate this concern by developing regulations that are fair and in the best interest of all Kansans. This approach provides the potential for citizens to have input in the process, yet leaves decision-making and implementation to impartial government officials who have the resources and networks to construct responsible strategies.

Advocates of this approach believe that management of a vital state resource should be left to the state so that all levels of concern, including all citizens, are considered. These Kansans argue that to ensure extension of the aquifer, enforceable and sensible management is necessary. They prioritize fair restrictions, and suggest that government regulation is the route to achieving this goal.

Protecting a Public Resource

In Kansas, water is classified as a public resource that is protected for the use and benefit of the

people of the state. One responsibility of the Division of Water Resources, through the Kansas Department of Agriculture, is to govern how water in the state is allocated and used. As previously noted, this is done through the issuance of permits, and subsequent reviews and inspections to guarantee water is being put toward beneficial purposes.

Advocates of this approach reason that with such practices already in place, the Kansas state government not only has the duty to protect the public interest, but the resources and expertise necessary to do so. By approaching management from the state level, uniform (and hydrologically appropriate) reductions can be established, creating an even playing field for all involved. For instance, state regulations could reduce acceptable water withdrawals for all water users in an area, or close specific locations to further appropriation.

In addition, government involvement can act as a facilitator for bridging water management

Figure 10. Current IGUCA orders

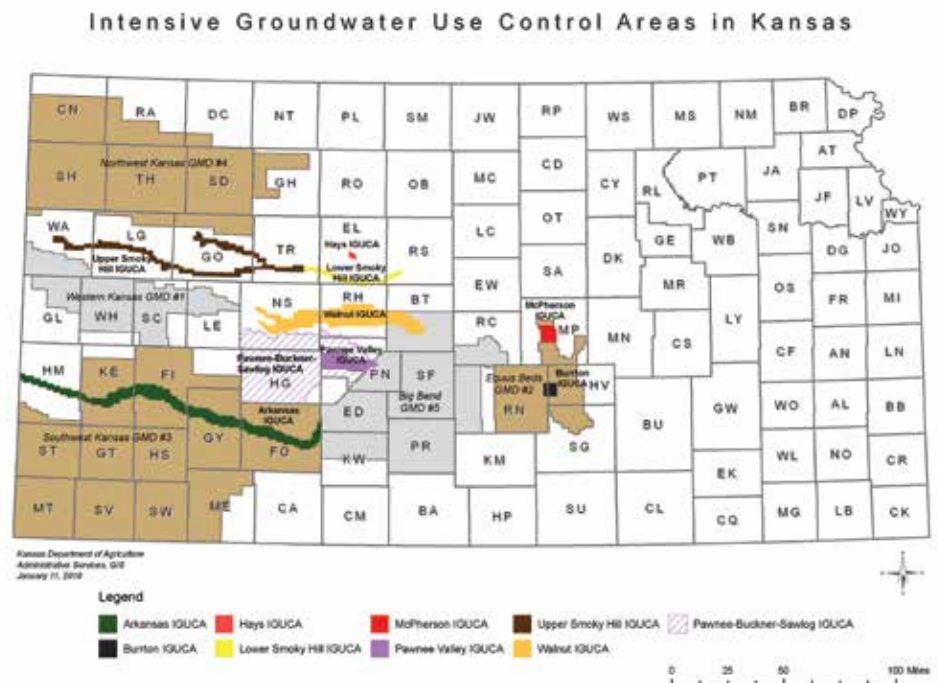


Figure 11. Water flowmeter.



efforts between agriculture, municipalities, and other entities. Accordingly, state regulations would enable collaborative management efforts rather than depending on, or targeting, particular entities to change. Further, blanket regulations eliminate the potential for community conflict that may otherwise stem from local policy disagreements.

Unlike other approaches, regulations established by the state government would guarantee the enforcement of corrective measures, ensuring adherence to the policies and consequently, benefits to the aquifer. Such regulations would necessitate the mobilization of citizens in the present, rather than postponing conservation. Those attracted to this approach appreciate the equity associated with government regulation and the certainty of enforceable measures.

Local Input

Although this approach suggests the state should have the “final say” when it comes to implementing regulatory policies, that does not mean the state would have the “only say.” Citizens could not only request regulatory measures, but in most instances,

The Approach in Action

To help extend the life of the aquifer, one form of state regulation has already been implemented in eight areas of western and central Kansas — the designation of Intensive Groundwater Use Control Areas (IGUCA).

This water management tool, also known as an IGUCA, was enacted by the Kansas legislature in 1978. Using a public hearing process, the state’s chief engineer can order the designation of an IGUCA in particular areas. Designation is paired with specific corrective measures, such as closing the designated area to further appropriation and reducing current withdrawals. If deemed within the public interest, the chief engineer can later amend the corrective controls associated with an IGUCA.

According to the statute, any one of five conditions can warrant the creation of an IGUCA: 1) there are significant groundwater declines; 2) groundwater withdrawal is equal to or exceeding the annual recharge; 3) there is a preventable waste of water occurring; 4) the quality of water is

deteriorating; or 5) any other conditions within the public interest.

For example, to address over-appropriation and excessive groundwater level declines, the state’s first IGUCA (McPherson) was ordered in 1980. The area was closed to additional groundwater appropriation and flow meters were required, among other corrective provisions. Since then, the IGUCA has been successful at reducing the rate of groundwater declines. Specifically, before its creation, groundwater levels were declining at an average rate of 10.84 inches per year; however, after enactment, decline rates decreased to an average of 2.8 inches per year, according to the Kansas Division of Water Resources.

As noted by the Kansas Department of Agriculture, each of the eight current IGUCA orders will be reviewed in a process that includes a public hearing before June 30, 2015. These reviews will determine whether the IGUCA order should continue and if any adjustments to corrective measures are necessary.

also could influence regulations developed at the state level. From making suggestions for corrective measures and identifying new and improved solutions, to pinpointing particular areas of concern, local involvement could be an integral component to state regulation. Furthermore, by participating in

the planning process, local citizens could ensure their concerns are heard.

In summary, this approach indicates that state government, rather than individuals should manage water in the Ogallala, because uniform regulations have the potential to be the fairest and in the best interest of all Kansans.

A Closer Look

Why should we move in this direction?

- The state government can establish hydrologically appropriate reductions that are fair to all involved and in the best interest of present and future Kansans.
- As historically proven, regulating water management efforts can ensure conservation of the aquifer, potentially extending the life of the resource.
- State regulation provides the enforcement needed to mobilize citizens in the present, rather than leaving aquifer management to future generations.
- Government officials have the expertise, resources, and duty to protect the public interest that many citizens lack when it comes to making water conservation decisions.

What concerns does this approach present?

- Although citizens may request regulations and have input in the process, the chief engineer may develop more restrictive water-use measures than locals feel they can handle. Undesirable reductions may result in citizen resistance to regulations.
- Government involvement could alter the allocated water usage by rights holders, reducing a resource that was legally identified as theirs.
- Leaving regulation to the government has the potential for water to become a polarizing political issue. A resource that is required for sustaining life should not be susceptible to party politics.
- Restrictions on water use could produce a domino effect, impacting the economic stability of the state in the short term.

Approach #4

Treat Water Rights as a Free-Market Good

Approach Summary

Use a free-market system that permits water entitlements to be bought and sold, and requires a portion of the amount exchanged is conserved. This approach lets the market dictate the price, enables water rights holders to voluntarily transfer entitlements, and allows water to be used where it is needed most while simultaneously cutting back on overall use.

The basic economic concept of supply and demand suggests that as supplies decrease, price often increases. Similar to other natural resources, water is no exception to this principle. As water supplies in the Ogallala decrease, the price for this commodity will likely rise. Therefore, this approach suggests that water from the Ogallala should be managed through a free-market system.

Treating water as a free-market good would account for changing supplies and allow the market to dictate the price. This approach argues that placing a greater monetary value on water can decrease or eliminate wasteful use and enhance economic efficiency. Moreover, the ability to buy and sell water entitlements enables the resource to be used where it is needed most.

Kansans attracted to this perspective believe that management of water resources should be rooted in economics, rather than self, local, or statewide regulations. These advocates support the idea that a free-market focus not only gives all water users an equal opportunity to obtain the resource, but also carries the potential for a conservation component.

Economic Procedures and Incentives

This economic approach is primarily rooted in voluntary action. Through this perspective, water-rights holders are afforded the flexibility to sell (or buy) their water rights at a time that is economically plausible and profitable for them, without being forced into negotiations. Making participation an opportunity, rather than a requirement, places power within the hands of the consumer and suggests that anyone can participate in the free-market system.

Further, by identifying water as a free-market good, advocates of this approach argue that water rights holders would be given the monetary incentive to “sell” water to areas where it is needed most. This form of an exchange could have an array of benefits, from the capability to relieve water stressed areas to the economic rewards for those willing to sell. Those attracted to this approach believe that as (and if) the value of water increases in the market, water users would be more likely to eliminate wasteful use in efforts to reduce personal costs.

Individuals that favor economic-based water management strategies appreciate the flexibility of participation and the associated economic and environmental benefits that could result from a free-market system. Through a clear exchange of goods and compensation, this approach could have the support of a “contractual obligation,” ensuring adherence to the agreements.

Conservation Component

Using a free-market approach as a management strategy has the capability to transfer water and funds to where they are needed, however, this perspective also has the potential to conserve water in the aquifer. Through the process of buying and selling, water rights holders can require that a portion of the amount transferred be conserved. For instance, this notion is already practiced in the state’s groundwater water bank system. In this example of a market-system (see more about water banks in the Approach in Action), all exchanges are paired with a minimum of a 10 percent savings in consumptive use. Other free-market systems could implement similar requirements, thereby reducing the amount of water extracted from the aquifer.

In addition, a free-market system is not limited to individual actions. Water rights holders within communities have the capability to collectively develop a market and in doing so, could account for conservation. For example, through the concept of an “all-in-auction,” which is an economically

competitive approach to reallocating reduced water supplies within a particular area; stakeholders may establish a percentage of water for conservation, before reallocating those supplies.

In summary, this approach argues that water management should be left to economics, rather than other regulatory measures because it gives all individuals an equal opportunity to use the resource and has the potential to eliminate wasteful use of a state resource.

A Closer Look

Why should we move in this direction?

- Leasing water entitlements is completely voluntary, allowing individuals and other entities to participate when (and if) they choose.
- Transferring water rights allows the resource to be used where it is needed most. This could eliminate wasteful use and promote economic efficiency.
- With this approach, all parties would profit from an exchange; the buyer gets access to the resource, the seller earns revenue, and the citizens of Kansas benefit from conservation of a state commodity.
- Official trades could have the power of a contractual obligation, ensuring adherence to the terms of use and associated conservation efforts.

What concerns does this approach present?

- This approach is dependent on volunteers. Without willing participants, the economic and conservation components would be moot.
- Understanding, implementing, and monitoring an exchange of water entitlements can be complex, requiring extensive education about the process.
- Allowing the market to dictate the price will inevitably disadvantage those with less economic power.
- Having to establish a well and pump for a leased agreement can be cost prohibitive.

The Approach in Action

For residents within the boundaries of Groundwater Management District #5, the market-based approach to water rights is nothing new.

Since 2005, the Central Kansas Water Bank Association (CKWBA) has facilitated *deposits* and *leases* for water rights. This market-based management approach, known as a water bank, allows water rights holders to temporarily sell their water to others within the boundaries of the bank. Although the CKWBA is located within the borders of a groundwater management district, the association is a not-for-profit organization that is separate from Groundwater Management District #5.

As explained by the Kansas Water Office's 2012 Governor's Report, water banks further serve "as a means to move water to areas of growing need where new water rights are not available and to deposit water for one's own future use." As a result, water banks allow water to be used where it is needed most, ultimately benefiting stressed areas.

Using an electronic bulletin board, users can post water available for lease, along with a price they set for that water. Similarly, those looking to lease water can post the rate they are willing to pay. Completed transactions, along with the price paid, are also posted on the board. Exchanges, however, must occur within the boundaries of Groundwater Management District #5 and within the same hydrological unit.

To enhance water conservation, each leasing exchange is coupled with a conservation minimum, ensuring at least a 10 percent savings in consumptive use.

In addition to exchanges, the CKWBA offers safe deposit accounts that allow water users to carry-over a portion of unused water from one year to the next. This means water users can "deposit" unused water for future use, or to be leased to other users.

From 2005 until 2012, the CKWBA was the only permitted groundwater water bank in the state. In July of 2012, the Kansas House passed bill 2516, permitting the more than one groundwater water bank in the state. This legislation allows for the creation of multiple free-market systems throughout Kansas.

Keeping the Tap Flowing — A Summary of the Approaches

Independently Manage Water Usage

Approach 1 Overview

Allow Kansans to continue water usage according to their water rights, leaving conservation efforts to the individual. This prevents short-term economic consequences in the region, while providing individuals with the freedom to identify personal conservation goals.

Why should we move in this direction?

Water-rights holders are allowed to maintain and use what is legally theirs.

The economy will not suffer from temporary setbacks.

This approach does not target particular groups, but asks all water users to do what they can to help.

Individuals, industries, agriculture and other entities have the flexibility to identify and implement usage and conservation goals that best suit individual capabilities.

What concerns does this approach present?

Without collaborative approaches, individuals will likely not conserve enough, and competition for declining water will lead to impairments and lawsuits.

Conservation efforts may become contingent on the current weather or individual financial situations, dictating how and when water is saved.

Individual management eliminates the potential for better collaborative solutions.

Extending the life of the aquifer would depend on the ability and willingness of people to act selflessly and hold themselves accountable.

Create Localized Partnerships to Enhance Conservation

Approach 2 Overview

Promote the development of local conservation plans, enabling communities to cooperatively design their own water management efforts. This approach enables stakeholders to set and achieve conservation goals, while allowing for input from all who are affected.

Why should we move in this direction?

Local partnerships enable stakeholders to have an influential voice in the process of setting policy.

Collaborative goals do not place the burden on one group or entity to make a change.

Accordingly, cooperative partnerships allow a variety of water rights holders — within a groundwater management district — to be involved.

Group efforts require and enhance discussion about the aquifer, providing the setting for new solutions or goals to surface.

Once a plan is implemented, all participants are held accountable for upholding the agreement for the life of that plan, thereby ensuring conservation of the aquifer.

What concerns does this approach present?

Pressure to join the partnership or agree to conservation restrictions could be controversial.

Having a widespread impact on the aquifer may require the creation of multiple partnerships across an extensive space, leaving sustainability to the willingness of large groups to work together.

Agreeing on a management strategy is often time consuming.

Establishing a tapestry of local water use policies may not have enough collective impact to sustain the life of the aquifer indefinitely.

Allow the State Government to Regulate Water Usage and Conservation

Approach 3 Overview

Allow the Kansas state government to regulate conservation when conditions warrant it, or when citizens request it. This approach can establish responsible regulations that are fair to those involved, while preserving the water supply for the common good of present and future Kansans.

Why should we move in this direction?

The state government can establish hydrologically appropriate reductions that are in the best interest of present and future Kansans.

As historically proven, regulating water management efforts can ensure conservation of the aquifer, potentially extending the life of the resource.

State regulation provides the enforcement needed to mobilize citizens in the present, rather than leaving aquifer management to future generations.

Government officials have the expertise, resources, and duty to protect the public interest that many citizens lack when it comes to making water conservation decisions.

What concerns does this approach present?

Although citizens may request regulations and have input in the process, the chief engineer may develop more restrictive water use measures than locals feel they can handle. Undesirable reductions may result in citizen resistance to regulations.

Government involvement could alter the allocated water usage by rights holders, reducing a resource that was legally identified as theirs.

Leaving regulation to the government has the potential for water to become a polarizing political issue. A resource that is required for sustaining life should not be susceptible to party politics.

Restrictions on water use could produce a domino effect, impacting the economic stability of the state in the short term.

Treat Water Rights as a Free-Market Good

Approach 4 Overview

Use a free-market system that permits water entitlements to be bought and sold, and that requires a portion of the amount exchanged to be conserved. This approach lets the market dictate the price, enables water rights holders to voluntarily transfer entitlements, and allows water to be used where it is needed most while cutting back on overall use.

Why should we move in this direction?

Leasing water entitlements is completely voluntary, allowing entities to participate when (and if) they choose.

Transferring water rights allows the resource to be used where it is needed most.

With this approach, all parties profit from an exchange; the buyer gets access to the resource, the seller earns revenue, and the citizens of Kansas benefit from conservation of a state commodity.

Official trades could have the power of a contractual obligation, ensuring adherence to the terms of use and associated conservation efforts.

What concerns does this approach present?

This approach is dependent on volunteers. Without willing participants, the economic and conservation components would be moot.

Understanding, implementing, and monitoring an exchange of water entitlements can be complex, requiring extensive education about the process.

Allowing the market to dictate the price will inevitably disadvantage those with less economic power.

Citizens should be wary of allowing water to be bought and sold through a free market, especially since it is necessary to sustain life.

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