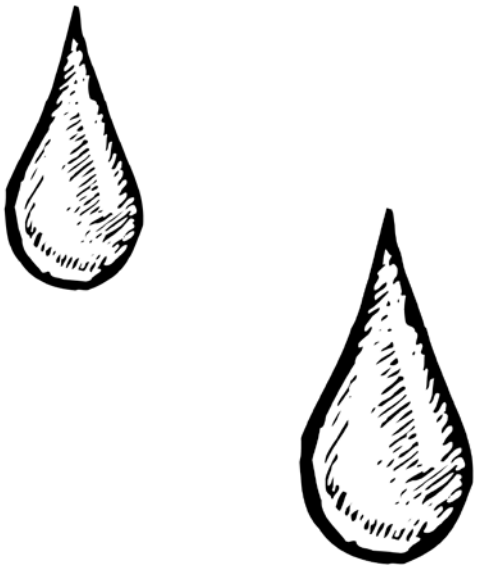
Role #1—Citizens Alliance for the Aquifer

Concern #1—The Citizens Alliance for the Aquifer (CAA) has several concerns regarding managing the Ogallala Aquifer CAA is a consortium of more than 1,500 individuals and businesses from several states in the High Plains region. Our consortium's mission is to hear—and to represent to public officials—the concerns of citizens throughout the region.

The following is a summary of the multiple issues that we believe must be taken into account as a multistate resolution is sought:

- Multistate cooperation with regard to the remaining resources of the Ogallala Aquifer
- Scientific research on the ecological repercussions of artificial groundwater recharge using reclaimed wastewater
- Economic incentives for sustainable practices
- Locally enforceable regulation (because the region is too large for regulation by a few federal agents)
- Ecological impact statements on the effects of aquifer mining on wildlife
- Increased access to the *playa* lakes for recreational purposes (e.g., game bird hunting)
- Subsidies to offset economic losses of farmers who must dig deeper for water
- Monitoring of feedlots to reduce nitrogen waste seepage and pesticide seepage
- For new construction, impact fees that are based on projected water usage of new households
- Full-scale assessment (e.g., feasibility, available markets) of drought-tolerant crops
- Federal assistance to offset the rising cost of drilling for water
- Equity in subsidies for all farmers or incentives for water-use reductions
- A framework of regular communications with citizens



Role #2—Colorado High School Student

Concern #2—I think we need to stop wasting the remaining water and to find out what it would take to let the aquifer recharge.

The Ogallala Aquifer once held enough water to fill Lake Huron. However, we are using the water faster than it is being replenished. In some places, the aquifer is almost empty. Once drained, the aquifer will take an estimated 6,000 years to refill. Agriculture is the primary drain on the aquifer and is the topic we need to focus on while seeking a solution to the overuse problem.

The Ogallala Aquifer, which stretches from Texas to South Dakota, is the main source of water for all the High Plains. The aquifer is being depleted at an alarming rate in many areas. At current use rates, the aquifer will be dry in 30 or 40 years. That is during my lifetime!

I have read that many farmers are using inefficient watering methods. They use sprinklers that spray water from such heights that much of it evaporates before it reaches the plants. Farmers who irrigate with ditches pour too much water onto the crops, and the excess water sits there until it evaporates.

Some solutions for those wasteful practices are readily available. Because the water evaporates from the high sprinklers before reaching the crops, why not install lower sprinklers? If the water is closer to the plants, less will evaporate. To keep from wasting water in ditch irrigating, the farmer could buy gypsum blocks, which are a valuable device that is buried in the ground near the roots to monitor available soil moisture. With this method, you can always tell how much water you are using and how much water you need. Given the status of water resources, there is no excuse for wasting any.

Unless methods for conserving water are implemented in the High Plains, the water supply could run out in a matter of years, which would be an undesirable outcome not only for the farmers but also for those of us who depend on their produce for food.

I do not understand why nothing is being done when we know about this problem and that it is only getting worse. What if the water is gone by the time I am 50? What will I do? Will I have to move away? What about all the families who live in the High Plains states? Will everyone have to move? A lot of people can't afford to just move—the poorest will be left behind. We need to redefine the agricultural industry, keeping the jobs but stopping the wasting of water. What about all the people in the United States who rely on beef and grain from the High Plains? What will happen if the industry falls apart in 50 years? We need to produce food on our own land here in the United States so that we are not dependent on foreign countries. Depending on foreign food would make us very vulnerable as a nation. Does everyone realize how important this matter is? I am eager to do what I can to work toward a solution; that is why I came to this summit.

Sources:
www.bvsd.k12.co.us
Based on a student letter by L. Thompson.
www.conservewy.com

Role #3—Ecologist from Nebraska

Concern #3—I believe we threaten our species and others by disturbing the web of life that we don't fully understand. We're all connected.

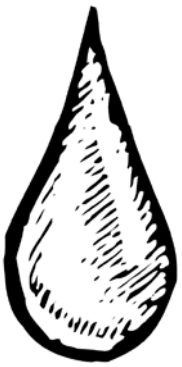
The loss of water from the aquifer is not just about humans running out of water for their use. The repercussions affect the wider ecological community. Underground water reserves are connected to aboveground water sources. We need to look at the entire system when considering the environmental impacts of depleting this resource. When withdrawals exceed recharge rates, the result is lower water tables and (often in the summer) slower, lower, and warmer streams.

Those factors affect species living in the streams. Insect larvae are a critical link in the stream food web. Those and other species are extremely sensitive to variables like temperature, nutrient concentrations, contaminants such as pesticides, dissolved oxygen, and flow rate. Less water in streams reduces habitat for species and impairs water quality. When streams run too slowly, creatures that depend on the flushing of contaminants such as pesticides can be poisoned. When streams run too low, creatures that have grown dependent on higher rates cannot survive.

I am particularly concerned about trout. Higher water temperatures in the summer reduce reproduction rates. The fish depend on groundwater contributions to stream flow; the temperature of the groundwater keeps their eggs from overheating in summer and from freezing in winter. Groundwater and waters on the surface are intimately connected; I doubt that we have even begun to understand the complexity and interrelationships of the system. In this semiarid climate, the impacts of depleting groundwater resources are likely magnified.

My point is simple. Groundwater moves toward and connects to water on the surface. Ecology is about systems. When we try to divide up issues and are not seeing them in context, or as a whole, we make mistakes. Our knowledge is limited, so we must use all we know to make the best possible decisions. We can't ignore "minor details." For example, eliminating trout habitat doesn't just affect recreational fishing. Simply put, if trout are affected, other species will be also. And speaking personally, I believe that trout are valuable simply because they are trout. I do not want a world where fish do not swim free in our rivers. They are a part of my quality of life; my health and well-being are tied to theirs.

Source:
Jackson et al. 2001 (B).



Role #4—Meat Industry Representative from Texas

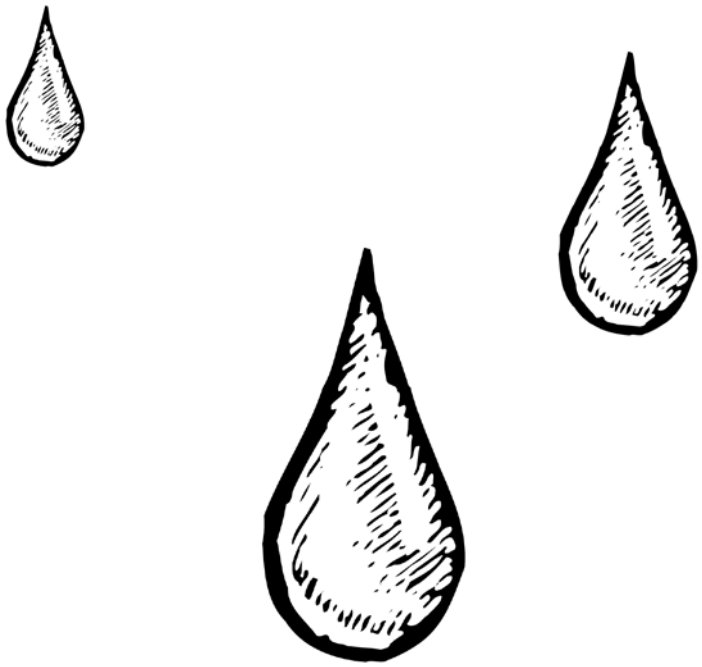
Concern #4—Folks, millions of people rely on Ogallala water, including my company's employees and their families, the farmers of the High Plains, and most meat-eating Americans. The economy of the region depends on the aquifer's water. Restricting our ability to pump water will cause financial problems for many of us.

Most of the water pumped from the Ogallala is used to irrigate crops, much of which are grown to feed livestock. Throughout the 1980s and 1990s, the largest beef-packing company of the High Plains increased employment from 9,500 to 52,000 people, and sales grew from $4.6 billion to $16.9 billion. In October 2001, the company merged with the world's largest poultry producer, making it the nation's largest meat-packing company. The company, which processes beef, pork, and poultry, now claims the largest percentage of the U.S. market, serving as the nation's (and perhaps the world's) largest beef processor. I represent the company.

The previous chief executive officer of this company based in the High Plains also served on the board of directors for several organizations, including a federal reserve bank, a major energy company, a petroleum corporation, and the National Livestock and Meat Board. Clearly, the meat industry is big business in the United States, and upper-level meat industry executives are major players on the national and international business scene.

My company now provides thousands of jobs across the United States, keeps meat and grain farms in business, and feeds the nation. We have been a responsible neighbor, constructing wastewater treatment systems to reduce ammonia discharge into the Missouri River and resolving water quality issues at former facilities in Texas.

Source:
Center for Study of Responsive Law, 2005 (E).



Role #5—Farmer from Kansas

Concern #5—Mostly what I want people here to keep in mind is that the sustainable farming practices have not been proven over generations to not harm farmers' livelihood, and I simply cannot afford to take that risk with my operation.

My family relies on support payments from the government. With the federal economic incentives, we can turn a profit and make a living. Federal programs do not recognize the crop rotation system that the sustainable agriculture folks propose. My family would receive nothing if I implemented those suggestions. You all seem to have this nostalgic attachment to the American farmer, but then you don't seem to know one when you're looking at her or him. My family has farmed this land for generations, and my students are learning to farm this land after me. We maintain the way of life you say is being lost in this country, so I don't understand why you aren't willing to provide more support for the regular farmer who can't afford to take the risks you suggest.

I represent the people who are the backbone of this region's economy. Let's not forget what this issue is about. Families, cities, entire states, and a nation depend on our grain and meat industries. If I switched to more sustainable practices, I understand that for the first few years I would likely have lower yields. I am aware that this approach might be offset by the costs of fertilizers and pesticides, but it is still a risk. I barely make a living some years as it is. You say there is little difference—even with increased labor costs—but, again, I can't take that risk.

Don't get me wrong; I am interested in the increased water-holding capacity of sustainable practices. But I have already invested in a large-scale irrigation system and can hardly imagine running drip irrigation lines across all those acres! Farming is a business. There's no time to do all that by hand. If I didn't have a family to support, maybe I could take more risks. Someday in the future, maybe my students will have to grow wheat or farm some new way because pumping the water will be too expensive.

I say, "No more regulations on farmers." We aren't the ones overpopulating this region. What about all those people watering their lawns and golf courses? What about all the people eating the food we produce? Farmers cost the government less per acre than suburban people. We don't need the infrastructure that they do. In the suburbs, water and sewer lines run to every house, on every quarter of an acre. Has anyone compared water use per acre on farms to the use in the suburbs? Why do people want to blame farmers so fast? Maybe they don't want to look at their own way of living. I don't mean to offend anyone; I just want fair representation for farmers.

Source:
Guru and Horne 2005 (E).

Role #6—Agricultural Engineer from Wyoming

Concern #6—We need to think about the long-term sustainability and environmental impacts of water use in this globally significant agricultural area.

The Ogallala Aquifer, underlying half a million square kilometers of the central United States, could be the largest aquifer in the world. Although figures vary, it is estimated that the aquifer provides 20 percent to 30 percent of the total groundwater used for irrigation in the United States. It also provides domestic water to approximately 80 percent of the 2.3 million residents of the region. About 40 percent of those people live in the region's 10 largest cities. The region is a globally significant agricultural production area. More than half the land (54 percent) is used for agriculture. Wheat, cotton, and corn grown here amount to 15 percent to 20 percent of the total of each crop grown in the United States.

Eighteen percent of the cattle in the United States and a growing percentage of swine are also produced here. In 1995, regional water use for irrigation and meat processing amounted to almost 20 billion gallons per day. One-fifth came from surface waters (85 percent of which came from the Platte River in Nebraska), and four-fifths came from aquifers. Excluding the Platte River, 92 percent of the water used in the High Plains is supplied by groundwater, and about 95 percent of this water irrigates crops. The rest is used for domestic drinking water, livestock, mining, and industry, in that order.

Regional water-quality issues of concern include the following:

- Nutrient enrichment or pollution of groundwater from the operations of feeding confined animals
- Effects of agricultural and urban land use practices on general groundwater quality—specifically, the potential degradation of drinking water
- Deterioration of groundwater quality as a result of infiltration of degraded surface water
- Effects of focused recharge through *playa* lakes on local groundwater quality

Groundwater is being depleted globally because, in some areas, it takes centuries to recharge. Some aquifers are rechargeable, but others that contain fossil waters that had been formed when the Pleistocene ice sheets melted are considered a nonrenewable resource. Rates of recharge vary widely, from hundreds to tens of thousands of years. Some scientists consider the Ogallala to be nonrenewable. It does not recharge quickly enough to sustain current use levels. By the 1970s, farmers were already draining the aquifer 10 times faster than the recharge rate in some areas. For nonrenewable groundwater sources, sustainable or appropriate rates of extraction are difficult issues to discuss. Almost any extraction may be nonsustainable, and appropriate rates of extraction are difficult—if not impossible—to determine. At what rate should groundwater pumping be allowed? For what purpose? And who, if anyone, will safeguard the needs of future generations? In the Ogallala Aquifer, for example, the water may be lowered significantly over the next century.

Source:
Jackson et al. 2001 (B).

Role #7—Toxicologist from Nebraska

Concern #7—Poor agricultural practices are contaminating the water quality of the aquifer.

The Ogallala Aquifer's water supply is being depleted at alarming rates. At the same time, the remaining water quality is becoming increasingly polluted because of poor agricultural practices. Agricultural runoff is the greatest nonpoint source of water pollution in the United States. Salt, fertilizers, pesticides, chemicals, and animal wastes are contaminating the aquifer and consequently affecting soil productivity and our health.

Unlike municipal or sewage water, irrigation does not permit improvement of water quality before it returns to the source. This situation leads to changes in the amounts of dissolved salts and adds agricultural chemicals and eroded sediments to both the soil and the aquifer. For instance, nitrates found in the fertilizers used on farms and home lawns seep into groundwater; that water can be harmful when consumed by children and pregnant women. Pesticides have also seeped into groundwater; in some areas, they have exceeded water quality standards established by the Environmental Protection Agency. There are no known economical ways to remove the pesticides once they have entered groundwater sources. Animal wastes from confined feeding operations of cattle, hogs, and chicken are another major source of water pollution, which, in turn, decreases the soil's productivity.

The water of the Ogallala Aquifer is generally still suitable for irrigation. However, levels of dissolved solids or salts, fluoride, chloride, and sulfate are above the EPA's drinking water standards. Federal monitoring occurs in any community that relies on groundwater for drinking, but in other areas, such monitoring is infrequent or nonexistent because of the associated high costs.

Better management and monitoring are needed to help safeguard the water quality of the Ogallala Aquifer and to ensure that future generations can safely use the water for drinking and irrigation.

Source:
Guru and Horne 2005 (E).

Role #8—Economist from South Dakota

Concern #8—Conserving the Ogallala Aquifer is essential to the economy of the High Plains.

The economy of the High Plains is centered on three sectors: crops, livestock, and meat processing. Each of those sectors is highly dependent on water drawn from the Ogallala Aquifer. Irrigated crops provide food for livestock, which, in turn, is the primary input for meat-processing plants. Because of the aquifer's slow rate of recharge, the High Plains economy relies on a finite resource.

Water is fundamental to the region's livelihood, and policies affecting water use ultimately change the scope and distribution of economic activity, plus the use of land and other natural resources. For instance, the U.S. Department of Agriculture's Farm Service Agency instituted the Conservation Reserve Program in 1985. This voluntary program, which is available to agricultural producers, helps protect environmentally sensitive land. Participants plant long-term, resource-conserving groundcover to improve water quality, to control soil erosion, and to enhance wildlife habitat. This method reduces water runoff and sedimentation and, therefore, protects both groundwater and water on the surface. In return, participants receive rental payments and other financial assistance.

Legislators should focus on the economics of water conservation when drafting new policy initiatives. We must conserve for economic efficiency, which means that resource use should yield the greatest net benefit to society. However, private costs of pumping are less than the social costs of withdrawing water—so excessive pumping occurs. Colorado, Kansas, and New Mexico have adopted policies to deny new water permits if water availability in surrounding wells would be significantly reduced. However, no such restrictions occur in Texas, where the Texas Supreme Court ruled that "the owner of the land is the absolute owner of the soil and percolating water."

Sources:
Peterson, Marsh, and Williams 2003 (B).
U.S. Department of Agriculture Farm Service Agency 2003 (E).