

Agricultural White Paper  
October 2012

*Agricultural Water:*  
Protecting the Future of Our Nation



*A diverse group of concerned agricultural producers react to the lack of leadership on water supply issues and priorities*





*Photo by: David Stoecklein*



# *Agricultural Water:* Protecting the Future of Our Nation

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# INTRODUCTION

## **Agricultural Water: A National Issue**

Agriculture shapes the fabric of the United States. The world has no match for our Midwest breadbasket, vast rangelands, irrigated fruit and vegetable farms, carefully sustained timberlands, and southern cotton fields. American agriculture, in its varied abundance, feeds, clothes, and provides us with renewable fuels. It shaped and sustained us in the past, provides secure and abundant food and fuel today, and will determine our future. Our agricultural proficiency has fulfilled the dreams of our forefathers and will, if we are prudent, support the aspirations of our children and their posterity. Agriculture links our economy, our environment, and our communities as both user and steward of our nation's resources. Though U.S. agriculture has been a reliable provider to our citizens for nearly four centuries, it is expected to produce even more for future generations amidst the growing complexities faced by our country and the global economy.

The challenges posed in the global economy were described in "Global agriculture towards 2050" at the 2009 High Level Expert Forum - How to Feed the World in 2050:

*"[A]griculture in the 21<sup>st</sup> century faces multiple challenges: it has to produce more food and fibre to feed a growing population with a smaller rural labour force, more feedstocks for a potentially huge bioenergy market, contribute to overall development in the many agriculture-dependent developing countries, adopt more efficient and sustainable production methods and adapt to climate change."*

While facing these enormous challenges amidst great uncertainty and change, agriculture has proven to be resilient, innovative, and increasingly productive. One factor, however, that could prove the undoing of agriculture's ability to continue as provider, employer, innovator and steward of the environment: *Our nation needs agriculture and agriculture needs water.*

## **Special Session on Water Strategy**

With this significant issue in mind, a group of concerned agricultural land owners who collectively manage more than five million acres of ranch and crop land across the U.S., assembled on May 1 and 2, 2012 to address the single topic: "Water Strategy." The working group, representing enterprises from across the nation, received a briefing paper of potential issues, and a keynote speaker provided additional topics. The participants then generated and prioritized their own list of water issues facing agriculture and the current state of water policy. As these experienced agriculturists identified the most critical water resources priorities, their deliberations quickly turned to strategies needed to prioritize adequate water supplies for *all* users. Their decision to expand their focus should not be a surprise. For agricultural producers, thinking globally is a necessary survival skill.



The meeting participants unanimously agreed that agricultural leaders must join with other water stewards to address water supply and management strategies. Consequently, the deliberations did not focus on specific industry or regional issues, but intentionally concentrated on comprehensive issues more likely to affect all water users. They requested that this white paper be prepared to:

- Call on landowners and agricultural producers to engage at all levels and proactively lead in the strategic development of solutions to the long-term water issues facing our nation
- Voice the urgency sensed by the agricultural community on water issues
- Reach out to the greater community on the critical and urgent need for wise water resource planning and management
- Urge sound policy development in local, state, and national forums

The participants identified three priority issues to be addressed in this white paper: 1) water supply, 2) water resource stewardship, and 3) long-term water policy. Their recommendations on these three issues, and background information on each, are presented below:

- Effectively use existing water resources
- Responsibly increase water supplies
- Encourage continued investment in water infrastructure
- Protect water rights ownership
- Incentivize innovation and private investment in water resource management

The goal of this paper is to guide policy discussions and help our nation. It is not intended to criticize, but to inform. It is time to loudly sound the alarm that unless there are significant shifts in local, state, and federal water policy, water supply problems will only worsen in the coming years. Political and legal battles, or worse, will erupt. Opportunities to develop optimal, cooperative solutions will be lost. The cost of water, food, fiber, and renewable fuels will drastically increase. Water and food shortages will develop at home and abroad. Wars of this century will be fought over food and water unless all of humanity receives needed sustenance. It is no exaggeration to suggest that our national security is at stake.

The agricultural community recognizes that solutions to the water issues at hand will come at a cost. For water to be available in the future as it has in the past, and regardless of water source or use, all users must understand that they will need to pay more for the water they use.

## *Our nation needs agriculture and agriculture needs water*



This Special Session on Water Strategy was hosted by the King Ranch® Institute for Ranch Management with appreciated sponsorship by King Ranch, Inc. and Deseret Ranches.

### **Water Strategy Working Group and Authors**

G. Hughes Abell	<i>General Partner, Llano Partners, Ltd., Texas</i>
James H. Clement, Jr.	<i>Chairman of the Board, King Ranch, Inc., Texas</i>
Monte Cluck	<i>President, Dean Cluck Feedyard, Inc., Texas</i>
David S. DeLaney	<i>Vice President and General Manager, Ranching and Wildlife Operations, King Ranch, Inc., Texas</i>
Ford Drummond	<i>Owner and Operator, Drummond Ranch, Oklahoma</i>
Matt Echeverria	<i>Owner and President, Echeverria Cattle Company, California</i>
Paul Genho	<i>President, Farmland Reserves, Inc., and Chairman of the Board, AgReserves Inc., Utah</i>
Mitch Hutchcraft	<i>Vice President for Real Estate, King Ranch Florida, LLC, Florida</i>
Jack Hunt	<i>Retired President and CEO, King Ranch, Inc., Texas</i>
Erik Jacobsen	<i>Operational Vice President and General Manager, Deseret Ranches, Florida</i>
John Lacey	<i>Partner, Lacey Livestock Company, California</i>
Clay P. Mathis	<i>Director, King Ranch® Institute for Ranch Management, Texas</i>
Bob McCan	<i>General Manager, McFaddin Enterprises, Texas</i>
Jay O'Brien	<i>Rancher, Texas</i>
Warren Petersen	<i>Vice President, Farmland Reserves, Inc., Utah</i>
Forrest Roberts	<i>CEO, National Cattlemen's Beef Association, Colorado</i>
Todd Swickard	<i>Owner and Operator, Five Dot Land and Cattle Co., California</i>
Robert J. Underbrink	<i>President and CEO, King Ranch, Inc., Texas</i>
Ross Wilson	<i>President and CEO, Texas Cattle Feeders Association, Texas</i>



# **WATER SUPPLY**

## *Recommendations*

- *Engage all stakeholders in strategic planning for replacement of aging infrastructure and creation of new infrastructure needed to supply water for expanding food production and growing urban centers.*
- *Encourage research universities to analyze water availability, storage opportunities, environmental costs of alternative technologies, and human interaction with the water cycle so that water supplies can be increased and better managed.*
- *Research, develop, and implement adaptive strategies in response to weather cycles, such as improved forecasting, enhanced irrigation technologies, better watershed management, and more water efficient plant varieties.*
- *Advocate greater and more innovative options for investing in water supply infrastructure and management.*
- *Support practical conservation efforts, both in urbanized and agricultural environments, on a basin-wide approach rather than user by user.*
- *Investigate resource sharing, re-use, or multi-use agreements.*
- *Support changes in water laws that impede efficient water use.*
- *Increase the emphasis on water storage technologies, including underground storage when practical.*
- *Support investment in research and technologies that allow all users to improve overall aquifer or basin-wide water use efficiencies.*
- *Increase water infrastructure investment by providing certainty for water right ownership.*
- *Develop improved measures of water use in agricultural production.*



**PROBLEM STATEMENT:** *What are the water supply issues?*

The analysis of water supply must begin with these questions: What are the challenges to our water supply? What opportunities do we have to manage and perhaps increase water supplies? This examination is critical. American agriculture has provided a safe and reliable food supply, preserved open space and natural resources, driven economic opportunities for rural and urban America, furnished the foundation for critical industries, and expanded these roles to the world economy. Does the future hold the predictable and reliable supply of water that agriculture needs to continue these essential roles?

Population growth, weather, infrastructure limitations, investment uncertainty, lack of research, counterproductive water laws, and in many cases lack of planning and prioritization, all presently limit water supplies. At the same time, population growth creates demand for additional water and food production. Weather also plays a major role. The current drought favors agricultural producers who have irrigation. In fact, 50% of our food supply (in value) is grown on the 16% of U.S. farmland that is irrigated. Much of the 84% of farm and ranch land that is not irrigated could produce more with irrigation. Water supplies for cities and irrigation require adequate water infrastructure. Water infrastructure shortcomings have been described as a “trillion dollar question” facing the U.S. In this setting, it is fair to ask if we have maintained adequate research to cope with weather changes, increased production demands, and water management and utilization technologies.

*Population*  
*Weather*  
*Infrastructure*  
*Research*





## Population Growth and Population Trends

The U.S. population will increase from 309 million people in 2010 to over 439 million in 2050 (U.S. Census), with more than 80% of this population growth occurring in urban areas. Cities for the most part do not produce their own food and water and cannot exist without healthy supply lines. Farmers and ranchers form an important part of those supply lines, yet the support base for cities grows increasingly narrow. As of the 2010 Census, only 17% of the U.S. lives in rural areas, and agricultural producers number less than 2% of the American population. World population is expected to increase from roughly 7.2 billion today to about 9.7 billion in 2050. The world's dependence on American agriculture is significant; in 2011 American agriculture exports totaled \$137.4 billion. From 1950 to 2000, water usage in the U.S. increased from 14 to 43 billion gallons per day, with per capita use increasing from 146 gallons per day to 179 (US EPA Clean Water and Drinking Water Infrastructure Gap Analysis Report, September 2002). Population growth that increases overall demand and per capita consumption will be stifling to food production.

Population growth and the trend to urbanization will continue to affect agricultural water supplies. In most of the U.S. there are no new sources of unused water, so growing cities increasingly reach out at greater and greater distances to take water currently used by agriculture. Approximately half of the population growth in coming decades is projected to occur in Arizona, California, Florida, and Texas, all regions that produce a huge portion of our domestic food supply.

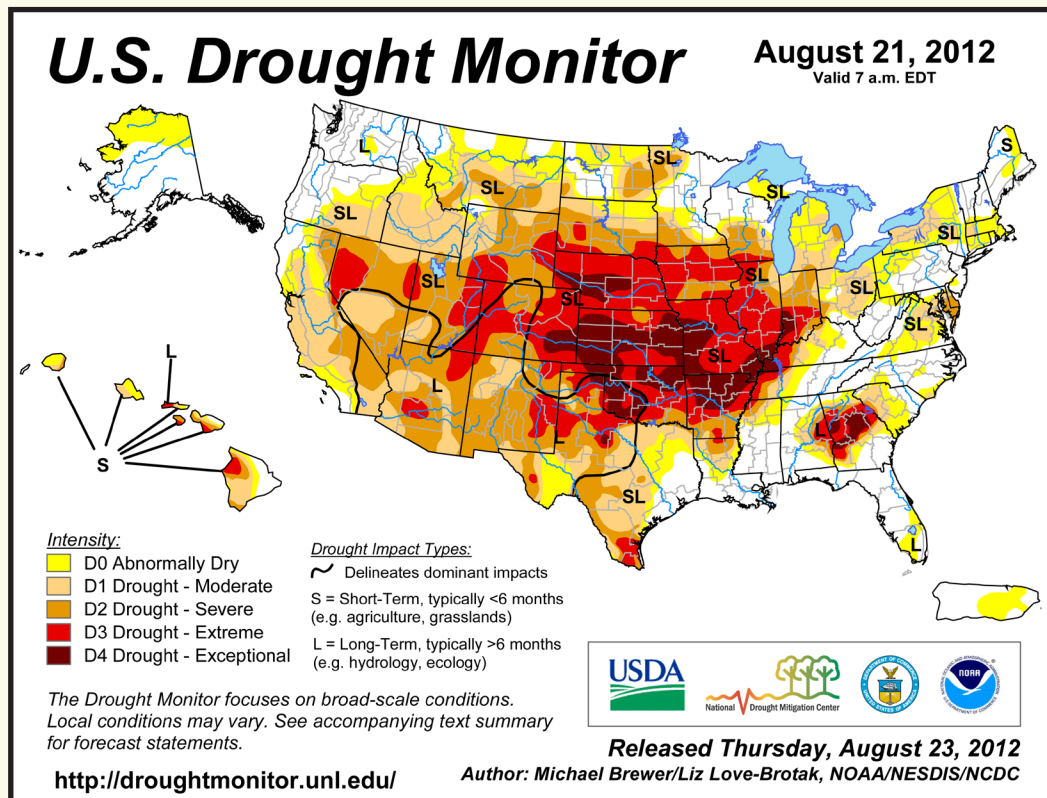
*World population is expected to increase from roughly 7.2 billion today to about 9.7 billion in 2050*

Urban and rural citizens alike expect increased production of food, renewable fuels, and fiber, often without regard to the basic food production agronomics. These forces combine to create a “perfect storm.” Cities take the water needed to grow food for their burgeoning populations, even as prolonged droughts diminish water supplies. Producers face the challenges created by nature, but they also face antagonism from a public far removed from the realities of food production, and policies created with good but misguided intentions that have impaired productive capacity. How then do we balance the basic equation of increased food production = more water demand = need for more water supply? This question is made more difficult by the additional challenges discussed below.



## Weather

For agricultural producers, the supply and demand equation can become exponentially complicated by short- and long-term weather patterns. The droughts of 2011 and 2012 provide a heated reminder of the weather factor. As of July 2012, approximately 61% of the lower 48 states are experiencing “abnormally dry” or “drought” conditions (U.S. Drought Monitor), with the USDA predicting long-term persistent “dry” conditions for the South and Southwestern U.S. As of August 2012, more than half of the counties in the U.S. had been designated as primary disaster areas due to drought (NWRA *Water News Daily*, Aug. 2, 2012). The effects of the drought are obvious and significant, ranging from direct economic losses in the billions, to increases in household budgets for essential food and fiber items (e.g., cotton products), to potential food shortages worldwide. American consumers, who on average spend less than 10% of their disposable income on food, may see modest increases in their food budgets. Consumers in countries such as Pakistan that already spend more than half their income on food will see catastrophic increases.

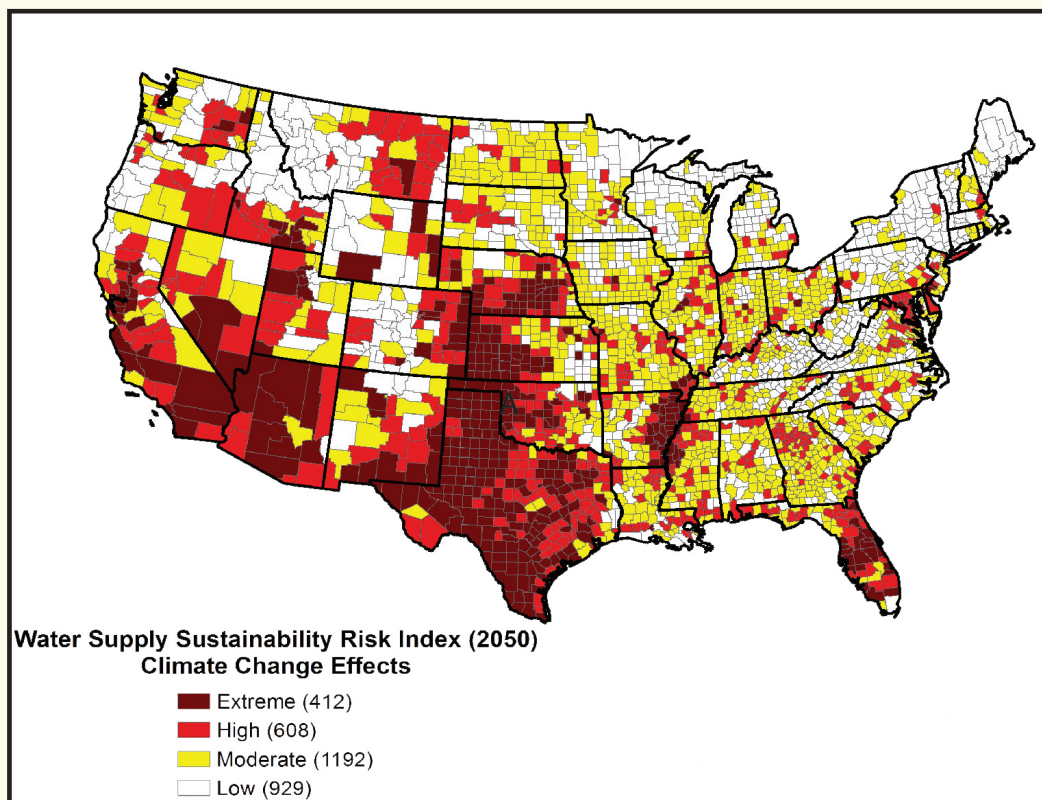




While the climate change debate is both contentious and unsettled, the fact remains that the Earth experiences weather and climate pattern changes that affect agriculture. This graphic, taken from research completed for the Natural Resources Defense Council by TetraTech, illustrates counties in the U.S. likely to face water shortages as a function of a) projected weather cycles; b) annual water demand (agricultural, urban, and industrial withdrawals); and c) projected renewable water supply (including groundwater). The weather cycle projected for this study exposes 14 states to extreme or high risk for having an unsustainable long-term water supply (*Evaluating Sustainability of Projected Water Demands in 2050 under Climate Change Scenarios*, NRDC).

This same study estimated current and future water withdrawal as a percentage of precipitation. While the majority of the U.S. is currently consuming less than 5% of annual rainfall, water use in the western U.S. consumes approximately 30%. In arid regions, including Texas, Arizona, and portions of New Mexico and Nevada, water consumption exceeds 100% of available rainfall. This trend is unsustainable and necessitates new approaches to water policy.

Ultimately, weather patterns have changed throughout as much of the Earth's history as humans are able to study, and weather patterns will continue to change. The only effective approach is to focus research and development on more adaptive practices and technologies.

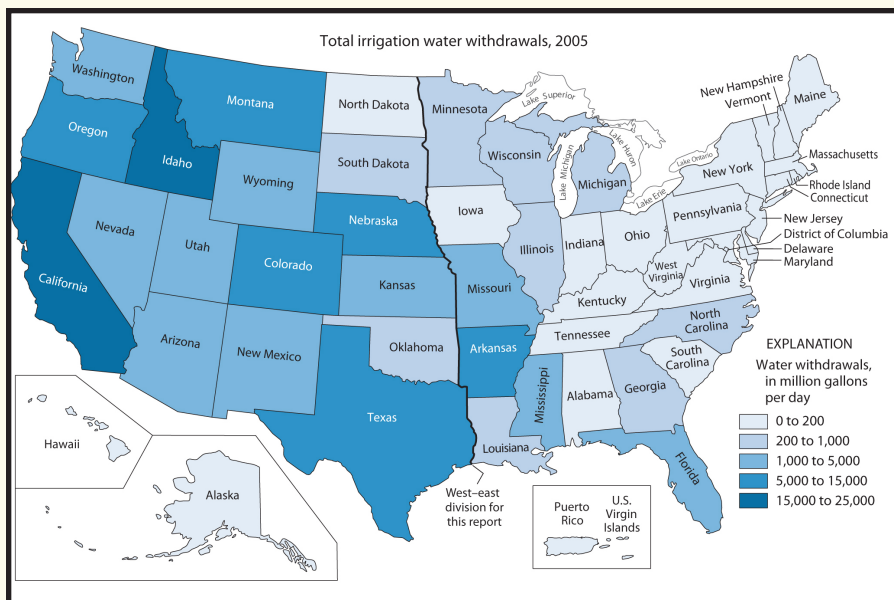




## Water and Food Production Infrastructure

Water infrastructure, simply defined, provides the means to move water from its hydrologic source to the point of human use. Our national water infrastructure has been a work in progress from the time of early colonization. Yet, foreseeable water demands will push our existing water infrastructure well beyond its current capability. Our nation faces these challenges:

- Many water supply facilities are more than 50 years old and are nearing or beyond their design age, yet continue to function as primary facilities without redundant or reserve capacity.
- Many major facilities were built and funded as federal projects. Current federal policy mandates maintenance of such facilities, but often does not fund maintenance, improvement, or replacement. Local economies that have grown up because of and around this infrastructure have not shown ability to fund needed repairs and replacements.
- Water infrastructure development has not kept pace with population growth and the increased need for irrigation.
- Changes in weather patterns, population distribution, and water use technologies cause economic obsolescence of existing infrastructure.
- Current water policy discourages private investment in water infrastructure over concerns with “privatizing” a “public” resource.



Efforts to address infrastructure needs must also address the need for irrigated agriculture. Nearly half of all U.S. crop economic value grows on the 16% of agricultural land that is irrigated. The remaining 84% of agricultural land (farms not irrigated) produces just over 50% of the crop value. (USDA, Economic Research Service). Even a cursory look at irrigation water withdrawals (both from surface and groundwater sources) as shown in the above graphic reveals the need for

more robust infrastructure, especially in an extreme drought year like 2012. Food production in states with heavy irrigation use, including Arkansas, California, Florida, Idaho, Kansas, Nebraska, Texas, and Washington, demonstrate the value of such infrastructure to our food production and national well-being.



Irrigation allows production of rice in Arkansas; fruits, vegetables, tree nuts, citrus, and a range of other crops in California; citrus, fruit, and vegetables in Florida; potatoes, grain corn and sweet corn in Idaho and Washington; wheat, corn, and soybeans in Kansas and Nebraska; along with citrus, irrigated pasture, peanuts, melons, and many other food crops in Texas. In the 2012 drought, farmers using irrigation in the parched Midwest are enjoying record production, while neighboring farmers have suffered greatly reduced yields or have been forced to plow under drought-destroyed crops without taking a harvest.

Meanwhile, on-stream and off-stream irrigation dams and storage reservoirs are aged with increasing risk of failure, as are levees that protect farmland along the Missouri, Mississippi, and other river systems. Loss of these water management structures will curtail food production. Constraints imposed by environmental legislation and litigation hamper replacement of these structures. Often the sheer cost of regulatory compliance and litigation originating from environmental activists render replacement projects uneconomical.

Future water supplies are likely to require significant investment and increased user costs. Since agriculture is the largest water user, producers should anticipate such water cost increases. Still, water costs must be low enough to assure an adequate food supply. Further, producers and consumers alike should recognize that higher water costs will affect production and be reflected in the price of food and fiber.





*...research,  
innovation, and  
improvement  
are a way of life*

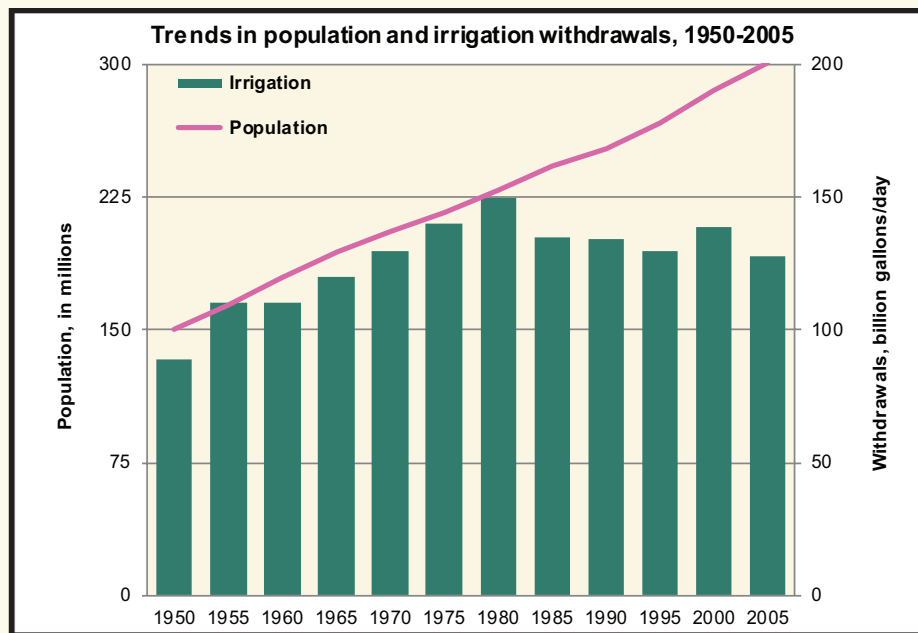
## Research

A broad array of tools will be required to meet the water supply and infrastructure challenges of the coming century. In agriculture, research, innovation, and improvement are a way of life. Agricultural technologies change as rapidly as in any other field, but agriculture remains largely the science of managing and adapting to natural processes. In short, agricultural practices must conform to the laws of nature. One such law is that the living organisms used to meet human needs require water. Research helps improve our effectiveness in managing water resources.

Against this background, the special session participants expressed great concern that the number of university programs devoted to agricultural research appear to be shrinking at the very time that our food production needs to be expanded and our water resources more carefully managed. The participants are well aware of this trend, as research universities and farmers and ranchers have enjoyed a long history and beneficial relationship. The participants strongly advocated greater emphasis on water related research.

Agricultural research has significantly improved production efficiency. Compared to production in the 1950's, agriculture today produces up to five times more product on a per acre basis and many times greater output per person (Productivity Growth in US Agriculture, USDA, September 2007). Research in irrigation technology and plant water needs is fundamental. Irrigation demand, when compared to population growth, has been steadily declining since the 1980's, as shown in this chart. The explanation for reduced irrigation water withdrawals lies in improved irrigation technologies and better plant varieties. These benefits were discovered through basic and applied research.





Several areas are recommended for further research. As an example, water supply infrastructure has relied heavily on dams and reservoirs to store water, often with distribution to great distances from the source. While surface storage reservoirs and other technologies have served well, the agricultural community should consider supporting additional research on:

- Dispersed storage with infiltration (shallow storage over larger acreage with minimal infrastructure) in addition to dams and deep storage reservoirs
- Re-circulated, re-use, or multi-use water systems
- Use of aquifer storage and recovery or well injection to store water during wet years in groundwater aquifers for later withdrawal
- Prediction of long-term weather cycles
- Strategies and tactics for adapting to weather changes, both short term and long term
- Storm water recapture systems/filter marshes and other methods to collect, treat, and store storm water for use by downstream users
- Improving effectiveness of water use technologies, including irrigation
- Increasing water supplies through watershed management techniques such as re-establishment of native plant species at appropriate densities where prior mismanagement has impaired recharge areas
- Decision making processes and analytical models that increase collaboration among water users
- Education and involvement of public officials and the public at large
- Laws that impede efficient development and use of water

Many other areas for potential research could produce significant benefits. This list is not meant to be exhaustive, but only to call on interested stakeholders to support additional research focused on augmenting and managing our water supplies.



# WATER RESOURCE STEWARDSHIP

## *Recommendations*

- ***Provide leadership and education on why agriculture needs reliable water supplies to provide for the greater community and contribute to our national security.***
- ***Collaborate with other water user groups to develop strategic water infrastructure and supply projects.***
- ***Advocate flexible policies that provide incentives to land owners who steward water resources.***
- ***Encourage better utilization of university, government, and private research capabilities in information gathering and analysis for continued water resource planning and policy development.***
- ***Increase research on shared benefits among water users.***



## PROBLEM STATEMENT:

*Who will address our water needs?*

### **Leadership, Cooperation, Research**

Agriculture is the biggest water user in most states, especially west of the Mississippi River. The special session participants recognized the responsibility of managing this enormous resource by designating water resource stewardship as one of three priority needs. The key components to stewardship are not only to maintain good management and conservation practices, but to also improve leadership, representation, and education on water issues.

The need for strong leadership and careful management could not be more critical. Regional conflicts emerge throughout the U.S. as shared water supplies fall short. These shortages have many faces. Increased urban water demands, parched crops and other symptoms of regional drought, fisheries affected by stream flow reductions, declining aquifers, water quality impairments, and many other problems create challenges for responsible water stewards.

Though there are a broad range of water users, the effects of water supply shortages usually fall first on agriculture and subsequently on consumers through higher prices. The sheer volume of water needed for agriculture exposes producers to all the water supply problems discussed above. Farms and ranches do not have the buffering provided by the extensive infrastructure (even with its limitations) available to cities. Agriculture's attempts to prepare against water shortages are often undermined by a lack of predictive tools. For example, after extensive flooding in areas and abundant rainfall across the northern Great Plains and mountain states in 2011, the drought of 2012 surprised weather forecasters and farmers alike.

The agricultural community, in part because of its unique perspective, can offer leadership in critical water resource planning. As a starting point, agriculture's leaders might forge constructive alliances with other water stewards. In the past, stewardship decisions such as the location, scope, design, and funding of infrastructure or allocation of water supplies were often limited to narrow groups of participants directly involved in a project. There is now a healthy trend of recruiting all relevant stakeholders when undertaking projects. This improved cooperation lends strength to shared values such as water rights protections, conservation, wise growth management, environmental protections, and aquatic and riparian habitat enhancement. Experience suggests that this cooperative approach creates greater decision costs, but reduces litigation and other costs of conflict and provides more comprehensive solutions. This in turn increases water use efficiency and gives opportunities to distribute project costs over a larger user base. These larger constituencies can also generate greater political energy and effectiveness at the local, state, and regional level.

## *Only agricultural producers can tell the whole story first hand and have both the knowledge base and the need to do so.*

On the other hand, unless water stewards combine efforts, we must expect that activists will drive policy decisions and exhaust resources that otherwise could be directed toward improving water supplies. Litigation brought under the citizen lawsuit provisions of the Clean Water Act, the Endangered Species Act, the National Environmental Policy Act, and other statutes do not increase water supplies.

Agricultural leaders have many forums in which to advocate improved water stewardship. Farmers and ranchers represent a great body of knowledge gained from formal education and their operational experience, but also from service on Soil Conservation District, irrigation district and other boards, and industry organizations. Associations formed in these groups can be used to network with other water stewards and improve collaboration. The leaders trained through these efforts can develop new governing structures in districts, regional authorities, and private enterprises. These can in turn develop effective multiple benefit projects.

To stimulate such opportunities, water stewards must demonstrate value for all participants. Suggestions include:

- Developing strategic alliances between agricultural groups and other stakeholders with common goals, including agricultural and conservation organizations, wildlife advocates, public land managers, and public water supply managers
- Educating water users and members of the public regarding water supply complexities, utilizing a wide range of forums
- Providing incentives for landowners to protect or enhance wetlands and water sources to ensure increased storage or sustained return flows
- Advocating flexible, incentive-based policies that compensate land owners for stewardship of water resources, such as conservation activities, wetlands enhancements, development of water powered energy sources, or improvement to public water supplies
- Creating opportunities for “payment for non-use” where special interest organizations, cities, or other users can invest in programs or facilities that help agricultural users reduce water utilization
- Educating the greater community that agriculture provides stewardship of flora and fauna, critical open space, and other natural resources, including areas where water recharge enters our aquifers, lakes, and streams

The agricultural community already provides these services in many instances. Otherwise, the taxpayer would have to do so through various levels of government and with uncertain results.



## Public Education and Involvement

The common assumption that “everyone knows what we know” clouds communication. “If only they knew what I know” is a variant of the same theme. Public education regarding water resource management and food production is greatly needed. The general public does not know what agriculture producers know in part because there is little incentive to know. Water and food are more abundant, cheaper, and convenient than at any time in human history. The vast majority of the U.S. population does not know what goes on beyond the water faucet and the grocery store. Only agricultural producers can tell the whole story first hand and have both the knowledge base and the need to do so. With only 2% of the U.S. population directly involved in production agriculture and only 1% in full-time farming, there needs to be a concerted effort to provide future generations the enhanced understanding of the social, economic, national security, and environmental benefits of agriculture and the stewardship required to preserve and grow these unique communities and eco-systems.

The need for public education arises in many settings. For example, demands from regulatory agencies, retailers, and others who would prescribe non-sustainable production practices must be met with information and sound science. Otherwise agricultural producers will be forced out of business. Loss of agricultural producers in the U.S. would export production to other countries and away from the soils and growing conditions that give the U.S. a competitive economic advantage and the most environmentally sound agricultural production. This loss would diminish the U.S.’s agricultural self sufficiency, increase costs and reduce food safety and security, both domestically and abroad.





Development of good policy in a democratic society first requires education of both stakeholders and the general public. The founders of our nation encouraged nothing less.

The distance between public understanding of agriculture and modern production realities might be described as either amusing or tragic. Media portrayals of agriculture are at least seriously outdated and may even be twisted by special interests.

Those agendas have succeeded in distracting from the underlying truth that agriculture is broad based and showcases a multitude of products, technologies, capabilities, and a strong sense of stewardship. Common images of the 1920's "Grandpa's farm," with a red barn, Model T Ford pickup, multiple species of domestic animals, muscle-powered farm equipment, and a laid-back lifestyle, are as incorrect in every detail as those of the rancher packing an open-sight Winchester rifle, living on the range, and coming to town only to visit the Long Branch saloon. We can do better by incorporating meaningful facts to consumers and voters, while retaining positive preconceptions.

One overriding message that should be presented to both public and water managers alike is that agriculture is on the front line of water issues. Metaphors have been applied such as "the canary in the coal mine," or "the point of the spear," but a key message is that when agriculture faces water problems, the effect on the public at large soon follows. The agriculture community will likely not be able to carry this message alone, but will need to recruit communications expertise and other stakeholders with related interests to improve:

- Public awareness through a more effective presentation of modern agriculture production
- Public education on the interaction between agriculture and the natural environment, with emphasis on the understanding that agriculture succeeds only by maintaining healthy ecosystems
- Education of policy makers and opinion leaders on the connections between water supplies, food production, and homeland security
- Water supply options dependent on the long-term viability and success of agriculture
- Private investment in land, water rights and permits, and related infrastructure essential to the well-being of society
- Decision makers' understanding that agriculture offers many of the most effective and least cost options for managing water supply and providing environmental benefits
- The amount of water available for all user groups by incentivizing stewardship, funding sound research and analysis, implementing improved technology, and expanding cooperation
- Work with other land and water stewards to sound the alarm using modern communication and marketing techniques focused on the key message points in the Water Supply section of this paper



# LONG-TERM WATER POLICY

## *Recommendations*

- *Include agricultural representatives in rule making and policy implementation to ensure inclusion of their perspective and needs, recognizing present and future agricultural uses as essential to water supply planning and public need.*
- *Support comprehensive, aquifer and basin-wide planning with local flexibility and implementation.*
- *Establish water policies that allow and encourage integrated, long-term planning and solutions.*
- *Advocate that water policies be developed in a “systems” context, addressing hydrologic characteristics, opportunities for cooperation, the optimal mix of private and public investment, existing and projected water use patterns (including crop rotations), etc.*
- *Water right owners must receive full market value compensation when water supplies are taken or impaired to meet public policy objectives.*
- *Support science based creation and enforcement of rules governing water use and management.*
- *Include water policy training in industry association programs.*
- *Reinforce the availability and predictability of long-term water rights and permits for agricultural uses, including banking of water rights for future food production expansions.*
- *Eliminate contradictory, overlapping, and punitive regulations.*
- *Participate in broad-based efforts to review and revise water policies at local, state, and national levels.*

## **PROBLEM STATEMENT:** *How will the needed changes be accomplished?*

The session participants identified water policy as the final and perhaps most emphatic of the three priorities. Much existing water policy was created in response to immediate issues without good science and without adequate consideration for long-term consequences on all stakeholders. This paper proposes that effective water policy must include: a) good contextual planning with collaboration among all responsible stakeholders; b) sound scientific research; c) accurate factual analyses; d) implementation consistent with policy; e) incentives aligned with agreed objectives; and f) effective dispute resolution processes. Policies should be developed against these guidelines; those not consistent with them should be reconsidered. Too many policy decisions have left a trail of conflict, obsolete infrastructure, and wasted resources. Such policies, whether at the local, state, or national level, threaten rather than protect water supplies.

### **Planning**

Nature does not care about political boundaries, party affiliation, or the next election. To the extent we base water decisions solely on politics rather than good contextual planning, we do so at peril to present and future needs, whether the planning is meant to produce infrastructure, policies, or management institutions. The powerful data collection, mapping, computer modeling, and decision support algorithms now available should compel investment in collection and analysis of data for use in planning. Such information is most useful when it is developed on an aquifer or basin wide scale to allow planning in a “systems” context, addresses the needs of multiple “consumers” including agriculture, urban users, and the environment, and recognizes water as a basic, essential resource. Such contextual planning facilitates inclusion among stakeholders and prioritization of needs. As noted, this approach can slow down and add expense to the decision making process, but in the long run reduces or eliminates errors, improves overall water supplies, and creates policies and projects that stand the test of time.







Experienced water users have seen planning and policy formulation fail due to focus on narrow or short-term issues without regard to long-term consequences. Planning also fails when governmental agencies issue sweeping mandates without funding or knowledge of local circumstances. Implementation of policy and projects often fail for the same reasons. Poor planning spawns aggressive competition instead of cooperation, stagnation instead of innovation, and narrowed instead of expansive solution development. Agricultural interests should increasingly join with non-agricultural users to foster good water planning and plan implementation. Agriculture is often not perceived as being innovative, but farmers and ranchers are resilient and innovative problem solvers who use their education, technical training, common sense, and experience to overcome challenges. Agriculture needs to be heard in planning circles and planners need to listen more to agriculture. It can well be said that our future depends on:

- Better water infrastructure planning, including present and future agriculture needs
- Long-term water supply planning, with future water allocations reserved for agriculture
- Recognition of effective results require aquifer and basin wide planning and inclusion of all stakeholders, with local implementation
- Education of planners and political leadership on the comprehensive benefits agriculture brings to all stakeholders
- Inclusion of incentives for all users to store, conserve, reuse, and trade water supplies as an essential element of all policy and infrastructure planning
- Protection of the underlying water rights and water permits and the investment they support

Future agricultural production requires that our nation minimize or reverse the gradual erosion of water allocations away from agricultural to urban and other uses. Urban planners often see water used in agriculture as a reservoir from which to draw water for future urban water demands. Agriculture must be recognized as a legitimate use essential to our economy and our national security.

Through knowledge gained in the past century and willingness to face the critical resource needs that lie ahead, our society should be able to make more accurate and effective decisions about land uses, economic benefits, and environmental systems. We can then promote cooperation among groups too often in conflict, such as policy makers and water users, planners and developers, agricultural users and municipalities, and environmental groups and industry.

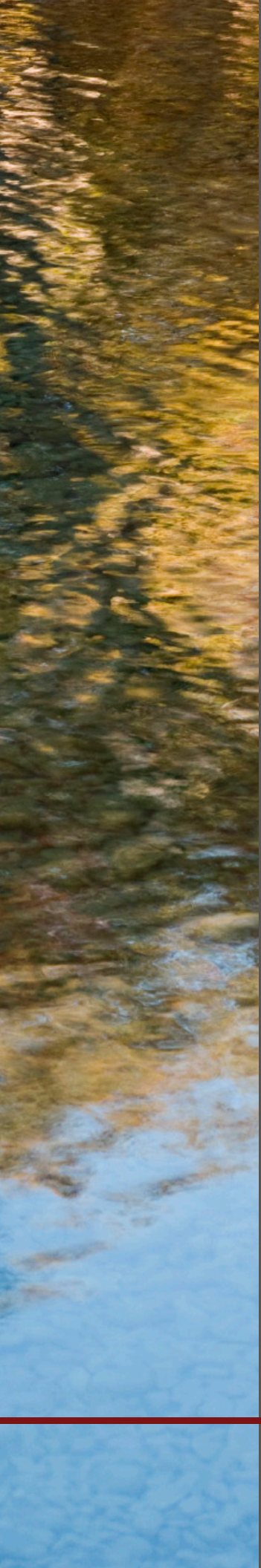
*Agricultural interest should increasingly join with non-agricultural users to foster good water planning*



## Alignment of Policy Objectives and Incentives

In the midst of their forward-looking and positive discussions, this group of agricultural producers expressed considerable frustration over the misalignment of policy and incentives. Water managers in agriculture and elsewhere universally promote conservation, but water right and water permitting agencies often punish water users who attempt conservation. Water supply agencies plead for additional funding for planning and infrastructure development, while they establish policies which virtually preclude private investment in or management of water infrastructure (except through purchase of municipal bonds). Citizen lawsuits brought by “environmentalists” block range and forest management practices that would allow restoration of natural vegetation and thereby increase water supplies. Many other examples were discussed.





The group proposed some creative recommendations to align water management objectives and incentives:

- Water rights and water permit agencies, in the experience of the participants, all impose a “beneficial use” requirement. This requirement is often described as “forfeiture” or “use it or lose it.” This backbone principle cannot be repealed or ignored, but it creates enormous disincentives to wise water use. Such requirements instead might be coupled with statutes to allow agricultural water users to file water use plans that would set aside water rights for future food production needs. The water permitting agency would be authorized to recognize such plans as a legitimate reason to hold a water allocation for future use rather than risk forfeiture. This concept could be taken one step further by paying for agricultural water to not be used to make water available for cities elsewhere in the river basin or aquifer. These combined policies would promote conservation, preserve water for future food production, and help farmers cooperate with cities to meet urban water demands. Such a system has been used very successfully by the Metropolitan Water District of Southern California.
- Water infrastructure has come to be largely constructed, financed, and operated by public agencies. Greater opportunity for direct private investment in water infrastructure would free critical public capital for other needs and would create opportunities for public/private partnerships. Similar ventures in renewable energy supplies have received significant tax incentives and mandates, even though the economic feasibility and science of many such technologies are still in doubt. The science and feasibility of water infrastructure are not in doubt. Such investment might be facilitated by:
  - Changes in rules that streamline regulatory processes and encourage investment from private sources into new and innovative infrastructure
  - Financial incentives and cost sharing for projects with natural resource benefits
  - Recreation fees on reservoirs or water storage areas, with public liability protections for reservoir operators who allow public use
  - Allowing surcharges for incorporating renewable energy (such as hydroelectric) into new infrastructure

When public sector financing is needed, especially for projects in water basins that cross state lines, federal funding could play a constructive role. Revolving loan programs have proven to be especially effective in the federal-state funding arrangements. This approach takes advantage of the more efficient state and local management of infrastructure construction, maintenance, and improvements, while using more efficient federal funding.

Landowners should be encouraged to implement innovative approaches to our water supply and quality challenges, and to seek shared solutions.

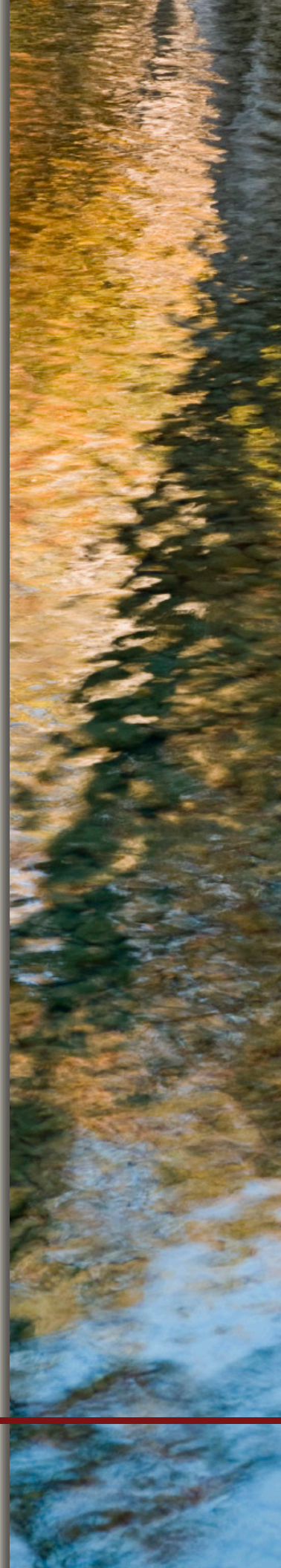


## Water Policy and Regulatory Change

The discussions highlighted the disjointed nature of water policy and the need for alignment of practice with purpose. The participants described many instances where innovative opportunities were precluded by old regulatory mindsets, regulations that blocked landowners from investing capital in water resources, and poor decisions made when more research was needed to understand real issues or opportunities. The participants recognized need for legitimate enforcement of science based rules because such rules provide guidance and predictability, but they also opposed inconsistent, overlapping, and overreaching regulations. Among the many challenges and recommendations discussed, these were highlighted:

- Water policies need to be developed in a “systems” context, with water being recognized as a key resource
- Regulations must be competently weighed by knowledgeable representatives of all interests, rather than a confrontational format that pits wildlife protection against agriculture, development over conservation, or water quality over water quantity
- Regulations that discourage innovation in areas such as re-use or conservation must be eliminated or modified
- Private investment in infrastructure must be allowed
- Land use decisions must consider the consequences on water and create value for good stewardship of the land and water resources
- Water planning must recognize that hydrologic systems seldom follow political boundaries

The long-term stability of water rights and permits surfaced in every part of the discussion, along with the related topic of protecting investments in infrastructure. Increases in cost and uncertainty have long-term effects. Huge investments in land improvements, irrigation systems and other infrastructure, transportation, food processing, distribution, marketing, and financial systems all tie back to relatively small investments in water rights and permits. State laws tightly control water right and water permit ownership. Local ordinances, state statutes, and federal statutes and regulations all influence how water moved from natural sources to crops, to harvest, and finally to our food supply. Any impairment of water rights or water permit ownership shakes the foundation of our food and fiber supply.



Water rights holders described a long list of policies that limit or diminish agricultural water supplies:

- Cities reaching out to acquire water by purchase or condemnation
- Reallocation of water to instream flows for fish and other aquatic species at the expense of agriculture
- Cutbacks to agriculture and other users to provide water for Endangered Species Act (ESA) recovery plans
- Clean Water Act limitations such as Numeric Nutrient Standards and limitations on trans-basin diversions
- Tribal reserved water rights claims
- Water rights or water permit forfeiture for nonuse without allowance for crop rotations, changes in husbandry practices, etc.
- Denial of permit renewals in favor of allocating water supplies to uses deemed to have higher social utility (e.g., landscape irrigation)
- Curtailments on water extractions or diversions due to over-appropriation
- Land use (zoning restrictions) and extraction limitations for areas within drinking water source protection areas
- Mineral extraction activities interfering with water sources

Long-term rights/permits are critical to encourage the investment in technology, infrastructure and innovation whether the water is used for agriculture or other uses, including use by public agencies. In instances where water rights or permits are moved to other uses, the market place provides an effective transfer mechanism through willing seller and willing buyer. When eminent domain (condemnation) powers are used, compensation is not fair and reasonable without accounting for the full effect of losing the critical water resource.



*Photo by: David Stoecklein*



Finally, the participants joined with many who advocate limits to federal regulatory reach (e.g., EPA, ESA, Clean Water Act, executive orders, etc.) to ensure that new regulations are properly promulgated, fully supported by objective data and analysis, and developed with a full understanding of the social, economic, employment, environmental, and industry effects. Many burdensome, duplicative, or punitive regulations that actually impede sound water policy can only be described as government agency activism. One symptom of activism is the spectacle of one level of government imposing fines upon or bringing litigation against another level, creating the sheer madness of government agents spending limited fiscal and human resources, fighting each other at the citizens' expense, rather than using these resources to address water supply problems. Other actions that can best be described as activism include:

- Implementing rules through litigation settlements without public input, meaningful data and analysis, or without regard to the economic consequences on cities, utilities, and agricultural operations.
- Utilizing the Endangered Species Act to compromise well-considered state water policies, thereby imposing unnecessary effects on state and local governments and private landowners.
- The Environmental Protection Agency and Army Corps of Engineers' utilization of "guidance" (not subject to rulemaking procedures) to create broad-reaching shifts of power from the states to the federal government. This is the case with proposed guidance declaring jurisdiction over virtually all water features in derogation of United States Supreme Court opinions.

The agricultural community must become more engaged in the policy making arena to ensure inclusion of agriculture's unique perspective during the drafting and implementation of policy, including enforcement. This may require:

- Increased recruitment of agricultural landowners to consider public service in elected or appointed office
- Renewed efforts to acquaint elected officials with the numerous benefits of agriculture
- Active participation in rule drafting and regulatory implementation
- Holding elected officials accountable for rules that are duplicative, over-reaching, or unnecessarily burdensome
- Ensuring that agency rules and policies are established through transparent rulemaking processes

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# CONCLUSION

Our nation cannot exist without agriculture and agriculture cannot exist without dependable and affordable water supplies. Our agricultural industry supplies essential food, fuel, and fiber; provides open space; protects natural resources; forms the foundation of a thriving economy; supports vibrant urban and rural communities; furnishes wildlife habitat; and serves as a motivated and experienced land steward. If competition for limited water resources harms agriculture, then society as a whole suffers consequences as measured by scarcity, increased costs to consumers, and increased dependence on foreign food sources with the attendant risks to our national security. Many organizations predict that wars will be fought over water supplies in the near future. In light of all this, national security concerns regarding food and water deserve thoughtful consideration.

The telling of this story belongs to the agriculturalist, those 2% of the American population who actually manage soil and water, whether as farmer or rancher. They, more than anyone, have the opportunity to stand in the quiet landscapes where one can virtually hear the Earth breathe and there gain needed perspective. The urban dweller, whose very existence depends on the agricultural producer's ability to manage the brunt of Mother Nature's most severe challenges, whether expressed as drought, blizzard, or swarming insects, might be excused from knowing the story unless it is told and told well. Those who are not on the front lines of these battles do not know how close the contest has become. Hence, the agricultural producer must not only have a seat at the water policy table, but also fulfill the responsibilities that come with that role.

Those who prepared this paper firmly believe that our nation's current water policies do not adequately allow for the water supply, infrastructure, and stewardship required to support the agricultural community, much less an economically balanced, secure, and environmentally sound nation. The agricultural community knows the perils of bad policy and that we cannot wait for others to provide timely solutions. Wise, creative, cooperative, and practical solutions that assure water supplies are desperately needed and are needed very soon. But this nation has the people who can provide direction and who will take action. This document is presented to help provide positive direction and a blueprint for constructive action.



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*Agricultural Water:* Protecting the Future of Our Nation

Agricultural White Paper  
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