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Finding Solutions with Competing Uses in Agriculture and Natural Resources: Report from the Texas Water Summit

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Introduction

The Texas Water Summit: Focusing on Water for Agriculture and Natural Resources, held November 5-6, 2003, in Austin, was organized to seek creative solutions to the challenges of managing scarce water resources in the face of increasingly competitive water demands. This event is the latest in a series of programs conducted through the Texas Agricultural and Natural Resources Summit Initiative, an apolitical forum for the discussion of the critical issues affecting Texas' food, fiber, and natural resource systems. This presentation describes the Summit Initiative and its role in facilitating stakeholder input into critical public policy concerns. This is followed by a summary of the outcomes of the Texas Water Summit and its implications for research and educational programming targeted at complex water resource issues.

The Texas Agricultural and Natural Resources Summit Initiative

The Texas Agricultural and Natural Resources Summit Initiative is an apolitical forum whose mission is to identify and resolve high-priority issues facing Texas agriculture and natural resources. Since 1993, when the first Summit was held on the Texas A&M University campus, the Initiative has organized at least one Summit per year. The issues addressed have included food quality and safety, environment and natural resource policy, the 1996 Farm Bill, rice farming, agricultural finance and risk management, forestry, biotechnology, and international trade.

The leadership and vision for the Summit Initiative is provided by the Summit Executive Committee, which emphasizes the need to involve all stakeholders in the resolution of issues. Coordination and staff support is provided by the agriculture programs of the Texas A&M University System and Texas Tech University. Financial support has been provided by a variety of sponsors including the Houston Livestock Show and Rodeo. Additional information about past Summits and future plans is available at <http://agsummit.tamu.edu>.

The Summit Initiative as Public Policy Education

As the issues facing agriculture and natural resource stakeholders become more complex, new approaches are needed to bring together those individuals and groups who are likely to be most affected. The Summit Initiative serves as a process for bringing these diverse interests to the table to learn about, to discuss, and to begin the process of seeking resolution to these concerns. The development of the Summit Initiative has paralleled the organization of the Agricultural Issues Center at the University of California - Davis (Nuckton et al. 1992).

The Summit Initiative process, as illustrated in Figure 1, begins with the identification of the key issue for the next Summit. The issue or theme, on which the Summit will focus, is chosen by the Summit Executive Committee based on several considerations. These include opinions and values expressed by interest groups and policy makers, media coverage, inputs from the universities and state agencies, and the state of our scientific knowledge.

Once the key issue or theme has been identified, the next phase of the process is to compile what is known about the issue. This background information is summarized in a publication that clearly explains the issues in an easy-to-read fashion. That publication is made

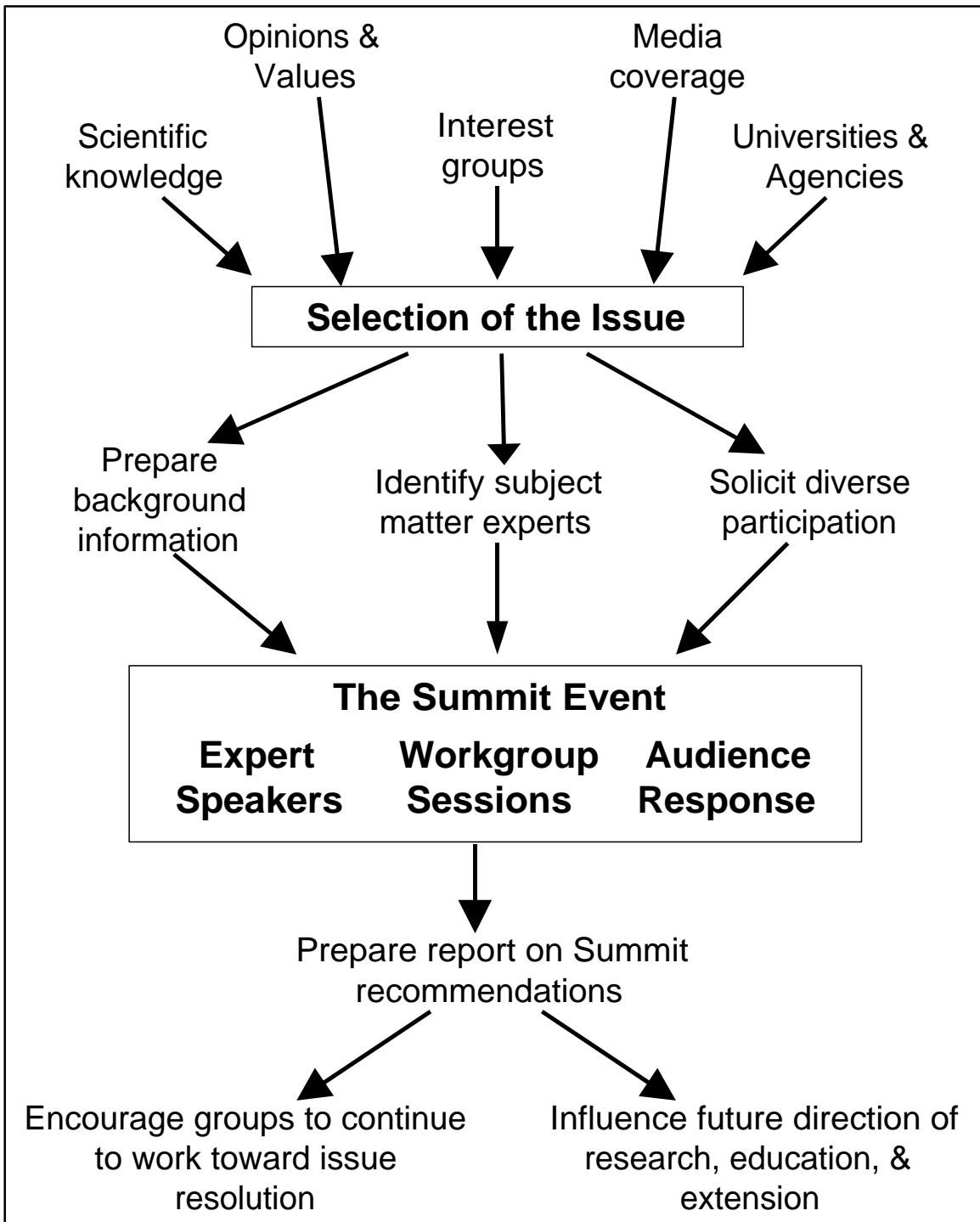


Figure 1. Addressing Critical Issues through the Summit Initiative Process.

available to the Summit participants in advance of the event. At the same time, subject matter experts are identified to make presentations at the Summit, and diverse participation is solicited to assure that all aspects of the issue are considered.

The Summit event is usually planned for 1½ to 2 days with the time equally divided between presentations by the experts and discussion and workgroup sessions involving the participants. The active participation of those attending is crucial to the success of the process. The participants are divided into three to five workgroups. Each workgroup is led by a chair, who reports back to the total group in the closing session and an experienced facilitator, while a recorder prepares the input to the final report.

Following the Summit, a report is prepared that summarizes the findings and recommendations of the workgroups. Copies of this report are distributed to the participants and to key policy makers, agency heads, industry leaders, and the public. The objective is to encourage groups to continue to work toward the resolution of the issue long after the Summit has concluded. Experience also shows that the Summit Initiative has influenced the directions of university research, education, and extension programs.

Based on our experiences with the Texas Summit Initiative, the following appear to be the keys to the success that we have experienced:

- The Summits have been planned to focus on timely high-priority issues.
- The organizers have worked to involve a broad spectrum of participants from all sides of the issue.
- The participants have been provided background information relevant to the issue.
- The Summit events have been conducted as participatory working sessions with facilitators.
- Efforts are made to communicate Summit recommendations to university leaders, policymakers, and the public so that Summit findings can be acted upon.

The Summit process is not intended to resolve the issues. That would be an ideal, but not a realistic, expectation. As Nuckton, Carter, and Cleaves (1992) conclude, “The model succeeds, however, in bringing together [the] expertise to increase public knowledge regarding complex, multidimensional policy issues.”

Water Issues in Texas

Achieving consensus about water issues (and other natural resources concerns) is one of the biggest challenges facing policy makers and resource managers in Texas. This process is complicated by the different sources and types of water, the amount of water, and the quality of water from one region of Texas to another (Figure 2). Despite this variety of circumstances, there is one constant—most regions of the State face limited water supplies to meet growing water needs.

Across Texas, water planning agencies, researchers, and the public all agree that providing water for agriculture, cities, industries, and recreation, while protecting the environment, will require tough choices in the years ahead (Figure 3). By the year 2050, the Texas Water Development Board (TWDB) anticipates the following scenarios:

- Total statewide water demands will rise by 18% to more than 20 million acre-feet.
- The amount of water available from currently existing sources is expected to drop by 19% to less than 15 million acre-feet.

- Roughly, 38% of Texas cities and other water user groups will likely be unable to meet water needs during droughts without the development of better conservation strategies.
- Agriculture is now the biggest user of freshwater in Texas, but irrigation water demand will decline by 12%, from 9.7 to 8.5 million acre-feet per year by 2050.
- Because of over-pumping and water quality concerns, groundwater supplies will not be able to meet the needs of some agricultural and urban areas.
- Only eight new major dams and reservoirs are proposed. Less than 25% of surface water supplies are projected to be supplied from these new reservoirs.

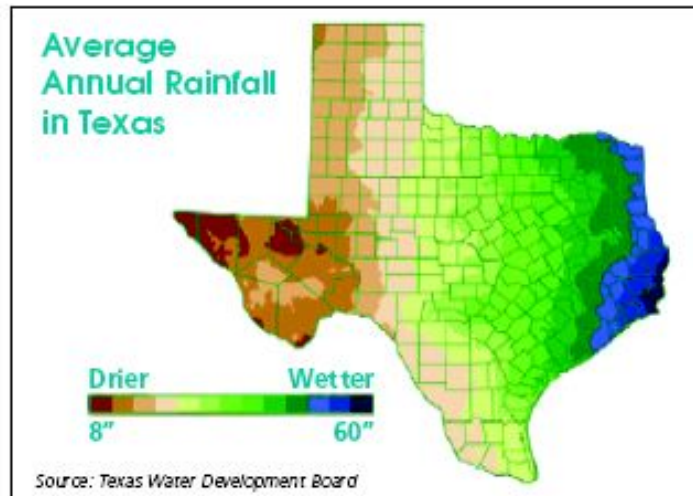


Figure 2. Average Annual Rainfall in Texas.

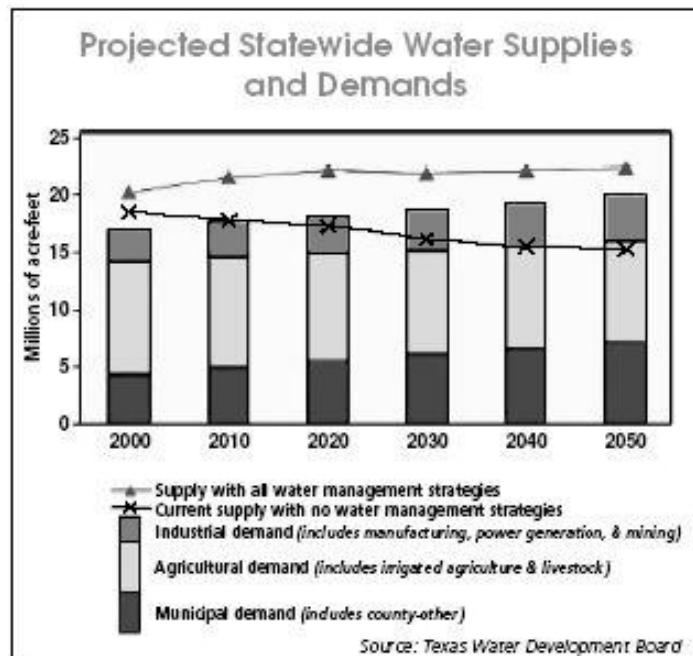


Figure 3. Projected Statewide Water Supplies and Demands.

Beginning in 1997, TWDB (the state agency charged with water resources planning), encouraged more widespread public participation and feedback by requiring that planning committees in each of 16 geographic regions identify future water needs and then develop programs or strategies to meet these demands. These regional planning groups identified several innovative strategies to help meet their water needs over the next 50 years (Kaiser et al. 2000).

More recently, the Texas Legislature expanded the regional water planning process. It now requires planning groups to consider water conservation practices and strategies, especially if water transfers are proposed that may affect their region. These changes require planning groups to more fully evaluate the effects of water plans on environmental water needs.

During the 2001 session, the Texas Legislature passed Senate Bill 2, creating a special study commission to develop policy recommendations for protecting freshwater flows in rivers and into bays and estuaries.

To meet these water resources challenges, it will be necessary to draw upon the best resources from higher education, government agencies, the private sector, and interested citizens. By encouraging information sharing and working together, we have the best chance of succeeding at solving these highly complex issues. Three of the most-pressing water resources issues Texas must address include (1) meeting future water demands, (2) water markets and transfer policies, and (3) instream flows for environmental purposes.

Meeting Future Water Demands. The ways in which we meet increased water demands will affect various water users in different ways. For example, a city might meet its water shortfall by acquiring water rights and water supplies from nearby farmers. Alternatively, encouraging water conservation in agriculture by lining canals, purchasing more efficient irrigation systems, and other means might allow farmers to keep the water they need for irrigation while freeing up water for non-agricultural needs.

Water Markets and Transfers. Similarly, water transfers and water marketing have the potential to greatly affect irrigation supplies and agriculture. While water marketing (transferring water from one region to another) is often suggested as one way to solve urban water problems, many experts recognize that much of the exported water will come from agriculture or at the expense of streamflows. While water marketing may represent a short-term, economic shot in the arm for agriculture, it will be crucial to assess the extent to which transfers lessen waters supplies needed for agriculture. The effect of transfers on the environment and the rural economy must be assessed.

Environmental Flows. Providing flows sufficient to protect the environmental quality and habitat of rivers, bays, and estuaries is becoming especially challenging as overall water demands increase. The combined impacts of reservoir development and increased upstream water use make it harder to assure that streamflows will be adequate to sustain the environment. Still, it is critically important to maintain flows in aquatic ecosystems to protect water quality, prevent erosion, provide nutrients and sediments, and support fish and other aquatic species. Texas is nationally recognized for efforts to evaluate the instream flow needs of its waters. Studies have been done to examine the optimal levels of flows needed in bays and estuaries, and investigations are now being conducted to assess the streamflow needs of river systems.

Organizing the Water Summit

Planning for the Water Summit began in late 2002 with the formation of a planning committee. The initial goal was to identify the critical water resources issues facing agriculture and natural resources that needed to be addressed through the Summit framework. Then on

November 5-6, 2003, more than 300 stakeholders with a keen interest in water resources issues met in Austin, Texas to participate in the Texas Water Summit. They learned about, discussed, and recommended resolutions to these issues. The Summit focused on three main themes: meeting future water demands, water marketing and transfers, and environmental flows.

The Summit provided an outstanding opportunity for attendees to hear presentations from some of the most prominent scientists, water managers, and policy makers from Texas and elsewhere. A special report entitled, "Water for Texas: Increasing Demand, Tough Choices," was prepared for the participants to provide background information on these water issues. It was distributed to those who registered for the Summit in advance of the conference and was made available at the conference. The Water Summit also showcased outstanding graduate student research in water resources from universities throughout Texas through a poster competition. The posters can be viewed at <http://twri.tamu.edu>.

Presentations by scientists and other experts provided the information and frame of reference for the work group deliberations. The Summit agenda is available at http://agsummit.tamu.edu/water_summit/water_final.htm. The significant aspect of this conference, however, was the opportunity for the participants to provide feedback regarding Texas' most important water resources issues, as well as to offer recommendations about what needs to be done to resolve these concerns.

The Summit participants were randomly assigned to one of four work groups to develop recommendations to respond to the major themes of the conference. Within each work group, participants nominated policy and strategy options. Once all the nominated policy and strategy options had been articulated and recorded, nominal group technique methods (Cooper 1996 and Sample 1984) were used to vote and reach a consensus within each group about the most-important issues. The nominal group technique encourages group members to discuss and clarify all the ideas that are presented. Several votes are then taken to allow the group to decide which issues are the highest priorities. In some cases, groups may have decided to identify how recommendations and measures should be implemented, but this was not consistently done by all groups.

Recommendations from the Water Summit

Each of the four workgroups produced an extensive list of recommendations. The highest priority recommendations are shown below and are organized according the three themes of the Summit: meeting future water demands, water marketing and transfers, and environmental flows. These elements provide a framework for developing an action plan for managing Texas water resources.

Meeting Future Water Demands

- 1. Increasing Water Conservation.** A common theme addressed by many participants is that conservation and reuse, as well as efforts that create additional water supplies by tapping sources of water that are not now widely used, are an important strategy for meeting future water demands. Summit participants suggested that synergistic partnerships should be developed between agricultural, urban, and environmental partners to support and implement these water conservation efforts.

Participants suggested that more funding should be made available for state and regional water planning activities, especially the development and implementation of conservation plans and water audits. Funding is needed to improve the infrastructure and facilitate full-scale conservation and reuse programs. The use of improved landscape and agricultural irrigation technologies and strategies were identified as a key measure to meet future water needs. Thorough economic analyses are needed to assess the costs and benefits of these measures.

Several participants recommended that conservation planning continue to be a regional activity, with “grass roots” decisions being made at the local level. Summit participants suggested that the Water Conservation Task Force (created by the Texas Legislature in 2003) should be utilized to develop recommendations and standards for acceptable losses in water distribution systems and best management practices for water conservation.

2. **Developing New Sources of Water.** Summit participants suggested that renewed efforts be undertaken to develop new sources of water. This includes such measures as desalination of coastal and inland waters and brackish ground and surface waters; treatment of impaired waters (including oilfield-produced brines) for reuse; brush control to increase flows; conjunctive management of surface and ground waters; systems management of groups of reservoirs; weather modification; and the capture of atmospheric moisture. Some participants suggested that the capture of excess floodwaters (defined here as river flows that are greater than identified ecological needs of bays and estuaries) could be a method to develop new water sources. However, this option may not be acceptable to those who believe that bay and estuary systems should receive all floodwaters to provide the greatest ecological benefits.
3. **Expanding Educational Programs.** Educational programming was recommended as an essential step in meeting future water demands through conservation. Measures identified by participants include water education programs for schoolchildren and adults, demonstration and outreach efforts, and training water managers in new conservation techniques.

Water Markets and Transfers

1. **Assessing Third Party Impacts.** Summit participants cautioned that water marketing and transfer initiatives must include assessments of the unintended third-party impacts and consequences for exporting region. This may include determining if and how compensation should be provided to specific groups in the basins of origin.
2. **Evaluating Economic, Environmental, and Societal Impacts.** Summit participants recommended that comprehensive computer models be developed to examine the economic, environmental, and societal impacts of water transfers. Participants suggested that more information on water markets and transfers (specifically data on the excess amounts of water that are available from aquifers and stream segments) should be developed for decision making. In particular, Summit participants urged that the merits of

exporting waters from one region to another should be compared to the benefits of other measures to meet future water demands on a case-by-case basis.

- 3. Considering Related Policy Issues.** Several policy issues associated with water markets and transfers need to be studied. Some of the areas that most need to be investigated include examining how junior water rights might be affected by interbasin water transfers. The impact of the right-of-capture rule on groundwater transfers should be reviewed. Summit participants suggested that policy recommendations be developed and submitted to the Texas Legislature, addressing such issues as the regulation of groundwater transfers (including whether or not groundwater marketing rules should be consistent throughout the State) and requirements for comprehensive assessments of all proposed water transfers before they are approved.

Environmental Flows

- 1. Identifying Instream Flow Needs.** Participants emphasized the importance of sound science (including reliable data-gathering and monitoring activities) to accurately and objectively identify instream flow needs. Participants suggested that issues regarding instream flows should be examined from a broad perspective—including the complex relationships between the volume of streamflows and water quality, as well as the unintended effects of upstream conservation and reuse programs on flows in rivers and streams.
- 2. Developing Appropriate Regulations.** Regulatory and legal structures should be reconsidered for guiding the processes of identifying, permitting, and implementing management plans for environmental instream flows. A major challenge identified by participants was the need to balance environmental flow needs with agricultural and urban water demands.
- 3. Market-Based Strategies.** Participants recommended developing and assessing alternative market-based policies and strategies to provide environmental instream flows while recognizing the needs of urban and agricultural water users. Participants suggested that programs could be developed that increase conservation and provide a portion of the saved water for environmental purposes. Other strategies identified by participants include improved floodplain management and the possible capture of excess flood waters to provide instream flows.

Conclusion

Water is not a new problem in Texas. During certain seasons and in certain parts of the State, heavy rains and runoff can produce abundant supplies water—even flooding. More typically, however, water is scarce in much of the State. Increasing water demands throughout Texas are making it much more challenging to satisfy all the water needs of agriculture, urban areas, and the environment. Creative approaches are needed to develop strategies and policies to respond to these issues.

The stakes are high. The bottom line is that the way in which Texas resolves its water resources has important implications for the economic development of the State and the

preservation of its natural resources. The outcomes of this Summit will provide a valuable starting point that can focus efforts that agencies and organizations may want to consider as they develop strategies to address Texas' water needs.

The recommendations of this Summit emphasize the importance of planning, and support the regional planning process that was initiated by the State Legislature, implemented by TWDB, and carried out by regional planning groups. These results will be forwarded to the Governor, leaders in State and Federal government, regional water resources managers, and stakeholder groups for their consideration.

We learned during the Summit that the issues related to the management of surface water and ground water are closely related. We were reminded there are no easy solutions. The hydrological and the socioeconomic and political inter-relationships are complex. Research and education are needed to better understand these relationships.

The Summit provides an ongoing way to educate and engage stakeholders and policy-makers in pressing natural resources concerns. The process provides a meaningful way for participants to speak out and become actively involved in seeking solutions to these issues. At the same time, the Summit process allows university leaders to keep in touch with their key constituents and learn what they believe are the most vital concerns.

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