

Water for People and the Environment

A Regional Conference for South Central Texas

Sponsored by the Lone Star Chapter of the Sierra Club, in partnership with
Bexar County Audubon Society
Christian Life Commission
Environmental Defense
League of Women Voters of Texas of San Antonio
League of Women Voters of Texas of San Marcos
League of Women Voters of Texas
National Wildlife Federation
Pro-Tex Network for a Progressive Texas
San Antonio Peace Center
Socially Responsible Investment Coalition
Smart Growth Coalition San Antonio
Texas Committee on Natural Resources
Texas Impact
Texas Wildlife Association

*Generous Support of this Conference, a part of the Living Waters Project,
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The Houston Endowment, Inc.
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Magnolia Charitable Trust

PROCEEDINGS
San Marcos Conference “Water for People and the Environment”
October 12, 2002

Welcome: Andrew Sansom, International Institute for Sustainable Water Resources, Southwest Texas State University

Andrew Sansom is Executive Director of the International Institute for Sustainable Water Resources at Southwest Texas State University. Sansom served for more than a decade as Executive Director of the Texas Parks and Wildlife Department and prior to that as Executive Director of the Texas Nature Conservancy. He has published two books on conservation in Texas along with numerous articles in Texas Monthly, Texas Highways, Texas Parks and Wildlife, The Texas Observer and Politics Today. He is currently directing watershed research in the Rio Grande, Guadalupe, and Colorado River Basins.

There are three major natural resource issues in Texas

1. Expand public lands
2. Work with private landowners to preserve wildlife habitat and accomplish other important natural resource goals
3. Address our state’s water need for human beings and the environment

Overview: Ken Kramer, Chapter Director, Lone Star Chapter, Sierra Club

Ken Kramer, PhD. has been director of the Lone Star Chapter of the Sierra Club since 1989. Kramer has served on an LCRA advisory committee in the development of its water management plan and was a stakeholder in the TWDB's process for developing recommendations for the state water plan. He holds a Ph.d. in political science from Rice University and a B.A. in history from Texas Lutheran University.

This conference is an activity of the Texas Living Waters Project. The project partners include National Wildlife Federation, Environmental Defense and the Lone Star Chapter of the Sierra Club. The funders of the Project include The Houston Endowment, Inc.; The Meadows Foundation; The Brown Foundation, Inc.; The Jacob and Terese Hershey Foundation; and Magnolia Charitable Trust.

The goals of the Texas Living Waters Project include:

- 1.Ensure adequate water for people and environmental needs
2. Reduce future demand for water and foster efficient and sustainable use of current water supply
- 3.Educate public and decision makers about the impact of wasteful water use and the opportunities for water conservation
4. Involve citizens in the decision making process for water management.

Public Outreach activities of the Project include:

1. Statewide and regional water conferences
2. National Wildlife Federation Video – “Water for Life” is available at <http://www.texaswatermatters.org/>
3. Presentations to organizations (contact Erin or Jennifer at 512/477-1729 to set up a date)
4. Educational materials

The context of the Project and this Conference include:

1. a focus on Texas
2. a focus on water quantity
3. a linkage to state and regional water planning

Getting Serious about Water Conservation in South Central Texas: Saving Money and Saving Water for Fish and Wildlife (Part1)

Moderator: Carole Baker, Harris-Galveston Coastal Subsidence District

**Mary Ann Dickinson, California Urban Water Conservation Council
“Getting the Most Out of Conservation – Best Management Practices”**

Mary Ann Dickinson is Executive Director of the California Urban Water Conservation Council, a non-profit organization composed of over 293 urban water supply agencies, environmental groups, and other entities interested in water conservation. Previously she worked for the Metropolitan Water District of Southern California, the South Central Connecticut Regional Water Authority, and the Connecticut Department of Environmental Protection. A graduate of the University of Connecticut with a degree in environmental and natural resources planning, she has authored numerous publications on water conservation and land use planning, and has co-produced two films. She is past Chair of the American Water Works Association Water Conservation Division and currently serves on California’s State Water Plan Advisory Committee.

Since 1950, total US freshwater withdrawals have tripled. Texas and California are withdrawing more freshwater resources than any other state. The water situation in California has many parallels to the situation in Texas. Due to federal laws, there have been no new on-stream construction projects and very few off-stream projects in order to procure new sources of water. Therefore water conservation has become a powerful tool. During drought, good planning provides short-term relief. Planning helps lessen the gap between water demand and available supply. Through water conservation you can defer capital expenditures such as water treatment plants and wastewater facilities. Over 15 states have conservation programs in place. There are federal incentives to implementing conservation programs.



Interbasin transfers are a disaster. The environmental impacts last forever. California has been paying for the environmental impacts of their water transfers and will be for much longer.

The American Water Works Association did a study of how much water can be saved in an average household through conservation. Households that participated in conservation programs realized a 30% savings. This is dependable water that a supplier can count on. These water savings can be used to flatten peak demand in order to reduce need for water supply and treatment, satisfy new demands from population growth, and build lake efficiency with “saved” water. These water savings also have environmental value. They facilitate maintaining habitat along rivers and streams. They help restore fisheries with increased flows. They protect groundwater from excessive depletion and contamination. Efficient water use also reduces the volume of wastewater discharge, reduces excessive runoff from urban contaminants, and restores the natural values and functions of wetlands.

California has “Urban Water Management Plans” which are similar to those required under SB1 in Texas. These are required every 5 years from water suppliers with 3,000 connections or that supply over 3,000 AFY (an acre-foot of water is equal to approximately 32,000 gallons – enough water to flood one acre of land to the depth of one foot). These plans must examine water conservation, best management practices and water reuse as alternative sources of water supply. These plans must be completed in order to receive state funding for projects. *The water suppliers have signed a Memorandum of Understanding with water agencies and environmental groups to make a good faith effort to implement the best management practices that are cost effective.* Through this process, the California Urban Water Conservation Council was created in order to oversee conservation. They have come up with 14 state of the art conservation programs known as “best management practices”. The costs of implementing these programs are typically \$0.46 to \$1.40 per 1000 gallons of water. Utilities typically spend more than this on new supplies.

The council assists water suppliers and agencies through research, technical assistance, legislative advocacy, pre-qualifying consultants, facilitating group bulk purchasing, consumer materials and gathering data on conservation for state and federal agencies.

Website: www.h2ouse.org

Selected Questions and Answers

Q: Will conservation make up for increases in demands?

A: Conservation won’t cover all future water needs, but will significantly help. There will be a shortfall and additional storage will be necessary.

Q: Are there any incentives for homebuilders for rainwater harvesting?

A: No, in California it is illegal because of water rights issues. (There is a concern that capturing rainwater will reduce runoff going into streams and thereby reduce water availability in those streams.)

Getting Serious about Water Conservation in South Central Texas: Saving Money and Saving Water for Fish and Wildlife (Part2)

Moderator: Tony Gregg, City of Austin

Norman Johns, National Wildlife Federation

“Avoiding Costly Water Projects Through Conservation”

Norman Johns, PhD. is Water Resources Scientist for the National Wildlife Federation Gulf States Regional Office. He has analyzed water resource issues while working in Texas government, university, and private settings for the past 15 years. His topical areas of expertise include hydrology, water supply planning, surface water rights, surface water quality protection, and groundwater hydrology.

There are three issue areas in water conservation.

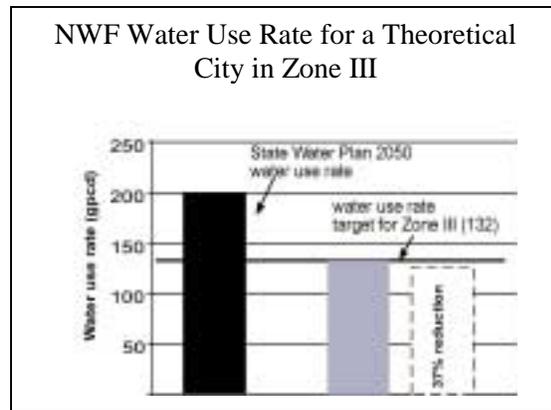
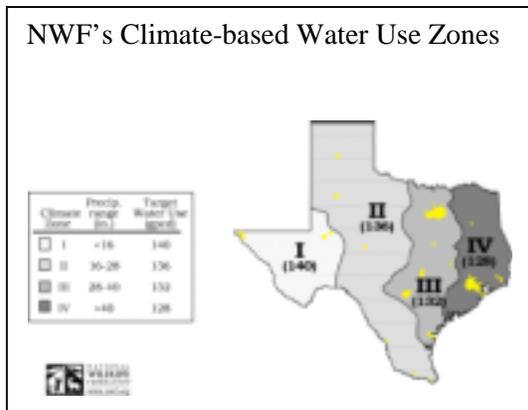
- Programs – measures to save water
- Policy – legislation and rule changes
- Potential – how much we can save

This talk focuses on the potential for water saving assuming that the programs and policy will fall in to place.

Texas' population is expected to double to 40 million people in the next 50 years. All water use categories are projected to go up on a statewide basis except for agricultural use. According to the state water plan, municipal growth statewide is expected to consume 2.9 million acre-feet per year, which equals 1,788 Astrodomes full of water per year. This is just the NEW growth over the next 50 years. Municipal Demand growth is enormous. There are 8 proposed major reservoirs in the state water plan which would supply 1.1 million AFY worth of water. A whole bevy of pipelines are proposed as well. Some pipelines are to transfer water from reservoirs and some are for interbasin transfers. Pipelines are extremely costly and environmentally destructive.

It is simple to figure out how much water we will need in the future to satisfy demands. In order to get projected water demand, multiply demand per person by population. The problem is that the State Water Plan assumed inflated per person water usage numbers to calculate their general water demands. This started the whole planning process off with inflated demand numbers. There are incredibly variable water usage rates across the state.

The National Wildlife Federation (NWF) studied the potential for water conservation by first dividing the state into four climatic zones based upon precipitation. In the study NWF based the potential water savings on water savings that resulted from water conservation measures implemented by El Paso and San Antonio. Both these cities are great examples of what can be done with water conservation. These cities have reduced their water usage by about 37%. We looked at water usage rates for other major municipal water suppliers in Texas and applied a 37% reduction to those cities (no city is expected to do more conservation than SA and EP have demonstrated is possible) and looked at how much water could be saved through conservation. Statewide, the 37% water reduction comes out to just over a million AFY saved through conservation.



Statewide a 37% reduction in water use would result in an additional savings of 1.048 million acre-feet per year (133 to 341 billion gallons/year). These are extremely significant savings compared to the 1.116 million acre-feet per year of water supply that would be developed with the proposed eight major dams in the State Water Plan costing multiple billions of dollars. Substituting conservation programs for dam or other project construction would also result in cost savings since such programs are proving to be one of the least costly water supply alternatives.

Bill Hoffman, City of Austin
“Big Savings – Industrial Conservation and Retrofits”

Bill Hoffman has been active in the field of water conservation and water reuse for over three decades. He is former Assistant Director for Water Resource Planning with the Texas Water Development Board where he was specifically over water conservation, water reuse and alternate water resources (such as rainwater harvesting) programs. He is currently Coordinator of Industrial and Commercial Water Conservation Programs for the City of Austin. Mr. Hoffman has authored many papers and has coauthored chapters on water conservation in several manuals. He holds a B.S in Chemical Engineering and an M.S. in Environmental Health Engineering both from UT-Austin.

Industrial, Commercial and Institutional (ICI) Water Conservation Programs include everything except single-family residences. With ICI programs you get more bang for your conservation buck. These are the big users and you can get more water quickly through big conservation programs with businesses. ICI programs target the larger users in the system.

Forty-two percent of the water used for nonagricultural uses goes to single-family residences. If we only looked at conservation programs for single-family residences we would be missing out on 58% of the potential water to be conserved. Industrial water conservation is too significant to overlook.

The cheapest water we will ever have is the water we already have. Spending money on conservation incentives for ICI customers frees up water that can be used in other ways by a water supplier. This is a much cheaper way to get water than building for or buying new water supplies.

Water is an infinitely replenishable resource, but at a finite and variable rate. The cost of water is going up. It costs a lot of money to desalinate water and to procure new sources of water. Therefore, it makes economic sense to the water customer to favor conservation.

Conservation makes sense for everybody. Look at the true costs of water...walk in to a business and show them the true cost of water and what it costs to conserve and they will listen to what you have to say. Tell them it costs 3.8 cents per flush for a 5-gallon toilet. An efficient toilet that the city will GIVE you cost 1.3 cents per flush. In a business that has toilets that get flushed 80 times a day that adds up to measurable savings. Some Austin apartments have been retrofitted with efficient toilets and realized a 25% water savings. One hotel put in an ozone system for laundry and is saving 6000 gallons of water per day. This equipment is free from sales tax and they can get a property tax exemption. Cooling towers, dishwashers, ice machines (air cooled instead of water cooled), pools and spas, car washes, landscape, food service (water gets used in so many places in these businesses), hospital uses (cooling towers, autoclaves, x-rays etc are just some of the places where an ICI program can have a dramatic effect.

ICI programs are a great way to realize dramatic water savings. They are cost effective for the water supplier and the commercial customer. Remember, the cheapest water you will ever have is the water you already have.

**Calvin Finch, San Antonio Water Systems
“Water Conservation Pricing”**

Calvin Finch, Ph.D., has been the Manager of Conservation for the San Antonio Water System since April 2000. The Conservation Division includes a staff of 18 and manages a \$7.0 million budget. SAWS reached an overall per capita water use of 143 gallons/person/day (gpd) in 2001 with a goal to reach 140 gpd by 2008. Prior to becoming the SAWS Director of Conservation Dr. Finch was the Bexar County Extension Agent for Horticulture.

San Antonio’s water conservation efforts have contributed significantly to San Antonio’s record low pumping from the Edwards. Weather has had a big effect on the big water usage drop, but it doesn’t totally account for the drop.

Inverted block rates are where water suppliers charge people different prices for water depending on how much water they use. The amount of water used in a basic household is billed at a low rate. As you go use more water, you will be billed at a (much) higher rate per unit of water used. The theory behind this is that a person will do things to try and stay out of the higher blocks. They might fix leaks and improve landscape irrigation efficiency. Customers must be educated about the inverted block rate in order to respond to it. San Antonio mails out very detailed water bills in order to facilitate customers understanding of how they are being billed. In order for an inverted block rate to be effective in curbing water use, people must know how much water different activities use and water costs must be high enough to matter. These items make this kind of program have a chance to work.

What is happening with this program in San Antonio? Average consumption in the lower three blocks is decreasing. Customer consumption in the fourth block is going up but the number of customers in the fourth block is not increasing. We need to figure out why this happens and what it indicates. The source of funding for the conservation programs in San Antonio is meter fees for commercial ratepayers and residential use (nine cents for every 1000 gallons used in the fourth block). Conservation programs include low-flow toilets, education, rebates, certifications, and audits.

Look at the SAWS website for details on this program at <http://www.saws.org>.

**Kelly Bender, Texas Parks and Wildlife
“Maximizing Water Efficiency Through Landscape Choices”**

Kelly Bender has served the people and wildlife of Texas with Texas Parks and Wildlife for 7 years. As the Urban Wildlife Biologist for the Austin metropolitan area, she has coauthored Texas Wildscapes: Gardening for Wildlife. She earned her B.A. in Psychology and Biology at Southwestern University and her M.S. in Zoology at Emporia State University.

Are native landscapes a magic bullet to lower personal water use? Average landscape water usage rates are highly variable. You cannot tell how much water a household uses for landscaping just by looking at their landscape. There are other factors besides plant selection that effect how much water a garden needs.

Native plants require less supplemental water. They also use fewer chemicals and pesticides. Many exotic species come from Brazil, China and East Asia, Australia, the Far East, Mediterranean, South America, and South Asia. These species come from areas where the

climate is quite different from ours. Our climate is considered temperate and dry. Many of these exotic plants take too much water to be used efficiently in our area.

Plants Choices - Set your personal goals for your landscape, choose plants that are appropriate for your region of the state and your specific location. Do you live in a riparian zone, on a limestone cliff, have sun or shade? Look at these factors when choosing plants for your landscape.

Plant Placement – Look at your yard and really study it. Where and how long do you get sun and shade? What kind of soil do you have? What areas of your yard tend to stay dry or wet (keep plants with similar water needs in the same area).

Plant Management – Place plants with similar water needs in the same area of your garden. Water deeply, infrequently and in the morning. Plant in the fall and use generous amounts of compost and mulch. Mow higher and less frequently and allow your lawns to go dormant in the summer.

There are several resources available to assist you with your landscape planning. One is a program run by Texas Parks and Wildlife called Texas Wildscapes. Through this program you can use information (book/CD-ROM) to design a backyard wildlife habitat. Another program is called Best of Texas. This program is a partnership between Texas Parks and Wildlife and the National Wildlife Federation.

Wise Choices and Wise Landscapes = Lower Water Usage

Questions and Answers

Q: Is there anything that will shut off sprinkler systems when it rains?

A: Yes, there are several types of shut-off devices linked to rain sensors. Some will shut off when it rains or when it rains a specific amount. Austin requires these for new commercial water customers.

Special Presentation: Outlook for Water Issues at the State Level 2003

The Honorable Robert Puente – Texas House of Representatives

State Rep. Robert Puente has served in the Texas House of Representatives since 1991. Upon being sworn in, Puente was appointed to the House Natural Resources Committee, where he continues to serve today. He was instrumental in the passage of the Edwards Aquifer Authority legislation and SB 1, implementing a comprehensive water plan for our state. Puente has a law degree from University of Texas Law School and a B.A. in Political Science from Saint Mary's University in San Antonio.

During the last 5 legislative sessions, we have embarked on a historic modernization of water law- especially with the passage of SB 1 in 1997 and SB 2 in 2001. Through these two bills, we have provided a foundation for the protection, management, and development of Texas' water resources. Now with the first round of regional and statewide planning completed earlier this year, both the House Natural Resources Committee and the Joint Committee on Water Resources created last session – on both of which I am a member - have spent this interim exploring our next steps with respect to the water planning process. While a foundation has been laid, there are many issues that remain.

This interim, one of the charges issued to the Joint Committee on Water Resources was to study the appropriate role of environmental and wildlife concerns in water permitting and water development. This issue has been brought to the forefront by the application of the San Marcos River Foundation for a surface water right from the Guadalupe River for instream flows and freshwater inflows to the Guadalupe Estuary and the San Antonio Bay system.

In terms of background, the Water Code lists the specific uses for which state water may be appropriated, stored, or diverted. These uses include domestic, municipal, industrial, irrigation, and other specific uses. While the Water Code does not specifically identify instream use or freshwater inflow as a category, it does allow appropriation for “any other beneficial use” and TCEQ rule specifically lists “instream uses, water quality, aquatic and wildlife habitat or freshwater inflows” as beneficial uses.

The San Marcos River Foundation application, although it falls within TCEQ’s regulatory framework, raises a number of issues regarding our state’s policy on balancing water supply development versus environmental protection, especially as we are faced with implementing specific projects contained in the first round of regional planning, that will be impacted by environmental flow permits. Supporters of the Foundation’s application say that permitting for environmental purposes, although largely unprecedented in Texas, is the best way to ensure that the environment and the wildlife that depend on that environment are protected, especially as more water is diverted to supply Texas’ growing population, especially in times of drought. According to environmental groups, some of our rivers and streams flow today only because people who have water rights have not fully exercised those rights, a situation that is likely to change, however, as demand grows. Opponents of the application and permitting of environmental flows in general argue that permitting for this reason is inconsistent with the statutory framework for appropriation of water in this state and will only serve to limit future development of water resources. Right now, the TCEQ has just completed technical review of the application and has issued a draft permit. A public comment period is open until October 23, 2002.

One of the alternatives suggested during the committee’s hearings include operating within the existing system, while conditioning new permits or permit amendments with minimum flow requirements *on a case-by-case basis*. At the same time, create regional groups, perhaps patterned after SB 1, that can access and plan for the environmental flow needs of each individual bay and estuary system, while Parks and Wildlife, TWDB, and TCEQ conduct instream flow studies that were mandated by SB 2. While there is no single solution to this problem, I feel that a climate of uncertainty does not benefit anyone, and we must act proactively next session to address this issue and come up with a policy that ensures the health of our rivers and bays and estuaries while at the same time balancing our need to develop additional water supplies.

With current dependable water supplies meeting only 72 percent of the projected water demand by 2050 and now even instream flows competing for those limited supplies, an important part of narrowing the gap between projected supply and demand is conservation. SB 2 requires regional plans to include conservation and drought management measures in their plans. However, conservation has always been somewhat of a local issue in terms of finance and organization. I feel next session is the time to push statewide conservation measures that will ensure every community does their part to reduce water demand.

During the interim, the committees heard testimony claiming that the weak link in our push for conservation at the state level is a failure to thoroughly assess the implementation and success rate of programs. State funding for pilot projects and data analysis is also important. Other

potential conservation legislation includes eliminating deed restrictions and covenants that prohibit xeriscapes or other low water use landscapes. Much like the issue of environmental flows, we must act proactively. Conservation is no longer just an option in Texas. In order to meet our state's needs, we must view conservation as a viable long-term supply option, same as any other supply project. For example, in San Antonio, we have made the commitment to true conservation efforts and have seen identifiable results - namely, one of the lowest per capita usages in the State. Next session, we must look at ways of making our conservation efforts as effective and efficient as possible statewide

While conservation is imperative, it won't do the trick alone. In order to develop and maintain an adequate water supply, our communities must have access to sufficient financing for the capital costs associated with new water supply projects. According to the TWDB's recent Infrastructure Financing Report, there are \$18 billion in key water management strategies and projects needed to meet Texas' water supply needs through 2050. While local governments, regional authorities, and other political subdivisions will play an important role in paying for these projects, they cannot do it alone. Consequently, the Report recommends that the state broaden its current role in providing funding. I'm sure you have all heard the reports of an expected shortfall of at least \$5 billion next session, however, we must continue to look at funding mechanisms because as we all know, if we can't implement our supply projects or reach our conservation goals, we can't meet our water needs.

A number of legislators actively involved in the revamping of state water law in recent years will be leaving the Legislature at the end of this term, taking a wealth of talent and historical knowledge with them. Specifically, Senate Natural Resources Chairman Buster Brown, author of SB 1 and SB 2, resigned in August after 21 years of service. On the House side, we are losing Chairman Ron Lewis, sponsor of SB 1 and SB 2, Representative Gary Walker, our committee's expert on groundwater and groundwater districts, and Representative Tracy King, one of our committee's experts on agriculture and irrigation. They have definitely laid the best foundation possible for the rest of the membership to continue to make our state's water planning efforts a success.

Kevin Ward – Executive Administrator, Texas Water Development Board

Kevin Ward was selected as the Texas Water Development Board's executive administrator in April 2002. He brings with him 18 years of experience in public and private sector governmental management positions, including service on national boards and committees, and managing water and wastewater municipal utility districts and corporations. Kevin spent 2-1/2 years in undergraduate petroleum engineering studies before receiving his Bachelor of Business Administration from UT-Austin.

The mission of the Water Development Board is to provide leadership, technical services and financial assistance to support planning, conservation and development of water for Texas. The board has two goals. The first goal is to plan and guide the conservation and orderly and cost-effective development and best management of the state's water resources for the benefit of all Texans. The second goal is to provide cost-effective financing for the development of water supply, for water quality protection, and for other water related projects.

The regional water planning process is underway and the groups tasks include...

- Describing the regional water planning area
- Quantifying current and projected population and water demand

- Evaluating and quantifying current water supplies
- Identifying water surplus and needs
- Evaluating water management strategies and preparing plans to meet those needs
- Recommending regulatory, administrative and legislative changes
- Adopting the plan, including the required level of public participation

Senate Bill 2, adopted by the Texas Legislature in 2001, has a requirement for the regional planning groups to generate a report determining how local governments, regional authorities, and other political subdivisions propose to pay for water infrastructure projects identified in the approved regional water plans. The regional planning groups are also required to recommend what role the state should play in financing projects identified in the plan. The role of the board was to consider these reports and submit a report to the legislature by October 1, 2002. Their report was to include an analysis of the regional reports and recommendations. The report is called the “Infrastructure Financing Report”.

The Infrastructure Financing Report is complete and the key findings are...

- There were 18 billion dollars in needs identified in the 2002 state water plan
- It will be the responsibility of the political subdivisions to generate 16.2 billion dollars of this money
- Approximately 1.2 billion dollars will be the responsibility of the private sector and 575 million dollars will be the responsibility of agriculture
- The board estimates that 2.4 billion dollars in additional state assistance may be required to implement 129 water supply projects needed by political subdivisions

The next round of regional water planning is underway. New legislation requires the plans the groups come up with to consider water conservation measures and to be consistent with the long-term protection of the state’s water resources, agricultural resources, and natural resources. SB2 has also included important responsibilities for studies in instream flows. This will be carried out by the Water Development Board, Texas Parks and Wildlife and the Texas Commission on Environmental Quality. These agencies will coordinate to establish and maintain instream flow data and conduct studies and analyses to determine appropriate flow conditions for the state’s rivers and streams to support a sound ecological environments. The results of the studies shall be considered by the TCEQ in its review of any management plan, water right or interbasin transfer.

2007 State Water Plan Schedule

Month	Description
June 2002	Board approval of funding contracts
August 2002	Final draft population projections released
September 2002	Phase 2 regional water planning contracts
January 2003	Requests for revisions to population projections due to TWDB
March 2003	Requests for revisions to water demand projections due to TWDB
March 2003	Population projections submitted for board consideration
May 2003	Water demand projections submitted to board for consideration
June 2003 to March 2005	Regional Water Planning Groups (RWPG) work on plans
April 2005	Initially prepared Regional Water Plans submitted for board consideration
June 2005	Initially prepared plans due to the board
Fall 2005	TWDB and other state and federal agencies to provide written comments on initially prepared plans
January 2006	RWPGs to adopt regional water plans and provide to TWDB

January-December 2006	TWDB to develop State Water Plan
November 2006	TWDB to hold public hearings on the State Water Plan
January 2007	State Water Plan due to Legislature

Questions and Answers

Q: Plan mandates brush control. My research shows that it will not work unless all trees are removed. (Question to Ward)

A: Ward: Brush control is controversial. There are some funds to implement a brush control program.

Q: Land use planning? Is the legislature going to look at giving counties land use planning controls? (Question to Puente)

A: Puente: Yes, we are looking at this, but rural areas do not want this. There has to be enough urban legislators to support this. We want local government to be able to do what they want to and should do.

Q: I would like both of your perspectives or opinions on inter-basin transfers.

A: Puente: every area of Texas needs access to all resources. It can be a good tool

Ward: we have quite a few inter-basin transfers in Texas right now. We have more tools to be able to understand the issues that will arise and which transfers will be a big problem for the environment.

Integrated Resource Management

Moderator: Glenn Longley, Edwards Aquifer Research Center

**Walter Rast, Aquatic Station, Southwest Texas State University
“Integrated River Management”**

Walter Rast is the Director of the Aquatic Station and Associate Professor of Biology, as well as Associate Director of the International Institute for Sustainable Water Resources at Southwest Texas State University. He previously was the Deputy Director of the Water Branch of the United Nations Water Programme (UNEP), and also served as senior environmental advisor to the US-Canada International Joint Commission. He holds a Ph.D. in Environmental Science, with a specialization in water quality and water resource management, from the University of Texas at Dallas. Much of his previous work has focused on the environmentally sustainable management of aquatic ecosystems for their sustainable use for meeting human water needs and in maintaining ecosystem health.

The most critical natural resources are used for human survival and socio-economic development. Both an ancient and modern task is supplying water for drinking, sanitation, and food production. The use of water for socio economic development causes a lot of our competing uses. In developing areas, you need some degree of economic development before there can be a movement to environmental concerns. Poor nations have few options.

Sustainable water development involves establishing a balance between resource needs and nature’s ability to supply the resources.

Global water distribution is an important issue. There is approximately one quadrillion AF of water in the world. Of this, 33 trillion AF is fresh water. The oceans account for 97.5% while freshwaters 2.5%.

We must keep in mind that water use is on a watershed basis. We have inter-basin transfers and there are different boundaries for groundwater and surface water. Nature is fickle in that the water is unevenly distributed, both in time and space.



Integrated water resource management (IRM). With the traditional approach, one pays attention only to the needs. With an integrated approach, one looks at all aspects on a watershed basis. Paying attention to socio-economic aspects is fundamental to IRM. It is very important that legal, regulatory and institutional frameworks be in place to control water resources.

Some problems with IRM are: humans aren't perfect, there are linkage problems between science and how people use water, lack of management of water quality, lack of consideration of ecosystem needs in water allocation, fragmentation of authority, and no common vision of sustainable water needs.

Constraints to implementation of IRM include lack of proper coordination of management activities, lack of appropriate management tools, inability to integrate water policy, institutional fragmentation, insufficient trained and qualified manpower, and shortfalls of funding.

Mr. Rast ended by stating that IRM is an evolving process.

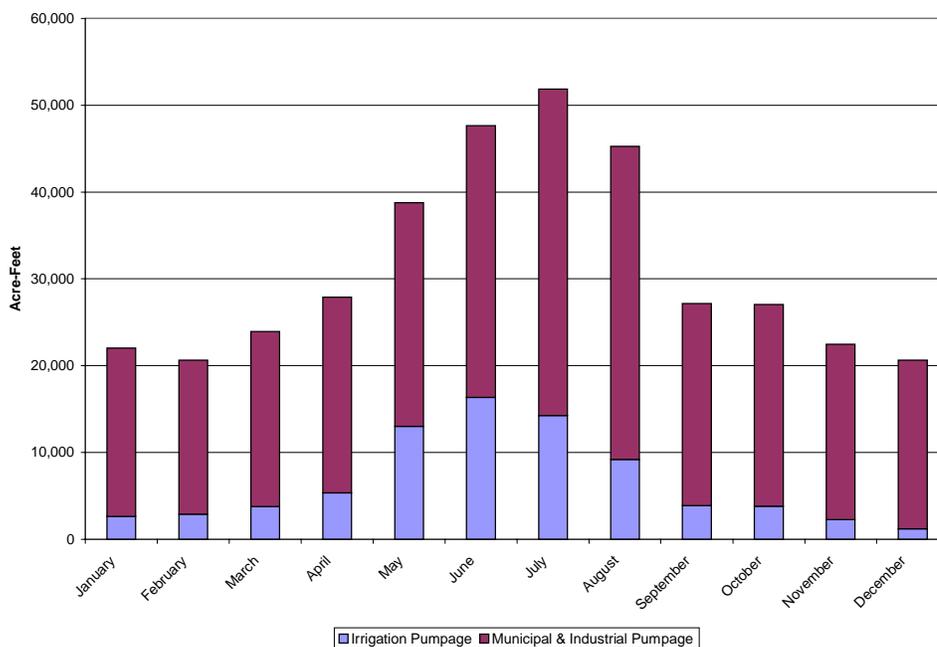
**Gregg Ellis, Edwards Aquifer Authority
“Managing Summertime Peak Demands”**

Gregg Ellis is the general manager of the Edwards Aquifer Authority, a special purpose district created by the Texas legislature to manage and protect the southern portion of the Edwards Aquifer through regulation of groundwater withdrawal in an eight county region. An attorney, Mr. Ellis is the former general counsel for the Harris-Galveston Coastal Subsidence District. Prior to joining the Subsidence District he worked as a legislative aide to Texas Senator Bill Ratliff and then to Texas State Representative Terral Smith.

As water is one part oxygen and two parts hydrogen, it is also one part science and two parts politics.

The first step in assessing the Edwards aquifer situation was to measure water use. The EEA did this by metering all wells. By 1998, we began to measure all water being pumped from the aquifer (with the exception of livestock uses). This first step constituted gathering the science, which led to the need for another study. Looking at 2001 groundwater use you can tell that usage shifts throughout the seasons. Both irrigation and municipal are part of the large users with peaks in the summer months. Municipal peak includes July and August, which are the hottest months. The four months with the highest heat correlated to the highest water use, which correlates to a drop in aquifer level. Rainfall also correlates to level of water in the aquifer. When recharge increases, demand decreases. During average years, there isn't necessarily a problem. But annual use from the aquifer is not a good way to look at the aquifer use because it fluctuates. There is a variation of usage over the year.

2001 Municipal & Industrial and Agricultural Pumpage Edwards Aquifer



San Antonio has the opportunity to store extra water in the aquifer when water availability is high through aquifer storage and recovery (ASR). They are also looking at demand reductions over time.

EAA Critical Management Plan

If drought of record occurred now, Comal Springs would go dry. But the EAA is working on a Habitat Conservation Plan (HCP) to ensure the protection of the endangered species. The EAA hopes to bring in additional recharge through their ASR projects. The answer to the problem is shared pain. The solution of stopping the watering of crops won't work because it doesn't pass the political test, and it is hard on the economy. Stopping municipal use won't work because it affects voters and there are economic impacts.

Alternative sources of supply also have environmental and economic costs: ASR projects, recharge in quarries, recharge and recirculation, potential storage of Edwards water west of the Kinnipa gap. Costs for these projects are an issue. Who is going to pay the cost? Can we look at water as a marketable commodity within the Edwards aquifer? There are impediments to interbasin surface water transfers however; groundwater does not have this limitation.

Chris Brown, Consultant

“Existing Resources – the Answer for San Antonio?”

Chris Brown has authored and coauthored many water plans, including the 1998 SAWS Water Conservation Plan, the EAA's Groundwater Conservation Plan, and the Region L Conservation Guidelines. He also serves as the vice-chairman of the Texas Section AWWA Conservation and Reuse Division. He has a master's degree in Water Resource Management and a B.A. in theology.

Demand numbers used in the regional planning process were inflated. Take away some of the demand and there is a reduction in project needs. With this new information, some big water projects are no longer needed. Internal SAWS documents are more aggressive than the demand projections used in the regional planning process. Having a drought contingency plan also pushes the projections down.

There is a big difference between a house with conservation and a house without. We need to make sure that all houses in San Antonio are water-conserving homes.



Some of the alternative projects that were looked at in the region are lining of irrigation canals, urban and agricultural conservation, water markets, aquifer storage and recovery, and artificial and enhanced recharge.

Some examples:

Lining the irrigation canals within Bexar-Medina-Atascosa Water District. There is the potential of fixing 130 miles of canals and laterals for freeing up 33,718 AFY (approx. \$100 /AF). This project would cost approximately \$46 million (\$26 million would come from the federal government)

Urban Conservation: Includes techniques such as retrofits, education and a tiered pricing structure. SAWS per capita water usage is currently 143 gpcd. SAWS would like to reduce this number to 125 gpcd. This would save almost 20,000 AFY at a cost of \$226 per acre-foot.

Agricultural conservation: Use high efficiency irrigation. Municipalities can purchase and install the equipment and get the conserved water. Farmers are still in control and the municipality gets the water. That way the farmer's economy is kept whole and complete. This program could save about 37,000 AFY at an average capital cost of \$333 per acre-foot.

Aquifer Storage and Recovery: This program can assist with seasonal peaking, bridging interim supplies, act as an emergency water supply in times of drought or water facility failure, reduce water loss due to evaporation and percolation. This program is designed for seasonal storage of water. This is a good viable alternative that needs cooperation to work. \$100 to \$300/AF.

Alternatives are available and average between 100 to 350 dollars per acre-foot. Large quantities of water are available. These projects will require cooperation and partnerships among regional water authorities and purveyors.

Questions and Answers

Q: We have talked a lot about quantity, what about quality?

A: Ellis: The EEA has a responsibility to protect water quality. We have banned underground storage tanks over the aquifer. Pollution limits our water supply.

Q: What about evaporation and how much is lost per year?

A: Ellis: The evaporation rate is about 52 inches per year and definitely is something to consider, which is why you don't see large reservoirs in the plan.

Hot Topics – What’s Boiling the Waters in South Central Texas

Moderator: Laura Brock, Environmental Defense

Sheril Smith, Lone Star Chapter, Sierra Club “LCRA/SAWS Water Project”

Sheril Smith is currently the volunteer Water Resources Chair of the Lone Star Chapter, and works for the University of Texas as a manager. Prior to working at UT she worked over 20 years in nursing and health care. She has a BA in Political Science/Environmental Science and has done graduate work in water supply studies, hydrology and community planning at Texas A & M-Corpus Christi and UT-Austin. She lives in the country and raises Longhorn cows and horses in her spare time.

There are three goals for the LCRA/SAWS water project. They are...

- To serve the long term water needs of the Colorado River Basin and the City of San Antonio
- To provide water for agricultural and rural communities
- To maintain higher lake levels at Travis and Buchanan lakes

The projected total for new water from this project is 330,000 AFY. This will come from four of-channel reservoirs (150,000 AFY), the Gulf Coast aquifer (62,000 AFY), and agricultural conservation (118,000 AFY).

In order to be viable the project is required to protect the Lower Colorado River basin and Matagorda Bay and protect river flows. There must be increased conservation by San Antonio, public participation and scientific review. The project must also maintain the baseline levels of the lakes.

There are environmental concerns related to this project. They are...

1. Reduced instream flows to bays and estuaries – If the amount of water in the river is reduced it may effect riparian habitats, change water quality, and threaten the Blue sucker spawning habitat. The off-channel reservoirs would capture 5.28% of the freshwater inflows to Matagorda Bay, which would increase salinity and reduce sediment/nutrients carried to the bay.
2. Availablity of groundwater
3. Agricultural issues – The plan considers land leveling, canal improvements, irrigation changes and new rice varieties. Concerns in the area are lack of incentives for landowners and lessee. Will farmers use conserved water to expand crop acreage?
4. Municipal return flows – If water rights holders used all of their water and did not return any to the Colorado River as return flows, there would not be much left. Different users along the way return much of the water in the river. If large cities began keeping their wastewater, downstream users would certainly suffer.

The LCRA/SAWS project is currently in the early stages of high level planning. This large, multifaceted project will be difficult to manage. There will be public meetings in the Lower Colorado River basin in the coming months. The project has potential to be controversial. There will be many opportunities to comment on it along the way. People should use their voices and get involved on this issue.

**Joe Moore, Biology Department, Southwest Texas State University
“GBRA/SAWS/SARA Water Project”**

Joe Moore, PhD. was the first Executive Director of the Texas Water Development Board. Moore was Chair of the state's water pollution control agency and administered the national water pollution control program before creation of the EPA. He taught in the Environmental Sciences program for 13 years at U.T.-Dallas and has been at Southwest Texas State University since 1996, where he is a Distinguished Professor of Biology. He has been a court-appointed official in three controversial lawsuits, the last being Sierra Club v. Babbitt, concerning threatened and endangered species in Comal and San Marcos Springs adversely affected by unlimited pumping from the Edwards Aquifer.

This project is located in Region L. Spring discharge at Comal and San Marcos Springs provides instream and bay and estuary inflows and surface water rights on the Guadalupe River. The Lower Guadalupe Supply Project would be the first to bring large amounts of surface water to San Antonio; firm yield = 94,500 AFY. The partners are Guadalupe Basin River Authority (GBRA), San Antonio Water System (SAWS), and San Antonio River Authority (SARA). The project is for untreated water from the Guadalupe River that would be diverted near the mouth of the river and brought by pipeline to San Antonio for treatment and use. The estimated cost for the project is \$600 million dollars and the water will be delivered by 2010.



The deal is a fifty-year contract for the sale of water, not water rights. Water will be sold at \$60 per acre-foot; interruptible, excess water will go for \$35 per acre-foot. There is a seven-year reservation period at the front end of the contract. The SAWS and SARA partnership agreement addresses cost sharing: SARA will cover ten percent and SAWS will cover ninety percent of the costs. SAWS and SARA will jointly market the water to other users. The SARA portion will be sold first. SAWS and SARA will have the first right of refusal on out-of-district sales, the right to acquire additional/future supplies and use the diversion facilities, the right to oversize facilities and the right to terminate at any time.

The issue of freshwater inflows to bay and estuaries has been raised in regard to this project. Texas Parks and Wildlife has stated that the Guadalupe Estuary needs 1.15 million AFY to sustain existing health and productivity. According to project proponents, the benefits of the Lower Guadalupe Supply Project are that surface and groundwater are managed together, GBRA's water rights are protected from cancellation, unappropriated flow in both the Guadalupe and San Antonio Rivers is protected, and water is provided for use within both rivers for 50 years. The phased implementation of the project also results in increased instream flows in the long run. The water plan would result in a net gain in freshwater inflows to the Guadalupe estuary and San Antonio bay when the project and plan are implemented. The Lower Guadalupe River Supply Project will include a permit for unappropriated flows at the saltwater barrier. This permit will contain a special condition for the reservation of the flows needed for the bays and estuaries.

**Dianne Wassenich, San Marcos River Foundation
“Maintaining Environmental Flows in the Guadalupe Basin”**

Dianne Wassenich is the executive director of the San Marcos River Foundation, and was involved as a volunteer for the seventeen years since SMRF formed, serving four years as President of the Board. She has also served on the TPWD Rivers Conservation Advisory Board for four years, and recently on the TPWD Advisory Task Force on the issue of 4x4 traffic in rivers. She grew up near Matagorda Bay, and attended college at Rice University and University of Houston, graduating with a BFA from U of H.

I think I am destined to work on water issues in Texas. I grew up on Matagorda Bay and all of my family enjoys fishing as their main form of recreation. When I was young, it was a major source of food for my family. My grandpa's farm is in the area that will be negatively affected by the pumping by Alcoa from their strip mine near Bastrop to send water to San Antonio, and I am also very concerned about the impacts of this plan on creeks and springs that contribute to the Colorado River and Matagorda Bay inflows. I have lived for 20 years in the Guadalupe Basin, and watched the growing impacts of low river flows during dry years on the whooping cranes at the Guadalupe estuary, and on the economy of rural counties and coastal communities, while more demands are placed on the Guadalupe and San Marcos Rivers by growing central Texas.



The San Marcos River Foundation (SMRF) is a small nonprofit organization involved in a water rights controversy because we applied for a water right to leave water in the river to reach the estuary. Several years ago we got involved in a bed and banks hearing and were shocked at how little protection there is for instream flows. SMRF learned a lot about water rights in a short time during that hearing, and put our knowledge to use by applying for a right to leave water in the river. Texas has no real mechanism to assure water in our rivers reaches our bays/estuaries in adequate amounts. We started researching water rights in earnest because of dry periods in the early 90's. We found that there are only restrictions to protect bay and estuary inflows within 200 miles of coast, even though the Comal and San Marcos Springs are widely known to be the majority of flow to the estuary during dry periods. They are beyond 200 miles from the coast, so water rights can be granted from central Texas and no consideration is given to the needs of the estuaries in those cases. There are a lack of options in Texas for protecting environmental flows.

During a mild drought in the 90's, central Texas was barely was affected while the coast was seriously affected. The salinity of the bays was very high and this is very important because many organisms that cannot tolerate the high salt levels enter estuaries to reproduce. Without Texas bays we have a dead Gulf of Mexico, since most fish reproduce in the bays. Twelve percent of the Whooping cranes died in one year in the late 90's. The entire coastal ecosystem was deteriorating, according to fishermen and shrimpers groups. Both commercial and sports fisherman were very concerned about flows, while water rights were being handed out left and right. It was apparent that action was needed.

We learned about the state's water rights process. We knew (from the Texas Parks & Wildlife '98 Guadalupe Estuary Study) the minimum amount of water needed for a healthy bay and estuary and so we applied for that amount. We pledged in our legal notices to put the water right into the Texas Water Trust when it is granted to us. We filed our application with TCEQ in July 2000, and

we have a priority date of December 2000. We informed Texas Parks and Wildlife and the Guadalupe Basin River Authority of our application and asked them receive it as a gift from us, to place in the Water Trust. TPWD agreed, GBRA did not. There are many opposing parties to our application like GBRA and the San Antonio Water System. The TCEQ Draft Permit does recommend 1 million acre-feet (1.15 is needed to ensure sufficient flows). We hope the permit will be sent to a hearing soon, so we can discuss the needs of the estuary more fully and decide what amount should be preserved.

SMRF hopes to preserve the rivers and bays for future generations. SMRF knows that if people knew the truth about the level of threat, the public would support the cause. We have received a lot of grants and help, which we appreciate, but much more education and work needs to be done, so please join us and help spread the word.

SMRF's website is at <http://www.sanmarcosriver.org>

**Hari Krishna, Texas Water Development Board
“Desalination: The Ultimate Solution? A Tool in the Toolbox?”**

Hari Krishna, PhD. is a Senior Engineer at the Texas Water Development Board in Austin. His areas of work include Water Conservation, Water Reuse and the development of alternative water resources technologies such as Desalination and Rainwater Harvesting. Prior to joining TWDB he worked at TNRCC for seven years. Previous to that he was Professor and Director of the Water Resources Research Institute at the University of the Virgin Islands. Dr. Krishna received his Ph.D. in Engineering from Utah State University in 1980 and has over 20 years of experience in water resources development and management.

Desalination is any process that removes salts from brackish surface water, groundwater or seawater. Desalination is often misunderstood.

Why do we need desalinated water? We need it because if a drought occurs in 2050, almost one-half of the states municipal demand would not be met. By 2050, almost 40% of the state's population could face water shortages unless they reduce demand or develop additional sources of water. Water supplies from existing resources are expected to decrease 19% while demand is expected to increase 67% (through 2050).

The solution is to reduce demand through conservation and increase supply through processes such as desalination. There are approximately 100 small units operating in Texas producing 40mgd. The raw water for these operations is brackish surface water or groundwater. Reverse Osmosis is most common is the method used in more than 80% of our desalination plants.

Governor Rick Perry has an initiative to construct a seawater demonstration desalination plant to be located on the Texas Gulf Coast. TWDB has invited statements of interest and will provide recommendations to the Governor and Legislature in January 2003.

Advantages of desalination...

- Unaffected by local hydrology
- Drought proof resource
- No new dams required
- No complex water rights issues
- Brine can be discharged out to sea

As technology advances with time, the cost of desalination will be going down. The cost of membranes used for reverse osmosis went down by 75% between 1982 and 2002. The opposite is true with conventional water systems, where prices are likely to increase with time. Due to the increasing demand for water, both the strategies of water conservation and desalination may be needed to meet the state's future water needs.

Closing Comments: Ken Kramer, Chapter Director, Lone Star Chapter, Sierra Club

What can you do to help protect Texas water? The Texas Living Waters Project has developed a set of five principles for protecting Texas' water resources. The principles are to use existing water supplies efficiently, keep rivers flowing, protect wildlife habitat, use surface and groundwater sustainably, and to save tax dollars. We would like as many organizations in Texas to sign on to these principles as possible. With your support, we will urge state, regional and local decision-makers to develop, manage, and use Texas' freshwater resources in a way that benefits all of Texas.

For a copy of the Principles for Protecting Texas' Water Resources, go to <http://www.texaswatermatters.org/> and download a copy of the principles or contact us via e-mail at lonestar.chapter@sierraclub.org and we will send you a copy.