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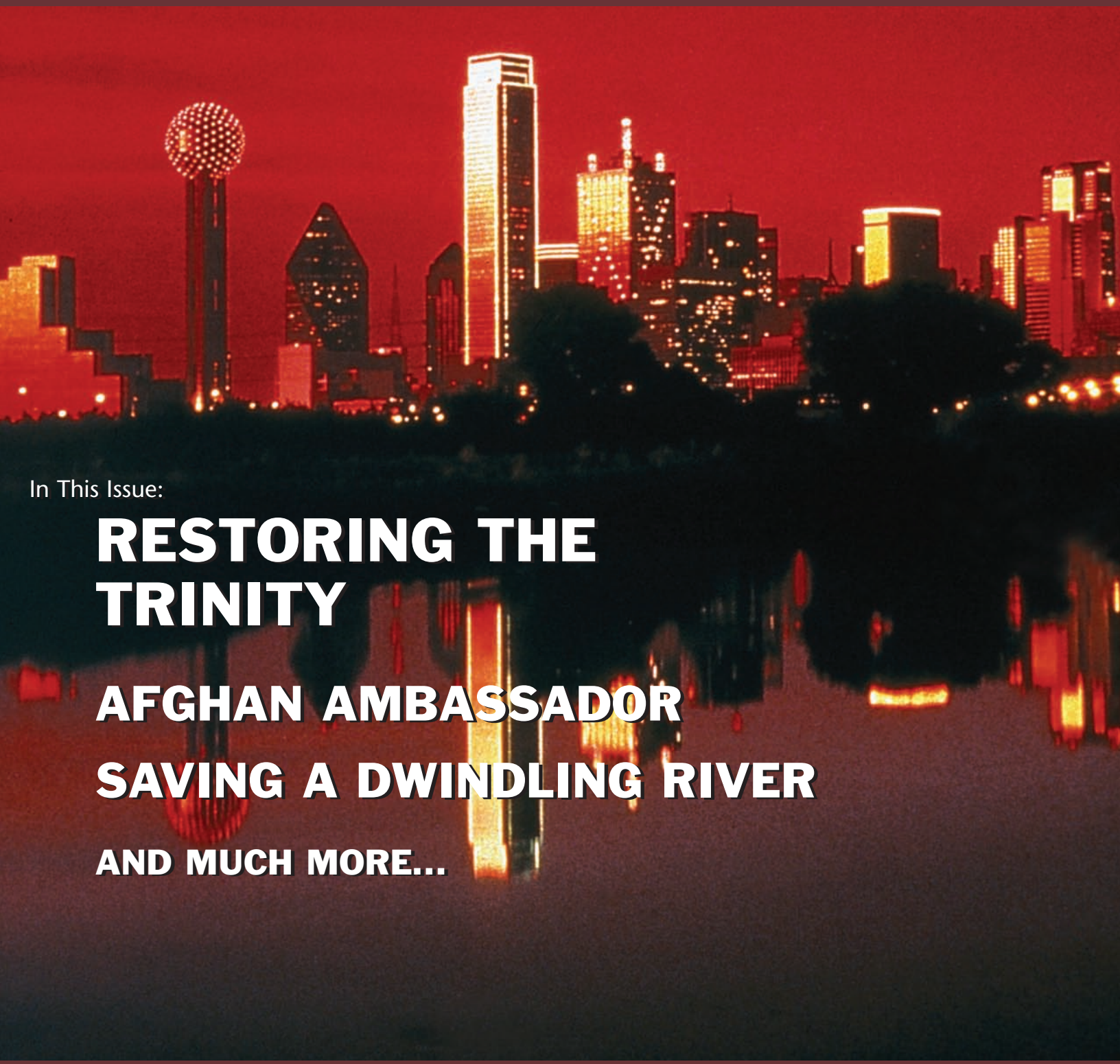

In This Issue:

RESTORING THE TRINITY

AFGHAN AMBASSADOR

SAVING A DWINDLING RIVER

AND MUCH MORE...

Texas Water Resources Institute | Texas Agricultural Experiment Station | Texas Cooperative Extension

Working Together for Texas Water

The end of 2006 proved to be an award-winning year for Texas Water Resources Institute. The Institute nominated several individuals and TWRI projects during the year, and the results have been great.

The following awards were presented to the selected individuals and projects in January 2007:

- *2006 Vice Chancellor's Awards in Excellence: Award in Research* to the Rio Grande Basin Initiative Research Team consisting of Drs. Edward Rister, Giovanni Piccinni, Bob Wiedenfeld, Juan Enciso, Zhuping Sheng and Ari Michelsen
- *2006 Vice Chancellor's Awards in Excellence: Award in Professional Special Services* to Patricia "Patt" Junek of Contracts & Grants for her help and guidance through the TWRI grant submission and approval process
- *2006 Vice Chancellor's Awards in Excellence: Award in Extension Education and Service* to Robert "Bob" Whitney, Comanche County agriculture and natural resources Extension agent, for his assistance with numerous TWRI programs over the years
- *2006 Vice Chancellor's Awards in Excellence: Award for Administration* to Dr. C. Allan Jones for his leadership as TWRI director
- *2006 Epsilon Sigma Phi Retiree Service Award* to Dr. Bill Harris, TWRI associate director
- *U.S. Department of Agriculture–Cooperative State Research, Education and Extension Service National Water Program 2007 Awards in the Outstanding Integrated Activities for Water Resources* to the Rio Grande Basin Initiative project

We thank these individuals for their continuous efforts toward water quality and conservation and for the help and services they provide. Congratulations!

C. Allan Jones

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http://twri.tamu.edu
for more information.

On the cover:
Trinity River reflects the Dallas skyline.
Photo by Dallas Convention
and Visitors Bureau

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THE TEXAS A&M UNIVERSITY SYSTEM

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Texas Water
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make every drop count

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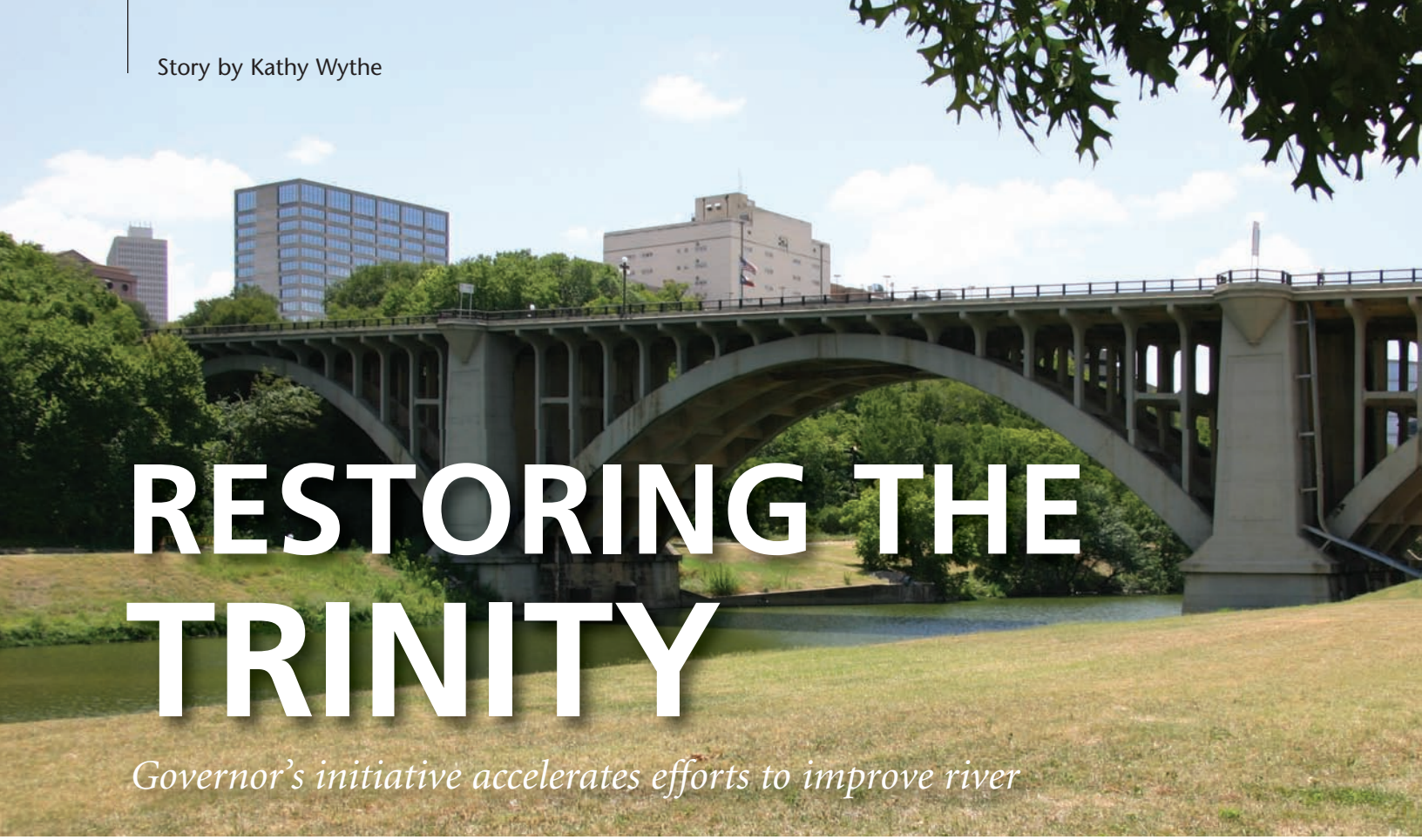
Story by Kathy Wythe



RESTORING THE TRINITY

Governor's initiative accelerates efforts to improve river

Editor's Note: The Trinity River Basin has been the center of water resources projects for years. With Gov. Rick Perry's announcement of the Trinity River Environmental Restoration Initiative, attention has increased concerning this river that stretches from North Texas to Galveston Bay. The following stories feature a few of the projects that deal with water conservation and water quality of the river.

A comprehensive effort to improve the Trinity River Basin watershed, its ecosystem and water quality is underway with federal, state and local agencies working together with The Texas A&M University System. In September 2006, Gov. Rick Perry announced the Trinity River Basin Environmental Restoration Initiative.

The Trinity River, the 512-mile-long river that stretches from north of the Dallas/Fort Worth Metroplex to Galveston Bay, and its natural resources are important assets to Texas. Providing drinking water for more than 8.9 million residents, the river and its 1,983 miles of major tributaries drain an area of more than 11.5 million acres.

The city of Fort Worth, Tarrant Regional Water District, Streams and Valleys and the Corps of Engineers all work together in providing access to the river to the citizens of Fort Worth. Fort Worth's Main Street crosses the Trinity River just past the convergence of the West and Clear Forks of the river. *Photo by Clay Church, Corps of Engineers*

Rapid development and changes in land use, however, strain its reservoirs' capacities and threaten its water quality, according to those involved in restoring the river.

Although many projects are already in place to protect the river, it received additional attention when Gov. Rick Perry announced the Trinity River initiative at news conferences in Arlington and Houston.

"The cities of Fort Worth and Dallas both have major, ongoing Trinity River projects, and I compliment city and county leaders for their vision for restoring the vitality of this great river," Perry said at a press conference in Arlington. "Our objective is to work closely with the cities, private landowners and federal and state agencies to build on the success that the Metroplex has enjoyed.

"If Texans all along the Trinity River band together to fully protect its water quality and restore the river to its more pristine past, it will have a dramatic impact on birds and wildlife, ecotourism and water quality," Perry said.

The A&M System's Institute of Renewable Natural Resources (IRNR) is working with the Trinity River Authority (TRA), the Trinity Basin Conservation Foundation and other agencies and non-profit organizations to help landowners and other stakeholders make their own decisions on how the watershed is managed and restored, said Dr. Neal Wilkins, IRNR director. "The stakeholders have the most at stake in restoring the river," he said.

IRNR and TRA are developing a user-friendly Trinity River Internet Mapping System (TRIMS) that will give users access to mapping data, remote-sensing data and low-elevation aerial photographs and other information that will help in planning the restoration. Funded by a Clean Rivers Program grant from Texas Commission on Environmental Quality (TCEQ), TRIMS will generate information for future projects that will address water quality, hydrology, floodplain management, wetland restoration, bottomland hardwood establishment and wildlife habitat management, Wilkins said.

TRA General Manager Danny Vance said, "The databases that are being pulled together show a lot about how the river is doing. We are glad to be working with other Trinity interests on this."

IRNR also has funding from the Texas State Soil and Water Conservation Board (TSSWCB). Through partnerships with local soil and water conservation districts, TSSWCB provides technical resources to assist rural, agricultural producers in making land-use management decisions that protect water quality and enhance water conservation.

"The governor's Trinity River Basin Environmental Restoration Initiative will strengthen the Board's work with farmers and ranchers to address rural-urban interface issues," said Aubrey Russell, TSSWCB chairman. "The programs and tools developed through this initiative will improve the ability of landowners to make informed local decisions on watershed management."

The project's Web site is **http://trinityriverbasin.tamu.edu/**.

"TRIMS is the first step then we will begin the planning process," Wilkins said. "Long-term, we want to provide a means for local stakeholders to make sustainable and measurable contributions to the restoration of the Trinity River."

Tarrant Regional Water District (TRWD) and the Agricultural Research and Extension Center at Dallas are combining efforts to develop a comprehensive urban water conservation education program in both the Dallas/Fort Worth Metroplex and Houston areas.

Urban water conservation is essential to meet the rising demands of these rapidly growing areas. In addition to the growth, the region's worst drought in 50 years resulted in many cities in the Metroplex implementing outdoor water restriction programs in 2006, and reservoirs such as Lakes Lavon and Chapman were substantially below normal levels.

"This urban water conservation educational program will be a large-scale undertaking to the public," said Dr. Frank Gilstrap, resident director of the Dallas center.

With funding by the Texas Water Development Board (TWDB) and TCEQ, the urban education program will teach the public through workshops about urban land stewardship, with

Gov. Rick Perry announces the Trinity River Basin Environmental Initiative in Houston in September 2006.

emphasis on water-efficient landscaping techniques, water-conserving plants
and landscapes that help prevent nonpoint source pollution.

"We will be using existing water education programs such as WaterWise, Water IQ, Earth Kind and Texas SmartScape®," said Clint Wolfe, manager of the project. "In addition, the Dallas center will be working with Texas Cooperative Extension specialists to develop topical information on water conservation for local cities and organizations.

"TRWD will be developing demonstration gardens within the community so people can see that water conservation landscapes can be attractive and economical," Wolfe said.

Workshops will teach landscapers, engineers, grounds managers, nursery owners, developers and builders how to design and install landscapes that not only conserve water but also prevent nonpoint source pollution. The program will also provide mini-grants for cities, counties and agencies to conduct water education programs in the Metroplex and Houston areas, Wolfe said.

This educational effort will involve a number of local organizations and cooperators, including the North Central Texas Council of Governments, University of Texas at Arlington, TSSWCB, Master Gardeners, Botanical Research Institute of Texas and others. The Web site for the project is **http://trinitybasin.tamu.edu**.

In another project funded by the TWDB, SSL will study how urbanization and other land-use changes in the Upper Trinity watershed have affected sediment and nutrient loading into the reservoirs.

Dr. Raghavan Srinivasan, SSL director, said his lab will use the SWAT model to predict the effects of urbanization over the past three decades as well as practices designed to reduce stormwater runoff and soil and stream-bank erosion.

The Trinity River drains one of the largest and most rapidly urbanizing areas in the United States. From its headwaters north and west of the Dallas/Fort Worth Metroplex to its outlet into Galveston Bay, the Trinity River and its tributaries drain an area of over 11.5 million acres. *Photo by Danielle Supercinski, TWRI*

"Modeling will provide information to help managers identify specific projects needed to protect the watershed and maintain reservoir capacity and improvement of water quality," Srinivasan said. "Once completed, this modeling could serve as a prototype for the remainder of the basin and the rest of the state."

Dr. Allan Jones, Texas Water Resources Institute director, said the governor's initiative has pulled together a diverse group of organizations for a common purpose and served as the catalyst for these projects.

The funding agencies also see this initiative as positive for the state and its citizens.

"These projects, as part of the governor's Trinity River Basin Environmental Restoration Initiative, will provide citizens and professionals alike with powerful tools and programs for understanding water quality issues, making informed planning decisions and promoting effective restoration projects," TCEQ Chairman Kathleen Hartnett White said.

"The TWDB is pleased to participate along with other state and federal agencies in this effort to better understand the many complexities of the Trinity River Basin," said Kevin Ward, TWDB executive administrator. "A very important component of this effort will be to contribute to the advancement of municipal water conservation through education."

Ward said the $200,000 in grant funds was given to the TRWD and fellow A&M System collaborators to study how land-use changes may impact sediment and nutrient loading of reservoirs in the basin and the development of an urban water conservation education program. "These are fundamental components of our long-range goal of the best use of the natural resources in the Trinity River Basin."

Some of the other ongoing projects along the Trinity River include:

Trinity River Vision–Fort Worth

The Trinity River Vision Master Plan addresses the environment, ecosystems, flood protection, recreational opportunities, access to the waterfront, preservation of green space and urban revitalization on eight segments of the river and its tributaries within the Fort Worth area. (**http://www.trinityrivervision.org/**)

Trinity River Corridor Project–Dallas

The city of Dallas is collaborating with state and federal agencies to construct the Trinity River Corridor Project involving flood control and transportation improvements, downtown lakes, park facilities and the environmental preservation of the Great Trinity Forest through the acquisition of 3,500 acres of land along the Trinity. (**http://www.trinityrivercorridor.org/**)

North Central Texas Water Quality

TWRI, Texas Agricultural Experiment Station and Texas Cooperative Extension are collaborating with TRWD to study water quality protection and sediment- and nutrient-loading improvements in five reservoirs along the Trinity River. (**http://nctx-water.tamu.edu/**)

Richland–Chambers Water Quality

Texas Agricultural Experiment Station and USDA's Agricultural Research Service scientists are verifying the effectiveness of best management practices installed on Mills Creek within the Richland–Chambers Reservoir watershed to reduce nutrient enrichment and algal growth from excess nitrate and nitrite and high pH.

Richland–Chambers Wetlands

TRWD is diverting water from the Trinity River, treating it in constructed wetland water-treatment units and storing the water in reservoirs. Additional stages of the project will consist of constructing approximately 1,229 acres of treatment wetlands.

Texas Coastal Watershed Program

The Texas Coastal Watershed Program, a part of Texas Sea Grant and Texas Cooperative Extension, provides education and outreach to local governments and citizens on the impacts of land use on watershed health and water quality. Project areas focus on water quality and land use, soil and site evaluation for on-site sewage systems, urban stormwater treatment, and wetland creation and restoration. (**http://www.urban-nature.org/**)

Story by Kathy Wythe

CORPS IMPROVEMENT

Engineers key players in basin restoration

One of the key federal players in the restoration of the Trinity River Basin is the U.S. Army Corps of Engineers, whose primary civil mission is developing and managing the nation's water resources, including projects to reduce flood damage; improve navigation channels and harbors; protect wetlands; and preserve, safeguard and enhance the environment.

The Corps has been involved in the Trinity River Basin for more than 50 years, but the impetus for the current projects in the Upper Trinity River Basin was mainly from findings in a Corps environmental impact statement (EIS) report in the 1980s, according to Gene Rice, Corps project manager of the Dallas Floodway and Dallas Floodway Extension projects, two of the Trinity River Basin projects.

Two major conclusions of the report were: (1) a widespread lack of Standard Project Flood protection existed, and (2) Corps and local community permitting strategies significantly increased this lack of flood protection. At the time the EIS was issued, each city in the river basin was using its own set of criteria for permitting floodplain development.

Based on these conclusions, federal legislation was enacted to initiate studies. A reconnaissance report, published in March 1990, investigated the possible federal interest in flood control efforts/projects within the Upper Trinity River Basin. The serious potential flood threat was further verified in this report, Rice said.

The Corps, in partnership with the North Central Texas Council of Governments and its member governments along with the Texas Water Development Board, initiated a follow-up feasibility study in 1990. Study efforts were directed toward addressing improvements in flood protection, ecosystem restoration, water quality, recreation and other purposes in the Upper Trinity River Basin, with specific attention to the Dallas/Fort Worth Metroplex. Phase I of this feasibility study, which established base conditions, was completed in February 1995. Phase II of the feasibility study is ongoing.

The Corps of Engineers recently opened a new channel for the Trinity River in south Dallas. The realigned channel will help with overall flood-damage reduction within the Dallas Floodway and ensure the structural integrity of the I-45 Bridge. *Photo by Al Petrasek, Carter & Burgess*

As a result of these studies, the Corps has numerous projects within the Upper Trinity River Basin, including:

Central City Project, Fort Worth

The Corps' Central City project, part of the larger Trinity River Vision, a master-plan community project that includes 88 miles of hike and bike trails, roads and bridges, is constructing a bypass channel and associated structures to control flood flows along the Clear Fork and West Fork of the Trinity River. The project will replace an aging levee system designed for the city's population in 1960s. Ecosystem restoration and recreation facilities are also included at locations along the project footprint.

Trinity River Project, Dallas

The project consists of raising the existing east and west levees, removing the abandoned AT&SF railroad bridge, restoring historic wetlands, bottomland hardwoods, river meanders and constructing linear recreation facilities. The Trinity River Corridor Project, a much larger overall project by the City of Dallas, includes various transportation facilities and open water for recreation.

Dallas Floodway Extension

The Dallas Floodway Extension project consists of a chain of wetlands, two levees, 123 acres of wetlands for ecosystem restoration, realignment of the Trinity River at Interstate Highway 45, 31 miles of recreational trails and protection of 1,179 acres in their natural state to mitigate environmental impacts of the project. The Corps' Fort Worth District and the City of Dallas are using an innovative approach to return floodplain value to the Trinity River, while improving flood damage reduction.

Big Fossil Creek Watershed

The Big Fossil Watershed Study will address flood damage reduction, while identifying associated water quality, ecosystem restoration and recreational opportunities within the basin. The watershed, located in northern Tarrant County, encompasses 73 square miles and drains into the West Fork of the Trinity River.

The Corps is constructing a chain of wetland cells along the west bank of the Trinity River including Cell G (far top right) that will provide overbank capacity during flood events and restoration of wetlands and native grasslands during normal time. *Photo by Al Petrasek, Carter & Burgess*

Corps Project Manager Gene Rice describes the Riverside Oxbow Project with Brigadier General Robert Crear and Colonel John Minahan near the Beach Street Bridge at I-30 in Fort Worth. *Photo by Melanie Ellis, Corps of Engineers*

The Corps is a partner in the Central City or Trinity Uptown project, part of the larger Trinity River Vision, a master plan project. *Photo by Clay Church, Corps of Engineers*

Story by Kathy Wythe

SURVIVAL OF THE FITTEST

SmartScape® landscapes fare better during drought

The Native Plant Society of Texas and Texas Master Gardener volunteers maintain a SmartScape landscape demonstration at the Southwest Regional Library on Hulen Street in Fort Worth.

The SmartScape demonstration at the Hulen Street Library is one of numerous gardens throughout the Dallas/Fort Worth Metroplex.

During last year's drought, North Central Texas homeowners using Texas SmartScape® landscapes fared much better than homeowners with traditional landscapes when cities in the Dallas/Fort Worth Metroplex imposed water restrictions.

"Traditional landscapes suffer a great deal more than Texas SmartScape landscapes," said Dotty Woodson, Tarrant County Extension horticulture agent. Texas SmartScape is an educational program intended to help homeowners design and maintain attractive landscapes using native or adapted plants that require less water.

Woodson said by using the program's principles "people can have beautiful, sustainable landscapes even while water restrictions are in place."

Texas SmartScape has joined Tarrant Regional Water District (TRWD), The Texas A&M University System's Agricultural Research and Extension Center at Dallas and other partners in an urban water education initiative, part of Gov. Rick Perry's Trinity River Basin Environmental Restoration Initiative (see accompanying story).

Texas SmartScape complements the Water IQ program used by the North Texas Municipal Water District and e-Life, the environmental education program sponsored by North Central Texas Council of Governments, U.S. Environmental Protection Agency, Texas State Soil and Water Conservation Board and KTVT-TV CBS 11.

Texas SmartScape staff trains Master Gardeners to present educational seminars to individuals, civic organizations, homeowner associations and others. With the drought and corresponding water restrictions, interest in the program increased over the past year, Woodson said.

Many cities proclaim March as Texas SmartScape month to heighten awareness about the program. This year's theme, "Keep Your Green" highlighted the cost benefits of using native and adapted plants that use less water and less fertilizers to thrive in our local climate. Throughout the region, events presented the "how's" and "why's" of SmartScaping.

The SmartScape Web site (**http://www.txmartscape.com/about.asp**) is an interactive how-to guide that walks viewers through the SmartScape concept. Using the Web site, viewers can search for more than 200 plants, shrubs and trees that thrive in North Central Texas and learn how to care for them in a manner that saves time and money.

The ultimate goal of the program, Woodson said, is to conserve local water supplies and improve stormwater runoff quality by reducing the amount of water needed to maintain landscapes while decreasing the amounts of pesticide, fertilizer and herbicide used in landscaping plants.

Woodson said the program addresses how individuals can make a difference. "Individuals can't do anything about the millions of dollars needed for more water resources," she said, "but Texas SmartScape provides something every individual with a landscape can do."

Texas SmartScape was initially created in 2001 through the leadership of the North Central Texas Council of Governments. Other agencies involved in the project are the Tarrant County Health Department, Texas Cooperative Extension, TRWD, Texas Parks and Wildlife Department and Weston Gardens. The program Web site was developed in 2003 through sponsorship from Dallas Water Utilities, City of Irving, North Texas Municipal Water District, TRWD and the Upper Trinity Regional Water District.

Story by Kathy Wythe

Environmental education goes multimedia

A new environmental education program, "e-Life," that combines an interactive Web site and television news spots, premiered last fall as the latest tool to help North Texans learn more about their environmental quality of life.

"Whether by mouse or remote control, North Texans can click their way to a whole new world of environmental information," said Richard E. Greene, U.S. Environmental Protection Agency's (EPA) Region 6 administrator, at the kick-off event.

"The e-Life project is intended to increase awareness about local environmental issues and individual, voluntary measures that the public can take to protect our North Central Texas watershed resources," said Project Coordinator Leslie Rauscher of the North Central Texas Council of Governments (NCTCOG).

e-Life is co-sponsored by EPA, Texas State Soil and Water Conservation Board (TSSWCB), NCTCOG and KTVT-TV CBS 11.

The environmental program focuses on the nine watersheds in the Upper Trinity River Basin with its network of lakes, creeks and rivers that supply North Texas with fresh water.

Through on-air news stories and public service announcements, KTVT-TV and its team of meteorologists and reporters broadcast useful information to viewers on how they can help conserve water and prevent or minimize nonpoint source (NPS) pollution. Through an Environmental Education Events calendar, citizens also learn how they can get involved in local watershed protection and NPS pollution prevention efforts in their communities.

"We are so excited about this opportunity to help our viewers better understand where their water comes from and the risks of taking it for granted," said KTVT-TV Chief Meteorologist Kristine Kahanek. "I hope this awareness leads to a community ready to do whatever it takes to protect our watersheds."

The comprehensive Web site, **http://ktvt.iewatershed.com**, is an educational tool to help individuals learn how they can help prevent water pollution at home and in the community, Rauscher said.

Interactive watershed tools provide information about drinking-water quality, wetlands, floods and droughts, agriculture, land use, forestry, soil erosion, urbanization and other watershed topics. Animated movies compiled from satellite and radar technology replicate moving "flyovers" of specific watersheds.

"Through sponsorship of e-Life, TSSWCB hopes to bridge the rural-urban interface to educate and involve the public in improving and maintaining the quality of water resources for current and future generations of Texans," said Aubrey Russell, TSSWCB chairman.

Rauscher said the project uses stakeholders to provide expertise in a variety of topic areas, including NPS prevention and abatement, stormwater management, water conservation, solid-waste management, air quality, flooding, soil erosion and applied environmental science. Eligible participants include local governments, federal and state agencies, soil and water conservation districts, water districts, universities, environmental associations and environmental non-profit groups that operate in the Upper Trinity River project watersheds. Interested stakeholders can contact Rauscher at **LRauscher@nctcog.org**.

To be successful, Rauscher said the project needs local information about the Upper Trinity River watersheds such as:

- Upcoming local, educational events the public can attend
- Ideas for environmental news stories
- Links to local Web sites that contain useful information about the project watersheds
- Digital copies of helpful brochures and other educational materials that can be posted to the Web site
- Photos of the project watersheds for the photo gallery

The project is modeled after a successful collaborative effort anchored by EPA and supported by StormCenter Communications for the Chesapeake Bay Watershed. These innovative projects are now active in nine metropolitan areas across the nation.

(This story was compiled from EPA and CBS 11 news releases and the project's Web site.)

Story by Courtney Swyden

GROWING SMARTER

Water IQ campaign raises awareness of water sources, conservation

The North Texas Municipal Water District (NTMWD) has launched a "Water IQ: Know Your Water" education campaign to help residents conserve water, providing North Texans with a goal they can embrace—reduce water use by 5 percent and save money on monthly water bills.

Lubbock and Austin are also implementing the campaign in their regions. Lubbock Water Utilities along with the High Plains Underground Water Conservation District No. 1 and the city of Austin along with Lower Colorado River Authority are challenging residents to use 10 percent less water. Both cities are prepared to show residents how to save water and are working towards raising residents' water IQ.

To kick off its campaign, NTMWD chose a Plano couple—Mike and Candace Fountoulakis—to employ water-saving tips and reduce water-use by the target goal of 5 percent. NTMWD will work with the Fountoulakis', who were featured in an educational video during outreach events, as they take the challenge and pledge to do their part to save water.

The Fountoulakis' recorded water consumption from June through September 2006 showed a 6.3 percent reduction in water use compared to the same months in 2005, said Ted Burton, vice president of EnviroMedia, the public relations and advertising agency that developed the campaign.

"This is really great news," Burton said, adding that he is pleased with their results since the Fountoulakis' savings were about the same as the program's goal.

The campaign was developed from research funded by the Texas Water Development Board. NTMWD—the first in Texas to launch the campaign—is working with EnviroMedia to participate in aggressive consumer outreach to educate businesses and individuals on the source of their water and how to conserve it.

"The public education campaign was launched the same day that Drought–Stage 3 was initiated for the area," said Denise Hickey, NTMWD public relations coordinator, of the June 1, 2006 kick-off date.

The restrictions affected more than 1.6 million people in Collin, Dallas, Denton, Hunt, Kaufman and Rockwall counties. With the Drought–Stage 3 restrictions, residents are restricted to watering landscapes once every seven days. Outdoor watering with sprinklers is prohibited from 10 a.m. to 6 p.m. and residents cannot wash vehicles with a hose or

drain and refill swimming pools, except to replace normal water loss.

A press conference in the Fountoulakis' front yard on June 1, the first day of mandatory water restrictions throughout the region, illustrated the water-saving contributions the district is asking of all North Texans. Stations were set up demonstrating sensible, easy tips for outdoor water use that residents can implement around the home such as raising the height of lawn mower blades and using soaker hoses, as well as swimming pool tips and explanations on how to read water bills.

EnviroMedia originally conducted statewide research in 2004 on behalf of the governor's Water Conservation Implementation Task Force.

"Based on that research, we found that only 28 percent of Texans knew the natural source of their water," Burton said.

Once they knew where their water came from, 87 percent polled said that they would be much more likely to conserve and save water, he said.

Servicing 1.6 million people in 60 cities, towns, special utility districts and water-supply corporations, NTMWD is educating locals on their primary water source, Lake Lavon, which reached dangerously low levels in 2006. Lake Lavon was constructed in 1948, shortly before the 1950s drought, when there was a high concern for dwindling water supplies in the area. Today, North Texans are facing the same drought conditions. The National Weather Service reported that 2005 was the driest year on record in North Texas since the '50s.

The Water IQ campaign provides simple and cost-effective tips to conserve water, and it is focus-group tested. For more information and to identify your water source, visit **http://www.wateriq.org/**.

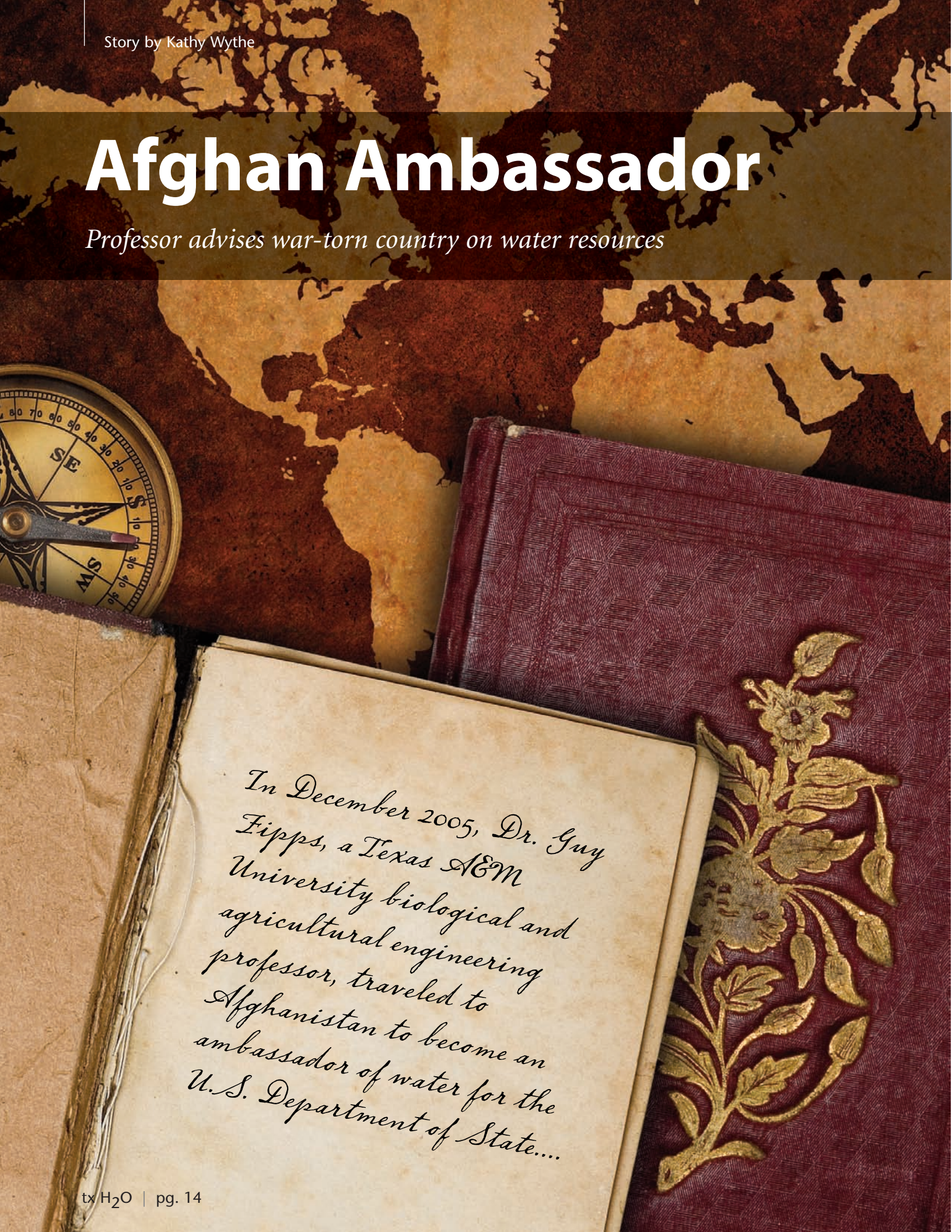
The campaign offers easy water-saving tips to help consumers use less water at home or at the office:

- Use 5 percent less water. Read your latest utility bill and note how many gallons you consumed. Simply multiply the number of gallons by .05—that's your 5 percent goal (i.e.: 8,000 gallons X .05 = 400 gallons).
- Water your lawn 1 inch every seven days.
- Water your lawn in the early morning or at night. Mid-day watering results in fast evaporation and scorches your lawn and plants.
- Operate your in-ground sprinkler system manually—don't use the timer.
- If you own a pool, pay close attention to the water level.
- Use plenty of mulch in flower beds; experts recommend 4 to 6 inches to prevent evaporation and keep soil moist.
- Choose "water wise" or native Texas plants such as lantana, salvia and Mexican sage.
- Raise your lawn mower blade and cut grass to a height of 3 inches—this shades the soil, which reduces evaporation and allows roots to grow deeper.
- Check for leaks in taps, pipes and hoses.
- Use soaker hoses instead of sprinklers to water trees, shrubs and beds more efficiently.

Story by Kathy Wythe

Afghan Ambassador

Professor advises war-torn country on water resources



In December 2005, Dr. Guy Fipps, a Texas A&M University biological and agricultural engineering professor, traveled to Afghanistan to become an ambassador of water for the U.S. Department of State....

As senior advisor for water at the U.S. Embassy in Kabul, Afghanistan, Fipps' mission was to conduct strategic analysis and water planning for the war-torn country and advise the ambassador on related policies and programs. He also provided technical assistance to the U.S. Agency for International Development (USAID), the military and non-governmental organizations involved in reconstruction efforts in Afghanistan. Stationed in Kabul, Afghanistan's capital, he traveled throughout 14 provinces in the country, examining water infrastructures, evaluating issues and, finally, recommending solutions.

Fipps worked closely with the Afghan Deputy Minister for Water and the First Vice President in developing a strategy and organizational framework to address the highly contentious issues related to water-use, allocations and development.

Water is recognized as a key, and usually as the key to Afghanistan's future, he said. According to Afghanistan's Ministry of Energy and Water, 85 percent of the population is involved in irrigation-dependent agriculture and 98 percent of all water diverted from the rivers is used by agriculture, with 60 percent or more of that water lost to seepage and poor on-farm efficiency. In addition, the irrigation canal systems also provide drinking water to the vast majority of the population.

After 20 years of war, Soviet occupation and then Taliban rule, what little water infrastructure for irrigation and domestic drinking water the country had was destroyed or had deteriorated, Fipps said. Only 30 percent of the irrigation infrastructure was functioning when Fipps was in the country, and modern domestic water supply and waste treatment systems do not exist.

"Water has the same urgency as security, energy and roads, and it is even more critical to the long-term stability and economic development of the country," he said. "Unless effective programs are implemented, water shortages, internal water conflicts and international water disputes will increase and become more serious, with destabilizing consequences."

Since the majority of the population is involved in agriculture, Fipps said improving irrigated agricultural production and livelihoods is critical for maintaining social order in the country. With so many refugees who fled the country during the Soviet occupation and Taliban rule returning to the country, he said there is a need to develop new irrigated farmland for these displaced people, some of whom are involved in the insurgency against the government.

"The thinking is by getting them back into Afghan society through farming, they will no longer need to seek payment from the insurgency," he said.

He recommended increasing water infrastructure projects that would expand irrigated land and provide rural drinking water.

"Rehabilitation of irrigation systems and increasing the water supply to farmers is important," he said. "There's an urgent need for rural residents to see some benefits from the new government."

The rural economy and standard of living would improve vastly if the traditional two-crops-per-year system could be reestablished, and would reduce the need for farmers to grow poppies, Fipps said.

Another major problem Fipps said he saw was the lack of standards for the water infrastructure projects being implemented by organizations and the military. He documented through photographs examples of poor workmanship or inadequate design or use of insufficient materials. Before leaving, he presented a plan for developing standards for design, materials and performance of water structures.

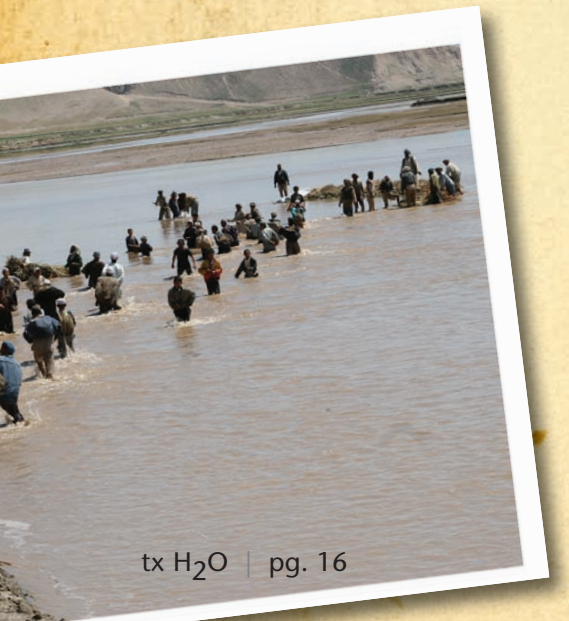
Because he identified transboundary water issues between Afghanistan and its neighbors as a major issue for long-term stability of the country and the region, Fipps helped implement a memorandum of understanding between Afghanistan and neighboring Tajikistan to cooperate on joint development of water resources, such as a large hydro facility on the Amu Daya River.

Other threats Fipps identified were rapid and uncontrolled exploration of groundwater, conflicts between upstream and downstream water-users, the lack of water laws and regulations and recurring droughts.

Besides working on the water planning, Fipps said his best memories are of spending time with the military. When he first arrived, he visited provincial reconstruction teams or PRTs, which are military units that provide security for the reconstruction projects.

"I was able to help them out on what they are trying to accomplish in the PRTs," he said. "We all should be proud of our young men and women serving in Afghanistan. They're very dedicated and committed to the mission in spite of the tough and dangerous conditions they have to deal with."

Because of his diplomatic status, he was escorted by the military when traveling beyond Kabul.



"It's a rather unique experience to be taken out to look at an irrigation project escorted by three to four Humvees and guarded by 10 or more armed soldiers," he said.

While his official work as water advisor is over, Fipps remains involved in Afghan water concerns. He continues to advise the Afghan government on water issues, and USAID has asked him to return for a short-term assignment to help establish a national water agency for the country, an idea that he promoted while in Afghanistan.

In the Spring 2007, he will return to Afghanistan for a few weeks to help USAID in planning its water sector development program and to assist the Afghan government in developing its international transboundary water policy.

He will follow up on his project of designing the water supply and irrigation systems for irrigation teaching farms at three Afghan universities and introduce polypipe, a thin-walled, flexible pipe material used in irrigation to save water. He said Afghans suffer from a lack of expertise and experience with modern irrigation technologies and management practices needed to increase crop yield and farm income, while conserving water.

"Introducing polypipe could have a major impact on irrigation in Afghanistan," he said.

This training is important, he said, because the country lost a whole generation of college-trained Afghans during the Soviet war and Taliban rule.

Top photo, page 15
Afghan farmers and their sons work to repair a dike that was destroyed in a rainstorm.

Middle photo, page 15
A group of Afghan men weave ropes from thick straw brought in from 50 km away. The farmers use these ropes to transport dirt clods on their backs to the dike and bind together bales of reeds.

Bottom photo, page 15
An Afghan farmer weaves ropes from thick straw that looks like dried water reeds.

Top photo, page 16
Afghan men wade out into the river to fill the dike with straw and dirt clods, leaving gaps in the dike to reduce pressure and erosion from the river.

Middle photo, page 16
Twenty men float the large bales of dried reeds into the river to plug the gaps left in the dike. Once the bales are in the dikes, dirt clods are then layered onto the bales.

Bottom photo, page 16
As time goes on, more layers of clods and straw are built up and the dike expands further into the river.

Top photo, page 17
Restoring the diversion dike is demanding but necessary work for the Afghan farmers.

"Outside of Kabul, the country is essentially still in the 13th century...."

An excerpt from Guy Fipps' journal

Dr. Guy Fipps, a Texas A&M University professor in the Department of Biological and Agricultural Engineering, spent nine months in Afghanistan as senior advisor for Water of the Afghan Reconstruction Group. "There are lots of disadvantages to these structures," he said, recounting Afghan farmers and their families rebuilding an irrigation water diversion dike."They wash out two or three times a year and they don't provide good control of water. It's a big strain on their subsistence economy to take the time to rebuild the dikes. But they work."

The following is an excerpt from his journal:

Kunduz is the capital of Kunduz Province in Northern Afghanistan, a regional center surrounded by vast expanses of agricultural land. Every trip out is eye-opening, but in Kunduz, I saw something really extraordinary: the construction of an irrigation diversion dike using methods and materials that have not changed for centuries, maybe for thousands of years….

For thousands of years people have lived along the rivers of what is now Afghanistan and diverted water into hand-dug canals to irrigate their crops. Taking advantage of the mountains and slopes, a single canal can run many miles and provide water to many villages, tens of thousands of people and large irrigated areas.

Afghans construct earthen dikes extending out into the river to divert water. Unfortunately, these dikes frequently wash out when the rivers rise in the spring and early summer as the melting of the mountain snow accelerates. It is the snow that falls in winter that gives water and life to this arid land.

Such was the case of the KZ canal. A weekend rainstorm just three days ago caused the river to rise high enough to completely wash out the existing diversion dike. Now, very little water is flowing into their canal, and approximately 20,000 families cannot irrigate their crops. It's early in the growing season; plants are short and cannot go more than a week without water. As of today, the local farmers have only five days to get the dike rebuilt before facing the danger of crop failure….

…we're amazed at the size of the operation, approximately 400 men and adolescents hard at work.

And what an operation it is. The men are divided into several different work crews. One crew digs up large dirt clods, each weighing around 50 pounds…. The Afghans hope that the grass will take root and help hold the dikes together.

A group of men are busy weaving ropes from a thick straw that looks like dried water reeds…. Some of these ropes are used by the men to cradle the dirt clods on their backs. A group of men lift the dirt clods and help secure them on the backs of the workers who then carry them to the river and wade out into the moving water to drop them onto the expanding dike. Layers of clods and straw are built up, and the dike is extended farther into the river.

The work is very hard and demanding; it must be extremely difficult, first carrying a large load of dirt on your back, then wading though the water with the thick underfooting of river bottom silt.

We watch as the dike quickly forms and extends farther into the river. Such a massive and organized operation is amazing and fascinating to watch. Each farmer along the canal contributes labor or money proportionally to the size of his land.

I watch as the straw men make huge rectangular bales of dried reeds held together by the thick ropes of woven straw. Finally, their purpose becomes clear. As the dike is constructed, gaps are left in the dike in order to reduce the pressure and erosion caused by the moving water in the river. It takes 20 men to roll the huge bales into the river and to float them out to the dike to plug these gaps. Dirt clods are then layered on the straw bales to complete the dike….

The dike will wash out a few times a year, taking money and labor away from cultivation and harvesting of crops, further hurting the subsistence agriculture of the region.

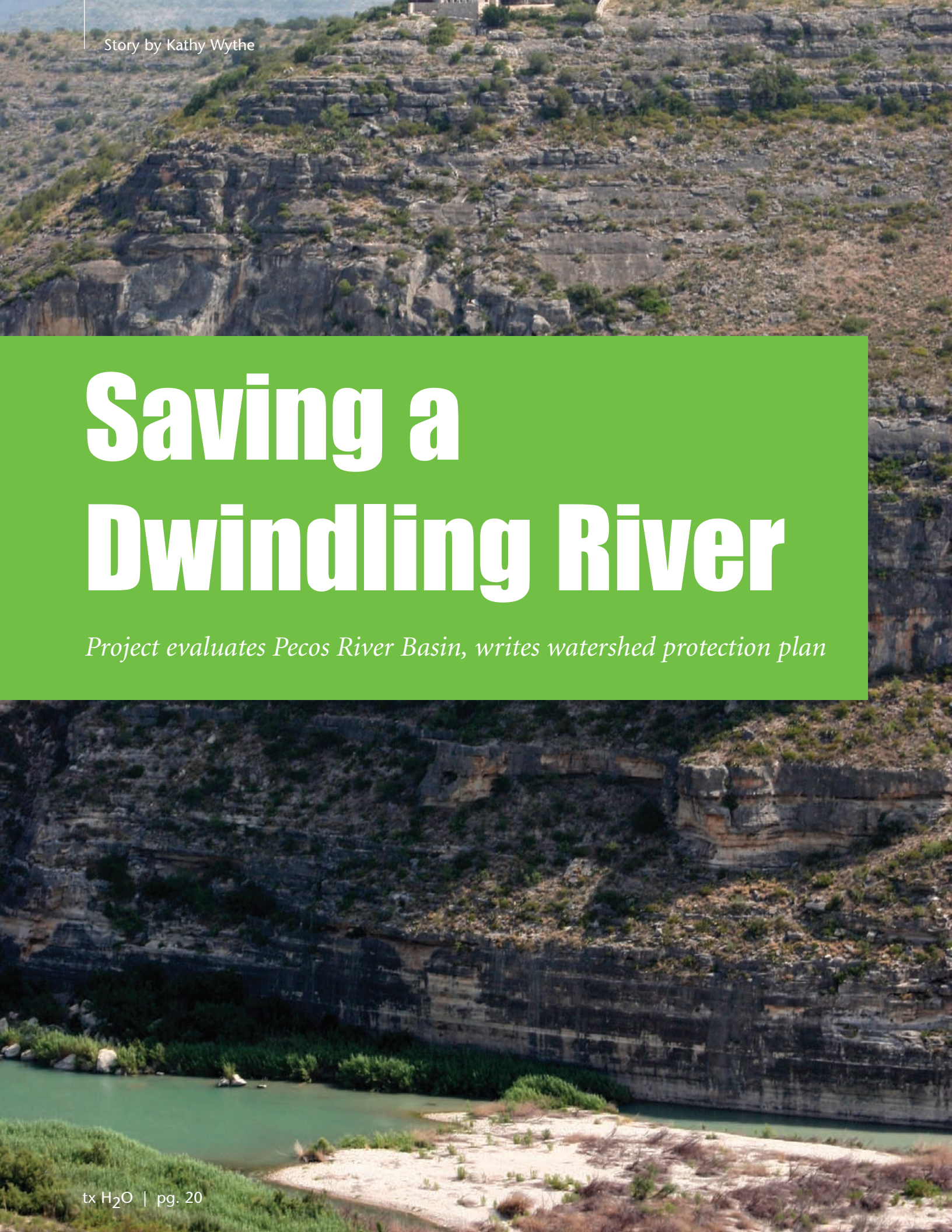
Three weeks later, I visit the site. The dike is still standing even though the river has already risen a foot since my last visit. The dike is working perfectly and diverts large amounts of water into the KZ canal.

Dr. Guy Fipps of Texas A&M's Department of Biological and Agricultural Engineering was escorted by the U.S. military as he traveled throughout Afghanistan to inspect water resources projects.

Story by Kathy Wythe

Saving a Dwindling River

Project evaluates Pecos River Basin, writes watershed protection plan



A group of researchers, educators and stakeholders are deciphering the Pecos River Basin and its ecosystem as the first step in solving the watershed's water quality and quantity problems. This multiagency group is evaluating the river and developing a watershed protection plan as part of the Pecos River Assessment Program.

The Pecos River, which winds more than 800 miles through semiarid and arid landscapes of eastern New Mexico and West Texas, is crucial to many communities, mainly for irrigation, recreational and environmental use and recharging underlying aquifers. The river is the largest U.S. tributary flowing into the Rio Grande, accounting for 11 percent of stream inflow into the Amistad Reservoir.

The Pecos was once a grand river, providing early settlers with abundant water to irrigate crops and furnishing their families with drinking water. Today, however, the river's flow has dwindled—to a trickle in some areas—due to natural and man-induced causes. Irrigation demands and the use of inefficient systems, reoccurring droughts and the spread of non-native, water-thirsty saltcedars have depleted the water supply. The river's salinity is so high that the water is sometimes harmful for irrigation, livestock and drinking. This salinity stems from natural saline deposits—remnants of the shallow Permian Sea that once covered the area—in soils and rocks. The reduced quality and quantity has also harmed the river basin's biodiversity. These problems have persisted for many years and have only been intensified by human influences.

The three-year project that began in 2004 is a collaborative effort of Texas Cooperative Extension, Texas Agricultural Experiment Station, Texas Water Resources Institute and the U.S. International Boundary Water Commission's (IBWC) Clean Rivers Program. The Texas State Soil and Water Conservation Board (TSSWCB) funded the project through the Clean Water Act, Section 319 from the U.S. Environmental Protection Agency.

"The river's importance—historically, biologically, hydrologically and economically—to the future of the entire Pecos River Basin and the Rio Grande is huge," said Will Hatler, project coordinator. "If the integrity of the Pecos is to be improved and maintained, it is crucial that its water quality and quantity be increased."

According to Dr. Charles Hart, project director, the project's first objective is establishing a research baseline for the watershed by identifying and evaluating the river basin's physical features, from both a historical view as well as current conditions.

"We needed to determine what we could do to alleviate some of the problems," said Hart, an Extension range specialist and professor in Texas A&M's Department of Rangeland Ecology and Management.

Aerial photographs, delineations and characterizations of riparian zones and the river system are currently being incorporated into multilayered, interactive maps, Hart said. These maps will cover the entire basin and link with a database allowing users to access information about specific points, such as water quality testing sites.

High salinity was already known as the river's biggest water quality concern—it is one of the saltiest rivers in North America—and has affected its biodiversity as well as making it nonpalatable for livestock or irrigation use.

According to Dr. Seiichi Miyamoto, professor at The Texas A&M University System Agricultural Research and Extension Center at El Paso, the flow of the Pecos accounts for a significant amount of salts entering Amistad International Reservoir, a water supply source for much of the lower Rio Grande Valley. The reservoir provides water for municipal as well as agricultural uses. Its salinity reached 1,000 mg per liter (the upper limit of secondary drinking water standard) in 1988, Miyamoto said, and, unless salinity is controlled, there is a concern that such incidents may occur with greater frequency.

Miyamoto, Fasong Yuan and Shilpa Anand of the El Paso center analyzed the streamflow and salinity data from 11 gauging stations and found much of the Pecos Basin's salinity stems from dissolution of salts from natural sources that are remnants of the

shallow Permian Sea that once covered the area. They also found that the main salt loading is occurring upstream of Red Bluff Reservoir, north of the Texas/New Mexico border. More detailed information on this research is available by downloading TWRI Technical Report 291, "Reconnaissance Survey of Salt Sources and Loading into the Pecos River," at **http://twri.tamu.edu/reports.php**.

The research team has also compared flow and salinity data from the Pecos River to salinity levels in Amistad International Reservoir. Their report, "Influence of Tributaries on the Salinity of Amistad International Reservoir," was completed in April 2006 and is available to download as TWRI Technical Report 292 at **http://twri.tamu.edu/reports.php**.

Another portion of the project assesses the fate of salvaged water from controlling saltcedar, a non-native water-thirsty plant. Hart, Hatler, Alyson McDonald a range management specialist for Extension in Fort Stockton, and Dr. Zhuping Sheng, assistant professor at the El Paso center are evaluating how much water can be salvaged by eliminating saltcedars, and how water flows between the river and the shallow aquifer.

"Our preliminary results show that an acre of saltcedar uses two to four acre-feet of water a year," Hart said. "And we are able to salvage about 65 percent of that" by controlling the plant with aerial spraying of herbicides and other methods of control.

Controlling saltcedar was the focus of another project, the Pecos River Ecosystem Project.

Hart, McDonald and Sheng are also assessing the amount of water saved with saltcedar control that may contribute to downstream flow and/or groundwater recharge. Monitoring data demonstrate a good interaction between the river water and shallow groundwater. Hydrologic conditions control whether the saltcedar control can generate a greater stream flow or a greater recharge into the shallow aquifer. The information collected will help predict the effect of saltcedar control on water quantity as well as quality under different management scenarios.

"We are expecting that by treating saltcedar, base flows in the river will increase," Hatler said.

Both Hatler and Hart said having local landowners and other stakeholders involved in the project was important. The team conducted a survey and held stakeholder meetings to receive their input. The survey found that most stakeholders believe the invasive, water-thirsty saltcedar and debris left from killing it are the biggest concerns for the river.

"We have taken all the information gained from the survey and meetings and incorporated it into the watershed protection plan," Hatler said.

The plan is now a working document and is being reviewed and refined, said Lucas Gregory, who manages the project for TWRI. Once the project's team finishes the draft, local stakeholders will give their input on the plan. The watershed protection plan assesses current management measures as well as determines what future management measures need to be implemented in the river basin to protect the river's water quality, Gregory said.

Gregory, who oversees the development of the project's research and educational programs and is responsible for project reporting, said some members of the project's team have developed a historical paper, "The Influence of Human Activities on the Waters of the Pecos Basin of Texas: A Brief Overview" as well as a historical fact sheet, "Historic Water Issues Facing the Pecos Basin of Texas." These publications give stakeholders an overview of the river, its history and issues and are available on the project's Web site.

Other state and federal agencies are conducting research on the Pecos.

IBWC, Texas Commission on Environmental Quality's Clean Rivers Program, Texas Parks and Wildlife Department and the U. S. Geological Survey are conducting ongoing programs to monitor the river's water quality and biology. Monitoring the aquatic species that are present in the Pecos River will provide insights to assess the effects of point and nonpoint sources of pollution such as nutrient enrichment and sedimentation. This information can also be used to develop plans to protect threatened and endangered species in the region and to increase the diversity of aquatic species in the Pecos River.

The Texas Nature Conservancy is working with private landowners to acquire, protect and manage critical habitat in the lower reach of the river near its confluence with Independence Creek.

Hatler said it will take a long-term commitment from everyone involved, especially stakeholders, to restore the Pecos. "We want to see success in long-term management," he said.

For more information on the project, contact Will Hatler at **wlhatler@ag.tamu.edu** or go to the Web site at **http://pecosbasin.tamu.edu**.

Story by Danielle Supercinski

Practicing Precision

Researchers demonstrate irrigation techniques on producers' farms

Wintergarden and High Plains researchers and county agents worked with 30 growers from various counties to conduct on-farm research demonstrations evaluating the extent to which limited irrigation practices may provide water savings and associated benefits.

These growers, Texas Agricultural Experiment Station researchers and Texas Cooperative Extension specialists and county agents have been working together since 2005 as part of the Precision Irrigators Network (PIN). The first stage of the PIN project was completed in September 2006, yielding preliminary water savings and establishing on-farm collaborations.

"Results from the first year of the study show tremendous possibility for water savings," said Dr. Giovanni Piccinni, PIN project leader and assistant professor of crop physiology with the Experiment Station at Uvalde. "While some growers are doing a very good job using limited irrigation strategies, others are overwatering their crops. These are the growers we want to target next year to improve their water-use efficiency."

PIN is educating agricultural producers about water conservation and irrigation management of various crops, including corn, cotton, grain sorghum, wheat and such winter vegetables as onions, spinach and other economically significant crops. The project's main tasks include: (1) evaluating limited irrigation on agronomic and vegetable crops, (2) evaluating the use of subsurface drip irrigation for forage production, (3) validating the High Plains Potential Evapotranspiration Network, and (4) developing and delivering educational programs.

A LEPA (Low Energy Precision Application) irrigation system is used on the PIN cotton field at The Texas A&M University System Agricultural Research and Extension Center at Uvalde along with lysimeters to evaluate crop water use and develop deficit-irrigation management strategies.

This project was built upon ongoing success achieved through the North Plains Potential Evapotranspiration Network (NPET), which provides updated data agricultural producers can use to precisely apply the amount of water that meets crop needs, thus resulting in water conservation. In the past, translating new research discoveries into farming practices were often stalled because of the perception that research results do not conform to on-farm reality, Piccinni said. Therefore, PIN demonstration trials are carried out on producers' fields in the Wintergarden and High Plains regions, rather than on research centers, so producers can be involved in the research as well.

"We involve the producers in the research project by developing strategies specific for his/her farming system," Piccinni said. "By being involved firsthand in the research process, the producers are more likely to 'buy' into it and continue to apply newly developed strategies on his/her field, giving immediate adoption of research-proven practices.

"Furthermore, we envision that neighboring growers will be more likely to implement new management practices demonstrated on nearby farms rather than those shown only on small Experiment Station plots."

PIN strives to achieve these water savings through producer education, which results in the adoption of advanced technologies and conservation practices. Preliminary studies suggest that, based on 90,000 acres of irrigated land, widespread use of deficit irrigation practices have the potential to save up to 60,000 acre-feet or 19,530 million gallons of water annually in the Wintergarden region, and as much as 413,000 acre-feet of water each year in the Lower Rio Grande Valley (TWDB report 347, August 2001). In the High Plains region, the sum of the 12 producer fields totaled water savings (water pumped) of 16,715 acre-inches for the 1,900 acres of production monitored. The average water savings per corn producer was 8.7 inches per acre annually.

Studies conducted through this PIN project serve as a baseline for potential water savings and serve as a focus for Extension educational programs. A second project, which continues using PIN project data, began in September 2006, and researchers and county agents will continue working on-farm with agricultural producers to evaluate crop water needs and uses to further test irrigation methods to find the most water-efficient methods and amounts.

"We would like total participation of the Wintergarden and High Plains producers," Piccinni said. "By joining the Precision Irrigators Network, producers can achieve water savings resulting in increased profits. As always, when we talk about limited irrigation, the bottom line is we want to 'make every drop count.'"

PIN, as well as the continuation project, was funded by the Texas Water Development Board. Additional support was provided by the Rio Grande Basin Initiative through the Texas Water Resources Institute, Texas Agricultural Experiment Station, Texas Cooperative Extension, San Antonio Water Systems and Edwards Aquifer Authority.

Lysimeters are used in the cotton field to determine crop coefficients to use in combination with deficit-irrigation methods.

Story by Kathy Wythe

Gaining a World View

A&M students exposed to European environmental issues

The Summer 2006 group of the Environmental Soil and Water Study Abroad program in Belgium, a program of Texas A&M University's Department of Biological and Agricultural Engineering traveled to the Delta Works project in the Netherlands.

When Brandon Hartley traveled to Belgium last summer, he gained a first-hand appreciation for international soil and water issues.

Hartley, a Texas A&M University biological and agricultural engineering major from Santa Fe, Texas, is one of 24 students who have traveled with the department's Environmental Soil and Water Study Abroad Program to Belgium over the last two summers to obtain a different view of environmental soil and water issues.

"The program gave me a chance to experience something totally different from what I was used to," Hartley said. "It gave me a global perspective on what I will be pursuing after graduation and some of the problems I may need to face in a global market."

Dr. Clyde Munster, a professor in the Department of Biological and Agricultural Engineering, organized the program. "Our students need to get international experience," he said. "The job market is not just state- or United States-wide anymore."

The five-week program, scheduled to correspond with A&M's second summer session, is hosted by the Katholieke Universiteit of Leuven, Belgium. The Belgium Study Abroad program costs $3,000, which includes lodging, meals and field trips. Students are responsible for their A&M tuition, airline ticket and spending money.

Each summer the program offers two nonengineering courses and one engineering class for six hours of course credit toward graduation. Engineering students can take one of the nonengineering courses as a technical elective. The study abroad program, which satisfies the international and cultural diversity requirement, is open to all students in The Texas A&M University System.

In summer 2007, Munster and Dr. Ann Kenimer, a biological and agricultural engineering professor, will teach a basic environmental hydrology class (one engineering section and one nonengineering section) and an overview class on the technology

The Oosterscheldekering, the largest of the 13 series of dams of the Delta Works project, is a series of gates that can be opened and closed to protect the land from storm surges of the ocean.

for environmental and natural resource protection (nonengineering course).

Munster said classes are intense with all-day, in-class teaching on Tuesdays and Wednesdays, and field trips to different water and wastewater projects unique to Europe on Thursdays. Since Belgium is small and centrally located, the group has traveled to the Ardennes region of Belgium as well as the Netherlands and Germany on field trips.

"The field trips allow the students to compare and contrast European ways to solve environmental problems," he said.

One of the students' favorite trips is to the Delta Works project in the Netherlands. The Dutch developed this project after a huge North Sea flood in 1953 broke dikes and seawalls, killing nearly 2,000 people and forcing evacuation of 70,000 more. The flood-defense system consists of 13 projects, one of which is called *Oosterscheldekering*, which is a series of 50 to 60 gates that can be opened and closed to keep the sea at bay while preserving the saltwater river delta for wildlife and for the fishing industry.

"They came up with a solution that is environmentally sound but still protects," Munster said. "It's very cutting-edge technology."

Hartley, whose home is near Galveston on Texas' coast, said he was particularly interested in this project because of the damage of Hurricane Katrina in 2005. "Observing this project has reassured me that once people put their minds to something, they can accomplish just about anything," he said.

Hartley said since the A&M classes are open to other international students—students from Vietnam, Iran and Kenya were in the 2006 classes—he learned about environmental problems in those countries as well.

Both Hartley and Craig Birkenfeld, a biological and agricultural engineering student from Nazareth, Texas, said they were intrigued with Belgium's sophisticated recycling program.

In Belgium, Hartley said, every piece of land is put to good use. "What is not used for towns or cities is used for agriculture," he said. "Everything is recycled because they do not have any land for landfills."

"I was amazed at how much effort is put forth to avoid wasting materials," Birkenfeld said. "I think I may be able to apply these practices to my career field some day."

Elvin Sterns, who participated in the program in 2005, said that in every interview he has had since participating, he has been asked about his experience and what he gained from the program. Sterns, who graduated in May 2006 and is currently interning at the National Association of State Departments of Agriculture, said he became interested in international water issues because of the program.

"Many other countries are not as modern as the United States when it comes to water management," he said, "and that is something where we could use our knowledge to help others."

Munster agreed that the program gives students a diverse outlook.

"The students gain a different perspective on the world and other people's culture. They see things a little bit differently." Munster said. "But they also see that we're all basically the same."

TWRI Briefs

The *Efficient Irrigation for Water Conservation in the Rio Grande Basin* project received the Cooperative State Research, Education and Extension Service's National Water Program 2007 Award for its Outstanding Integrated Activities for Water Resources. Dr. Michael O'Neill, national program leader for water resources at CSREES, presents Dr. Bill Harris of TWRI and Craig Runyun of New Mexico State University the award. RGBI was one of the 37 projects nominated.

Dr. Elsa Murano presents Dr. C. Allan Jones, director of TWRI, with the Vice Chancellor's Awards in Excellence: Award for Administration for his expertise and commitment to TWRI. Respected throughout the state and nation, Jones grew TWRI's three projects and $300,000 budget in 2001 to today's 70 projects with more than $13.5 million in funding.

The Rio Grande Basin Initiative Research team won the 2006 Vice Chancellor's Awards in Excellence: Award in Research. Drs. Elsa Murano, (far left) vice chancellor and dean for Agriculture and Life Sciences, and director, Texas Agricultural Experiment Station, and Bill Dugas, (far right) associate director for operations, Texas Agricultural Experiment Station, present Drs. Bob Wiedenfeld, Edward Rister, Juan Enciso, Zhuping Sheng, Ari Michelsen and Giovanni Piccinni the award for the entire research team.

Sandra K. Fry, Epsilon Sigma Phi chapter president, and Dr. Ed Smith, Texas Cooperative Extension director, present Dr. Bill Harris, associate director of TWRI, with the Epsilon Sigma Phi Retiree Service Award, an honor that recognizes a retired Extension professional who continues to contribute to Extension programs and volunteers in community activities. Since Harris retired from Extension in 2001 and joined TWRI, he has been active in acquiring nearly $14 million and eight major projects for Extension in Texas.

New Faculty

Dr. Humberto Perotto-Baldivieso

Agricultural Research and Extension Center at Uvalde

Dr. Humberto Perotto-Baldivieso joined the Uvalde center in August 2006.

Perotto received his doctorate in rangeland ecology and management from Texas A&M University in 2006.

Perotto is the first landscape ecologist to be on staff at the Uvalde center where he will perform spatial structural analysis of crop lands for precision agricultural applications and vegetation as well as animal landscape interactions in South Central Texas rangelands in order to improve water resources management and improve farming and ranching efficiency.

Dr. Armen Kemanian

Blackland Research and Extension Center at Temple

Dr. Armen Kemanian recently joined the Temple center as an assistant professor.

Kemanian received his doctorate in biological systems engineering from Washington State University in 2003.

Kemanian's research focuses on the development and application of biophysical models to agroecosystems with an interest in watershed level, plant, crop, soil and whole-farm systems. His research includes measuring and modeling ammonium flux from irrigated, high-input crops.

Dr. Yongheng Huang

Department of Biological and Agricultural Engineering

Dr. Yongheng Huang joined the Department of Biological and Agricultural Engineering as an assistant professor.

Huang received his doctorate in civil engineering from the University of Nebraska–Lincoln in 2002.

Huang's research interests include water treatment technologies, environmental chemistry, environmental-remediation technologies and water quality modeling with concentrations in anaerobic biological wastewater treatment and membrane technology for desalination.

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RESTORING THE TRINITY

Federal, state and local organizations are working together to restore the Trinity River Basin. Gov. Rick Perry's announcement of the Trinity River Basin Environmental Restoration Initiative in September 2006 provided a catalyst for additional projects to improve the Trinity River Basin watershed, its ecosystem and water quality *(see story on page 2).*