



Breaking news about water resources research and education at Texas universities

March 19, 2007

TWRI grant recipient develops decision support framework

In areas where sources of groundwater are a main concern, especially in dry and arid environments, the ownership and regulation of groundwater is important, said **Muthukumar Kuchanur**, a graduate of Texas A&M University–Kingsville who studied environmental engineering and was a recipient of a 2005-2006 Texas Water Resources Institute research grant.

Groundwater management that incorporates ecological demands enables groundwater conservation districts (GCDs), who may monitor only a portion of a water source, a regulated and sustainable policy for reconciling economic growth and ecological demands on a region. Policy regulated by multiple GCDs has been a consistent problem in many areas, where one county's policy may affect a neighboring county due to the interconnected nature of geological formations, Kuchanur said.

Advised by **Dr. Venki Uddameri** of Texas A&M–Kingsville, Kuchanur developed a decision support framework based on game theory to help GCDs in Texas formulate and assess water management policies, which is helpful when multiple stakeholders share groundwater.

For the full report of Kuchanur's research, click [here](#).

Bi-National Water Seminar Series hosted by Texas A&M

[The Bi-National Water Seminar Series](#), co-sponsored by university colleagues in architecture, engineering and agriculture departments at Texas A&M University, Tecnológico de Monterrey, Universidad Autónoma de Nuevo Leon and Universidad Autónoma de Coahila, is covering a variety of water-related issues. Some of the seminars are at Texas A&M; others will be presented at the institutions in Mexico and transmitted via TTVN technology to Texas A&M.

On **March 21**, the series topic is "Characteristics and Causes of Drought in the Southwestern United States" presented by **Dr. Steven Quiring**, a geography professor at Texas A&M. Other speakers are **March 28**, "Basin Management" by **Dr. Jürgen Malknecht** of Tec de Monterrey; **April 18**, "Industrial Residual Water Treatment" by **M.C Luis Castro Solís**, Universidad Autónoma de Coahila; **April 25**, "Use of GIS for Hydrologic Modeling" by **Dr. Francisco Olivera**, Texas A&M University; **May 2**, "Fluvial Water Management" by **Dr. Justino César González**, Universidad Autónoma de Nuevo León.

The Bi-National Water Seminar Series meets at noon in Library Annex room 407.

Comparison reveals Texas' water quality in High Plains Aquifer favorable

Water in Texas is less likely to be affected by chemicals than in other High Plains states, such as Nebraska, according to the U.S. Geological Survey's National Water-Quality Assessment (NAWQA) report on the High Plains region. The USGS research compared shallow groundwater quality beneath irrigated cropland in the High Plains Aquifer. Samples from Texas and Nebraska indicate that nitrate concentrations were larger and pesticide detections were more frequent in shallow groundwater of the Nebraska cropland, primarily used to grow corn and soybeans. The study sampled 30 wells in each state.

In addition to the NAWQA study, researchers conclude that water quality in Nebraska is affected by a higher water table, greater precipitation, smaller evapotranspiration rates and greater recharge rates, as well as an increased use of pesticide to control crops.

The High Plains—or Ogallala—Aquifer encompasses eight states from South Dakota to Texas and is about 174,400 square miles. For information on water quality in the other six states involved in this study, click [here](#).

TWRI grant recipient studies, adjusts irrigation monitor

Josh Bynum, a graduate student at Texas A&M University studying crop physiology and a recipient of a 2005-2006 TWRI research grant, has examined a device for managing irrigation known as Biologically-Identified Optimal Temperature Interactive Console or BIOTIC. Current irrigation practices involve the constant monitoring of soil moisture, atmospheric parameters and plant measurements such as leaf water potential and stomatal resistance, which require considerable time and effort, Bynum said,

Bynum, who is advised by **Dr. Tom Cothren**, said his study of BIOTIC relies on a thermal kinetic window that permits normal enzyme functions in plants. Developed at the USDA-ARS Plant Stress Lab in Lubbock, BIOTIC uses infrared thermometers to measure above ground plant biomass. When soil moisture becomes inadequate, transpiration is greatly inhibited and causes plant leaves to heat up. BIOTIC signals researchers or producers that it is time to irrigate when leaf temperatures exceed 28°C for an extended length of time.

Bynum tested BIOTIC in the College Station region where irrigation and rainfall supply sufficient water needs to plants. Bynum's goal was to build on the success researchers had in the South Plains area and tweak thresholds to determine the effectiveness in areas other than the South Plains.

For the full report of Bynum's research, click [here](#).

Spatial Sciences Laboratory offers training courses

[The Spatial Sciences Laboratory](#) at Texas A&M University is offering several training courses through the end of May. Courses fulfill continuing education requirements from the Texas A&M Office of Continuing Education and will be held in Centeq Building B, rooms 212 or 214. All sessions are \$500, or \$300 for students.

Beginner SWAT, March 20-22, May 1-3—train beginning users on the SWAT model using ArcGIS-SWAT interface

Advanced SWAT, April 17-19—covers sensitivity analysis, model calibration and uncertainty analysis using the 2003 version of SWAT with ArcGIS interface

Remote Sensing, April 3-5—train beginning users on Leica ERDAS Imagine 8.7 software

The Laboratory is dedicated to researching and teaching areas of advanced spatial analysis, spatial data handling, Geographic Information Systems, Global Positioning Systems and Remote

Sensing through application of spatial models, procedures and processes to address natural resource issues.

For more information and to register, contact Lesli Gomez at 979.862.7956.

AWRA student chapter to host Freese and Nichols, Inc.

The student chapter of the [American Water Resources Association](#) will hold its next meeting Tuesday, **April 12** at 5:30 p.m. in the Civil Engineering Building, room 203 on the Texas A&M campus and will be hosting **Freese and Nichols, Inc.**, a Fort Worth-based engineering and environmental science firm with extensive experience managing river authorities and water districts, with expertise in watershed, wastewater and storm water management.

AWRA is the preeminent multidisciplinary association for information exchange, professional development and education about water resources and related issues. For more information, contact AWRA student president [Jacob Torres](#).

Nonpoint Source Monitoring Workshop issues call for papers

The Texas Commission on Environmental Quality and Texas State University's River Systems Institute have issued a call for oral and poster presentations for the [15th National NPS Monitoring Workshop](#) to be held August 26-30 at the Driskill Hotel in Austin. The workshop will focus on national as well as local and regional water monitoring conditions.

The theme for the workshop is "Monitoring for Decision Making," and will include seminars on NPS pollution and karst aquifers; detecting change in water quality from BMP implementation; modeling applications for NPS pollution and control strategies; integrating social indicators monitoring with environmental monitoring; nonpoint source pollution TMDLs; and river restoration projects.

Presentations should be PowerPoint format and should not exceed 20 minutes. Posters should be no larger than 4 ft. by 5 ft. The deadline for submissions is **April 22**.

TRRMS and SETAC joint meeting issues call for papers

[Texas River and Reservoir Management Society](#) and [SETAC South Central Regional Chapter](#) joint meeting "Understanding Urbanized Landscapes: Atmospheric, Terrestrial and Aquatic Linkages" has issued a call for papers. The meeting will be held May 17 to 19 at Stephen F. Austin State University in Nacogdoches and will include a symposium on "Urban Aquatic Ecosystems" and information on the newly released State of Texas Water Plan.

Abstracts should be submitted by **April 18** and should not exceed 300 words. To submit an abstract, click [here](#). The cost to attend the South Central Regional meeting is \$75.

New Projects

"Copano Bay Education Program"

The project will conduct educational programs and demonstrations for land and livestock owners and coordinate with such programs as the *Urban Rancher* program for small landowners and the *Lone Star Healthy Streams* program for cattlemen. The programs and demonstrations will increase awareness of water quality issues and best management practices (BMPs) that owners can implement to decrease or prevent bacteria from entering waterways.

Principal Collaborators: Texas State Soil and Water Conservation Board, Texas Water Resources Institute, Texas Cooperative Extension, Welder Wildlife Refuge
Funding Agencies: Texas State Soil and Water Conservation Board, U.S. Environmental Protection Agency

“Lone Star Healthy Streams”

The goal of this project is to reduce the levels of bacterial contamination of Texas watersheds by delivering training in production and environmental management of grazing lands and their associated watersheds. The project will evaluate and demonstrate the effectiveness of best management practices (BMPs) in reducing bacterial contamination, and develop and deliver education programs to targeted watersheds. Once the education program is finalized, it will be used to promote statewide adoption of appropriate BMPs and other watershed / water quality protection activities through education, outreach and technology transfer.

Principal Collaborators: Texas State Soil and Water Conservation Board, Texas Water Resources Institute, Texas Cooperative Extension, Texas A&M Research & Extension Center–Uvalde, Overton and Stephenville, Soil and Water Conservation Districts, USDA Natural Resources Conservation Service
Funding Agencies: Texas State Soil and Water Conservation Board, U.S. Environmental Protection Agency

“Arroyo Colorado Watershed Protection Plan Implementation”

The *Arroyo Colorado Watershed Protection Plan* is one of the first completed Watershed Protection Plans in Texas and is now ready for implementation. Through this project, a watershed coordinator and grant writer will be hired to facilitate, coordinate and track implementation measures described in the completed Watershed Protection Plan and identify and seek additional funding to continue watershed protection efforts. The project team will publicize and build awareness of the watershed improvement efforts and work with local officials and stakeholders to identify additional measures for reducing pollutant loading to the Arroyo Colorado. All available water quality monitoring data will be analyzed to examine and document changes in pollutant loading, water quality and habitat during implementation of the plan.

Principal Collaborators: Texas Water Resources Institute, Texas Cooperative Extension
Funding Agencies: Texas Commission on Environmental Quality, U.S. Environmental Protection Agency

“Arroyo Colorado Agricultural Nonpoint Source Assessment”

In conjunction with the implementation of the *Arroyo Colorado Watershed Protection Plan*, this project will investigate site-specific differences and temporal variation of water quality in drainage from agricultural production areas and collect data for future recalibration of the SWAT model to better estimate the total nonpoint source loading. In addition, project scientists will perform a complete historical data review and analysis to determine efficacy of agricultural best management practices implemented in the Arroyo Colorado watershed.

Principal Collaborators: Texas Water Resources Institute, Texas Agricultural Experiment Station – Weslaco, Temple, Texas A&M University – Kingsville, Texas A&M University Spatial Sciences Laboratory,
Funding Agencies: Texas State Soil and Water Conservation Board, U.S. Environmental Protection Agency

"Watershed Planning Short Course"

The *Texas Watershed Planning Short Course* project will develop a week-long course that will provide information on stakeholder coordination and in-depth analysis of the Environmental Protection Agency's nine elements of a watershed protection plan. The course will also include information and case study examples about data collection and analysis, and the tools available for plan development, education and outreach related to water quality. The course will promote sustainable proactive approaches to managing water quality throughout the state.

Principal Collaborators: Texas Water Resources Institute, Texas Commission on Environmental Quality, Texas State Soil and Water Conservation Board, U.S. Environmental Protection Agency, Texas Cooperative Extension, Texas River Systems Institute

Funding Agencies: Texas Commission on Environmental Quality, U.S. Environmental Protection Agency

New Publications & Papers

"Water Quality Protection Information Services for Small Water Supply Systems" **Monty Dozier, Gene L. Theodori** and **Ricard Jensen**, a Texas Cooperative Extension Publication. Water quality protection is vital for managers of small waters systems. The publication highlights essential printed and electronic resources that will help small water system owners and operators gather pertinent information and do research on water quality topics. To read the publication, click [here](#).

"Water Issues Facing the Pecos Basin of Texas" **Charlie Hart, Will Hatler** and **Mike Mecke**, Texas Cooperative Extension in cooperation with **Ricard Jensen**, Texas Water Resources Institute. The publication focuses on the Pecos River Basin, which has been rapidly changing over the last 200 years due to human and environmental impacts such as the invasion of saltcedar, a tree that clogs river beds. Through efficient management of water resources and observation of the river's changes, researchers suggest ways to improve water quality and salinity and conserve the precious resource. To read the publication, click [here](#).

"**News Waves**," an email newsletter of Texas Water Resources Institute publishes timely information about water resources news, results of projects and programs, and new water-related research projects, publications, papers and faculty, at universities in Texas. If you have information for possible inclusion in "New Waves" please e-mail items to [Kathy Wythe](mailto:kathy.wythe@tamu.edu) or call 979.845.1862 and include your contact information. All submissions may be edited for grammar and style.

If you have difficulty with any links, please copy and paste the full URL into your web browser.

To subscribe, unsubscribe or manage your personal membership options to the "New Waves" mailing list, visit <http://taex001.tamu.edu/mailman/listinfo/newwaves>.