



*Breaking news about water resources research and education at Texas universities*

**April 24, 2007**

### **2007–2008 TWRI grant recipients announced**

TWRI has selected 10 water-related research projects to fund during 2007–2008 from a pool of 20 submitted proposals. Graduate students in collaboration with faculty members at Texas A&M University, The University of Texas at Austin, Texas Tech University, Baylor University and Rice University developed the projects, which will explore a wide assortment of topics.

The U.S. Geological Survey funds the grants as part of the National Institutes for Water Research annual research program. Students are able to support their research projects and education through this federal program. As a result, the institute will publish articles and reports about the progress of these studies and their benefit to Texas water resources.

Students and their projects are:

- **Narendra Das** (advisor: **Binayak Mohanty**), Texas A&M University, "Development of an algorithm to create repository of soil moisture and evapotranspiration maps for the State of Texas"
- **Stephanie Johnson** (advisor: **David Maidment**), The University of Texas, "Intra-watershed modeling of bacterial contamination"
- **Tae Jin Kim** (advisor: **Ralph Wurbs**), Texas A&M, "Reallocation of reservoir storage capacity between flood control and conservation purposes"
- **Steve Oswalt** (advisors: **Dick Auld, Thomas Thompson**), Texas Tech University, "Optimizing irrigation of oilseed crops on the Texas High Plains"
- **Nithya Rajan** (advisor: **Stephen Mass**), Texas Tech, "Comparative evaluation of actual crop water use of forage sorghum and corn for silage"
- **Kendra Johnson Reibschleager** (advisor: **Raghupathy Karthikeyan**), Texas A&M, "Bacterial impairment assessment for Lake Granbury watershed"
- **Ronnie Schnell** (advisor: **Don Vietor**), Texas A&M, "Chemically treated compost biosolids enhance water conservation and quality on urban landscapes"
- **Corinne Wong** (advisor: **Jay Banner**), University of Texas, "Evaluating the impacts of brush clearing on recharge of a karst aquifer"
- **Theodore Valenti** (advisor: **Bryan Brooks**), Baylor University, "Water quality influences on ionizable contaminants in the Brazos River Basin: Implications for water resource management of urbanizing watersheds"
- **Fanwei Zeng** (advisor: **Caroline Masiello**), Rice University, "Carbon isotopic measurements of dissolved inorganic carbon: A new tool to assess groundwater-river exchange in the Brazos River Basin"

## Institute requests Mills Scholarship applications

TWRI announces a request for applications for the 2007–2008 TWRI Mills Scholarship Program. This program, which is funded by the W.G. Mills Memorial Endowment, provides funds to graduate students in diverse disciplines pursuing research in water-related studies at Texas A&M University.

TWRI anticipates funding 15 graduate students with one-year \$1,500 scholarships payable at the beginning of the 2007-08 academic year. The deadline for submission is June 19, 2007. For more information, contact [Cecilia Wagner](mailto:Cecilia.Wagner@tamu.edu), [Cecilia@tamu.edu](mailto:Cecilia@tamu.edu), 979.458.1138.

## TWRI's Lake Granbury project updated

Scientists involved with TWRI's [Water Quality Program for Lake Granbury, Texas](#) project recently gave updates to **Rep. Chet Edwards** and others about the project's progress. The project is investigating golden algae and their toxic blooms that kill fish as well as educating stakeholders about the lake's water quality issues.

**Leslie Schwierzke** and **George Gable** of Texas A&M's Department of Wildlife and Fisheries Sciences gave a quick overview of the golden algae research portion of the project. They explained that researchers are using a custom-designed, boat-mounted dataflow unit to sample the lake's water. The unit continuously samples the water as the boat moves along the lake, measuring for certain parameters. The research team is currently investigating the water conditions surrounding the toxic blooms and this data will be used to determine if any relationships exists between the algae and *E. coli* prevalent in the lake's coves.



*TWRI Director Allan Jones talks with Rep. Chet Edwards and Hood County Judge Andy Rash about the Lake Granbury project.*

**Dr. Bruce Lesikar**, Department of Biological and Agricultural Engineering professor and Extension specialist, gave an update on the project's water quality education program and stakeholder involvement. Several stakeholder meetings and educational seminars have been given in the Lake Granbury area and more are scheduled for the near future. He said landowners around the lake are interested in an open dialog of what the most appropriate actions will be to improve the lake's water quality. He said more on-site investigations of the sewage systems around the lake are needed.

## A&M–Kingsville researchers, grant recipients recognized for research, writing

**Dr. Venkatesh Uddameri**, Department of Environmental Engineering associate professor at [Texas A&M–Kingsville](#), and his research group have recently achieved an honorable feat with eight of the team's research papers appearing in a special issue of [Environmental Geology](#) titled "Sustainable Aquifer Management for Semi-Arid South Texas."

The team's research focuses on progressive computing techniques for managing groundwater and the practical relevance of such tools for sustaining water resources in South Texas.

Uddameri's team evaluated a variety of issues including methods for calibrating watershed models for estimating the amount of rainfall that recharge aquifers and developing innovative tools to design underground dams or aquifer storage recovery systems that increase groundwater resources.

Of the eight articles featured in the special issue of *Environmental Geology*, two were co-authored by TWRI grant recipient **Muthu Kuchanur**, the first Ph.D. graduate of A&M Kingsville's [Environmental Engineering program](#), and by TWRI grant recipient **Vivekanand Honnugar**.

The Texas A&M Kingsville Environmental Engineering program, established in 1990, is an interdisciplinary engineering and physical sciences degree. The degree is part of the Center of Research Excellence in Science and Technology, or [CREST](#), a program established by the National Science Foundation in 2002 to support minority-serving institutions that enhance research abilities for under-represented minorities in science, technology, engineering and mathematics.

Water research is one of the program's leading areas of research, exposing graduate students to water resources and water management planning, especially within Texas. Projects being carried out by Uddameri's research group include field studies to elucidate coastal-groundwater interactions in Baffin Bay, attenuation of agricultural runoff effluents in drainage ditches of the Arroyo Colorado River watershed and groundwater modeling studies for Kenedy, Victoria, Refugio and other groundwater conservation districts.

For the complete story, [click here](#).

### **UT engineer receives water resources Web site grant**

**Dr. David Maidment**, director of The University of Texas at Austin's [Center for Research in Water Resources](#), received a five-year, \$4.6 million grant from the National Science Foundation to develop a comprehensive Web site compiling water-related data from hundreds of federal, state and local agencies.

"With more and more people using fixed water supplies or living next to water that can flood, the personal risk, the pollution and the water shortage potential are all increasing," Maidment said in a UT news release. "Water is a precious resource, and we need to thoroughly understand what effect human activities and other factors are having on it."

Maidment and his team will compile streamflow measurements, soil data, and satellite and meteorological data on a water database Web site, which will include user-friendly Web program models to predict how a water resource could change over time, and to ultimately gather water data from a wide variety of sources to the single Web site.

Maidment's comprehensive water information system will be developed with colleagues from Drexel University, The Ohio State University and the San Diego Supercomputer Center.

For the complete story, [click here](#).

### **Batchelor appointed McFarland Professor**

**Dr. Bill Batchelor**, a professor in Texas A&M University's Zachry Department of Civil Engineering, was recently appointed inaugural holder of the endowed Arthur McFarland Professorship in Engineering.

Batchelor's research is directed towards understanding, developing and improving existing treatment systems for water, wastewater, hazardous wastes and contaminated soils and sludges. His research has covered a variety of physical, chemical and biological treatment methods and he

has integrated these studies into his teaching and consulting. He is also involved in developing improved treatment technologies for desalination and industrial cooling water systems.

For the complete Aggie Engineering story, [click here](#).

### **First year of drought study complete, results pending additional year of tests**

Researchers in South and Central Texas have completed the first year of a two-year study of warm-season turfgrass drought tolerance. The Extension study, led by turfgrass specialist **Dr. David Chalmers**, compared 25 turfgrasses and cultivars using a 5,000 sq. ft. drought simulator. The Texas A&M University System's [Irrigation Technology Center](#) developed the simulator, located in San Antonio, and the [San Antonio Water System](#), [Turfgrass Producers of Texas](#) and the [Rio Grande Basin Initiative](#) funded the simulator.

Two hundred 4x4 ft. grass plots with soil conditions mimicking those of the Texas Hill Country were subjected to 60 days of drought-like conditions (high temperatures and low humidity), followed by 60 days of drought recovery irrigation. Researchers monitored the grasses' response, and will compare results with an identical test from the second phase of the study.

Grasses were planted in either 4 or 18 inches of soil, 4 inches to simulate the Hill Country, and 18 inches to simulate native soil depths. Results showed that no grasses in 4 inches of soil survived the modeled drought conditions, while all grasses survived in 18 inches of soil.

One of the researcher's goals is to monitor turfgrass performance based on San Antonio's conservation ordinance for new construction, which requires residential and commercial builders to use approved turf grasses that have summer dormancy capabilities on all new construction. The San Antonio Water System used the data from the first year of study to develop a list of optimal drought-tolerant grasses to be used in new construction.

For the complete AgNews story, [click here](#).

### **TWRI grant recipient determines efficacy of erosion control compost**

**Lindsay Birt**, a graduate student at Purdue University and formerly of Texas A&M University and a recipient of a 2005–2006 Texas Water Resources Institute research grant, evaluated the effectiveness of using compost rather than conventional hydroseeding or topsoil to reduce erosion from roadside construction.

The [Texas Department of Transportation](#) (TxDOT) has approved and promoted the use of compost as a stormwater best management practice during highway construction, encouraging compost application on the slopes of highways which frequently erode when topsoil and vegetation is removed. The addition of erosion control compost (ECC) supplies nutrients, retains moisture and helps establish vegetation on harsh growing sites where traditional erosion control methods have failed.

Through her research, Birt concluded that particle size, soil moisture capabilities and time at which rainfall is applied affect surface runoff. While TxDOT specifications use ECC at 5 cm depth on a maximum 3:1 slope, Birt found that an application depth of 1.3 cm is more effective for reducing first flush runoff and [interrill erosion](#) rates. According to Birt's research, the depth of compost application can be minimized, possibly reducing construction costs.

Birt's research relied on data from a constructed and calibrated indoor rainfall simulator that measured runoff rates, interrill erosion and interrill erodibility from five compost treatments in accordance with TxDOT specifications in order to determine the optimal application depth of

compost to minimize runoff. The treatment applications Birt used in her research included untreated woodchips, composted yard trimmings, topsoil and fertilizer-paper mulch blend.

Birt was advised by **Drs. Russell Persyn**, assistant professor, Department of Agricultural and Biosystems Engineering, South Dakota State University and formerly of Texas A& M University, and **Patricia Haan**, associate professor, Department of Biological and Agricultural Engineering, Texas A&M University.

Birt said she hopes that her research serves as a model for optimal use of ECC and, when applied to real-world situations, will aid and encourage TxDOT in its use of compost on hill slopes along highways.

For the full report of Birt's research, go to [http://twri.tamu.edu/usgs/2005-06/birt\\_report.pdf](http://twri.tamu.edu/usgs/2005-06/birt_report.pdf).

### **SHSU researchers develop efficient wastewater treatment system**

Researchers at Sam Houston State University's [Texas Research Institute for Environmental Studies](#) (TRIES) lab have developed an adaptable, cost-efficient portable and reconfigurable wastewater treatment system.

Known as DAAB, or Deployable Aerobic Aqueous Bioreactor, the system is ideal for smaller communities that are rapidly growing, according to TRIES technician **Joshua Quinn**, quoted in Sam Houston State's newspaper. DAAB is suitable for smaller water districts due to its portable nature and ability to run off minimal energy requirements.

A decentralized treatment system, like DAAB, results in smaller treatment facilities scattered over a large area, rather than one centralized system responsible for the majority of a city's wastewater treatment, which ideally reduces operations costs. In addition, DAAB is being considered for drought and water shortage relief because of the system's ability to locally circulate water in affected areas, rather than sending the water to a centralized water treatment facility miles away, according to the news article.

For the complete story, go to [https://www.shsu.edu/~pin\\_www/T@S/2007/wastewateritem107.html](https://www.shsu.edu/~pin_www/T@S/2007/wastewateritem107.html).

### **TWRI grant recipient studies counteractions for nitrate-rich groundwater**

**Omar Richard Harvey**, a graduate student at Texas A&M University studying water management and hydrological sciences and a recipient of a 2005-2006 Texas Water Resources Institute research grant, investigated the potential for the use of zero-valent iron for reducing the nitrate leaching to groundwater from agricultural systems. Harvey's research, advised by **Drs. Christine Morgan** and **Richard Loeppert**, focused on mineral contamination interactions, remediation and treatment of contaminated water, as well as the application of GIS, spatial statistics, modeling to the study of aquatic systems.

Nonpoint nitrate pollution of groundwater can have potentially detrimental effects, both economically and environmentally, on communities that rely on groundwater for drinking. Finding a way to reduce such pollution, which is largely due to high mobility of nitrate in the environment, by reducing the mobility of nitrate in soils is critical for controlling nitrate contamination. Harvey designed a series of laboratory-scale batch and column experiments to determine important factors for developing larger plot- and field-scale studies.

According to Harvey's results, the presence of zero-valent iron reduces nitrate to ammonium which is partitioned between the soil surface and the solution phase. Nitrate reduction was accompanied by a decrease in dissolved oxygen and an increase in pH with the magnitude and

rate of change being dependent on the amount of nitrate reduction and zero-valent iron in the system.

### **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 Coahuila, is covering a variety of water-related issues.

On **April 25**, **Dr. Francisco Olivera**, Texas A&M University, will speak on "Use of GIS for Hydrologic Modeling" and **Dr. Justino César González**, Universidad Autónoma de Nuevo León, will speak on "Fluvial Water Management" on **May 2**.

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

### **Spatial Sciences Laboratory offers beginner SWAT training course**

[The Spatial Sciences Laboratory](#) at Texas A&M University is offering a beginner SWAT training course **May 1–3**. The course fulfills continuing education requirements from the Texas A&M Office of Continuing Education and will be held in Centeq Building B, room 212 or 214. The course is \$500, or \$300 for students.

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

### **TRRMS and SETAC sponsor joint meeting**

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

The cost to attend the South Central Regional meeting is \$75. For more information, [click here](#).

### **Nonpoint Source Monitoring Workshop scheduled in Austin**

The Texas Commission on Environmental Quality and Texas State University's [River Systems Institute](#) are sponsoring the [15th National NPS Monitoring Workshop](#) **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.



## **New Publications**

### **["Rate Setting for Small Water Systems in Texas"](#)**

**Monty Dozier, Gene L. Theodori and Ricard Jensen**, Texas Cooperative Extension publication L-5485. Knowing how to set the proper rate for water service is a challenge for small water systems. They must generate enough revenue to remain solvent, but offer affordable service. This publication describes the various types of rates and explains in detail the many resources that are available to help managers of small water systems make wise business decisions.

### **["Resources for Small Water Systems"](#)**

**Monty Dozier, Gene L. Theodori and Ricard Jensen**, Texas Cooperative Extension publication L-5484. This publication is a guide to finding the many resources available to help managers of small water systems in Texas. Details are provided about sources of financial assistance, tools for capacity building, training programs and educational resources.

### **["Rainwater Harvesting: Landscape Methods"](#)**

**Rachel Alexander, Bruce J. Lesikar and Justin Mechell**, Texas Cooperative Extension publication E-441. With the state's growing population and limited supply of groundwater and surface water, Texans must use water wisely. Rainwater harvesting can help them as an innovative approach that anyone can use to capture rainfall. Authors explain how rainwater harvesting landscape methods can save consumers money, reduce potable water demand, use water efficiently plus reduce flooding, erosion and surface water contamination.

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