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New Waves

Texas Water Resources Institute's E-Newsletter
Breaking news about water resources research and education at Texas universities

April 28, 2009

Meeting to discuss solutions to Buck Creek bacterial contamination

Landowners and others interested in learning about and contributing to the development of the Buck Creek Watershed Protection Plan are invited to a public meeting April 30th in Wellington.

The meeting will be from 6:30-8 p.m. at the Wellington Auditorium, 802 10th Street. Light refreshments and meeting sign-in will begin at 6:00 p.m.

"Texas AgriLife Research and Texas AgriLife Extension Service staffs have been working with landowners to evaluate water quality in the creek, located in the southeastern part of the Texas Panhandle, because of bacterial contamination," said **Phyllis Dyer**, research assistant and watershed coordinator with Texas AgriLife Research in Vernon.

Results from a three-year monitoring study of the creek in Donley, Collingsworth, and Childress counties suggested that possible sources of the elevated *E. coli* bacteria are free-ranging animals, including feral hogs, livestock, and wildlife; and human sources, Dyer said.

The Texas State Soil and Water Conservation Board provided grant funding to Texas AgriLife Research and the Texas Water Resources Institute (TWRI) to conduct the water quality study and facilitate the development of the watershed protection plan.

Lucas Gregory, a project manager for TWRI, said the meeting will highlight progress being made in the project.

"Stakeholders will also learn about watershed modeling that will be used to help identify areas within the watershed with the highest potential for decreasing bacterial levels by implementing voluntary management practices," Gregory said.

The watershed model will use physical watershed characteristics to estimate these potential bacterial reductions, he said.

"Stakeholder input will greatly improve the accuracy of any bacteria load estimations made through modeling; therefore, we strongly encourage anyone with firsthand knowledge of the watershed to attend the meeting and provide input," said Dale Dunlap, Texas AgriLife Extension agent in Collingsworth County.

Scientists are currently working to identify specific sources of the bacteria in Buck Creek through bacterial source tracking and will continue to work with landowners to evaluate and select potential management alternatives for restoring the waterbody, Dyer said.

These landowner-selected management strategies will be incorporated into the Buck Creek Watershed Protection Plan, which will be a framework for holistically restoring water quality in the creek, she said.

"Stakeholder participation in this project and public meetings are critical to ensure that each person has a chance to participate in the decision-making process and decide what voluntary management measures will be recommended in the watershed protection plan," said **Curtis Scrivner**, Hall-Childress Soil and Water Conservation District chairman.

For more information see the project website at http://twri.tamu.edu/buckcreek, or contact Phyllis Dyer at 940-414-0195 or PMDyer@ag.tamu.edu.

Landowners, residents learn about bacterial pollution in Robertson County creeks

Robertson County landowners and residents reviewed the current progress of a water quality study that is examining bacterial pollution in five Robertson County creeks at a public meeting April 23rd in Franklin.

The Brazos River Authority, Texas AgriLife Research, Texas AgriLife Extension Service, Texas Water Resources Institute (TWRI), and Texas State Soil and Water Conservation Board sponsored the meeting.

The five tributaries — Walnut Creek, Spring Creek, Mud Creek, Pin Oak Creek, and Campbells Creek — of the Little Brazos River are designated by the state as impaired, said **Lucas Gregory**, a project manager for TWRI. The creeks are closed to recreational use due to elevated *E. coli* bacteria concentrations that exceed state water quality standards.

The federal Clean Water Act mandates state intervention to protect public safety, he said. Approximately 300 bodies of water statewide currently have this designation.

"Bacteria impairments occur statewide, but the impairments on these five creeks affect much of the western half of Robertson County," said **Ed Schneider**, Robertson County AgriLife Extension agent. "Landowners should make a concerted effort to attend future stakeholder meetings in order to participate in the decision-making process and ensure that their concerns and desires are known. Their participation is fundamental to the success of this study."

Although not all strands are harmful to people, elevated concentrations of *E. coli* in lakes and streams indicate fecal contamination and the possible presence of harmful pathogens, said **Jay Bragg**, regional environmental planner with the Brazos River Authority. Wastewater treatment plants, septic systems, livestock, pets, feral hogs, birds, and other wildlife are possible sources of *E. coli*.

The purpose of the study is to more accurately determine the level of impairment, Bragg said. It will also help identify feasible best management practices that can be voluntarily implemented to reduce bacterial concentrations and prevent more stringent federal regulation.

More information about the study is available at http://www.brazos.org/Little_Brazos_Trib.asp.

Paper explores stakeholder preferences in environmental models

Dr. Venkatesh Uddameri, associate professor in the Department of Environmental Engineering at Texas A&M University-Kingsville, and **Dr. Ric Jenson**, assistant professor in the Department of Contemporary Media and Journalism at the University of South Dakota, recently published a paper, "Using communication research to gather stakeholder preferences to improve groundwater management models: a South Texas case study" in the *Journal of Science Communication*.

Jensen previously worked for the Texas Water Resources Institute for 23 years, most recently as an assistant research scientist.

The paper provides a series of arguments and approaches about the ways stakeholder issues have recently been incorporated into environmental models, briefly describes some of A&M-Kingsville's efforts to develop groundwater models that incorporate stakeholder inputs, and presents and discusses a method in which communication research can be used to obtain stakeholder preferences input into modeling efforts.

The paper may be downloaded at
http://jcom.sissa.it/archive/08/01/Jcom0801(2009)A02/?searchterm=jensen.

Partners video magazine releases segments on Rio Grande

The U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service (USDA/CSREES) has released the latest edition of its *Partners* video magazine, titled "Fluid Planet."

"Fluid Planet" is a four-segment series featuring land-grant university researchers studying water conservation. The Texas Water Resources Institute's Rio Grande Basin Initiative (RGBI) is highlighted in two segments: "Big River Part I" and "Big River Part II."

Part I discusses the RGBI's focus on balancing demands for water and irrigation efficiency on farms and gardens. Part II details ways researchers in New Mexico are studying new and old irrigation systems using the Rio Grande, including state of the art drip lines and ancient acequia canals.

Partners is an award-winning video magazine produced by CSREES. It highlights the programs and accomplishments of the partnership between CSREES and the Land Grant University System in areas of research, education, and extension.

To view "Fluid Planet" and more *Partners* episodes, visit
http://www.csrees.usda.gov/newsroom/partners/partners.html.

TWRI grant recipient expands WRAP capabilities

By Caitlin Churchill

Tae Jin Kim, a graduate of Korea University now earning a doctorate from Texas A&M University in water resources engineering, recently worked with his advising professor, Dr. Ralph Wurbs, also a Texas Water Resources Institute (TWRI) associate director, to expand the Water Rights Analysis Package (WRAP).

WRAP is a generalized river/reservoir management modeling system that is routinely applied in Texas to support regional and statewide planning studies and administration of the water rights permit system.

Kim's research is supported by a 2007-08 TWRI research grant. With the $5,000 grant, Kim implemented newly developed WRAP capabilities for modeling reservoir operations for flood control to further expand WRAP. Kim added flood risk indices, enabling WRAP to evaluate interactions and tradeoffs between reservoir operations for flood control and conservation.

To develop and test extended WRAP modeling capabilities, a system of 12 reservoirs operated by the U.S. Army Corps of Engineers and the Brazos River Authority was adopted as a case study.

Kim said his research also extended the WRAP modeling systems period of analysis by 10 years. "The Brazos River Basin WRAP input dataset has a 1940-1997 hydrologic period-of-analysis. [My] research included developing and applying methods to extend the period-of-analysis to 1900-2007; providing a better representation of river basin hydrology."

After he completes his doctorate, Kim will seek a position related to water resources management so he may continue research efforts.

Research conducted by Kim was funded by TWRI through the U.S. Geological Survey as part of the National Institutes for Water Research annual research program. TWRI is the designated institute for water resources research in Texas.

For more information on Kim's research, visit the TWRI USGS Research Grants Web page.

AgriLife researchers compare tillage operations on runoff quality

Dr. Paul DeLaune, environmental soil scientist at the Texas AgriLife Research and Extension Center at Vernon, is studying the impact of different tillage operations in dual-use wheat on runoff quantity, water quality, and nutrient loss.

Much of Texas' wheat may be grazed as part of a dual-use crop, but many fields are still using conventional tillage, which may not efficiently capture rainfall; a key to economic success in a semi-arid environment, said DeLaune.

Each year, depending on market conditions, up to 75 percent of wheat planted in Texas may be grazed, and of that, 95 percent is under conventional tillage, DeLaune said.

He said tillage operations can increase soil compaction, thereby increasing runoff.

"There is a perception among some producers considering no-till production that using no-till in dual-use wheat production will increase compaction and therefore reduce water infiltration and decrease yields," he said.

DeLaune sought to determine whether this perception was valid. His study applied conventional-till, no-till, and no-till with aerator offsets to graze-out and graze plus grain production systems.

Months later, DeLaune applied a runoff-producing event to the crop with simulated rainfall of 2.75 inches per hour showered over the crop and allowed to continue until one-half hour after runoff started. The runoff water was collected, measured, and analyzed for quantity and quality.

DeLaune said the runoff came quickest, in the highest quantity, and with the most soil erosion from the conventional-tilled plots. Also, the total amounts of ammonium and phosphorous in the runoff water were higher from the conventional-tilled plots.

There was no statistical difference in runoff volume, soil erosion, and nutrient runoff amounts between the no-till plots and the aerated treatments, he said.

These initial results show that the use of an AerWay aerator may not be economical, based solely on soil and water conservation. Grazing effects and grain yields may indicate otherwise as the study continues, DeLaune said. Runoff quantity, water quality, and yield data will continue to be collected over the next two years.

This study is supported by the Texas Wheat Producers Board.

Portions of this story are featured in the AgNews release "Researchers to determine if aeration reduces compaction, runoff on no-till fields." To read the entire AgNews release visit http://agnews.tamu.edu/showstory.php?id=1100.

Storm drain markers installed for Earth Day

The Arroyo Colorado Watershed Partnership and member cities of the Lower Rio Grande Valley Stormwater Task Force installed storm drain markers throughout the Valley as part their Earth Day celebrations.

The storm drain markers, reading "No Dumping, Drains to Laguna Madre," will remind citizens not to dump their waste or trash directly into a storm drain or anywhere near storm drains, said **Jaime Flores**, coordinator for the Arroyo Colorado Watershed Partnership.

"All water that flows into the storm drains ends up in the Laguna Madre and if the water is polluted, it will pollute the Laguna," Flores said.

In a precursor to Earth Day, the city of Mission and its volunteers installed storm drain markers and picked up trash April 4th as part of its 2009 Mission Trash Bash.

On April 17, the city of Pharr Public Works Department and Fire Department and Pharr Elementary School students installed markers near the school. Other festivities included planting grass, flowers, and trees.

Saturday, April 18, the city of San Benito and Girl Scout troops installed markers at the San Benito Municipal Building. The city of San Juan and Pharr-San Juan-Alamo High School National Honor Society students installed markers near City Hall. The city of La Joya and a La Joya High School science class installed markers at the La Joya Municipal Park.

The city of Weslaco sponsored a "Green Family Festival" April 18th at City Hall. Volunteers installed storm water markers and planted flowers.

On the same day, the city of Harlingen and Harlingen Independent School District students met at the city's new Centennial Park for the marker installation. Information on recycling, water conservation, native plants, composting, and other green living ideas was provided by Harlingen Proud, Valley Proud Environmental Council, Texas Water Development Board, and Harlingen Park and Recreation. During the event, the Texas A&M University-Kingsville's Javelina Express Mobile Go Center, a 42-foot trailer that provides outreach to prospective students, was staffed by the A&M-Kingsville College of Engineering faculty, students, and staff.

The city of Alton and Alton Junior High School students installed markers April 22nd on the school's campus.

More than 1,000 markers will be installed throughout the Lower Rio Grande Valley during these events, and 20,000 will eventually be installed, said **Javier Guerrero** of Texas A&M University-Kingsville and the task force liaison.

The storm drain marking events are part of the Arroyo Colorado partnership's ongoing efforts to restore and protect the watershed. The partnership and local cities have also installed road signs marking Arroyo Colorado crossings or the boundary of the Arroyo Colorado watershed.

The stormwater task force was organized in 2002 with efforts by Texas A&M University–Kingsville's Frank H. Dotterweich College of Engineering to assist the cities in putting together a regional stormwater management plan and obtaining storm system permits required by the Texas Commission on Environmental Quality and the Environmental Protection Agency.

Water quality strategies workshop in San Antonio

"Implementing Water Quality Strategies in Central Texas" is set for Friday, May 8 from 8:30 a.m. – 3:30 p.m. in the San Antonio River Authority Board Room.

The workshop will review strategies underway in San Antonio and the surrounding areas to protect water sources, discuss current water priorities, and share information about how individuals can make a difference in water quality.

The workshop will include discussions about urban animal waste management, waste water management, water recycling, sustainable development, watershed planning and implementation, outreach and education, and funding strategies.

To attend the workshop, contact **Sarah Wardlow** at 512-245-9200 by May 5th. For more information, call **Eric Mendelman** at 512-245-5570 or e-mail him at em20@txstte.edu.

This workshop is coordinated by the River Systems Institute and Texas State University and funded through a U.S. Environmental Protection Agency (EPA) grant. Collaborators include the San Antonio River Authority, the Guadalupe-Blanco River Authority, the Texas Commission on Environmental Quality, and EPA Region 6.

Texas Groundwater Protection Committee legislative recommendations

The Texas Groundwater Protection Committee (TGPC) recently published a report to the Texas Legislature that provides recommendations to improve groundwater protection and describes the TGPC's planned activities for the next two years.

Fourteen groundwater protection recommendations were made to Legislature in three areas of interest including strengthening groundwater conservation and water quality efforts, advancing groundwater management and protection through enhanced data collection and availability, and supporting groundwater research. The 14 specific proposals can be found in the full report.

Activities and projects planned by TGPC and submitted to the Legislature fall within eight topical areas including implementation of objectives found in the Texas Groundwater Protection Strategy as well as agricultural chemical, groundwater data management, nonpoint source pollution, public outreach and education, groundwater research, and intergovernmental cooperation activities.

To read this report in full, visit
http://www.tceq.state.tx.us/assets/public/comm_exec/pubs/sfr/047_08.pdf.

New Publications/ Papers

Demonstration and Transfer of Selected New Technologies for Animal Waste Pollution Control, S. Mukhtar, L. Gregory, Texas Water Resources Institute Report TR-340, 2009
The project was designed as a means for evaluating animal waste treatment methods and their ability to remove phosphorus (P) from dairy waste. This report summarizes the results of each demonstrated product or technology and the turfgrass growth demonstration. It highlights both positive and negative aspects of each treatment methodology so producers who consider implementing one of the technologies may have science-based findings predicting respective performance.

Economic Impacts of Salinity Control Measures for the Upper Pecos River Basin of Texas, W. Thompson, Texas Water Resources Institute Report TR-348, 2009
The project analyzed the expected economic impacts of implementing potential salinity control measures on the Pecos River above Red Bluff Reservoir to decrease salinity levels in water used for irrigation in Texas. The purpose for this evaluation was to see if the overall economic impact of producing less salt tolerant, more profitable crops might be significant enough to encourage producers to convert current cropping practices to more profitable practices not currently useable due to elevated irrigation water salinity levels.

Expansion of Urban Area in Irrigation Districts of the Rio Grande River Basin, 1996-2006: A Map Series, E. Leigh, M. Barroso, and G. Fipps, Texas Water Resources Institute Report EM-105, 2009
The border region of Texas is experiencing rapid urban growth which is expected to have a continuing and increasing impact on the irrigation districts of the region. This report presents an analysis of the expansion of urban area during the ten year period from 1996 to 2006 in portions of the Rio Grande Basin. The report includes maps of five counties: El Paso, Maverick, Cameron, Hidalgo and Willacy, which show the expansion of urban area over this ten year period. Also, shown on the maps are the service areas of 30 irrigation districts.

TWRI Water Resources Training Courses

APEX	May 12-13, 2009
WinEPIC Training Workshop	June 2-4, 2009
SWAT for Beginners	June 8-9, 2009

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