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Texas Water Resources Institute's E-Newsletter

Breaking news about water resources research and education at Texas universities

November 25, 2008

TWRI grant recipient studies groundwater input to the Brazos River

By Caitlin Churchill

Rice University graduate student **Fanwei Zeng** is earning her doctorate in biogeochemistry as she works with her advising professor **Dr. Carrie Masiello** to test using carbon isotopes as a tool to estimate groundwater input from carbonate-containing aquifers to rivers. For this project, she measured dissolved inorganic carbon in the Brazos River.

Zeng, a native of China and graduate from the University of Science and Technology of China, is a recipient of a 2007-08 Texas Water Resources Institute (TWRI) research grant. With the $5,000 research grant, Zeng said she found that carbonate input to rivers can be detected using carbon isotopes. However, she is not yet ready to apply these carbon isotopic techniques to estimate groundwater. More research on the input of carbonate from surface water and interflow runoff and atmospheric carbon dioxide is needed, she said.

According to Zeng's report, she chose the Brazos River as her field site because the natural variation in bedrock carbonate content created near-ideal conditions for initial tests. Studying the area of the lower Brazos from Waco to the river mouth, Zeng concluded that the Brazos is supersaturated with carbon dioxide at all times of the year with different parts of the river having varying sources of carbon.

Zeng hopes her research can help people better understand regional carbon budgets. "Parts of Texas, Louisiana, Mississippi, Alabama, Georgia, South Carolina and all of Florida are in the same ecological region," she said. "It is likely that rivers in these areas behave similarly to the rivers we are studying."

She said results obtained from her study about groundwater discharge to subtropical rivers can be combined with results from other ecosystem types to ultimately model the global carbon cycle.

As Zeng completes her doctorate, she plans to continue working on carbon cycling related research.

Her research was funded by TWRI with funds obtained 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 Zeng's research, visit **USGS Research Grants**.

Institute requests graduate student research proposals

Texas Water Resources Institute (TWRI) announces a request for research proposals from graduate students for its 2009-2010 grant program. Funded by Congressionally provided support through the U.S. Geological Survey (USGS) and the National Institutes for Water Research, this program is aimed at funding water resources-related research of graduate students at Texas universities.

TWRI anticipates funding 10 graduate research enhancement grants of up to $5,000 in the area of water resources with the intent to strengthen graduate student research and education programs in water resources.

"Congressional funding for this program is uncertain, but anticipated to be known by March 2009," said **Cecilia Wagner**, TWRI's project manager for the program. "The amount and availability of the award is pending availability of funds from USGS."

Topics of research considered include conservation and management of water resources, surface water, groundwater, wastewater, irrigation, drinking water, watersheds, water policy, water quality, water marketing, geographic information systems, computer modeling, aquatic ecosystems, environmental flows and riparian issues. Proposals on other water-related concerns will also be considered.

Research proposals are due in the TWRI office by 5 p.m. on Dec. 18, 2008.

Submission information is available online at **http://twri.tamu.edu**. For further information, contact Wagner at **Cecilia@tamu.edu**.

Institute announces National Competitive Grants Program

In addition to the student program noted above, the National Institutes for Water Resources announces a request to submit proposals for the 2009 National Competitive Grants Program. Funded by Congress through the U.S. Geological Survey, any investigator at an institution of higher learning is eligible to apply for a grant.

Proposals are requested on the topics of water supply and availability. Proposals are sought in not only the physical dimensions of supply and demand, but also quality trends in raw water supplies; the role of economics and institutions in water supply and demand; institutional arrangements for tracking and reporting water supply and availability; and institutional arrangements for coping with extreme hydrologic conditions.

Proposals may request up to $250,000 in federal funds, though the government's obligation under this program depends on the availability of funds. Funds have not been appropriated yet, but if appropriated it is anticipated that less than $1 million in federal funds will be available.

Proposals must be filed on the Internet by 5 p.m. on Feb. 20, 2009 and approved for submission by the Texas Water Resources Institute by 5 p.m. on Mar. 6, 2009.

There have been changes for the application process this year. Detailed proposal, submission and registration criteria can be viewed at **http://twri.tamu.edu**.

For further information, contact Cecilia Wagner at **Cecilia@tamu.edu**.

AgriLife Research, Extension to investigate Cowhouse Creek conservation practices

A team of Texas AgriLife Research scientists and Texas AgriLife Extension Service specialists has received a $647,000 federal grant to evaluate the impacts of conservation practices within the Cowhouse Creek watershed in Central Texas.

"The purpose of our efforts will be to understand how specific conservation practices affect the watershed's overall health and landscape," said **Dr. Bradford Wilcox**, the AgriLife Research rangeland specialist who is leading the project.

The three-year grant is funded by the U.S. Department of Agriculture–Cooperative State Research, Education and Extension Service. Counties included in the study are Hamilton, Coryell and Bell counties.

Primarily the study will test the impacts of conservation practices already in place that were supported by other federal programs.

"Results from this project will provide agencies and landowners with an understanding of how alternative conservation practices, timing of implementation and distribution of conservation efforts impact grazing lands and assist in achieving watershed health goals," said **Dr. Bill Fox**, assistant professor with the Blackland Research and Extension Center in Temple and project researcher.

To continue this AgNews story, visit **http://agnews.tamu.edu/showstory.php?id=812**.

Arroyo Colorado partnership installs watershed road signs

The Arroyo Colorado Watershed Partnership recently installed 10 road signs marking the boundary of the Arroyo Colorado watershed in the Lower Rio Grande Valley as part of the partnership's ongoing efforts to restore and protect the watershed. The Arroyo Colorado, which runs 90 miles from Mission to the Lower Laguna Madre, is on the state's list of impaired waters for high bacteria levels and low dissolved oxygen.

In addition to the signs installed by the partnership, several local cities are also installing more signs to mark either the watershed boundary or an Arroyo Colorado crossing, said **Jaime Flores**, Arroyo Colorado watershed coordinator. The city of McAllen is installing two additional signs and other cities in the watershed, as part of the Lower Rio Grande Valley Stormwater Task Force, will install more later.

"It is our hope that these signs remind residents as well as those visiting our watershed that it is our responsibility to protect our local watershed," Flores said.

The partnership, which is a group of some 700 area citizens and representatives of federal and state agencies, local governments and private organizations, installed the blue and white signs at major roadway entrances to the watershed, including FM 1015 S northeast of Weslaco and 107 S north of Mission.

Along with the boundary signs, the partnership and Valley cities are planning to install storm drain markers. The markers will be tiles that read: "No Dumping, Drains to Laguna Madre." Local residents will be able to participate in the watershed-wide event to install the markers.

"The tiles will remind citizens not to dump their waste or trash directly into a storm drain or anywhere where the waste will end up in the storm drains," Flores said. "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."

The signs and tiles are part of a larger effort to implement the Arroyo Colorado watershed protection plan, which was released in 2007. One of the first plans released in Texas, its implementation is funded in part through a Clean Water Act 319(h) grant provided by the U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality. Texas A&M AgriLife's Texas Water Resources Institute administers the grant and the partnership.

Irrigation training program set for Rio Grande Valley, Gulf Coast

The Texas Water Resources Institute (TWRI) and Texas State Soil and Water Conservation Board (TSSWCB) and Districts are continuing to co-sponsor irrigation training events around the state as part of its Irrigation Training Program (ITP).

The final two events are the High Plains Irrigation Conference and Trade Show, set for Wednesday, Jan. 14, 2009 in Amarillo, and the South Texas Irrigation Conference and Trade Show, scheduled for Tuesday, Jan. 20, 2009 in Hondo, near Uvalde.

At each training program, irrigation experts will speak on efficient irrigation systems and their operation and management. Other topics are specific to the location.

The High Plains conference will be at the Amarillo Civic Center, 401 S. Buchanan. Registration is $15 at the door and includes lunch. The South Texas event will be at the Medina County Fair Hall, FM 462, in Hondo. Registration for the Hondo conference is $10 in advance and $15 at the door.

These training events are part of six programs held around the state to help farmers and others learn about efficient tools and techniques of irrigation management. Each event offered region-specific information about irrigation practices, cropping systems, policy updates and cost-share programs available to local producers. Other programs were held in Lubbock, Chillicothe, Mercedes and Sinton.

The ITP is a collaborative effort of TWRI, Texas AgriLife Extension Service, TSSWCB and USDA's Natural Resources Conservation Service. The Texas Water Development Board provides support funding for the project through its Agricultural Water Conservation Grant program.

For more information on the Irrigation Training Program, visit **http://twri.tamu.edu/project-info/ITP/**.

National Salinity Summit goes to Vegas

The ninth annual National Salinity Summit is scheduled for Jan. 15-16, 2009 at the Monte Carlo Resort and Casino in Las Vegas, Nevada.

This year's summit, hosted by the Multi-State Salinity Coalition and the U.S. Bureau of Reclamation, is titled "Water and Energy: Our Future in the Balance." The one and a half day conference will focus on salinity management and the water and energy nexus.

Specific session discussions range from the water/energy nexus to future federal legislation for desalination and salinity management, source control, environmental concerns, recycling water

desalination, and brackish water and ocean water desalination. Areas of applied research, technologies and project implementation will be covered along with discussions.

Expected attendees include congressional staff, regional and local policy makers, and managers and experts of salinity management and desalination

For more information about the National Salinity Summit, view the following web address: **http://wrri.nmsu.edu/conf/NSS.pdf**.

Transboundary Rivers Conference set for January

A conference on transboundary rivers is set for Jan. 22-23, 2009 at New Mexico State University in Las Cruces.

The conference, "Transboundary Water Crisis: Learning from Our Neighbors in the Rio Grande and Jordan River Watersheds," is hosted by the New Mexico Water Resources Research Institute and the International Relations Institute.

This one and a half day conference will compare similar characteristics between the Rio Grande and Jordan River Watersheds, and explore if shared problems might reveal shared solutions.

Discussions will combine past successful and failed efforts toward the two separate watersheds in hopes to collaborate possible future resolutions, according to the conference brochure. Experts of both watersheds will make recommendations for development of natural and human resources in both the watersheds.

There is no registration fee, but participants must register to attend. To register for the conference, visit **http://wrri.nmsu.edu/conf/rgrj/regis.html** or direct questions to Peggy Risner at 575.646.4337.

Textbook on transboundary water conflict recently published

Dr. Daene McKinney, professor in the Department of Civil, Architectural and Environmental Engineering at the University of Texas, along with three other university professors, has recently co-authored a textbook discussing transboundary water conflict.

"Bridges over Water: Understanding Transboundary Water Conflict, Negotiation and Cooperation" is co-written by **Dr. Ariel Dinar** of Johns Hopkins University**, Dr. Shlomi Dinar** of Florida International University**, Dr. Stephen McCaffrey** from the University of the Pacific and McKinney. The comprehensive text is intended for graduate level courses in policy, economics, engineering and international relations

"Bridges over Water" places the study of transboundary water conflicts in the context of the various disciplines, analyzing them using various quantitative approaches such as river basin modeling and game theory. Case studies of particular transboundary river basins, lakes and aquifers are also considered.

The book's publisher, World Scientific, promotes the book as "the first textbook for a relatively recent yet rapidly expanding field of study." The book is available online on Amazon.com or from the publisher at **http://www.worldscibooks.com/economics/6184.html**.

News from TWRI Water Resources Training Program

Floodplain Delineation with HEC-RAS and GIS Course

Last chance to register for the Floodplain Delineation Course with HEC-RAS and GIS course on **Dec. 3-5, 2008**.

The course will focus on the fundamental concepts of open-channel hydraulics and include hands-on applications of the HEC-RAS and HEC-GeoRAS software packages. Instructors will discuss steady and unsteady flow simulations using HEC-RAS and the delineation and mapping of floodplains using the HEC-GeoRAS tool.

For more information or to register online, visit **http://watereducation.tamu.edu**. Upon course completion, participants will receive Texas A&M University CEUs.

Second watershed planning course set for January

Don't forget to register for the Texas Watershed Planning Short Course at the Mayan Ranch in Bandera, Texas on **Jan. 12-16, 2009**.

This weeklong course will familiarize participants with EPA's nine key elements of a watershed protection plan and the general principles of and tools for: Building Partnerships, Assessing Watersheds, Identifying Solutions and Designing an Implementation Program. Upon course completion, participants will receive CEUs from the National Registry of Environmental Professionals.

A limited number of seats are available, so reserve your seat by registering today. For more information or to register online, visit **http://watershedplanning.tamu.edu/**.

5th International SWAT Conference set

The 2009 5th International SWAT Conference will be **Aug. 5-7, 2009** at the University of Colorado, Boulder, Colorado.

Workshops will be offered **Aug. 3-4, 2009** and include: Introductory SWAT, Advanced SWAT, SWAT Developers and Integrated APEX/SWAT.

Please visit the conference Web site **http://www.brc.tamus.edu/swat/conf_5th.html** for more information, including conference and workshop registration, lodging information, and more.

Other Upcoming Courses

SWAT for Beginners
Feb. 23-24, 2009

SWAT for Advanced Users
Feb. 26-27, 2009

Advanced Data Processing for ArcSWAT
Feb. 25, 2009

Modeling of Water Distribution Systems using EPANet
March 16-18, 2009

For more information, check the training program Web site at **http://watereducation.tamu.edu**.

New Publications/ Papers

Demonstration of the Rapid Assessment Tool: Analysis of Water Supply Conditions in the Harlingen Irrigation District, **E. Leigh, G. Fipps**, Texas Water Resources Institute Report TR-337, 2008
Less than optimal water supply conditions were found to affect approximately 21,000 acres within the district. This report includes tables and seven charts, which detail the types, extent and causes of the head problem.

Ponding Test Results Seepage Losses Laterals 8E and 2A-C, Maverick County Water Control and Improvement District No. 1, **E. Leigh, G. Fipps**, Texas Water Resources Institute Report TR-336, 2008

Thermal Imaging of Canals for Remote Detection of Leaks: Evaluation in the United Irrigation District, **Y. Huang, G. Fipps**, Texas Water Resources Institute Report TR-335, 2008
This report summarizes our initial analysis of the potential of thermal imaging for detecting leaking canals and pipelines.

Environmental Management of Grazing Lands, **K. Wagner, L. Redmon, T. Gentry, D. Harmel, C. A. Jones**, Texas Water Resources Institute Report TR-334, 2008
Bacteria levels are the number one cause of water quality impairment in Texas. Several recent Total Maximum Daily Loads (TMDLs) in Texas have identified grazing cattle as a contributor to bacterial water quality impairments in those watersheds through both direct deposition and runoff of their fecal matter to streams. This is the final report of a project to assist with development and delivery of technical information and support to ranchers on protection and enhancement of the functions and values of grasslands.

Demonstration of the Rapid Assessment Tool: Analysis of Canal Conditions in Hidalgo County Irrigation District No. 1, **E. Leigh, G. Fipps**, Texas Water Resources Institute Report TR-333, 2008

Seymour Aquifer Water Quality Improvement Project Final Report, **J. Sij, C. Morgan, M. Belew, D. Jones, K. Wagner**, Texas Water Resources Institute Report TR-332, 2008
To address high nitrates in the Seymour Aquifer, this 319(d) project worked to encourage the installation of subsurface drip irrigation (SDI) systems and other best management practices (BMPs) to improve water quality and increase water quantity in the Seymour Aquifer. The project provided technical and financial assistance to producers to implement SDI and other BMPs, education programs and demonstrations of methods for reducing nitrate infiltration and improving irrigation efficiency and an evaluation of the effectiveness of SDI implementation.

Irrigation Training Program (South Texas Edition), **D. Porter** (editor) with multiple contributing authors, Texas Water Resources Institute Report EM-103, 2008
The Irrigation Training Program is a collaborative effort between the Texas Water Resources Institute, a unit of Texas A&M AgriLife; Texas AgriLife Research, Texas AgriLife Extension Service, Texas State Soil and Water Conservation Board; and the U.S. Department of Agriculture Natural Resources Conservation Service. Special appreciation is expressed to the individual authors and technical advisors who have contributed to the information and publications contained in this manual; the agencies, irrigation districts, groundwater conservation districts, Texas Agricultural Irrigation Association and members of other associations who have contributed time and leadership in the delivery of irrigation training programs; and to the site coordinators and those who have shared their expertise as speakers at individual programs throughout the state.

Stormwater Management, **Fouad Jaber**, Texas AgriLife Extension Service publication, B-6158
The Clean Water Act and its amendments regulate certain discharges of stormwater. Learn which sources are regulated and what can be done to control stormwater and the pollution it can cause.

Onsite Wastewater Treatment Systems: Homeowner's Guide to Evaluating Service Contracts, **Bruce J. Lesikar, Courtney O'Neill, Nancy Deal, George Loomis, David Gustafson, David Lindbo**, Texas AgriLife Extension Service publication, B-6171
This guide helps homeowners who are seeking maintenance services for their onsite wastewater treatment systems (such as septic systems).

Current Events: How Streams and Rivers Flow Leader Guide, **Justin Mechell, Dotty Woodson, Fouad Jaber, Bruce J. Lesikar**, Texas AgriLife Extension Service publication, B-6210
This leader guide and its companion flip chart (B-6211) are to be used with a stream trailer to demonstrate stream processes and best management practices to protect and restore our streams and rivers.

Renewed Projects
Fort Hood Range Revegetation
This project will research and demonstrate new and adapted conservation practices designed to reduce soil erosion on Fort Hood. Information gained from this and other on-going projects at Fort Hood will be combined to enhance and test decision support tools that can be used by military land managers to simulate, predict, and assess training impacts as well as plan appropriate restoration programs.
Principal Collaborators: Texas Water Resources Institute, Texas AgriLife Blackland Research and Extension Center
Funding Agency: USDA Natural Resources Conservation Service

Lake Granbury and Lake Whitney Assessment
Funding provided to this research effort will support the continued investigation of linkages between the occurrence of coliform bacteria, loadings of nutrients and dissolved organic matter, the resulting in-lake physicochemical environment, and population demographics of the harmful algal bloom-forming haptophyte, *Prymnesium parvum* (golden algae), which is responsible for numerous fish kills in Lakes Granbury and Whitney, Texas. This research, coupled with findings from previous research, will enable the development of mitigation and management strategies aimed at preventing harmful blooms, thereby improving water quality.
Principal Collaborators: TWRI, Texas AgriLife Research, UT Arlington, Baylor, BRA, TPWD, TCEQ
Funding Agency: U.S. Department of Energy

"New Waves," an email newsletter of Texas Water Resources Institute of Texas A&M AgriLife, 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 email Kathy Wythe or call 979.845.1862 and include your contact information. All submissions may be edited for grammar and style.