



Breaking news about water resources research and education at Texas universities

December 12, 2006

Water research and education funding workshop set during Agriculture Conference

The Texas Water Resources Institute (TWRI) will hold a workshop, "Funding Your Water Research/Education Program: One-on-One with Water Agencies," in conjunction with the annual Texas A&M Agriculture Conference in College Station. The conference is scheduled for Monday, **Jan. 8, 2007** from 2 p.m. to 4 p.m. with additional time allotted for individual discussions from 4 p.m. to 5 p.m.

The workshop is for any university research and extension faculty – including but not restricted to Texas A&M Agriculture faculty – with involvement in water and environmental sciences. There will be discussions on priority water issues and roles of key state and federal water agencies. A panel of representatives from seven state and federal agencies will discuss their research and education needs and funding opportunities that faculty might pursue. Following the panel discussion, there will be time for agency personnel and faculty interaction.

"We believe a workshop of this type will greatly benefit the interaction between water resources researchers and educators and the government agencies involved in addressing the water resources issues in the state," said Dr. Allan Jones, TWRI director. "We especially believe that it will be beneficial to new faculty and will be a rare opportunity to gain one-on-one interactions with state and federal agencies to discuss project ideas, agency priorities and funding opportunities."

The workshop is in the Texas A&M University Memorial Student Center, Room 206. For more information and to RSVP to plan appropriately, contact Kathy Wythe at kwythe@tamu.edu or 979.845.1862.

Institute requests graduate student research proposals

TWRI announces a request for research proposals from graduate students for its 2007-2008 grant program. This program, funded by the U.S. Geological Survey through the National Institutes for Water Research, 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.

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.

Applications from graduate students within the state of Texas are eligible and encouraged to apply. Research proposals are due **Jan. 5, 2007**. Submission information is available online at <http://twri.tamu.edu> under the "What's New" section. For more information, contact Cecilia Wagner at CAWagner@ag.tamu.edu or 979.458.1138.

USGS announces RFPs for faculty grants

The U.S. Geological Survey in cooperation with the National Institutes for Water Resources announces the Request for Proposals for the FY 2007 National Competitive Grants Program.

Proposals are requested in not only the physical dimensions of water supply, demand and availability, 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.

Any investigator at a Texas institution of higher learning is eligible to apply for a grant through TWRI. Proposals involving substantial collaboration between USGS and university scientists are encouraged. Proposed projects may be from 1 to 3 years in duration and may request up to \$250,000 in federal funds. Proposals require a 50:50 match; thus, successful applicants must match each dollar of the federal grant with one dollar from non-federal sources.

Proposals must be filed on the Internet at <https://niwr.net/> by **Feb. 16, 2007**. For more information, contact Cecilia Wagner at CAWagner@ag.tamu.edu or 979.458.1138.

Area Creek Studied for Rangeland Effects on Water Quality

Dr. John Sij, Texas Agricultural Experiment Station agronomist in Vernon, and his team are measuring water quality of a rangeland watershed — Buck Creek in the southeast corner of the Texas Panhandle.

As a part of the Texas Commission on Environmental Quality's Clean Rivers Program, limited testing conducted on the creek showed bacterial levels (*E. coli*) in the water were sometimes elevated, indicating a potential water quality problem, Sij said. In response to the potential problem, the Texas State Soil and Water Conservation Board and EPA established the Buck Creek project.

Phase I, the bacterial monitoring phase, is essentially complete and Phase II is concentrating on bacterial-source tracking, he said. The Phase II study will identify the animal sources contributing to the contamination as well as their relative contribution to the total bacterial load.

"This may be one of the first efforts on small streams such as this to get scientific involvement from Step 1, the impairment, through the entire process of identifying the sources of nonpoint pollution and looking for solutions through a watershed management plan," Sij said.

To read the AgNews story, visit <http://agnews.tamu.edu/dailynews/stories/RNEC/Oct2406a.htm>.

Irrigation Technology Center constructs drought simulator

To test turfgrass species' 60-day drought survival rate and to evaluate recuperation time, the Texas A&M University System's Irrigation Technology Center (ITC) at San Antonio has constructed a 5,000 square foot drought simulator.

Construction was completed in July and the simulator is one of only two in Texas. It will provide background information for the San Antonio Water System (SAWS) and for the state on which turfgrass species and cultivars can survive and recuperate during drought conditions.

"The Rio Grande Basin Initiative supported this work through the time and effort of Extension associates Dr. Chris Braden, David Flahive and Dr. Wayne LePori who provided design and construction oversight," said Dr. Guy Fipps, Extension agricultural engineer and ITC director.

In January 2007, a new San Antonio ordinance will go into effect that requires new home construction to have at least 4 inches of topsoil in place prior to lawn establishment and plant grasses that are most likely to survive a 60-day drought.

SAWS, the Turfgrass Producers of Texas and the Rio Grande Basin Initiative provided funding for construction of the drought simulator. For more information on the simulator, download the current issue of the RGBI Outcomes newsletter at <http://riogrande.tamu.edu>.

Travis County 4-H program receives grant

Texas Cooperative Extension for Travis County received a \$7,500 Real 4-H Community Grant from Coca-Cola. The grant supports the Extension's 4-H children and adults Watershed Ecology Team.

The Watershed Ecology Team is a technology and literacy program that targets East Austin middle schools to encourage youth to understand the importance of water quality and protection.

Working with Extension and community organizations, students will participate in out-of-class programs like measuring and monitoring the water quality in their area.

To view the complete story, visit <http://agnews.tamu.edu>.

Grant recipient researches regeneration of Carbon Aerogel Ions for Water Treatment

Carbon-based derivatives such as charcoal, carbon cloth, activated powder and pellets are frequently used in water treatment. Sanjay Tewari, a graduate student in Texas A&M University's Department of Civil Engineering and 2005-2006 TWRI research grant recipient, under the direction of the late Dr. Timothy Kramer, is researching the use of Carbon Aerogel (CA) on water treatment and the problems associated with its use. CA is the newest carbon-based resource for water treatment and is highly conductive, a suitable quality for capacitive de-ionization (CDI) technology.

"CA electrodes were used in CDI for metal ions, bacteria and some organic pollutant removal," Tewari said. "The problem is, once these electrodes are used and saturated, they lose their capacity for removing ions and they need to be replaced."

Tewari said developing an effective regeneration technique is necessary because CA is expensive and the replacement of CA electrodes increases the cost of water treatment.

"The focus of my research is to regenerate used and saturated CA and also prepare a mathematical model to predict the behavior of CA during this regeneration process," Tewari said. "It will help in accurately predicting behavior of CA while purifying water using CDI."

Tewari said that water resources are increasingly polluted and are under high demand due to a rapidly growing global population. An economic and energy-efficient water purification and desalination process is needed in order to reuse available water resources.

"This research is about removing heavy metals and salinity from water using CA and regeneration of used and saturated CA," Tewari said. "In Texas, where we have saline ground water, heavy metal contamination in water and other similar problems, this research can be used as a part of water purification systems."

Tewari said the results of his study, which is still underway, will alleviate pollution in ground water and surface water in an energy-efficient way.

"Once completed successfully, this research will help in developing economic water purification processes with very low energy demand. Initial results show that this process is working," Tewari said.

Tewari's research was funded by TWRI as part of the National Institutes for Water Research annual research program through the USGS. TWRI is the designated institute for water resources research for Texas. For more information on his research, visit USGS Research Grants at <http://twri.tamu.edu> or download his final report at http://twri.tamu.edu/usgs/2005-06/tewari_report.pdf.

Second edition of "Dryland Agriculture"

Dr. Bill Payne of the Texas A&M University's Agricultural Research and Extension Center at Amarillo has co-authored and edited the second edition of "Dryland Agriculture," a publication highlighting the need for improved dryland agriculture technology due to the combined effects of growing competition for diminishing fresh water supplies and an expanding global population.

Payne cites an increasingly globalized economy as a primary change in agriculture since the first edition of "Dryland Agriculture" was published in 1983. The first edition focused exclusively on agricultural trends in the United States whereas the new edition incorporates global trends in dryland agriculture to provide comparisons of techniques worldwide.

Payne said that, while a major trend in the 1950s and '60s pushed many countries to find sustainable food resources, not as many countries are developing sustainable fresh water resources, a factor that complements the developed agricultural systems associated with long-term food resources.

Additionally, the evolution of no-till systems is a significant development in dryland agriculture since the first edition was published. No-till systems, while varied, emphasize restraint from disturbing the soil and protecting it by leaving crop residue in the field to conserve the soil and water resources.

Further topics covered in the second edition include soil conservation, crop choices and rotation, soil fertility, pest management, mixed crop-livestock systems and research issues such as weather variability, erosion, crop diversity, tillage and nutrients and soil organic matter.

The publication is one of several monographs published by the American Society of Agronomy. To obtain a copy of the book, visit <http://www.agronomy.org>.

TWRI grant recipient develops enhanced flooding model

Flooding continues to be a serious problem for many major urbanized cities. In particular, the City of Houston has encountered serious flooding over the last several decades, most recently from tropical storm Allison in 2001, a storm causing over \$2 billion in damages in the Harris Gully area.

To improve flood alert capabilities, Nick Zheng Fang, a graduate student at Rice University studying civil and environmental engineering, has worked to integrate NEXRAD radar rainfall data, and detailed

stormwater system data in GIS frame with Vflo™, an enhanced distributed hydrologic modeling tool, to achieve more accurate and timelier evacuation plans in cases of severe flooding in highly urbanized areas.

"The availability of NEXRAD radar data, GIS databases, accurate distributed hydrologic modeling tools and detailed stormwater system data have made the development of advanced stormwater modeling systems possible," Fang said, recipient of a 2005-2006 Texas Water Resources Institute's research grant.

Fang's research under advising professor Dr. Philip B. Bedient has resulted in an updated hydrologic model of Harris Gully watershed in Houston, a subwatershed of Brays Bayou, which flows in large box-culverts underneath the Texas Medical Center. The medical center was extensively flooded during Allison; stormwater in Harris Gully overflowed, causing flooding of the streets and buildings around the medical center. The model represents the existing drainage network, incorporating representative sewer and road systems in the updated model. Stormwater sewer systems are not generally modeled as part of hydrologic flood analyses for urban watershed areas.

"We focused on development of an enhanced distributed hydrologic model for Harris Gully that better represents the stormwater drainage network than the existing one does," Fang said. The use of Vflo™, a distribution model that preserves spatial variability by dividing the model domain into interconnected cells, helps researchers better understand the hydrologic and hydraulic response of Harris Gully in relation to Brays Bayou under severe weather conditions. Fang set up an updated hydrologic model by feeding higher spatial and temporal resolution precipitation data into the enhanced model.

"The increased information and accuracy of flood levels will provide Texas Medical Center decision-makers with more accurate flood warning information, enabling them to initiate timely evacuation plans under severe weather conditions," he said.

Fang said while his study focuses on severe weather issues in the Houston area, an enhanced distributed hydrologic model benefits a wide variety of communities and builds a solid foundation for a future real-time flood alert system for areas as small as Harris Gully.

"Even though Harris Gully was initially chosen as our research testbed, technologies and methodology used in this research can be beneficially applied to any coastal areas frequently impacted by severe rainfall events and tropical hurricanes," Fang said.

Fang's research was funded by TWRI as part of the National Institutes for Water Research annual research program through the USGS. TWRI is the designated institute for water resources research for Texas. For more information on his research, visit USGS Research Grants at <http://twri.tamu.edu>.

Environmental services conference set for February

Market-based trading of environmental services will be the topic of "Ecosystem Service Markets: Everyone's Business," a February meeting in Houston that will include presentations by top environmental attorneys, researchers and analysts.

The conference aims to help society find practical ways, through market place incentives, to protect ecosystems. Healthy ecosystems are economically important because wetlands purify water and assimilate waters; estuaries mitigate the impact of storms and floods; and forests provide timber and fiber, said Texas Forest Service Director James B. Hull.

The conference is targeted at businesses, government, universities and the non-profit sector with a focus on the scientific, public policy and economic foundations of emerging markets for ecosystem services.

"Leaders in government, business, academia and the non-profit sector need to address these critical issues proactively. Mainstreaming market-based ecosystem service transactions is challenging because of fragmented government rules and policies, difficult property rights issues, and the complexities of matching supply and demand," conference organizers said.

Sponsored by Texas Forest Service, USDA Forest Service, Texas A&M Institute of Renewable Natural Resources, Greater Houston Partnership, Houston Advanced Research Center and Conservation Capital, Ltd., "Ecosystem Service Markets" will be held Feb. 27 at The Westin Galleria Hotel in Houston.

To view the complete story, visit <http://agnews.tamu.edu>. For additional information on the conference and to register, visit <http://tfsweb.tamu.edu/ecoserv>.

New Publications/ Papers

"Reconnaissance Survey of Salt Sources and Loading into the Pecos River," **S. Miyamoto, Fasong Yuan and Shilpa Anand**, Texas Agricultural Experiment Station, in cooperation with **Will Hatler** and **Alyson McDonald**, Texas Cooperative Extension, and **Gilbert Anaya** and **Wayne Belzer**, International Boundary & Water Commission, U.S. Section. TWRI Technical Report 291. Download the report at <http://twri.tamu.edu/reports.php>.

High salinity of the Pecos River has adversely affected stability and biodiversity of the riparian ecosystems as well as the economic uses of this water resource. In addition, a recent study shows that the flow of this river system accounts for nearly one-third of the salts entering the Amistad International Reservoir located at the border to Mexico. These circumstances prompted various attempts to lower salinity, including control of saline water intrusion into the river, and eradication of salt cedars (*Tamarix* sp). This study was conducted for identifying additional salt sources and river reaches where saline water sources are entering the Pecos River.

"Federal Flood Assessment Conference Recommendations and Proceedings," **Ari Michelsen**, proceedings editor, Texas Agricultural Experiment Station. TWRI Technical Report 296. Download the report at <http://twri.tamu.edu/reports.php>.

Congressman Silvestre Reyes convened this Federal Flood Assessment Conference. This proceedings report contains summaries of each organization's observations, responses and recommendations regarding the area's flood events and conference agenda, list of participants, individual agency follow up reports identifying the agency responsibilities, flood event impacts from the agency perspective, agency actions, lessons learned, communication successes, full list of agency priority recommendations, identification of planned incident reports and agency contact information.

"Hydrology of the Texas Blackland Prairie: Riesel Watershed Data and Published Hydrologic Relationships," U.S. Department of Agriculture-Agricultural Research Service. TWRI Special Report 2006-05. Download this CD at <http://twri.tamu.edu/reports.php>.

This CD is a compilation of measured hydrological data of the Riesel Watershed collected since 1937 at the USDA-ARS Grassland Soil and Water Research Laboratory. The data contains the entire record of precipitation, runoff, sediment loss, management practices and limited meteorological information. Spatial information such as watershed boundaries, soil type, topography and site locations are provided in GIS format. The CD also contains publications based on the Riesel data. The data is also available at <http://www.ars.usda.gov/spa/hydro-data>.

If you would like your publication listed, please e-mail kwythe@tamu.edu with your information.

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