

Conservation Matters

THE TEXAS LAND, WATER AND WILDLIFE CONNECTION

[Institutes' year in review: 2014](#)



In 2014 the [Texas A&M Institute of Renewable Natural Resources](#) (IRNR) and the [Texas Water Resources Institute](#) (TWRI) wrapped-up a third full year of working together. As the institutes continue this partnership, **Dr. Roel Lopez**, IRNR director and TWRI interim director, said that he and the institutes' staff are looking forward to the research and education work ahead in 2015, as they reflect on the accomplishments made in 2014.

"2014 was a very productive year for IRNR and TWRI," he said. "Together the institutes received more than \$9 million in external grants, which was about a 53-percent increase from 2013."

"The institutes continue to work together and share services to efficiently address critically important water and natural resources problems."

IRNR's production of updated [Texas Land Trends](#) data and a resulting [new report](#) was one highlight of the year, Lopez said.

"The latest Texas Land Trends data enables us to pinpoint and show the dramatic loss and fragmentation of privately owned farms, ranches and forests that is happening in Texas right now," he said. "Conserving private lands and recognizing the importance of private land stewardship will continue to be a major priority for IRNR and our partners in 2015."

TWRI's [watershed programs](#) continued to expand and gain greater recognition in 2014, said **Dr. Kevin Wagner**, TWRI associate director. Watershed services were expanded to include not only bacterial source tracking and watershed assessment and planning, but also watershed monitoring. TWRI's Texas Watershed Planning Short Course was [recognized](#) as a 2014 Texas Environmental Excellence Award finalist in the education category.

"TWRI continues to seek greater opportunities to support the citizens of Texas in addressing the state's water issues by supporting local efforts through education and research," Wagner said.

In 2014 the institutes worked with a wide variety of partners, including Texas A&M University System entities, private foundations and organizations, other universities, and various local, state and federal agencies.

For additional reading on the institutes' past year of work, read some of the institutes' top Conservation Matters stories from 2014:

- [BST team wins interdisciplinary research award](#)
- [IRNR part of TAMU team receiving \\$1.4 million grant for woodland encroachment research](#)
- [New Texas Land Trends report shows decline in rural working land acreage](#)
- [Bryan, College Station citizen scientists help map local water impairment issues](#)
- [Buck Creek Watershed Protection Plan accepted by EPA](#)
- [Aquifer storage and recovery initiative aims to increase expertise, research](#)

- [IRNR researchers begin statewide quail decline modeling project](#)
- [Automated meters research could save consumers water and money](#)

[RFP: National Competitive Grant Program](#)

The [Texas Water Resources Institute](#) (TWRI) has announced the Request for Proposals (RFP) for the 2015 National Competitive Grant Program by the U.S. Geological Survey, in cooperation with the [National Institutes for Water Resources](#) (NIWR).

Proposals must be filed online at [niwr.net](#) by 4 p.m. CST on **Feb. 19**. TWRI will then approve the proposals for submission to the program by **March 12**.

Proposals are requested on the topics of improving and enhancing the nation's water supply, including:

- evaluation of innovative approaches to water treatment, infrastructure design, retrofitting, maintenance, management, and replacement;
- evaluation of the dynamics of extreme hydrological events and associated costs;
- development of methods for better estimation of the physical and economic supply of water;
- alternative approaches and governance mechanisms for integrated management of ground and surface waters; and
- evaluation and assessment of conservation practices.

Proposals are sought on not only the physical dimensions of water supply, but also the roles of economics and institutions in water supply and in coping with extreme hydrologic conditions. Further information on these priority research issues is in the [RFP](#).

More information is available at [twri.tamu.edu/usgs-104g/](#). The RFP is also available at [niwr.net/public/get_RFP/?type=104G](#) and includes additional information about proposal content, format, review process and registration with the NIWR system.

[Meet a scientist: Lucas Gregory](#)



On any given day one might find **Lucas Gregory** monitoring water quality in the field, analyzing data or writing grants and publications. “There’s really never a dull moment, and that’s one of the things that I like about working here,” said Gregory, Texas Water Resources Institute (TWRI) project specialist and quality assurance officer.

Gregory began working at TWRI in 2006 after he earned his master’s in water management and hydrological sciences and bachelor’s in agricultural systems management, both from Texas A&M University.

Gregory served as the project coordinator for the Center for Invasive Species’ [Caddo Lake Giant Salvinia Eradication Project](#), which set out to use weevils to control giant salvinia, an invasive aquatic plant originally from South America, in the lake. Reflecting on what was learned from the project, he said, “The real finding is that there is a huge need for a local source of weevils to replenish weevil populations on the lake annually.”

Gregory is optimistic that this need will be met. The project’s outreach component led to a grassroots effort to construct a new weevil-rearing facility on the bank of Caddo Lake in August 2014, he said. “This transfer of knowledge from the project team to local stakeholders was a great success for the project and only one of many positive outcomes.”

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Currently, Gregory coordinates the Carters Creek Stream Team, a volunteer water quality monitoring effort that includes students from Texas A&M University and members of the Brazos Valley chapter of Texas Master Naturalist. The stream team gives participants a chance to learn about water quality monitoring techniques, gain monitoring experience and helps stakeholders develop a better understanding of local water quality, Gregory said. "It's really a win-win for everybody."

Having the local stream team has allowed water quality data collection on Carters Creek to increase, from two sites monitored quarterly to 14 sites monitored monthly, Gregory said.

Gregory emphasized the importance of monitoring as the first step to ensuring water quality. Monitoring enables the development of a targeted approach, he said. "Before you can improve water quality you've got to have a good idea of what is going on out there."

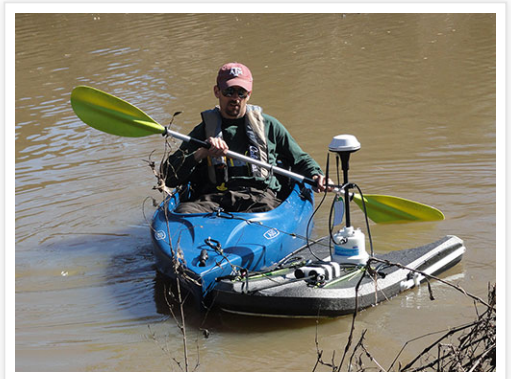
Writing and coordinating watershed protection plans (WPPs) is another one of Gregory's accomplishments. A WPP is a voluntary plan that helps improve water quality in an impaired watershed. Gregory has authored three WPPs and is currently developing a fourth.

"They're not something you can do at your desk," he said. "You've got to work with stakeholders, talk to them about the issues, discuss solutions to manage those issues and then translate that into a cohesive document that meets the needs of the funding agencies down the line."

Gregory is also working on a doctorate in [water management and hydrological sciences](#) at Texas A&M. His research focuses on bacterial fate and transport, specifically understanding how bacteria behave in streams, sediments and soils. The knowledge gained from his research will inform management decisions that address bacteria-related water quality issues, he said.

Gregory said his research stemmed from stakeholders' questions regarding the fate of bacteria in the environment. He hopes that his research will answer some of those questions. "At the end of the day we'll have some good information that we can relay back to those watershed stakeholders," he said.

For more information on the Carters Creek Stream Team, see this August 2014 *Conservation Matters* [article](#) or visit its [web page](#).



Lucas Gregory

[TWRI-led Lower Rio Grande Valley initiative receives \\$2.3 million grant](#)



A [Texas Water Resources Institute](#) (TWRI)-led initiative has received a \$2.3 million grant from the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) to address water quantity and water quality concerns in the Lower Rio Grande Valley.

The Lower Rio Grande Valley Water Improvement Initiative is being funded through the [Regional Conservation Partnership Program](#) (RCPP), a new program authorized by the 2014 Farm Bill.

NRCS State Conservationist **Salvador Salinas** announced the new initiative, along with another Texas RCPP project, at a **Jan. 15** news conference in College Station. These projects are two of more than 115 high-impact projects across all 50 states that will receive more than \$370 million as part of this new RCPP effort, according to NRCS.

“RCPP is a different approach to investing in natural resource conservation that empowers local communities and demonstrates the importance of strong public-private partnerships in delivering local solutions to tough natural resource challenges,” Salinas said.

Dr. Kevin Wagner, TWRI associate director, said project partners will work together to improve management of nutrients and irrigation water in Valley. (Watch the [interview](#) with Wagner about the new initiative.)

“The Lower Rio Grande Valley is experiencing significant population growth, putting greater pressure on the limited water supplies and increasing the need for improved agricultural water use efficiency,” Wagner said at the news conference. “Between 2010 and 2060, population in the region is expected to grow 142 percent. According to the 2012 Rio Grande Regional Water Plan, an additional supply of 610,000 acre-feet per year will be needed by 2060 to support the growing population in the Lower Rio Grande Valley.

Along with the limited supplies for the increased population, degraded water quality, particularly from nutrients, necessitates improved nutrient management and reductions in runoff through irrigation return flows, Wagner said. “Although addressing water quantity is the primary concern, the importance of water quality and quantity are inseparable and intricately linked in the Valley.”

“The Arroyo Colorado and Rio Grande have been identified as nonpoint source priority watersheds by the state,” he said. “Aquatic life in the tidal segment of the Arroyo Colorado is impacted because of sporadic occurrences of low dissolved oxygen. Nutrient concentrations are high throughout the Arroyo Colorado with concentrations of ammonia and nitrate being among the highest in the state and increasing.”

“Algal blooms in the tidal segment of the Arroyo are common in the spring and summer with wide daily swings in dissolved oxygen often accompanying these periods of high algal productivity,” he said. “A reduction in nutrients in the Arroyo Colorado is needed to help control excessive algal growth, improve dissolved oxygen levels and restore aquatic health in the arroyo’s zone of impairment.”

Wagner said the five-year project will address the Valley’s water quantity and quality concerns through improved irrigation delivery and scheduling, as well as innovative irrigation techniques and technologies.

“These innovations will decrease water use, improve productivity and reduce irrigation return flows, thus reducing nutrient and sediment loading to local water bodies,” he said.

According to NRCS, the initiative encompasses 1.59 million acres in Cameron, Hidalgo and Willacy counties and includes the lower Rio Grande, Arroyo Colorado and north Floodway.

“All these water bodies are important sources of freshwater inflows that ultimately reach the Gulf of Mexico,” Salinas said.

Wagner said the \$2.3 million will be leveraged with more than \$7 million in in-kind contributions from project partners: Texas State Soil and Water Conservation Board, Harlingen Irrigation District, Rio Grande Regional Water Authority, Black and Veatch, and Cameron County Irrigation District #2.

Jaime Flores, a TWRI program coordinator for the [Arroyo Colorado Partnership](#), said the project partners will coordinate water conservation and water quality activities in the Rio Grande Valley.

“Working through existing regional planning efforts, this initiative will provide additional technical and financial assistance to agricultural producers in the Valley supported by extensive outreach and education,” said Flores.

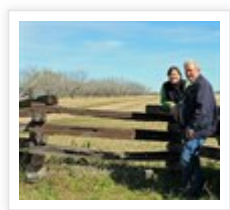
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"This partnership allows for a strong and enhanced approach to addressing the water quantity and water quality challenges facing farmers and ranchers in the Lower Rio Grande Valley," Salinas said. "NRCS and partners working through RCPP projects will help in bringing new ideas and technologies to production agriculture in the Valley."

TWRI is also a collaborator on the only other state Regional Conservation Partnership Program project funded in Texas, the Texas Gulf Coast Stream and Wetland Initiative, led by the Resource Institute, Inc. That project focuses on the restoration and protection of headwater stream and wetland systems on cropland, grassland, rangeland and pastureland within a contiguous 54-county area that includes portions of six major rivers in the Texas Gulf Coast region, according to NRCS.

For more information, read the [AgriLife Today](#) news release and visit the NRCS Texas [RCPP web page](#), which includes informational videos about the projects.

[Generation Next classes will cover profitably getting involved in the family ranch](#)



The [Texas A&M AgriLife Extension Service](#) is offering two-day schools around the state this spring for adult children and grandchildren of landowners who want to get involved in the family ranch.

Generation Next: Our Turn to Ranch School will be held at three locations beginning in early March, according to **Dr. Megan Clayton**, AgriLife Extension range management specialist.

"The schools are for anybody interested in starting an agricultural business," Clayton said, "but we especially want to provide this opportunity for children and grandchildren of landowners. Staying connected to the family ranch is difficult, especially when there's not an obvious way to make a profit."

Many end up needing to find careers outside the property, making it difficult for them to return to the ranch when their parents or grandparents are ready to retire, she said.

"As a result, we've seen a decline in the number of agricultural properties staying in the family," Clayton said. "So this school helps heirs explore profitable enterprises to supplement existing ranching operations. This two-day school is a great place to start for those wanting to get into or stay involved in the ranching business."

The schools will be held **March 5-6** in San Angelo, **March 12-13** in Stephenville and **April 9-10** in Corpus Christi.

The registration fee is \$100 per school until two weeks prior to the course and \$175 thereafter. College students can attend for \$75. The fee includes two days of classes taught by expert instructors, a resource notebook, digital copies of resource publications and materials, five meals and a certificate of completion at the end of the course.

Registration will be limited to the first 50 participants, so early signup is encouraged.

"The first day will be spent learning how to set up a new business," Clayton said. "We'll discuss drawing up effective wildlife and livestock leases, marketing agricultural products and protecting one's investment by understanding insurance and tax opportunities. The second day will explore cutting-edge land management techniques, ecotourism opportunities and other alternative ranching operations that could be coupled with existing practices."

"Staying connected to the land and finding your place in the family ranch can be difficult, but these schools are specifically designed to provide ideas and direction to make multi-generational ranching successful."

To register, go to agriliferegister.tamu.edu/ESSM or call 979.845.2604. For more information, contact Clayton at Megan.Clayton@ag.tamu.edu, call 361.265.9203 or contact your local [county Extension office](#).

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Read the full AgriLife Today [news release](#) for more details.

[Texas water roundtable hosting legislative briefing Feb. 16 in Austin](#)



The Texas Leadership Roundtable on Water is hosting a legislative briefing on its [recommendations](#) for water policy issues on **Feb. 16** from 2-5 p.m. in Austin, at the Capitol Extension Auditorium, E1.004.

The [Texas Leadership Roundtable on Water](#) is a diverse group of water professionals from throughout Texas brought together by the Wye River Group, a nonpartisan, not-for-profit organization.

Three panels will discuss the recommendations on surface water and groundwater management, the state water plan, and data gaps and new technologies.

Wendy Foster of Foster Solutions will moderate the surface water and groundwater management panel, with **Myron Hess** of the National Wildlife Federation, **Kinnan Golemon** of KG Strategies and **Weir Labatt**, former member of the Texas Water Development Board, as panelists.

The state water plan panel, moderated by **Craig Pedersen** of the University of Texas and Envrio Water Minerals Company, will include **Wayne Klotz** of Klotz Associates and the Coastal Water Authority, **C. E. Williams** of the Panhandle Groundwater Conservation District and **Crockett Camp**.

Mary Ellen Summerlin of the Headwaters Groundwater Conservation District will moderate the final panel, with **Bill Callegari**, former state representative, **Dr. Ken Kramer** of the Sierra Club-Lone Star Chapter and **Dr. Kevin Wagner** of the Texas Water Resources Institute as panelists.

Jon Comola, founder of the Wye River Group, will open the briefing, with **Rep. Doug Miller** giving opening remarks. **Rep. Eddie Lucio** will give closing remarks. A reception will be from 5-7 p.m. in the Legislative Reference Library.

Read the roundtable's [core principles](#) and [specific recommendations](#) for more information.

[International Year of Soils promotes the role of soil in meeting global challenges](#)

When it comes to natural resource conservation, water, air and wildlife are often discussed, but there is another equally vital resource that experts say needs protection — soil. 2015 was declared the International Year of Soils (IYS) by the United Nations Food and Agriculture Organization's [Global Soil Partnership](#). The designation celebrates the importance of soil as a nonrenewable resource.

"I think it is a significant time, because we're seeing the effects of degradation of our environment in general," said **Dr. Cristine Morgan**, professor in the [Department of Soil and Crop Sciences](#) at Texas A&M University. "There is more awareness about the role that soils have in global challenges, such as water and food security as well as biodiversity and human health."

The International Union of Soil Scientists (IUSS) will sponsor a number of international [events](#) to celebrate IYS. IUSS, along with the Soil Science Society of America (SSSA), Texas A&M and others, will sponsor the [Global Soil Security Symposium May 19-21](#) at Texas A&M.

At the symposium, attendees will address the five dimensions of soil security, which the conference defines a

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- Capability - The intrinsic capacity of a soil to produce products and ecosystem services
- Condition - The current state of the soil, including modification by human activities
- Capital - The economics of soil services to health, environment and food production
- Connectivity - The social connection of soil managers, custodians and users of soil products and services to the soil and to each other
- Codification - Policy frameworks: identification of policies that degrade soil security and those that secure soil

Symposium organizers said that the event is open to those interested in soil security, including economists, scientists, politicians and nonprofit organizations.

Details about registration and abstract submission for the symposium are on SSSA's [website](#).

At the national level, SSSA is using this opportunity to raise awareness about soil conservation. Each month, SSSA will celebrate a different benefit of soil, including “Soils support recreation,” “Soils clean and capture water” and “Soils support health.”

SSSA also provides educational materials, including presentations, lab experiments and a [video series](#), for various audiences, according to SSA Communications Director **Susan Fisk**.

“People are just becoming more aware of our Earth and our need to take care of it, and the soil is definitely a very important factor in that,” Fisk said.

The U.S. Department of Agriculture’s Natural Resource Conservation Service (NRCS) is also doing its part to bring attention to soils. NRCS [provides](#) educational resources about soil, including videos, an interactive map of soil health around the nation, fact sheets and infographics.

For more information, visit the United Nations Food and Agriculture Organization’s IYS [website](#). To learn more about how the SSSA is celebrating IYS, see this [news release](#).

[Texas Water Journal Forum reunites key players in Edwards Aquifer dispute](#)



Nearly 60 years ago, a tug-of-war began between competing interests battling over use of the Edwards Aquifer. The recent [Texas Water Journal Forum](#) reexamined this dispute by reuniting those who worked to resolve it.

The third Texas Water Journal Forum, “History of the Edwards Aquifer Dispute: A view from the trenches,” was held **Jan. 20** and centered on the conflict of environmental, municipal and agricultural interests in the Edwards Aquifer during the 1990s, at the height of the conflict.

The forum was hosted by [Texas State University’s Department of Geography](#) and [The Meadows Center for Water and the Environment](#) and was attended by approximately 140 people.

Although much of the struggle over use of the Edwards Aquifer occurred in the 1990s, events leading up to the dispute can be traced back to the record drought of the 1950s. **Dr. Robert Gulley**, a [Texas Water Journal](#) editor, kicked off the forum by providing a detailed background.

Municipal and agricultural use of the aquifer, alongside the drought, caused Comal Springs to dry up for five months in 1956. Reduced spring pulses ultimately lead to five species being listed as endangered or threatened in Com

Marcos springs between 1967 and 1980.

Over-pumping of the aquifer began to further threaten these aquatic species' habitat and subsequently led to suits filed by the Guadalupe-Blanco River Authority (GBRA) and later the Sierra Club, he said.

"It's my sense that at the base of the Edwards Aquifer dispute is the rule of capture," Gulley said. Deciding how to address competing interests would be an issue for many years to come, he said.

Following Gulley's introduction, panels consisting of many of the controversy's key players reflected on their roles in searching for a resolution.

Panelists discussed significant legal actions taken, including GBRA's decision to sue the U.S. Fish and Wildlife Service (USFWS) to enforce the [Endangered Species Act](#), protecting endangered and threatened species in the area.

"We had to do something," said **John Specht**, former GBRA general manager.

Former Texas Water Commission chairman **John Hall** recalled trying to reconcile clashing ideas about managing the aquifer. "If we could get some key players to agree on how the aquifer could be managed, that would be progress," he said.

The Sierra Club then filed an additional lawsuit in 1995 to protect threatened and endangered species in the area. Federal District Judge **Lucius D. Bunton III** ruled in favor of the Sierra Club. The ruling encouraged the development of a [habitat conservation plan](#), which was eventually approved in 2013. This plan protects the aquifer's spring flows and saved the eight threatened and endangered species that rely on the aquifer and downstream ecosystems, according to **Dr. Todd Votteler** Texas Water Journal editor-in-chief.

Bunton also directed the Texas Legislature to establish adequate pumping controls for the aquifer. In 1993, the Legislature created the Edwards Aquifer Authority to regulate groundwater pumping.

The second panel, moderated by Votteler, consisted of attorneys on both sides of the landmark Sierra Club v. Babbitt case and legislators who created the Edwards Aquifer Authority in response to Judge Bunton's ruling.

Stuart Henry, former counsel to the Sierra Club, said Bunton "did what any judge would have done."

Panelists also related the discussion to current events and future water issues in the state. **Russell Johnson**, McGinnis Lochridge & Kilgore partner and former counsel for the city of San Antonio in Sierra Club v. Babbitt and Sierra Club v. City of San Antonio, and **Dr. Ken Kramer**, former director of the Sierra Club Lone Star Chapter, moderated the final panel of state representatives **Lyle Larson**, **Doug Miller** and **Tracy King**.

The representatives reflected on what was learned from the dispute and what it means for Texas today. They also speculated on the potential impact of the pending U.S. Voting Rights litigation over the makeup of the Edwards Aquifer Authority board of directors.

Larson said the dispute is responsible for many of the strategies addressing water issues that San Antonio is implementing today, such as desalination.

The representatives agreed that water is something that will continue to shape regional and state legislation and economics. Larson stressed the importance of uniting as a state to address these issues. "We are all Texans," he said. "Water issues are regional, but we need to look statewide."

The Texas Water Journal is published jointly by the Texas Water Journal, a nonprofit organization, and [Texas Water Resources Institute](#). To read the journal, visit texaswaterjournal.org.

[Learn weed control strategies from Feb. 5 range webinar](#)



Best management practices for weed control will be the topic of a **Feb. 5** webinar by the Texas A&M AgriLife Extension Service [Ecosystem Science and Management Unit](#). “To Spray or Not to Spray” is the next topic in the Texas Range Webinar Series, which airs on the first Thursday of each month from noon to 1 p.m., said **Pete Flores**, webinar coordinator.

“Weeds are a common problem among landowners and can be managed with some best management practices,” said **Dr. Vanessa Corriher-Olson**, AgriLife Extension forage

specialist. “This presentation will include discussion on effective weed control with weed identification, proper timing and herbicide selection.”

This webinar and others in the series can be accessed at naturalresourcewebinars.tamu.edu.

Participants seeking Texas Department of Agriculture continuing education units must pay a \$10 fee on the website. For all others, there is no fee, Flores said. Licensed agricultural private pesticide applicators participating in this webinar can earn one integrated pest management unit.

For more information on the webinars, contact Flores at Pete.Flores@ag.tamu.edu. Read the full AgriLife Today [news release](#) for more details.

[Navasota and Round Rock well owners invited to trainings](#)



Local private well owners interested in water well management are invited to [Texas Well Owner Network](#) (TWON) trainings **Feb. 5 in Navasota** and **Feb.19 in Round Rock**. The trainings are free and open to the public, said **Drew Gholson**, Texas A&M AgriLife Extension Service program specialist and network coordinator.

“The TWON program is for Texas residents who depend on household wells for their water needs, so they can learn about improving and protecting their community water resources,” Gholson said. “The program was established to help well owners become familiar with Texas groundwater resources, septic system maintenance, well maintenance and construction, and water quality and treatment.”

The Round Rock training will be 8:30 a.m.–3:30 p.m. at the Community Room at the Jester Annex, 1801 East Old Settlers Blvd.

The Navasota training will be 8:30 a.m.–3:30 p.m. at the Texas Small Farmers and Ranchers Technology Center, Carver Community Center Campus, 1602 S. La Salle St.

He said participants may bring well-water samples to the training for screening. The cost is \$10 per sample, and samples are turned in.

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“Water samples will be screened for nitrates, total dissolved solids and bacteria,” Gholson said.

Well owners who would like to have their water sampled can pick up two sample containers from their [county AgriLife Extension office](#). Bringing water samples to the training is not required, Gholson said, but those wanting to have water samples analyzed must attend.

He said space is limited, so attendees are requested to register as soon as possible at twon.tamu.edu/training or by calling 979.845.1461.

Read the full AgriLife Today [Navasota](#) and [Round Rock](#) news releases for more details.

[GPRI hosting Wastewater Short Course in April](#)

The [Global Petroleum Research Institute](#) (GPRI) is hosting its annual short course, Water and Wastewater Short Course: Issues, Challenges, Solutions, and New Technologies, at Texas A&M University **April 8–9**. The course will include equipment demonstrations and cover practical aspects of separations technologies, case studies, system designs, industrial/commercial applications and field trials.

The registration fee for the full short course at Texas A&M is \$1,095, and options are also available for webinar viewing and purchasing presentations. For more information and to register, see www.gpri.org or contact **Carl Vavra** at carl.vavra@pe.tamu.edu or 979.862.1617.

GPRI is the managing partner of a cooperative effort to conduct critical research in the development of petroleum technology and is part of the [Harold Vance Department of Petroleum Engineering](#) at Texas A&M.

New IRNR and TWRI publications

[2014 International SWAT Conference Proceedings](#), Texas A&M AgriLife Research, USDA Agricultural Research Service, TR-472, 2014.

[Implementing the Pecos River WPP through a Heliborne Electromagnetic \(EM\) Survey: Final Report](#), L. Gregory, Z. Sheng, A. El Hassan, A. K. McDonald, A. Porter, TR-470, 2014.

New IRNR and TWRI projects

An Emission Comparison Between Diesel Powered and Dual Fuel Powered Drilling Rigs

Funding Agency: Pioneer Natural Resources

Partners: Texas A&M Institute of Renewable Natural Resources, Texas A&M AgriLife Research

Mussel Data Collection in the Middle Trinity River

Funding Agency: Texas Parks & Wildlife Department

Partners: Texas A&M Institute of Renewable Natural Resources, Texas A&M AgriLife Research, Texas Water Development Board

Mussel Survey on Rowlett Creek

Funding Agency: North Texas Municipal Water District

Partners: Texas A&M Institute on Renewable Natural Resources, Texas A&M AgriLife Research

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Lower Rio Grande Valley Water Improvement Initiative

Funding Agency: U.S. Department of Agriculture's Natural Resources Conservation Service
Partners: Texas Water Resources Institute, Texas A&M AgriLife Research, Black & Veatch Co., Cameron County Irrigation District No. 2, Harlingen Irrigation District, Rio Grande Regional Water Authority, Texas State Soil and Water Conservation Board

Natural Resources Training Courses

Urban Riparian Symposium
Feb. 11-13, 2015

Texas Riparian and Stream
Ecosystem Workshop - Dickinson Bayou Watershed
Feb. 27, 2015

Introduction to ArcGIS 10
March 11-12, 2015

Texas Riparian and Stream Ecosystem Workshop - Leon River Watershed
March 12, 2015