

June 2014 Conservation Matters



From our director: The state of the institutes

By Roel Lopez

At the Texas A&M Institute of Renewable Natural Resources (IRNR) and the Texas Water Resources Institute (TWRI), we share a complementary mission. Our role is to advance the interdisciplinary approaches required to effectively address complex natural resource challenges.

Since land and water activities are intrinsically linked, the Institutes collaborate on a wide range of issues. Sharing the expertise of more than 50 full-time professional and support staff, resources and multiple locations around the region and nation, we partner with departments, research and extension centers and various organizations to offer a more complete and effective approach to addressing the critical natural resource-related issues of our time.

As we continue forward with these missions, we appreciate your support and are happy to share with you our 2013 Annual Reports for both TWRI and IRNR. These materials are available at twri.tamu.edu/about and irnr.tamu.edu/about.

Wildfire season forecast: Moderately active

By Sara Carney



In recent years, severe Texas wildfires have made national headlines, increasing wildfire awareness and concern throughout Texas. With the exception of some significant wildfire events in the Panhandle, this year's winter/spring fire season was moderately active across the state, and the upcoming season is expected to follow a similar pattern, according to **Tom Spencer**, head of [Texas A&M Forest Service Predictive Services](http://TexasA&MForestServicePredictiveServices.com).

Spencer said the majority of Texas experiences two fire seasons: one that typically runs from January to April and another from mid-July to mid-September. The exception to this is the Trans-Pecos region, which has one fire season in the late spring to early summer.

Predictions for the summer/fall fire season are often based on the amount of rainfall in May and June — the wettest months in Texas.

"If June delivers like May has, then that could have a positive impact on reducing the potential severity of the summer fire season," he said.

Years in which these months are fairly dry, such as in 2011, are often followed by an active fire season. "May was pretty kind to Texas this year," Spencer said, "It brought significant rain to some of the drier areas of the state."

Droughts can lead to increased wildfire activity. Although Texas has seen an increase in rain in recent months, Spencer said it is important to remember that recovery can be a slow process. "It's taken us a long time to get into this drought, and it's going to take a while to get out of this drought," he said.

The majority of fires are caused by human activities. "Where we have people and fuel, that's where we get most of the fires," Spencer said.

He also said people should pay attention to outdoor activities, especially under conditions that have a greater potential for fire formation and when a burn ban is in effect. Spencer recommends that rural landowners take additional precautions to protect their property, such as constructing fire breaks to keep fires from spreading.

The Texas A&M Forest Service's [website](#) offers a number of educational resources including a [wildfire risk assessment](#) tool that maps wildfire risk across Texas.

The Texas A&M Forest Service recommends these tips to prevent wildfires.

- Do not burn trash or debris when conditions are dry or windy. Unsafe burning of leaves, brush, household trash and other debris is the number one cause of wildfires in Texas.
- Obey outdoor burning bans.
- The most common cause of wildfires is humans: Careless debris burning, unattended campfires, dumping hot charcoal or hot ashes, parking or driving in dry grass, dragging chains on the road and welding can all cause fires.
- Remove combustible materials away from your house.
- Be sure your family has a plan for evacuation. Part of your plan should include gathering important documents and prescription medicines and determine where you will go if you must evacuate.

Although much is learned each season about prevention and protection from wildfires, it is still important to remain cautious and stay informed. "The weather reserves the right to change or do what it wants," Spencer said.

If you would like to hear more about the upcoming wildfire season, see this video.

For additional information and to stay up to date on wildfire conditions, visit the Texas A&M Forest Service website at <http://texasforests.tamu.edu>.

Automated meter infrastructure project: How technology can reduce water usage

By Amy Buice



If people knew it cost around \$20 extra at the end of the month to leave their water hose on overnight, they might be more conscious about making sure it's off. At least that's the idea that Texas A&M AgriLife Research, Texas A&M AgriLife Extension Service and Texas A&M Engineering Experiment Station are testing in their automated metering infrastructure project (AMI), according to **Joel Andrus**, AgriLife Extension associate with the Texas Water Resources Institute.

From a consumer's perspective, Andrus said the project will make managing utility bills more tangible. From a utility company's view, it will provide a way to locate leaks, and thus save money. In both cases, the awareness between the two groups — industry and individuals — will ideally provide the information necessary to conserve water.

With the 2012 Texas [state water plan](#) forecasting that municipal water demands will have the fastest growth among all demand categories and predicting those demands to be greater than all categories in 2060, the Texas Legislature charged the A&M agencies to research new technology that addresses the future water needs of Texas.

Through the AMI technology, household water usage information can be wirelessly transmitted to the water provider, which to date in this project is the city of Arlington. Citizens volunteer to be a part of the

AMI study. Then, daily updates on the website inform the consumers about the quantity of water used and the associated costs. After mailing participation inserts with utility bills and sending emails, around 1,000 people in Arlington are currently signed up to receive updates via the website, and more are anticipated to participate, Andrus said.

"What automated water meters in conjunction with the website help you understand is for a particular hour in a day — say you use 150 gallons at 7 a.m. — if you know that all the water you used was to shower, you become much more aware of what that shower actually costs in terms of water usage," Andrus said.

Other attributes of the website include setting water use limits and email notifications for potential leaks. Users can set usage limits that if exceeded will trigger an email to the user informing them that they've used more than they wanted. This will help them not only save water but also help them manage their water bill, he said.

The website also provides helpful tips that raise awareness regarding water usage. For example, a helpful notice on the website informs consumers that watering a lawn for two hours a day uses water at a rate of 10 gallons a minute. At the end of the month, the result is 36,000 gallons of water used for a total of \$145.36 added to the water bill.

"From the utility perspective," Andrus said, "conservation can mean revenue loss." However, AMI technology allows utilities to manage leaks and non-revenue water loss in a way that offsets the revenue lost from conservation.

For example, a utility company may produce a million gallons of water, but what is delivered to the customers is only 900,000 gallons. Despite the fact that the 100,000 gallons are unaccounted for, the utility still has to cover those costs. Automated meters not only can help utilities track those losses and locate areas with potential leaks and damages, but can significantly reduce the amount of bill adjustments the utility gives to consumers who experience an unanticipated high water bill, he said.

The project is currently focusing on Arlington to ensure that the process has as few flaws as possible before expanding the project to other cities. Round Rock is anticipated to join the project within the next few weeks.

Andrus said the project's goal is that in a couple of months, participants' water usage will decrease 5-20 percent.

Once the data is collected, the institute is going to interview conservation officers regarding their conservation programs and the utilities about their experiences with AMI. The lessons learned from this project will be published in several extension guidebooks that water systems can use to better understand how to implement and use AMI and conservation programs, he said.

River course: TAMU graduate students gain experiential learning on Rio Grande

By Leslie Lee



Learning about river hydrology is more impactful in a canoe than in a classroom — or at least that's what a new graduate student course is betting on.

"We're doing a study of the Rio Grande as a part of our graduate water program here," said **Dr. Ronald Kaiser**, chair of the Water Management and Hydrological Science program at Texas A&M University. "This semester we're looking at issues all along the Rio

Grande, and in May we took the students on a fieldtrip, from the headwaters to the Gulf.”

The class, Contemporary Issues in Water Management, concluded with fieldwork trip **May 11-15** along the river, from its origins at the Continental Divide in Colorado, to its destination into the Gulf of Mexico. Kaiser said the course and fieldwork took an in-depth look at the water challenges facing the region.

“If you want to see an example of a course where students get real life experience and make a real contribution, we did that in the Rio Grande this year. It’s beyond abstract course work — it’s real life experience.”

Victoria Lopez, a master’s student in the program, said the trip was well planned. “And (it was) in the field where we could learn things we could have never learned in the classroom,” she said.

Adam Landon, doctorate student in Water Management and Hydrological Science program, said his perception of the river changed dramatically after traveling the entire length of the Rio Grande.

“The complexity of the water management system in its entirety, ranging from the headwaters to the Gulf is truly staggering,” he said. “Every drop of water in the river is allocated for a specific purpose. Disaster in a system designed with such hubris is always looming on the horizon.”

The issues students were examining depend on the section of the river they were visiting, according to **Dr. Rosario Sanchez Flores**, program coordinator of the Water Management and Hydrologic Science program. She said that in New Mexico near Taos, the students looked at the geology that surrounds and delineates the river flow and the differences between other sections of the river considering population, environmental concerns and intensive irrigation use.

“It is not the same to look at the river at Elephant Irrigation District, than at Taos Canon,” she said. “Sometimes people do not realize how water ‘travels’ and changes its quality and condition during that traveling.”

Lopez, who is from Brownsville, said she knew there were specific challenges in her region, “but it was quite shocking to see how affected other towns in the basin are as well. It was quite staggering how abundant the water seems to flow in some areas and changes drastically to cracked dry beds of the river in others.”

A source for municipalities, industries, agriculture and recreation, the Rio Grande is also the focus of political disputes, border security and international interdependence, Kaiser said. Communities and government officials on both sides of the border face a growing crisis in securing a sustainable water supply to meet projected increases in use.

“The combination of a semester-long seminar, the May field work along the Rio Grande and a special conference in the fall will provide an in-depth experience for students serious about tackling major water and environmental issues,” Kaiser said.

“Ultimately the students are going to write book chapters, and we’re going to publish a book on the Rio Grande using their work,” he said. “We’re trying to tease out the wisdom of students who are not constrained by old rules, to look at what can be done in water management. We’re trying to promote creativity in our graduate students.”

Landon said he understands the challenges facing the region much better after the trip.

“Interacting with stakeholders with different perspectives really put the scope of the problems of water scarcity on the Rio Grande in perspective,” he said. “Meeting the people whose lives depend on the resource really humanized the implications of water management decisions for me.”

To learn more about the course, see riobravo.tamu.edu, and visit waterprogram.tamu.edu for more information on the Water Management and Hydrological Science graduate program.

TSSWCB commemorates 75 years of soil and water conservation

By Sara Carney



May 29 marked the 75th anniversary of the founding of the [Texas Soil and Water Conservation Board](#) (TSSWCB) and the organization is celebrating its diamond jubilee throughout the rest of the year.

According to **Rusty Ray**, public affairs specialist at TSSWCB, the annual state meeting of Soil And Water Conservation District Directors will commemorate the 75th anniversary and will feature a number of speakers, including historian [Dan Utley](#) and former Texas Speaker of the House **Pete Laney**, who will deliver the keynote address. The conference is **October 27-29** in Galveston. TSSWCB is also expected to receive a historical marker from the Texas Historical Society, Ray said.

TSSWCB will celebrate the anniversary directly with the state's 216 soil and water conservation districts (SWCDs), Ray said. The exceptional work of SWCDs has significantly contributed to the success of TSSWCB, according to TSSWCB executive director **Rex Isom**.

"Their hard work has not only improved the state's soil and water resources, but has contributed to building a firmer foundation under our state and nation's economy," he said.

"The only reason the TSSWCB still exists 75 years after its establishment is because of the state's soil and water conservation districts, and they in turn exist because of the state's farmers and ranchers who come to local SWCDs for help in planning and implementing conservation programs on private lands," Isom said in a TSSWCB news release.

According to the news release, the organization was founded during the Dust Bowl, a time dominated by severe drought and soil erosion. Since then, TSSWCB has promoted the protection and conservation of natural resources by allowing landowners to connect with their SWCDs, which provide technical and financial support.

TSSWCB is also the lead agency for planning, implementing and managing programs for preventing and abating agricultural and forestry nonpoint sources of water pollution and administers a water supply enhancement program through the targeted control of water-depleting brush. It also ensures that the state's network of 2,000 flood control dams are protecting lives and property by providing operation, maintenance and structural repair grants to local government sponsors, according to the release.

"We're all about conserving the natural resources in the state of Texas," Ray said.

Isom said an additional factor in the success of TSSWCB has been the organization's ability to adapt over time. TSSWCB continues to develop innovative strategies to address changing conditions, he said. "It is important to remember that the conservation of soil, water and related natural resources will never be finished," he said.

Kevin Wagner, associate director of the Texas Water Resources Institute (TWRI), agreed the state organization has evolved as the needs and issues of state evolved.

"Initial focus was on soil conservation, then flood control, then nutrient water quality issues, and now bacteria water quality issues, ag water conservation, water enhancement and rehabilitating flood control structures," he said.

Wagner said TWRI and TSSWCB have been partners for two decades and have worked extensively together to "provide educational programs in impaired watersheds, evaluate and demonstrate new practices for reducing pollutant levels in agricultural runoff, develop watershed plans, assess watersheds and improve watershed assessment tools." Wagner considers the TSSWCB to be one of TWRI's best partners.

While remembering the past, TSSWCB is also looking ahead to the future. "With respect to the TSSWCB and SWCDs, we will be working diligently to maintain and increase the support of state and federal resources to meet Texas' soil and water conservation needs now as well as into the future," Isom said.

For more information about TSSWCB history, read its [news release](#) and this timeline.

Position announcement: TWRI director

The search is underway for a director of the Texas Water Resources Institute (TWRI). The position vacancy is posted on the Texas A&M AgriLife [Great Jobs website](#).

This position will lead the [Texas Water Resources Institute](#), which focuses on water-related applications, including water quality, supply and water use in Texas, the U.S. and internationally. The director will provide intellectual, philosophical and strategic leadership to system faculty and the institute's scientists, staff and students to meet teaching, research and extension missions. The director will be responsible for developing optimum tactical and strategic responses to water-related issues and opportunities and will manage the human and fiscal resources, including leading a contract and grants program that elevates water-related efforts throughout the Texas A&M University System.

This position requires a doctorate and 15 years of relevant post-doctorate experience with a documented record of distinction in teaching, research and/or extension, along with experience leading and managing interdisciplinary water-related programs and teams. Preference will be given to candidates with a doctorate in water-related science, engineering, policy or management and who are recognized experts in the field.

Visit the <https://greatjobs.tamu.edu/applicants/Central?quickFind=190114> for more details.

Dr. Roel Lopez is currently TWRI interim director as well as director of the [Texas A&M Institute of Renewable Natural Resources](#) and will continue in the later role following the hiring of a new TWRI director. The institutes will continue to work together and share staff and services.

Rainwater harvesting soaking in



After a long dry period, many parts of the state have finally received some badly needed rain, and those with rainwater harvesting systems have been reaping the rewards of this belated gift from Mother Nature, said Texas A&M AgriLife water resources experts.

"Rainwater harvesting is a time-tested and effective means of water conservation and irrigation," said **Billy Kniffen**, retired Texas A&M AgriLife

Extension Service statewide water resource specialist and past director of the American Rainwater Catchment Association.

"For years, AgriLife Extension and Texas A&M AgriLife Research personnel have been involved with rainwater harvesting projects, demonstrations and education throughout the state," said **John Smith**, AgriLife Extension program specialist, College Station.

In Edinburg, Smith and the AgriLife Extension horticulturist for Hidalgo County, **Barbara Storz**, worked with [World Birding Center](#) manager **Marisa Rodriguez** on a rainwater harvesting system at the facility's education center.

Another Texas A&M AgriLife effort geared toward educating people about water conservation is the [WaterSense](#) home at the [Texas A&M AgriLife Research and Extension Center](#) in Dallas. The home, completed in March of last year in partnership with the U.S. Environmental Protection Agency Region 6 and the City of Dallas Water Utilities, received a 2013 [Texas Rain Catcher Award](#) from the Texas Water Development Board.

"The Texas A&M AgriLife Research and Extension Center is to be commended for implementing new technology that promotes rainwater harvesting and the benefits of water conservation," said board member **Kathleen Jackson**.

This facility is the first of its kind in North Texas to receive certification as a renovation project and the first WaterSense home to have a rainwater harvesting system as one of its water-saving features, said **Clint Wolfe**, AgriLife Research urban water programs manager for the center. The system provides an efficient alternative source of irrigation by using captured rainwater for landscaping.

Smith said publications on rainwater harvesting by Texas A&M System experts are available for a cost at the Texas A&M AgriLife Extension Bookstore website, <http://agrilifebookstore.org>. Enter the word "rainwater" into the search field on the home page.

Additional information on rainwater harvesting, events and training can be found at <http://rainwaterharvesting.tamu.edu>. Texas residents wanting to know about a rainwater harvesting program in their area may also contact the AgriLife Extension office in their county.

For more information about Texas A&M AgriLife rainwater activities, read the full AgriLife TODAY [news release](#).

Quail Index taking off

The [Texas Quail Index](#), a statewide effort by the Texas A&M AgriLife Extension Service to monitor wild quail population dynamics, has taken full flight, said the effort's coordinator.

"There are going to be more ears cocked skyward listening to the bobwhite's iconic whistle this month than ever before," said **Dr. Dale Rollins**, AgriLife Extension wildlife specialist in San Angelo and statewide coordinator for the [Reversing the Quail Decline Initiative](#).

"We've spent the last month training AgriLife Extension agents and volunteers who are now implementing the demonstrations on 50 separate sites located across the state."

Rollins said the index was initiated in April in 43 counties and seven Texas Parks and Wildlife Department wildlife management areas. AgriLife Extension agents were among some 50 index leaders who were

trained in the proper methods of counting quail and assessing habitat at the Rolling Plains Quail Research Ranch near Roby last month.

Participating AgriLife Extension agents will be the leaders and points of contact in their respective counties. Rollins said they are well-versed in implementing the index, which involves multiple counts of quail, including whistle counts, roadside counts and the measurements of related habitat conditions. The ultimate goal is to determine if any of the various counts will reliably predict how successful the upcoming quail season will be, he said.

Rollins said funding for the work is part of a special appropriation made to AgriLife Extension through a partnership with the Texas Parks and Wildlife Department during the 83rd Legislature to address the decline of bobwhite and scaled quail in Texas. He said the funds were allocated to address both research issues and outreach education. To date, 13 different research proposals have been funded.

AgriLife Extension outreach efforts include both adult and youth education efforts. The Quail Appreciation Days being held across the state join the Texas Quail Index as two of the adult educational components, while the youth educational efforts include such activities as the [Bobwhite Brigade Wildlife Leadership Camps](#).

For more information about the Texas Quail Index, see <http://wildlife.tamu.edu/quail/texas-quail-index> or on Facebook at www.facebook.com/TAMUQDI.

For more information, read the full AgriLife TODAY [article](#).



Keeping landscapes in shape: There's an app for that

Many tools are available for turf managers to help monitor soil or weather conditions, diagnose turf problems or even take the guesswork out of selecting the best-suited grass type for the shade environment, according to a Texas A&M AgriLife Research turf expert.

Dr. Ben Wherley, an assistant professor for turfgrass science/ecology with AgriLife Research and the Texas A&M University Soil and Crop Science Department in College Station, demonstrated some of the new tools and technologies available to attendees of the turf and landscape industry at the recent Turf, Landscape and Irrigation Expo at the Texas A&M AgriLife Research and Extension Center in Dallas.

Whether it is shade, pH, salinity, soil compaction, air circulation, soil type, spray application, lawn size or soil moisture, Wherley said there are an increasing number of helpful apps and tools available for professionals, such as landscapers, golf course superintendents and athletic field managers, as well as homeowners, since most of the devices are reasonably priced.

Some iPhone or iPad apps that are handy, he said, are:

- Sunseeker app allows a person to enter any date and determine the exact trajectory of the sun for that date, helpful in determining how many hours of direct sunlight will reach a given area.
- Planimeter app allows a landscaper to pull up a GPS map of a client's home and drop pins on the corners of their property to get a quick, accurate estimate of the size of their lawn.
- Landscape and Garden Calculator app helps the landscaper or do-it-yourselfer calculate the quantity of materials, such as fertilizer and mulch needed for any given area, as well as fence lengths, spaces between items and angles if needed.

- Turfgrass Management app is designed for the southern U.S. and has pictures and information for all types of insects, pests and diseases.
- SoilWeb app allows anyone to access the GPS-based system, identify their location and determine what soil type is there.

The tools or devices Wherley demonstrated include a wind meter, daily light integral or DLI meters, quantum light sensor, soil profile sampler, soil moisture meters or soil probes. turf thermometer and electrical conductivity meter.

“These are just a handful of some of the latest tools and technologies that have enhanced the capacity of today’s turfgrass professional to more effectively diagnose issues and better manage high quality greenscapes,” Wherley said.

For more information, read the full AgriLife TODAY [article](#).

Statewide boat-draining rule takes effect July 1

Beginning **July 1**, boaters must drain all water from their boat and on-board receptacles before leaving or approaching a body of fresh water anywhere in Texas.

The new [Texas Parks and Wildlife Department regulation](#) is designed to help combat the further spread of zebra mussels and other invasive species. It applies to all types and sizes of boats whether powered or not: personal watercraft, sailboats, kayaks/canoes, or any other vessel used on public waters. The regulation requires the draining of livewells, bilges, motors and any other receptacles or water-intake systems coming into contact with public waters.

Live fish, including personally caught live bait, cannot be transported from the water body where the fish were caught in or aboard a vessel in water from the water body where the fish were caught. Personally caught live bait can be used in the water body where it was caught.

Anglers are allowed to transport and use commercially purchased live bait if they have a receipt that identifies the source of the bait. Any live bait purchased from a location on or adjacent to a public water body that is transported in water from that water body can only be used as bait on that same water body.

Texas Parks and Wildlife Department and a coalition of partners are working to slow the spread of zebra mussels by reminding boaters to Clean, Drain and Dry their vessels before traveling from one lake to another. The partners in this effort include: North Texas Municipal Water District, Tarrant Regional Water District, City of Dallas Water Utilities Department, Trinity River Authority, San Jacinto River Authority, Sabine River Authority, Brazos River Authority, Guadalupe-Blanco River Authority, Lower Colorado River Authority, Upper Trinity Regional Water District, Canadian River Municipal Water Authority, City of Grapevine, Water Oriented Recreation District of Comal County, and the Lady Bird Johnson Wildflower Center.

More information is online at www.texasinvasives.org/zebramussels.

See the Texas Parks and Wildlife [news release](#) for more information.

AgriLife Extension sets Living Waters Conference for Aug. 19 in Junction

The Texas A&M AgriLife Extension Service will conduct the Living Waters Conference beginning at 8 a.m. **Aug. 19** at the Texas Tech Junction Center, 254 Red Raider Lane, in Junction.

Sign-in for the program is set for 8-8:30 a.m., followed immediately by presentations on the Lone Star Healthy Streams program, what constitutes a watershed, and water quality of the South Llano River watershed, said **Sam Silvers**, AgriLife Extension agent in Kimble County.

The conference speakers will include several AgriLife Extension personnel from College Station including: **Dr. Larry Redmon**, state forage specialist; **Dr. Jim Cathey**, associate department head of the wildlife and fisheries department and wildlife specialist; **Dr. Dennis Sigler**, horse specialist; **Jennifer Peterson**, water quality program specialist; and **Dr. Barron Rector**, range specialist. Other scheduled AgriLife Extension speakers include **Dr. Bob Lyons**, range specialist at Uvalde, and **Dr. Alyson McDonald**, range specialist at Fort Stockton.

Individual registration is \$35, which includes lunch and the interactive South Llano River float trip. For more information and to register, visit <https://agriliferegister.tamu.edu/water> or call [979.845.2604](tel:979.845.2604). Also see the AgriLife TODAY [news release](#).

TCEQ issues request for nonpoint source grant proposals

The [Texas Commission on Environmental Quality](#) (TCEQ) recently posted its Request for Grant Applications (RFGA) for Fiscal Year 2015 nonpoint source projects under the Clean Water Act Section 319(h) Grant Program.

This solicitation can be accessed through the [Electronic State Business Daily \(ESBD\) web site](#). At the web site, in the "Browse Postings" section, in the line for "**Agency Requisition Number**," enter **582-14-43265**, and then click on "GO" to access this solicitation.

TCEQ will accept applications until 3 p.m. **July 31**. A separate form must be submitted for each individual project proposed. Completed applications should be concise, but also provide a sufficient level of detail to facilitate the consideration of the proposed project. Applicants are encouraged to check the ESBD throughout the RFGA period for additional information and/or requirements posted via Addenda.

If you have any questions or require assistance in accessing the ESBD web site, please contact Lilia VanderWal at Lilia.vanderwal@tceq.texas.gov or 512.239.1370.

Water/Wastewater short course for professionals Aug. 5–6 at Texas A&M

The [Global Petroleum Research Institute](#) (GPRI) is hosting a water/wastewater short course, "Challenges and Treatment Options," at Texas A&M University **August 5–6**. The course will include daily equipment demonstrations and cover practical aspects of separations technologies, case studies, system designs, industrial/commercial applications and field trials.

The registration fee for the short course is \$1,095 and includes an eBook manual, daily lunches, refreshments, certificates of completion and pilot plant demonstrations. A webinar option is available for \$250. Online registration is [available](#).

For more information, 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 TWRI and IRNR publications

[Modeling Support for the Attoyac Bayou Assessment Using Load Duration Curves](#), K. Borel, L. Gregory, R. Karthikeyan, TR-453, 2012.

[Modeling Support for the Attoyac Bayou Assessment Using SELECT](#), K. Borel, L. Gregory, R. Karthikeyan, TR-454, 2012.

[Environmental Effects of In-House Windrow Composting of Poultry Litter](#), K. Wagner, M. Brown, L. Gregory, D. Harmel, C. Coufal, T. Gentry, TR-459, 2013

Natural Resources Training Courses

Getting In Step – Top 10 Outreach Tips that Won’t Break the Bank	July 21
Stakeholder Facilitation – Working with Stakeholders to Move the Process Forward	July 22
Introduction to ArcGIS 10	July 29–30
Texas Freshwater Mussel Symposium and Workshop	August 18–21
Applied Environmental Statistics	August 25–29

New IRNR and TWRI Projects

Golden Cheeked Warbler Fecundity/Banding for Long Term Monitoring JB San Antonio-Camp Bullis; Presence/Absence Survey of Black-capped Vireo and Associated Habitat Delineation on Laughlin AFB; and Mesomammals at JB San Antonio-Lackland

Joint Base San Antonio environmental program ensures military mission activities are conducted in compliance with all applicable environmental laws, regulations and policies. The objectives of the Gulf Coast Cooperative Ecosystem Studies Unit are to provide research, technical assistance and education to federal land management, environmental and research agencies and their potential partners; develop a program of research, technical assistance and education that involves the biological, physical, and social, sciences needed to address resource issues and interdisciplinary problem-solving at multiple scales and in an ecosystem context at the local, regional, and national level; and place special emphasis on the working collaboration among federal agencies and universities and their related partner institutions. Based on the goals, Texas A&M Institute of Renewable Natural Resources will provide the necessary personnel, equipment, and materials required to conduct research support and technical assistance for the natural resources program within the JBSA Natural Resources Program.

Funded by: DOD – Corps of Engineers through the Gulf Coast CESU

Partners: Texas A&M Institute of Renewable Natural Resources, Texas A&M AgriLife Research, Joint Base San Antonio-Lackland, Camp Bullis and Laughlin Air Force Base

National Water Quality Initiative Monitoring Supplies and Equipment

TWRI will purchase the monitoring supplies and equipment needed to initiate a long-term monitoring program in the Lake O' the Pines that will: 1) assess sources of nutrient loading at the sub-watershed

scale, 2) determine priority sub-watersheds needing land treatment, 3) determine the impacts of NWQI in the Lake O' the Pines watershed.

Funded by: Texas State Soil and Water Conservation Board

Partners: Texas Water Resources Institute, Texas A&M AgriLife Research