



TEXAS STATE UNIVERSITY  
SAN MARCOS

# Edwards Aquifer Research and Data Center



TEXAS  
STATE  
UNIVERSITY  
SAN MARCOS

## Newsletter

Spring 2005

The Texas Legislature established the Edwards Aquifer Research and Data Center in 1979. EARDC's mission is to promote the study, understanding and use of the Edwards Aquifer.

### EARDC Staff

Director.....Dr. Glenn Longley  
Hydrogeology.....Raymond Slade, Jr.  
.....Rene Barker  
Education.....Lendon Gilpin  
Lab Manager.....Joe Guerrero  
Biomonitoring..... Victor Castillo III  
.....Meredith Cole  
.....Lori Kalich  
Administrative Assistants.....Gail Crews  
.....Michelle Guardiola  
Research Assistants.....Karen Pietsch  
.....Michelle Allison  
Undergraduate Research Associate.....  
.....James Royce  
Student Workers. . . . . Audri Cavazos  
.....Rebecca Cormier  
.....Glennette Reid  
.....Caroline Fernandez  
.....Teresa Hrabal  
.....Brent Moore

EARDC activities are organized around a Technical Services Center, an Education Center, a Research Center and a Data Center.



On April 7 a group of students from the Colorado College in Colorado Springs, CO toured EARDC facilities at San Marcos as part of a field study program in Southwestern Studies. They were accompanied by Dr. Jaime Chahin (L), Dean of the College of Applied Arts at Texas State University – San Marcos.

### Agency Interns:

EARDC has an agreement to furnish interns to work for the Texas Commission for Environmental Quality (TCEQ). Interns hired so far are Matthew Ashley, Craig Barnes, Thomas Barnett, Stacy Foster, David Pendergrass and Justin Taack. These interns work at least 20 hours per week at the TCEQ headquarters in Austin and gain valuable experience with the agency. EARDC also furnishes interns for the Texas Parks and Wildlife Department (TPWD) in San Marcos and workers for the U.S. Fish and Wildlife Service (USFWS) for their San Marcos River Invasive Plant Removal Project. TPWD interns include Kaarin Fusilier, Danae Johnson, Jason

Schunate, Michael O'Day, James Roye and Rachel Wiedenfeld. Andrew Winn and Benjamin Patterson assist USFWS. For information about these programs contact Dr. Glenn Longley at <mailto:GL01@txstate.edu>.

### **Study of the Springs of the Trans-Pecos Region of Texas:**

Texas State graduate students David Flores and Craig Watts are involved in a two year study that focuses on collecting current water quality data for 28 springs in the Trans-Pecos region of Texas (Brewster, Culbertson, Jeff Davis, Pecos, Presidio, Reeves and Terrell Counties). Historic and current data on groundwater systems is being compared and analyzed for trends in water quality and flow. Spring biota is being studied by use of Rapid Bioassessment Protocols. This project is funded by USDA as part of the Rio Grande Basin Initiative. The project is funded through June 2006.



### **Technical Services Center activities:**

#### **Water analysis services-**

The EARDC water analysis laboratory has been providing environmental services since 1979. The EARDC lab is certified by the Texas Commission of Environmental Quality (TCEQ) for the analysis of bacteria in drinking, source, surface and wastewater.

The EARDC lab is preparing to seek National Environmental Laboratory Accreditation Conference (NELAC) accreditation when TCEQ starts accepting applications.

The laboratory is equipped with basic water quality instrumentation and more advanced instrumentation such as Gas Chromatographs, Ion Chromatograph and Atomic Absorption Spectrophotometer with Graphite Furnace. Furthermore, EARDC has a Nikon Optiphot-2 microscope equipped with an Episcopic-Fluorescence attachment and associated attachments for detecting *Giardia* and *Cryptosporidium*. EARDC is in the process of updating equipment to meet new EPA requirements for the analysis of *Giardia* and *Cryptosporidium*. After requirements are met and proficiency is demonstrated EARDC will seek certification for the analysis of *Giardia* and *Cryptosporidium*.

The EARDC Laboratory operates under a stringent Quality Assurance Program that insures that data produced is scientifically sound, legally defensible and of known documentable and verifiable quality. The quality assurance system at EARDC stresses training and planning that yields increased personal performance and improved laboratory management.

EARDC has provided a wide range of services for private citizens and numerous organizations including the Environmental Protection Agency (EPA), TCEQ, Texas Parks and Wildlife Department (TPWD), Barton Springs Edwards Aquifer Conservation District (BSEACD) and City of San Marcos. Current customers for the EARDC water analysis lab include the City of San Marcos and the City of Killeen.

EARDC provides opportunities for students to train alongside biologists and chemists as student workers, work-study students or non-paid interns assisting in the preparation and

performance of basic analyses. Students are trained and are allowed to perform analyses only after proficiency is demonstrated. Laboratory hours are Monday-Friday 8 a.m. – 5 p.m. Containers and sampling instructions can be provided upon request. Bacteriological samples are not accepted on Friday. Special arrangements can be made to submit samples on Friday or after hours, if necessary. For information about laboratory services, contact Joe Guerrero at (512) 245-3545 or e-mail <mailto:JG13@txstate.edu>.



### **Biomonitoring services-**

The biomonitoring lab is currently in Phase II of a Texas Department of Transportation (Tx DOT) project to determine the effectiveness of their highway runoff filtration system and the toxicity of highway runoff to EPA aquatic target toxicity test organisms (fathead minnow, *Pimephales promelus* and water flea, *Ceriodaphnia dubia*) and the endangered fountain darter (*Etheostoma fonticola*).

The lab is working with the Texas Parks and Wildlife Department to determine the toxicity of the golden algae, *Prymnesium parvum* and to generate LC50 levels. The lab performs 2-hour and 24-hour acute toxin bioassays of water from Lake Whitney using the fathead minnow (*Pimephales promelas*) as a test species. *Prymnesium parvum* is a golden algae species that has been responsible for several large scale

fish kills in different water bodies around the state.



### *Prymnesium parvum*

Photo: Dr. Carmelo Tomas, UNC Wilmington

The biomonitoring lab cooperates with the U.S. Fish and Wildlife Service Contingency Plan to collect individual Texas blind salamander (*Typhlomolge rathbunii*), San Marcos salamander (*Eurycea nana*) and Comal Springs salamander (*Eurycea*) and distribute them to refugia.

EARDC has provided freshwater biomonitoring services since 1990 and has participated in EPA's Quality Assurance Plan since 1991. Available services include 24-hour acute screen and definitive testing, 48-hour and 96-hour acute testing and 7-day chronic testing. An ISCO Model 6712 Sampler is available for composite or sequential sampling services and for collection of industrial pretreatment samples. For information about biomonitoring services, contact Victor Castillo at (512) 245-3546 or e-mail <mailto:VC05@txstate.edu>.

### **Education Center activities:**

#### **San Antonio River Authority Educational Materials-**

EARDC is working with the San Antonio River Authority to produce water-oriented educational materials for students and teachers in Wilson, Karnes and Goliad Counties. The curriculum materials – named Basin Quest – will be designed to help 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade students

within these predominantly rural counties understand the concepts of the water cycle; water pollution, monitoring and control; and watershed protection and management. The materials should be available for field testing in these three counties this spring.

### **Aquatic Sciences Adventure Camp –**



Eight one week sessions and one two-day session were held during the summer of 2004. Nine teachers and 119 campers participated in the one-week sessions and 18 campers participated in the 2-day session. The Aquatic Studies Summer Camp has been held each year since 1989. It provides students aged 9–15 the opportunity to learn about aquatic biology and water chemistry in a university atmosphere while also enjoying various water-oriented recreational activities.

For 2005, we plan to add three sessions with a slightly different curriculum to be held concurrently with other camp sessions give the public more flexibility in scheduling options and a broader range of sessions to choose from. Additionally, we have added on-line registration and have redesigned our camp website. More camp information can be found on the camp website, <http://www.eardc.txstate.edu/camp.html>.

### **Aquatic Studies Field Days-**

During the past year, 859 students and 60 teachers from 31 schools attended aquatic studies field days. The field day program gives

students an opportunity to collect living aquatic organisms from a creek on the Texas State campus and observe them under a microscope. Students also learn about the Edwards Aquifer and its biota, collect organisms from a flowing artesian well and view San Marcos Springs from a glass-bottom boat at Aquarena Center. The field day website can be found at <http://www.eardc.txstate.edu/fielddays.html>.

For information about the Aquatic Sciences Adventure Camp or to schedule a field day, contact the education center at (512) 245-3541 or e-mail <mailto:LG16@txstate.edu>.

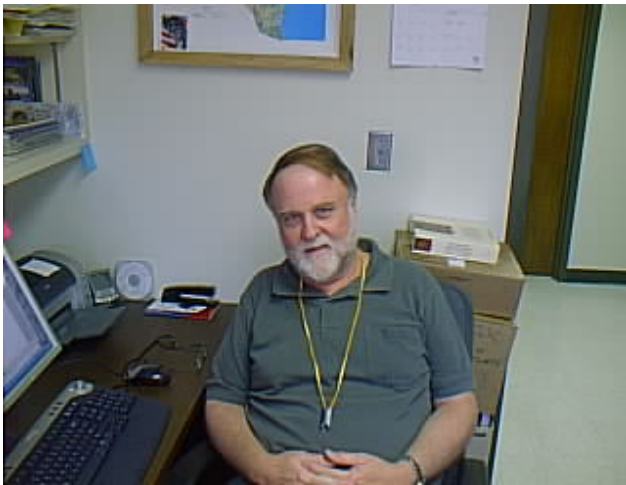


### **Research Center/Data Center activities:**

Former EARDC hydrogeologist Marshall Jennings has transferred to the River Systems Institute (RSI) (formerly the International Institute for Sustainable Water Resources) at Texas State University-San Marcos; Marshall's replacements at EARDC are Raymond Slade and Rene Barker, both recent retirees from the United States Geological Survey. Between them, Raymond and Rene have more than 70 years of experience in hydrology and have authored or coauthored more than 100 publications on surface water, groundwater, and earth science. Raymond's primary expertise is surface-water hydrology, while Rene's is groundwater hydrogeology.

Currently, Raymond and Rene are helping graduate student Eric Deddon with

an aquatic-habitat and water-quality assessment of the Cypress Creek watershed, as part of the larger Blanco River Project. The results of Eric's research--which involves the measurement, analyses, and interpretation of surface-water and groundwater conditions near the Jacob's Well spring--is being closely followed by the Hays-Trinity Groundwater Conservation District, the Wimberley Valley Watershed Association, as well as many environmentally concerned residents in the area.



Rene Barker



Raymond Slade, Jr.

The hydrogeology group at EARDC is continuing with their ecological characterization of the Blanco River Basin in central Texas. Funded jointly by the Nature Conservancy of

Texas and RSI, the Blanco River study includes the collection, analysis, and interpretation of aquatic biology and water-quality data, as well as other assorted hydrologic research efforts by graduate students. The hydrologic component includes streamflow measurements in the 500-square mile Blanco River Basin and watershed modeling using the SWAT 2000 rainfall-runoff model developed by the United States Department of Agriculture.

As part of a joint project with RSI to establish a National Science Foundation Hydrologic Observatory at the old Aquarena facilities, EARDC is installing meteorological instrumentation and lake-level recording devices on Spring Lake. In addition, a streamflow gaging station is being added above Spring Lake to measure inflows to the lake from Sink Creek, northwest of the Texas State campus in San Marcos.

EARDC hydrogeology is partnering with Sul Ross State University to investigate major springs in west Texas and to sponsor graduate student studies of aquifer properties in the West Texas Bolsons and the Igneous aquifer systems in Brewster, Culbertson, Hudspeth, Jeff Davis, and Presidio Counties. In addition, EARDC and Sul Ross are teamed with several groundwater conservation districts in west Texas to install and operate new groundwater monitoring stations using satellite telemetry. Additionally, groundwater studies in cooperation with RSI and Texas A & M University-Kingsville and funded by the Environmental Protection Agency are being established to aid groundwater conservation districts in south Texas with groundwater science, training, and policy issues associated with the Gulf Coast aquifer.

Inquiries regarding EARDC hydrogeology activities may be made to Raymond Slade (<mailto:rs40@txstate.edu>) or Rene Barker (<mailto:rb42@txstate.edu>).

To contact EARDC:

Phone (512) 245-2329

FAX (512) 245-2669

Website: <http://www.eardc.txstate.edu/>