



# **AQUIFER BULLETIN**

January - April 2009

#### Figure 1

**Drought Status:** 

# **CRITICAL STAGE DROUGHT**

Barton Springs/Edwards Aquifer Conservation District January 6, 2008





**Barton Springs Lovelady Monitor Well** Discharge Depth to water level (cubic feet per second) (feet) **Drought Status NO DROUGHT** 38 cfs 175.0 ft ALARM STAGE 192.1 ft 20 cfs 19.6\* cfs 193.4 0-day avg CRITICAL STAGE Previous value: 20.4 cfs on 11/20/08 \*discharge data estimated since 12/21/8 due to repairs at BS pool Previous value: 192.6 ft on 12/11/08

# IN THIS ISSUE:

2008 Permitting Update ... 2 BSEACD Calendar ... 2 GM Report ... 4 BSEACD Scholarships ... 5

Austin Cave Festival...6 Household Hazardous Waste Collection...7 Groundwater Stewardship Awards...8 Spring Educational Events...10

www.bseacd.org

# DROUGHT STATUS

# **CRITICAL STAGE DROUGHT**

# EDWARDS AQUIFER UPDATE

The District's Board of Directors declared Critical Stage Drought for the District area on December 11, 2008, and both drought indices, Barton Springs and the Lovelady Well, remain below their respective Critical thresholds (Figure 1). This is only the second time in the District's 21-year history that a declaration of this severity has been issued, and comes six months after the Board declared Alarm Stage Drought on June 23, 2008.

Currently, the U.S. Drought Monitor shows Central Texas remaining under exceptional to extreme drought conditions. The severity of this drought does not come as a surprise--2008 is the fourth driest year on record, and the driest since 1956 for the area. Austin received only 16 inches rainfall for the year, which is 48% of its average annual total. In addition, the summer of 2008 turned out to be one of the hottest on record, increasing the demand for groundwater in this ever-growing region.

The prolonged drought is related to La Niña conditions, an upwelling of cold water in the Pacific Ocean, which changes global wind and moisture circulation patterns. These conditions began in September 2007 and continued though the last year, bringing drier conditions and less frequent rainfall to Texas. As the precipitation diminished, so did flow in the creeks which provide recharge to the aquifer. Onion Creek, the largest contributor of recharge to the aquifer, essentially stopped flowing by October 2007. Decreased recharge has resulted in lower water levels, or storage, and decreasing springflow at Barton Springs (Figure 2).

# **BOARD OF DIRECTORS**

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Gary Franklin Precinct 2 - Director

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# DISTRICT STAFF

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Joseph Beery Hydrogeologist

John Dupnik, P.G. Senior Regulatory Compliance Specialist

Guy Rials Regulatory Compliance Technician

Nathanael Banda Geospatial Systems Administrator

# BSEACD PERMITTING SUMMARY (SEPTEMBER 2008 TO JANUARY 2009)

Permit Type	Number of Permits	Permitted Pumpage
Exempt Wells	2	N/A
NDU General Permit	2	500,000 Gallons/Year
Individual Production Permits	0	0
Permit Amendments	1	50 Million Gallons/Year*
Transport Permits	0	0

\* This amendment was submitted, applied for, and approved before drought was declared.

**Exempt Wells** - These are low capacity wells used solely for large lot residential or livestock needs. These wells are exempt from permitting but must be registered with the District and meet District Well Construction Standards.

**Nonexempt Domestic Use (NDU) General Permit** – This authorization is for wells that will be used solely for the domestic needs of residences located on small lots where there is no other alternative water source available.

**Individual Production Permits** – All other new nonexempt wells must have one of these permits to be authorized for pumpage. All new Individual Production Permits are designated as "Conditional" Permits, which means that they are interruptible and subject to 100% curtailment during extreme drought.

**Permit Amendments** – These amendments are required to increase authorized pumpage for existing permittees (permit holders). All new permit amendments are designated as "Conditional" Permits, which means they are subject to 100% curtailment during extreme drought.

**Transport Permits** – These permits are required to authorize the transport of groundwater out of the District. A Transport Permit may only authorize the transport of water permitted under an approved production permit.

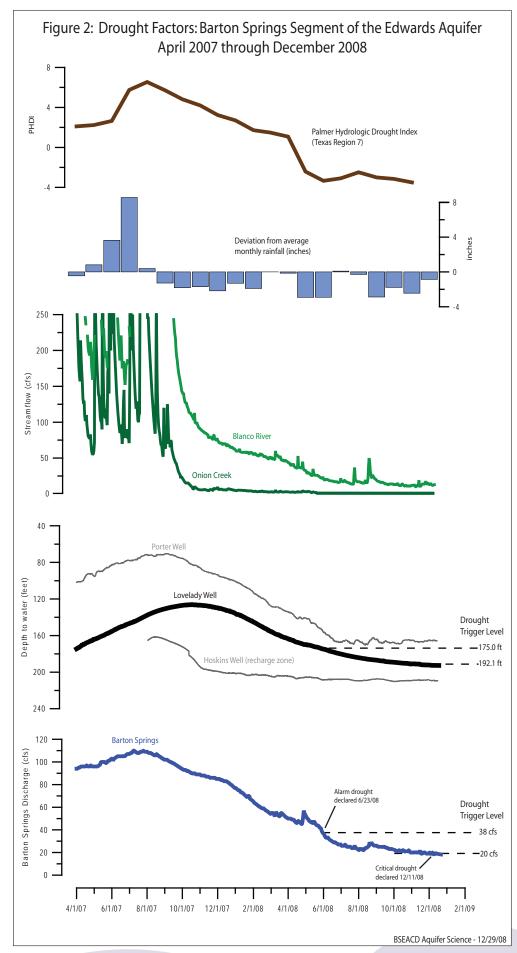
- JOHN DUPNIK, SENIOR REGULATORY COMPLIANCE SPECIALIST

# DISTRICT CALENDAR

The Board of Directors usually meets on the 2nd and 4th Thursdays of the month (beginning at 6 p.m) at at the District's office at 1124 Regal Row, Austin, TX 78748. However, the meeting schedule and location are subject to change. The agenda for posted meetings can be found on the District website at www.bseacd.org. Please contact the District office at 512-282-8441 with any questions.

January 22	6:00 p.m.	Board Meeting
February 12	6:00 p.m.	Board Meeting
February 16		Office Closed for Presidents' Day
February 26	6:00 p.m.	Board Meeting
March 12	6:00 p.m.	Board Meeting
March 26	6:00 p.m.	Board Meeting
April 9	6:00 p.m.	Board Meeting
April 23	6:00 p.m.	Board Meeting





Evidence of drought conditions can be seen beyond the District and Barton Springs. San Marcos Springs, the second largest spring in Texas, is currently discharging about 98 cfs, nearly 77 cfs below its average flow and close to Stage I cutbacks that would be initiated by the Edwards Aquifer Authority in San Antonio. In addition, a major spring issuing from the Trinity Aquifer near Wimberley, called Jacob's Well, ceased flowing in October 2008, for reportedly the second time in modern history.

Most rivers and streams are below normal according to the US Geological Survey. Flows into the Highland Lakes are about 30% lower than average and are less than inflows over the same period in 2006, which were the lowest on record since 1942. Lake Buchanan and Travis are 7 and 13 feet below average levels, respectively

(www.lcra.org/water/drought/index.html).

State-wide, the drought impacts are also grim. "Major losses in the agricultural sector have reached \$1.4 billion in Texas for 2008, according to Texas Agrilife. Of that amount, \$1.1 billion is from lost crops, while \$290 million is from livestock losses" (Drought Impact Reporter, http://droughtreporter.unl.edu).

#### Drought Outlook for 2009

Unfortunately, meteorological forecasts by the National Weather Service's Climate Prediction Center indicate that dry conditions may persist into early 2009. Late 2007 and early 2008 experienced weak to moderate La Niña conditions, which resulted in drier than normal conditions for Texas. The last few months of 2008 have been characterized as ENSO-neutral conditions (neither El Niño or La However, recent data and models Niña). suggest a current shift back toward La Niña conditions through early 2009 (www.cpc.ncep.noaa.gov).

In order for the aquifer to come out of drought, both Lovelady and Barton Springs need to be above their respective drought trigger levels. In order for substantial recharge to occur within the Barton Springs segment of the Edwards Aquifer, enough rain needs to fall in the contributing zone to produce flow in Onion Creek (and other creeks that flow across the recharge zone) for a period of months. Either a prolonged rainy period of above average rainfall or a major storm with 6 inches of rainfall or more is needed to relieve the aquifer drought.

- BRIAN HUNT AND BRIAN SMITH, SENIOR HYDROGEOLOGISTS

PAGE 3

#### "Change"

In the recent presidential election, we heard a lot about "change," and the changes needed for our country. Some changes are good for lots of folks, some changes are good only for a few special interests, and sometimes certain changes unexpectedly turn out to be bad for nearly everyone. That's true in the groundwater management arena as well as on the national scene. And fundamental change in groundwater management in Texas more often than not involves the Texas Legislature. The Legislature has the tough job of trying to balance evolving public policies represented by groundwater conservation districts (GCDs) with other forces that represent either historical inertia ("this is the way it always has been and it needs to stay that way") or new demands by certain segments of society ("this is the way it now needs to be, for me"), or both.

For 140 days in the first part of 2009, your District will be actively engaged in trying to assure changes associated with legislation being deliberated by legislative bodies are protective of the groundwater resources of our and other GCDs under foreseeable conditions. A couple of these initiatives will be sponsored by our legislators at our request. Others are being sponsored at the request of other parties; we will be following all of them and will help support or oppose them, depending on how we think they will affect our, and your, groundwater.

#### **Our Own Initiatives**

BSEACD has asked legislative sponsors to file two bills this session to address our own needs. Both of them are intended to be bills of local interest as opposed to statewide bills and appear to have widespread support of other political jurisdictions and our constituents. Nevertheless, we would ask that all of our stakeholders let your legislators know that you support these bills.

The first bill would direct TCEQ to prohibit the direct discharge of even highly treated sewage anywhere in the creeks that eventually recharge the Edwards Aquifer in our District. The effect of this bill will be to preserve the quality of the water supplies in this important aquifer at all times, and to promote more sustainable, cost-effective development in the suburban areas via the continued, proven use of land application technologies.

The second bill modifies the District's enabling legislation to allow the District to annex a rapidly growing part of southwestern Travis County that is already stressing the Trinity Aquifer so that the groundwater resources of this area can be better managed. The area is a designated part of the Hill Country Priority Groundwater Management Area and by other statute should have GCD protections already. The bill would expand the specified boundaries of the District, establish two additional single-member precincts, and re-define the relationship of the more urban and the more rural precincts to preserve the majority of the precincts that are dominated by groundwater use, even if less populous than those that use City of Austin or LCRA surface water. Only a few dozen of the wells in the new area, representing users of disproportionately large volumes of Trinity Aquifer water, will be required to apply for permits and pay a water-use fee for their use that affects regional groundwater availability.

#### Initiatives of Other Parties Being Monitored

Perhaps even more than in prior legislative sessions, this year will see some rather specific bills, or more insidiously some specific provisions in more innocuous bills, introduced that could have the effect of either chipping away or even fundamentally transforming how GCDs can manage groundwater effectively. Right now, only some of the bills that ultimately will be of concern to us (positively or negatively) have been filed. We anticipate, on the basis of recent appellate court cases and the current political/regulatory climate, some of these bills will include those intended to:

- Resolve whether, where, and/or under what conditions a vested property right attaches to groundwater by the landowner and whether a takings claim is warranted for groundwater regulation;
- Determine whether municipalities and other political subdivisions are immune from paying fines, penalties, and fees arising from non-compliance with environmental regulations of other political subdivisions;
- Address and/or specify the relationship of the terms of production and transport permits for groundwater that is slated to be exported out of a GCD to some distant user;
- Address uncertainties in the joint regional groundwater planning performed by the Groundwater Management Areas, including 1) how exempt use should be accounted for in the permitting limitations imposed by the Managed Available Groundwater determined by TWDB to produce the Desired Future Conditions (DFCs) established by GMAs; 2) how areas outside of GCDs are to conform to MAG use restrictions and preserve DFCs; and 3)and how stakeholder petitions as to DFC reasonableness should be approved and resolved; and
- Allow GCDs to define "beneficial use" more restrictively, for example, to exclude groundwater use above a certain amount in so-called "vanity ponds."

There will be lots more bills that we will be monitoring, either on our own or with the help of our state association, the Texas Alliance of Groundwater Districts. But the over-arching goal that we have is to preserve and reinforce the "local management" of groundwater by locally elected officials (or their appointees) so they are responsive to local issues, and not by a statewide or even regional administrative agency that isn't accountable to the local population affected by such decision-making. I hope that you agree with that approach, and that we can count on your support to ensure that "change" that affects our shared resource works for all of us, not just a few of us.

- KIRK HOLLAND, GM

PAGE 4

# Aquifer District 2009 Scholarship Program

For over ten years, the Barton Springs/Edwards Aquifer Conservation District has held an annual groundwater essay contest for Austin-area high school students. One winner each year receives a \$1,500 scholarship to the institution of his/her choice. The District will also provide ten scholarships to the Edwards Aquifer Research and Data Center's Aquatic Science Adventure Camp at Texas State University at San Marcos.

### Groundwater Essay Contest: Scholarship for Junior or Senior High School Students

The District is now soliciting applications and essays for its 2009 Groundwater Essay Contest. One essay will be selected as the winning entry by an independent evaluation panel, and the author will receive a \$1,500 scholarship to the college, community college, or training institution of his/her choice.

Essays must generally discuss groundwater issues, which may include but are not limited to non-point source pollution and pollution prevention, water conservation, or hydrogeology. While essays must focus on groundwater issues, applicants do not have to be planning a career path in a water-related field.

Applicants must be high school juniors or seniors currently enrolled in one of the seven school districts within the District's boundaries (Austin, Eanes, Dripping Springs, Hays Consolidated, Del Valle, Bastrop, and Lockhart), or an accredited private school located within the boundaries of those school districts. Those individuals who have acquired a GED within the last six months are also eligible. In addition, essay contest winners must plan to use the scholarship money for the 2008-2009 school year; funds will be provided directly to the selected institution.

For contest rules and applications, please visit the District's web page at:

www.bseacd.org/scholarship\_program.htm or call (512) 282-8441. Essays and applications must be received by Friday, March 6, 2009 at 5 p.m.

### Edwards Aquifer Research and Data Center's Aquatic Science Adventure Camp: Scholarships for Ages 9 to 15

The District is now soliciting applications and essays for its 2009 Camp Scholarship program. This year's program will provide:

• Two \$530 scholarships to the Edwards Aquifer Research and Data Center's Week-Long Aquatic Science Adventure Camp (Note: Parents will be responsible for providing the other \$150 of the camp fee, which will be the deposit needed to hold the child's spot.)

 Five \$130 scholarships to the Edwards Aquifer Research and Data Center's 2-Day Aquatic Science Adventure Camp (Note: All \$130 will be paid by the District.)

The scholarship contest is open to children ages 9 through 15 who reside in one of the seven school districts within the District's boundaries (Austin, Eanes, Dripping Springs, Hays Consolidated, Del Valle, Bastrop, and Lockhart). Interested students must submit an application and a 1-page essay/artwork entitled "Why I want to attend the Aquatic Science Adventure Camp!" Scholarship winners will be chosen in a random drawing; only completed applications with essays will be eligible. Deadline for submissions: Friday, April 3, 2009. For more information, rules, and an application form, please visit: www.bseacd.org/scholarship\_program.htm.

The District would like to thank our permittees, Gilbert Johnson, Neuro Institute of Austin, Hays CISD, and Texas Lehigh for donating their Conservation Credits this year to the scholarship fund. Their donations will provide 5 scholarships to the Aquatic Science Adventure Camp.

# AUSTIN CAVE FESTIVAL CELEBRATES SEVEN YEARS

(BSEACD) and the Texas Cave Management Association (TCMA) hold the Austin Cave Festival at the Village of Western Oaks Karst Preserve to educate local residents about the importance and sensitivity of the aquifer and its recharge features. This year's festival attracted over 1000 visitors from all over Austin and included short cave trips in Get Down and Live Oak Caves, vertical ropes courses, flintknapping demonstrations, hands-on activities for children, and two Halloween storytimes. Booth presenters from the following organizations provided the public with valuable and timely information and resources:

#### Austin Science and Nature Center

The Barton Springs/Edwards Aquifer Conservation District The Bureau of Economic Geology – University of Texas at Austin City of Austin Water Conservation Department City of Austin Water Utility Department's Wildlands Conservation Division City of Austin Watershed Protection and Development Review Department City of Sunset Valley Flintknapping with J.C. Pollard **Hill Country Alliance** Lower Colorado River Authority Splash! Into the Edwards Aquifer Exhibit Texas AgriLife Extension Service Texas Cave Management Association Texas H2Oasis Texas Water Development Board Travis County Balcones Canyonlands Preserve Travis County Master Gardeners Association Tree Information from Guy LeBlanc, Arbor Vitae Tree Care The Underground Texas Grotto



The Festival also included a drawing for prizes donated by the Lady Bird Johnson Wildflower Center, the Barton Springs/Edwards Aquifer Conservation District, the Capital Area Master Naturalists, and the Splash! Into the Edwards Aquifer Exhibit at the Barton Springs Pool. BSEACD would also like to thank the City of Austin's Water Conservation Department for donating a 75-gallon rainbarrel. BSEACD was pleased to present it to drawing winners Stephanie and Mark Johnson.

BSEACD and TCMA would like to thank all the organizations that helped make this year's Cave Festival Event possible. We would also like to thank Maudie's Hacienda on Brodie Lane for donating lunch for the Festival's volunteers presenters and for the fifth straight year (www.maudies.com) and the Magellan Pipeline Company for their donation of 700 LED cap lights.

Village of Western Oaks Karst Preserve is located in South Austin just west of MoPac at Davis Lane. It encompasses approximately nine acres in the recharge zone of the Barton Springs aquifer. Despite its small size, the preserve contains six karst features including one that is habitat for cave-dwelling species of concern and one that recharges, or contributes water to, the Aquifer. The preserve is open year round and is handicap accessible.







# San Marcos, Kyle & Hays County HOUSEHOLD HAZARDOUS ASTE GOLLECTION

630 E. Hopkins, San Marcos, TX 512-393-8036

# Saturdays: 8 a.m.- Noon : Rain or Shine Jan. 18, 2009 (Sunday) | April 18, 2009 | July 25, 2009



ACCEL Drain cleaners, concentrates, degreasers, oven cleaners, solvents, polishers, pool chemicals, household batteries, latex and oil based paints, spray paints, thinners, strippers, preservatives, brush cleaners, pesticides, sprays/dusts, weed killers, rat poisons, insecticides, antifreeze, batteries, motor oil and oil filters, brake fluids, transmission fluid.



Win NOT accel & Tires, containers larger than 5 gallons, medical wastes, empty containers, compressed gas cylinders or wastes generated by businesses.

SAFETY TIPS: Do not combine chemicals; keep products in original containers; transport chemicals in trunk and if broken or leaking, place in containers of like material.

FREE for San Marcos, Kyle & Hays County Residents. [proof of residency required]

This is a drive-through event, please do not exit your car.



30 E. Hopkin



# LEADERS IN GROUNDWATER PROTECTION HONORED

On November 7, 2008, the Barton Springs/Edwards Aquifer Conservation District hosted its 2008 Groundwater Stewardship Awards at a luncheon prepared and served by the Bowie High School Culinary Arts program. Each year, the District presents these awards to deserving individuals, organizations, companies or agencies that have excelled in efforts to protect and conserve water resources in the District.

BSEACD congratulates the following recipients who were chosen from a record number of submissions:

# Water Quality Protection: Jack Dahlstrom and the Dahlstrom Family

The Dahlstroms were nominated for their generosity and special efforts to preserve 2,200 acres of their land in the Onion Creek Watershed for water quality protection. This property has numerous well-defined karst features that take on significant amounts of upland recharge. In addition, 370 acres will be set aside for public access and education.



#### **Julie Jenkins and Jack Dahlstrom**



Nico Hauwert

#### Water Conservation by an Aquifer End-User: The Grenga Family

The Grenga family conserves water through a "home-spun" rainwater collection system that contains clusters of rain barrels strictly devoted to non-potable water storage and a completely separate "pod" of rain barrels devoted strictly to storing rainwater that will later be filtered and purified for drinking. From October 2007 to May 2008, they had the lowest water use of any house-hold in Sunset Valley with an average monthly use of only 2,074 gallons.

#### **Research: Nico Hauwert**

Mr. Hauwert was nominated for his years of commitment to studying the Barton Spring segment of the Edwards Aquifer. His work has contributed significantly to the conceptual model of the Edwards Aquifer and he has published numerous technical articles, reports, and papers.

#### Water Conservation by Water Supplier or Permittee: Bill and Shirley Burrell

The Burrells live over the aquifer recharge zone and have served as model permittees by adhering to the District's requirements associated with being a Nonexempt Domestic User of the aquifer in an exemplary manner and by responsibly operating their well with conservation as a priority. They have an average household water use of about 3,000 to 5,000 gallons per month. They also actively participate in District sponsored conservation education activities such as town hall meetings and presentations.

see AWARDS on page 9



**Chef Winemiller and the Culinary Arts Students** 

PAGE 8

#### **Education: Kyle Environmental Study Center**

Kyle Elementary has sought out and received over \$9,000 in grants to develop an outdoor classroom for teaching about water protection and conservation and the environment. The classroom has water-wise plants and four rain barrels, and is maintained by the students and their parents. They have designed a web page, brochure, and blog to record and share their project

(http://web.mac.com/pfmulligan/iweb/kyleproject/Home.html).

#### **Education: Iconmedia**

Iconmedia has produced a series of "Texas Water 101" programs, which showcase water issues, water conservation leaders, and water education events. Some of the programs that appear weekly on Channel 10, Austin's public access station include "Water Issues in the Hill Country", "BSEACD: Drought in Central Texas", "Selected Texas Springs", "BSEACD" about the District, and "Austin Cave Festival". These programs are available for viewing at www.iconmedia.org.

#### Stefan Wray, Board Member Franklin, and Pam Thompson



#### **Innovation: Centex Materials**

Centex has been instrumental in helping the District execute the 319h Non-point Source Pollution Grant, which was awarded to the District by the US Environmental Protection Agency (EPA) and administered through the Texas Commission on Environmental Quality (TCEQ). The goal of the grant is to reduce sediment entering the aquifer, particularly through Antioch Cave, which is the most significant recharge feature in the District. The cave is located on Onion Creek west of Buda. Centex has provided access from the north side of their property, and they have contributed staff time, heavy equipment for lifting, and cement to help cut costs for the construction phase of the project. Centex's participation has helped reduce the over-all costs for the project. Because of this project, more clean water will recharge the aquifer, helping to prolong water resources during periods of drought.

#### Permittee of the Year: City of Hays

The City of Hays has worked closely with the District by providing input to the District's drought management programs and recent rule and policy changes. They have modified the City's water use rates and tariffs to create additional financial disincentives for egregious water use by its end users during drought, and they have aggressively implemented the measures of their User Drought Contingency Plan to ensure compliance with pumpage limits during drought. The City has been proactive in initiating efforts to pursue alternate water sources to reduce pumping from the Edwards Aquifer during drought, including considering investment in deeper Trinity wells and connection to City of Austin surface water supplies. The City of Hays has served as a model for a District/Permittee partnership and cooperation in all mutual issues related to aquifer sustainability and preservation.



**BSEACD** Volunteers

# SPRING EDUCATIONAL EVENTS

### UPCOMING EVENTS AT THE LADY BIRD JOHNSON WILDFLOWER CENTER

#### **Tree Talk Winter Walk**

Saturday, January 24

# 9 a.m. to 5:30 a.m.

www.wildflower.org/nature/Our annual Tree Talk Winter Walk is a perfect time to explore the beauty and benefits of native trees and shrubs. Get tips on landscape design and tree maintenance and learn about individual tree and shrub species with walks and talks led by staff and local tree experts. Children can join in on the fun with tree activities. Admission free.

#### **Nature Nights**

Thursdays, 6 p.m. to 9 p.m. each evening \$1 admission www.wildflower.org/nature/

Join us for our signature family nature programs once a month on select evenings throughout the Spring. Nature Nights are fun, interactive explorations of animals, plants, and ecology in Central Texas. Learn about wildflowers, animal tracking, astronomy, and more!

March 6: Astronomy April 16: Wildflowers May 29: Animal Tracks

#### **Spring Plant Sale and Gardening Festival**

Saturday and Sunday, April 11 and 12 Members-Only Preview Sale, Friday, April 10, 1-7pm 9 a.m. to 5 p.m.

Choose from hundreds of species of your favorite or hard to find native plants! Experts will be on hand with landscape design and horticultural techniques to help them flourish. A list of available plants will be featured online at www.wildflower.org prior to the sale.





# AQUARENA EARTH DAY CELEBRATION

Aquarena Center, The River Systems Institute, and Stream Team Texas are excited to invite you to the 3rd Annual Aquarena Earth Day Festival on Saturday April 18th, 2009 at Aquarena Center. Combining the theme of Texas State's Common Experience "Civic Responsibility" with the theme of Earth Day "to raise awareness of man's environmental impact on nature", this years' festival, will celebrate gains we have made and the role of community members in creating new visions to accelerate environmental progress.

This free to the public event includes:

- Educational activities for all ages
- Recycling and green building displays
- Live entertainment
- Blessing of the San Marcos Springs
- Recreation opportunities for all ages.
- Food and vendor booths
- Nature based entertainment
- Glass Bottom Boat (\$2 Off with 10 aluminum cans)
- Glass Bottom Kayak tours (fees apply)

More information will be posted at: www.aquarena.txstate.edu/

see EVENTS on page 11



# UPCOMING EVENTS ON THE CITY OF AUSTIN WATER QUALITY PROTECTION LANDS

The WQPL is part of the City of Austin's Wildland Conservation Division. Its mission is to optimize water quality and quantity entering the Barton Springs segment of the Edwards Aquifer from project lands.

To register for a hike or see the most current volunteer and educational opportunities go to the calendar page of our website at www.ci.austin.tx.us/water/wildland.

#### Interpretive Hikes on the WQPL

All hikes are free and open to the public. Pre-registration is required.

Wooded Hills on Little Barton Saturday, February 7 and Sunday, April 12

9 a.m. to 1:30pm

Take a 4.5 hour guided interpretive hike through a dense woodland with large red oaks and flame leaf sumacs. Then, after exploring an open hilltop, you will descend to the limestone banks of Little Barton Creek.

Scenic Views and Hidden Springs

Sunday, February 15 2:00 p.m. to 4:30 p.m.

This moderate 2.5 hour hike in western Travis County takes in views from a high ridge before dipping down into a canyon and visiting a spring.

**Onion Creek Ramble** 

Saturday, March 7

9 a.m. to 4 p.m.

This is a rugged and strenuous 7 mile off-trail hike on the 2500 acre Onion Creek property. See historic home sites, areas managed with prescribed fire, and Onion Creek.

Bear Creek Bends and Open Savannas

Sunday, March 15 2:00 p.m. to 5:30 p.m.

This rugged 3.5 hour hike near Bliss Spillar and FM 1626 explores Bear Creek and examines WQPL land management.

Onion Creek Mini Ramble Saturday, April 4 9 a.m. to 1 p.m.

This rugged 3 mile off trail hike on the 2500 acre Onion Creek property explores uplands and riparian areas of Onion Creek. This is a different route than the longer March hike and visits several sinkholes and karst features.



# THE BUREAU OF ECONOMIC GEOLOGY CENTENNIAL ANNIVERSARY ACTIVITIES

Mark your calendar for these upcoming events:

**BEG** Centennial Symposium

"Energy and Water in the Southwestern US: Opportunities and Challenges." - August 6th and 7th This event will be held at the AT&T Executive Education

and Conference located on the University of Texas main campus.

### **Distinguished Lecture Series**

The Bureau's most esteemed scientists will lecture about the exciting research in which the Bureau is currently involved. Lectures will be free to those who host the event and are by invitation only. The Bureau will pay for the lecturer's travel costs, including hotel.

#### **Podcast Series**

This series of programs will review historical contributions and personalities of the BEG as well as build a context examining the connections of the past, present, and future and their impact on our world.

#### Centennial Coffee Table Book

The Bureau will publish a large-format ("coffee-table") book with large full-color images and simple text will capture a sense of the natural beauty of the many areas where the Bureau community has worked over the years.

