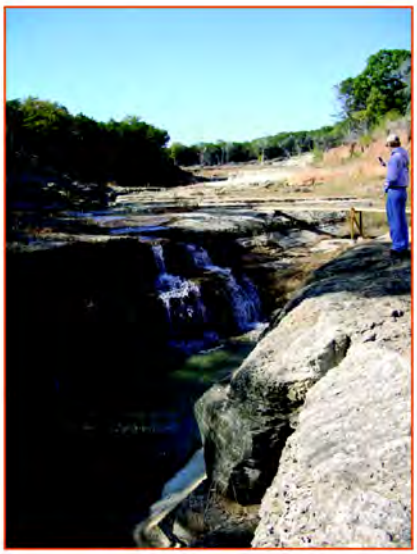
austin geological society



bulletin

volume 5

2008-2009

austin geological society

bulletin

volume 5
2008-2009

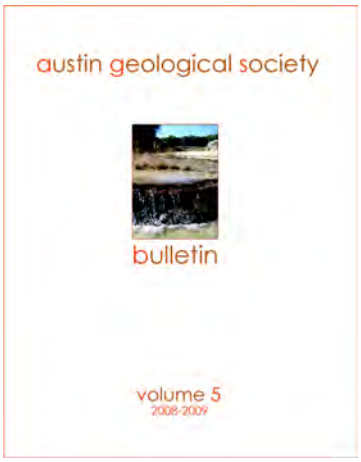


Image on preceding page: Waterfall at the Canyon Lake Gorge (photo by Shane Valentine).

note from the president

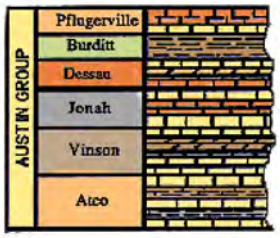
This has been another great year for the Austin Geological Society. I know it's been said many times, but the committee chairs and elected officers that give of their time are truly the force that makes this society work. As members we owe them a great deal of thanks. In addition, we should extend special thanks to Brian Hunt and Robert Mace for taking on the Sisyphean challenge of putting the AGS Bulletin together every year. The bulletin is a great publication and it is a treat to see it come out. I look forward to many more volumes.

Some highlights from 2008–2009 year included great talks ranging from local professionals sharing their experience, to University of Texas staff working on evaluations of global climate change. AGS's annual field trip to the Canyon Dam Gorge show cased the awesome power of central Texas flood events and some very cool geology that was exposed. On a personal note, the year's most challenging issue came with the Texas Board of Education evaluation of the content for the state's science curriculum. This is a matter that resonated with many AGS members and soon a letter writing campaign was organized. Dozens of members sent in letters to their state representatives to try and persuade them to keep science in science. In addition to members the AGS executive council drafted a letter and sent Ann Molineux to give public testimony to the Board of Education. This is an issue that will not go away. I hope that AGS continues to focus of spreading interest in Earth Science to young people in Central Texas.

Yours in Science,

Shane Valentine

Shane Valentine, 2008–2009 AGS President



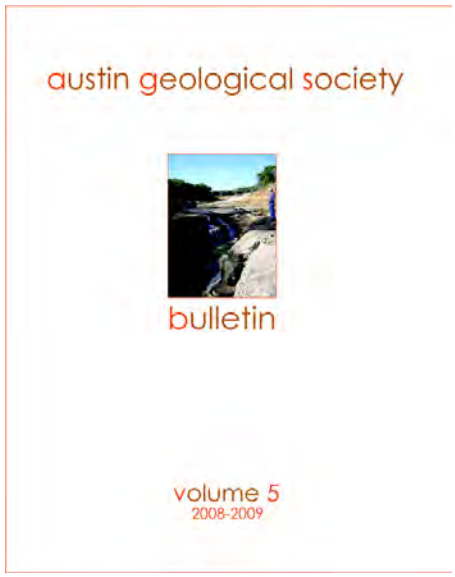
austin geological society

bulletin, volume 4, 2007-2008

mission: The mission of the *Austin Geological Society Bulletin* is to (1) summarize the previous year's activities of the Society and (2) publish technical papers, comments, and notes concerning the natural sciences of Central Texas.

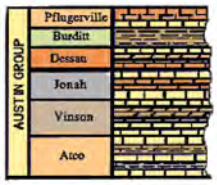
publication information: The *Austin Geological Society Bulletin* is published once a year in August and is available through the society's Web page (www.austingeosoc.org) and select geological libraries in Central Texas. Authors retain copyright of their material, but the bulletin and the authors should be referenced if any materials are used in documents or presentations. The Austin Geological Society is not responsible for statements and opinions in its publications. Mention of any trademark or proprietary product in the bulletin does not imply a guarantee, warranty, or endorsement of the product by the Austin Geological Society. The *Austin Geological Society Bulletin* is owned and published by the Austin Geological Society, P.O. Box 1302, Austin, Texas 78767-1302. There is no cost for digital access to the bulletin. Hard copies are available by print-on-demand.

information to authors: The Editor of the *Austin Geological Society Bulletin* invites contributions relating to the natural sciences of Central Texas in the form of technical papers and discussions. If you would like to submit to the bulletin, please see the instructions to authors at the end of this document. All submissions should be sent to the editor in digital format to editor@austingeosoc.org.



Cover photo: Canyon Lake Gorge (photo by Shane Valentine)

contents



austin geological society

Officers 2008–2009

President:
Shane Valentine—Berg-Oliver Associates, Inc.
President Elect:
Ann Molineaux—Texas Memorial Museum
Vice-President:
Gay Gutierrez—AECOM
Secretary/Newsletter:
Angela Ludolph—RMT, Inc.
Treasurer:
Dallas Dunlap—Bureau of Economic Geology
Past President:
Brian Hunt—Barton Springs/Edwards Aquifer Conservation District

Committee Chairs

AAPG Relations:
Laura Zahm—Bureau of Economic Geology
Awards:
Vacant
Bulletin:
Robert Mace—Texas Water Development Board
Education:
John K. Mikels—GEOS Consulting
Endowed Scholarship:
Vacant
Field Trip:
Chock Woodruff—Woodruff Geologic Consulting
Historical:
Dennis Trombatore—The University of Texas at Austin
Membership:
Jim Samson— Consulting Geologist
Publications:
Steve Ruppel—Bureau of Economic Geology
Student Liaison—Graduate:
Clark Thompson—The University of Texas at Austin
Student Liaison—Undergraduate:
vacant—The University of Texas at Austin
vacant—Austin Community College
Website:
vacant

news from the society

AGS mourns the passing of Dr. Todd Housh

Todd died Saturday, May 30, 2009, at his home in Round Rock at the age of 47. He is survived by his wife Cara and 12 children. Todd, an active member of AGS, contributed his time and expertise to the geologic community. In 2006 Todd was one of the leaders of an AGS fieldtrip guidebook #26 titled: "Volcanic Features of the Austin Area, Travis County, Texas." In addition, Todd recently (2007) published a map titled, "Bedrock Geology of Round Rock and Surrounding Areas, Williamson and Travis Counties, Texas." AGS extends our sincerest condolences to his family and friends—he will be missed by the Austin Geological Community as well.

Geologic Maps for Schools

At an educators workshop (May 25, 2008) called "Groundwater to Gulf" AGS Education Chair John Mikels, assisted by outgoing AGS President Brian B. Hunt, discussed geologic maps with about 50 teachers. At the end of the conference each teacher was presented a map to take back to their school courtesy of AGS.

AGS member Dr. Brian A. Smith presented the U.S. Geological Survey Tapestry of Time and Terrain map to two eighth-grade science teachers (above) at Bailey Middle School. Mrs. Tipps (left) and Mrs. Bakshi (right) are shown with the geologic map donated by AGS.

Out-of-print AGS guidebooks available online

The Walter Geology Library of The University of Texas at Austin has graciously posted out-of-print AGS Guidebooks on their website. There are nine guidebooks available and more coming! Thanks to Dennis Trombatore for making this happen.
http://www.lib.utexas.edu/books/landscapes/browse_pubs.php

AGS Scholarship Awards

AGS awarded two outstanding University of Texas students with scholarships at the May meeting. AGS President Shane Valentine (left) is shown congratulating Travis Kloss (right) and David Dagian (center).

AGS defends Texas science curriculum against Young Earth Creationists

The AGS Executive Committee and Chairs sent a letter to the Texas State Board of Education members asking for their support of unbiased and credible science education in Texas. Specifically, AGS asked them to resist changes to the Biology and Earth and Space Science curriculum as written by Working Groups (December 2008). The vote on various provisions to the Approved Science Curriculum will dictate what is taught in science classes in elementary and secondary schools and provide the material for state tests and textbooks. The standards will remain in place for a decade after their approval by the state board. Unfortunately, subtle language changes to the curriculum are being proposed as amendments by the Young Earth Creationists that would open the door for their agenda.

austin geological society

P.O. Box 1302
Austin, Texas 78767

March 17, 2009

Mr. Rene Nunez
Texas State Board of Education
William B. Travis Building
1701 N. Congress Avenue
Austin, Texas, 78701

Re: State Science Curriculum

Dear Mr. Nunez:

The Austin Geological Society (AGS), a professional organization created in 1965 with a current membership of over 150 earth scientists, strongly urges you to support unbiased and credible science education in Texas. AGS concurs with the National Academy of Sciences' definition of science - "the use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process". In addition, AGS has adopted the Geological Society of America's position on the teaching of evolution, as adopted in 2001 and amended in 2006.

AGS strongly believes that adherence to this definition of science is fundamental to effective science education in Texas schools. We request that you adopt the Biology and Earth and Space Science TEKS as written by the Working Groups in November, 2008 without any additional amendments or modifications. The working groups are composed of educators and scientists with deep expertise in science, and their proposed TEKS drafts should be given unreserved support without amendment. Please resist changes that are not approved by the working groups of scientists and educators.

The United States lags behind other industrialized and leading nations in educating our children and producing competent and leading-edge scientists. Science curriculum should reinforce critical thinking, scientific reasoning and problem solving. Introducing a science curriculum that blurs the sharp boundary between the scientific method and pseudo-science does a disservice to the students of Texas and the United States.

AGS understands the political pressure that is being exerted upon the SBOE and trusts that the Board will maintain a science curriculum based on the fundamental use of the scientific method to describe and explain natural phenomena.

Sincerely,

Shane Valentine, P.G.
President

Signing on behalf of:

Gay Gutierrez, P.G. Vice-President	Brian B. Hunt, P.G. President 2007-8	John Mikels, P.G. Education Chair
Ann Molineaux, Ph.D., P.G. President-Elect	Charles Woodruff, Ph.D., P.G. Fieldtrip Chair	Robert Mace, Ph.D., P.G. AGS Bulletin Editor
Angela Ludolph, P.G. Secretary	Steve Ruppel, Ph.D., P.G. Publications Chair	Dennis Trombatore Historical Chair
Dallas Dunlap, P.G. Treasurer	Jim Sansom, P.G. Membership Chair	Linda McCall, P.G. Financial Chair

GCAGS 2008—AGS Members Represent!!

Membership from the Austin Geological Society was well represented at the joint annual meeting between the Geological Society of America, Gulf Coast Association of Geological Societies, and the "tri-societies" in Houston, Texas, October 5–9, 2008. About 14 percent of the membership (21 of 149 members in 2008) were presenting papers or were co-authors to papers. Below is a listing of the AGS members and their respective papers. We hope this captures everyone that presented, so please forgive any unintended omissions.

Author or Co-Author		*GCAGS Transactions Paper Title*
Ardis	*Ann*	*Water Quality in Selected Carbonate Aquifers of the United States, 1993-2005*
Collins	*Edward W.*	*Geology of the Glenn Spring Quadrangle, Big Bend National Park; A Comparison of Digital Photogrammetric and Lidar High Resolution Digital Elevation Models of Bolivar Peninsula, Texas, USA*
Dunlap	*Dallas*	*Cyber Techniques Used to Produce Physical Geological Models*
Dupnik	*John*	*Characterization and Management of a Karst Aquifer In Central Texas*
Dutton	*Shirley*	*Variation in detrital mineralogy caused by provenance and depositional setting: linking Tertiary sandstones from the upper Texas coastal plain to the deepwater Gulf of Mexico*
Havorka	*Susan*	*Sequence Stratigraphy and Reservoir Characterization of Cranfield Field, Mississippi—An Enhanced Oil Recovery and Carbon Sequestration Study*
Holland	*Kirk*	*Characterization and Management of a Karst Aquifer In Central Texas*
Hunt	*Brian*	*Geophysical Delineation of the Freshwater/Saline-Water Transition Zone In the Barton Springs Segment of the Edwards Aquifer, Travis and Hays Counties, Texas, September 2006; Multilevel Monitoring and Characterization of the Edwards and Trinity Aquifers of Central Texas; Crystalline Basement Aquifer, Llano Uplift, Central Texas: An Overlooked Minor Aquifer of Texas; Characterization and Management of a Karst Aquifer In Central Texas*
Jones	*Ian*	*Investigating Recharge in Arid Alluvial Basin Aquifers: The Pecos Valley Aquifer, Texas*
Mace	*Robert*	*Boundary Changes and Additions to the Aquifers of Texas; Working towards a Recovery Implementation Plan for the Edwards Aquifer; In Hot Water? How Climate Change May (or may not) Affect the Groundwater Resources of Texas*
Mccall	*Linda*	*Spectacularly Preserved, Mollusc-Dominated Fauna from a Cavity Layer In the Lower Cretaceous Edwards Formation, Central Texas*
Milliken	*Kitty*	*Quartz Cementation Modeling to Elucidate the Timing of Deformation along the Pine Mountain Overthrust, Eastern Kentucky*
Molineux	*Ann*	*Spectacularly Preserved, Mollusc-Dominated Fauna from a Cavity Layer In the Lower Cretaceous Edwards Formation, Central Texas*
Ruppel	*Steve*	*Geochemical Constraints on the Depositional Environment of the Barnett Formation, Permian Basin, West Texas, USA; Differences In Nanopore Development Related to Thermal Maturity In the Mississippian Barnett Shale: Preliminary Results*
Sharp	*Jack*	*From Outcrop to Numerical Modeling of Dolomitizing Fluids, Permian San Andres Fm, Guadalupe Mountains and Algerita Escarpment; Volcanogenic Karstification: Implications of This Hypogene Process*
Smith	*Brian*	*Geophysical Delineation of the Freshwater/Saline-Water Transition Zone In the Barton Springs Segment of the Edwards Aquifer, Travis and Hays Counties, Texas, September 2006; Multilevel Monitoring and Characterization of the Edwards and Trinity Aquifers of Central Texas; Characterization and Management of a Karst Aquifer In Central Texas*
Trevino	*Ramon*	*Sequence Stratigraphy and Reservoir Characterization of Cranfield Field, Mississippi—An Enhanced Oil Recovery and Carbon Sequestration Study*
Vyas	*Radha*	*Groundwater - Surface Water Interactions and Geochemistry along a High-Sinuosity Meander in a Mountain Meadow*
Williams	*Charles R.*	*Developing the Desired Future Conditions of Aquifers in Groundwater Management Area 8*
Woodruff	*Chock*	*Hillslope hydrology in stepped limestone terrains of the Central Texas Hill Country*
Zell	*Mark*	*Building Tomorrow's Cities on Yesterday's Contamination: A Case Study*

about the technical content

The technical content in the Bulletin consists of abstracts or extended abstracts for presentations, summaries of the field trips, technical papers, and notes.

presentation

The Austin Geological Society hosts technical presentations from invited speakers concerning the natural sciences. We publish an abstract in the Society's newsletter and allow for an extended abstract in the Bulletin.

posters

The Austin Geological Society hosts a poster session each spring. Presenters can submit an abstract concerning their poster topic. This year, we also received abstracts from young scientists from local schools who participated in the regional science fair.

field trip

The Austin Geological Society tries to have at least one field trip per year. The summary included here provides an overview of this year's trip. Interested readers are encouraged to purchase the guide book for additional information and details.

technical paper

The Bulletin accepts technical papers for publication provided that the papers meet technical and editorial requirements.

note

The Bulletin also accepts notes, which may be technical or anecdotal.

presentation

august 25, 2008, bureau of economic geology

Giving Geologic Testimony—Ethics, Sound Practice, and the Common Good

Charles M. Woodruff, Jr., Ph.D., P.G.
Charles Woodruff Consulting

This presentation is about Truth and the practice of geology. It is about searching for the truth in nature, and then reporting discoveries with precision. Part of the presentation focuses on legal testimony, but it goes beyond that. In a broader sense, it is an attempt to explore the concept of "giving testimony" in the process of living as a human being, working as a geologist, and contributing to the common weal. So the talk is part hortatory sermon and part practical guide, with a side trip into etymology.

presentation

october 6, 2008, bureau of economic geology

Energy and the Middle East

Hans Mark, Ph.D.
Department of Aerospace Engineering and Engineering Mechanics, Cockrell School of Engineering
The University of Texas at Austin

About two thirds of the world's known oil resources are located in a small area near the Persian Gulf. The industrialized nations of the world, especially the readily developing ones link India and China depend critically on this resource. Depending on the world's economic growth rate, this resource is likely to be exhausted within 20 to 50 years. The process of seeking alternatives with an emphasis on nuclear energy will be discussed.

presentation

november 3, 2008, bureau of economic geology

Multilevel Monitoring of the Edwards and Trinity Aquifers and Implications for Groundwater Flow

Brian A. Smith, Ph.D., P.G., and Brian B. Hunt, P.G.

Barton Springs/Edwards Aquifer Conservation District

The Edwards and Trinity Aquifers are significant sources of water for domestic, industrial, and agricultural use and for ecological resources in Central Texas. In southern Travis and northern Hays Counties demand for groundwater has increased considerably in recent years. The Trinity Aquifer has increasingly become a source of water as limits have been placed on the Edwards Aquifer. Proper management of these aquifers requires an understanding of factors affecting the hydraulic relationship between the two aquifers. Until recently, there has been insufficient head data and water-quality data to assess the hydrologic connection and potential for flow between the Edwards and the Trinity Aquifers.

To address these issues, potentiometric data were collected from three Edwards/Trinity well pairs and a Westbay® multiport well (Figure 1). The multiport well was installed to a depth of 1,120 feet and was completed with 14 monitoring zones, three in the Edwards and 11 in the Trinity (Figure 2). Groundwater samples can be collected from each of these zones, in addition to potentiometric and hydraulic conductivity data. Potentiometric data from all four sites show that head values are considerably higher in the Edwards and Upper Trinity than in the Middle Trinity. Head differences between the Edwards and Middle Trinity are as much as 160 feet at the northern well pair and about 50 feet at the southern well pair (Figures 1 and 3).

Water-quality data show that groundwater from 13 sampling zones of the multiport well can be divided into three distinct hydrochemical facies: Calcium bicarbonate, calcium sulfate, and an intermediate facies. The calcium sulfate facies has the highest levels of sulfate, magnesium, calcium, and total dissolved solids (TDS) and is associated with zones in the upper member of the Glen Rose Limestone. The zones of lowest TDS are in the Edwards, the Cow Creek Limestone, and a rudist reef unit (zone 7) in the lower member of the Glen Rose Limestone (Figures 4 and 5).

Significant head differences between zones and the distribution of hydrochemical facies suggest that there is very little, if any, vertical flow between zones. Faults in the area do not appear to create pathways for vertical flow nor do they create barriers to lateral flow. Relay-ramp structures (Figures 6 and 7) that are common in the Balcones Fault Zone provide for some lateral continuity of lithologic units and therefore lateral flow of groundwater.

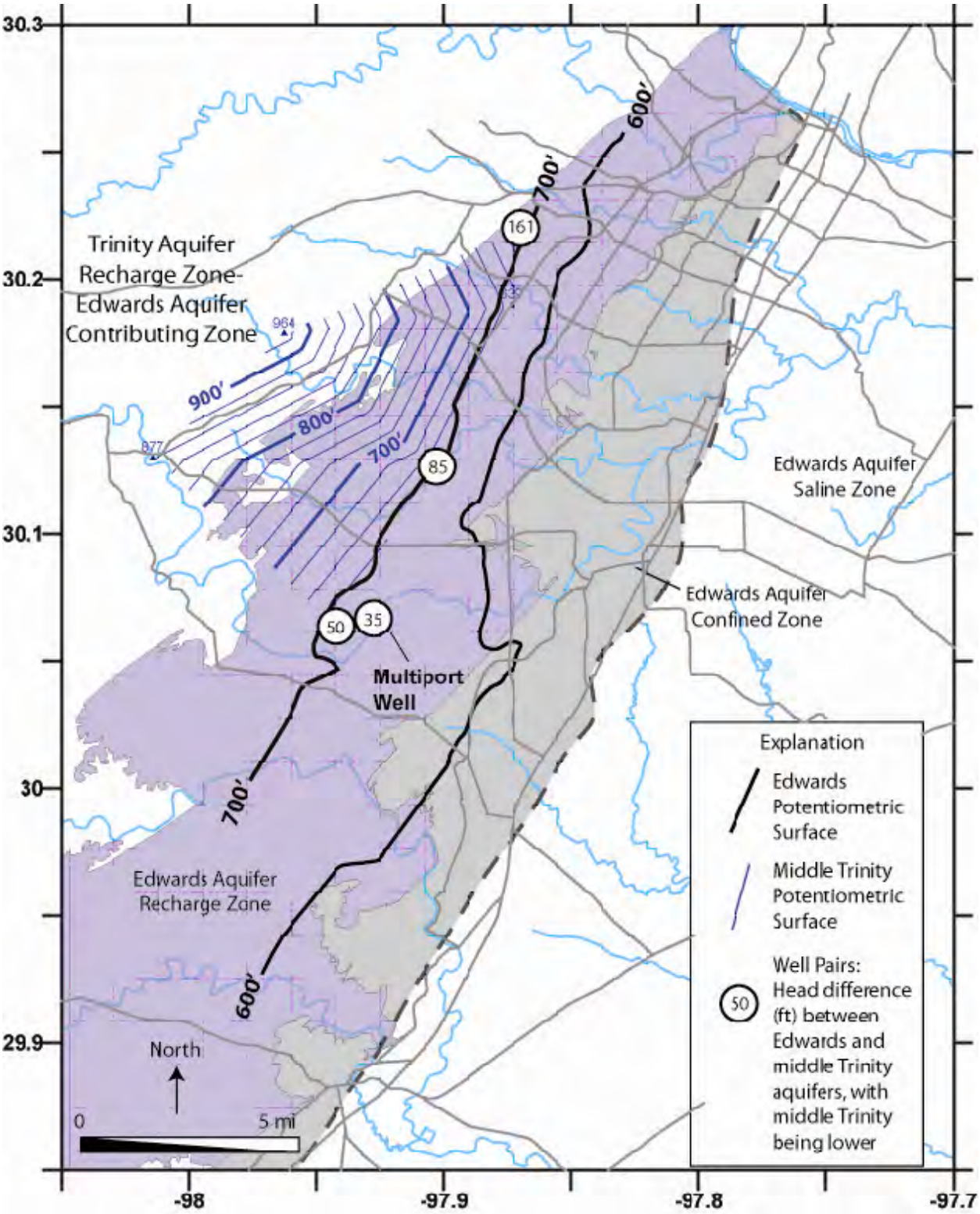


Figure 1. Potentiometric map of the Edwards and Middle Trinity aquifers from November 2005 (below average flow conditions). Also shown within the circles are the differences in head at the multiport well and well pair locations.

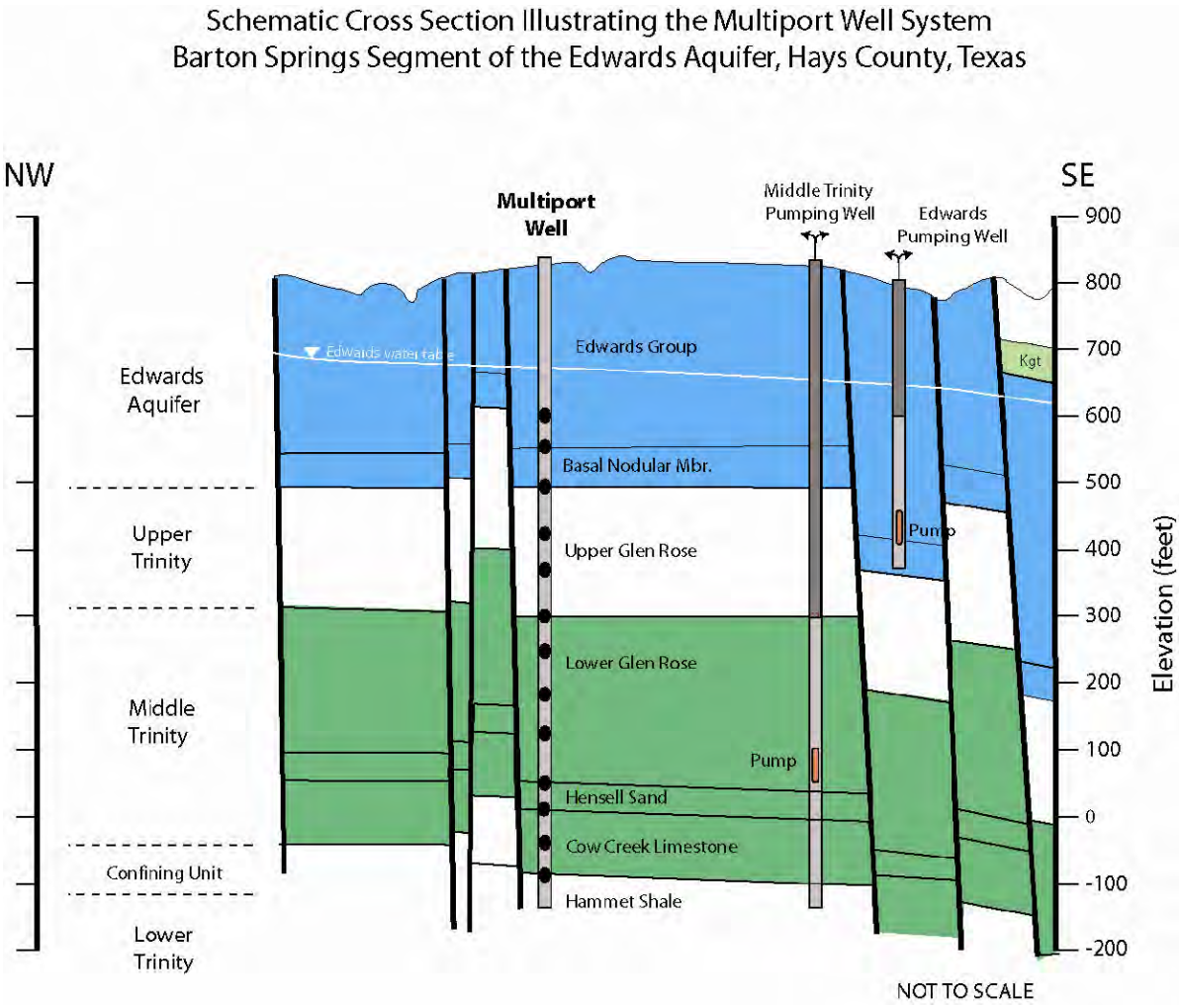


Figure 2. Schematic diagram showing the multiport well and a well pair configuration relative to the Edwards and Trinity Aquifers. Black ovals indicate packers that separate each monitor zone.

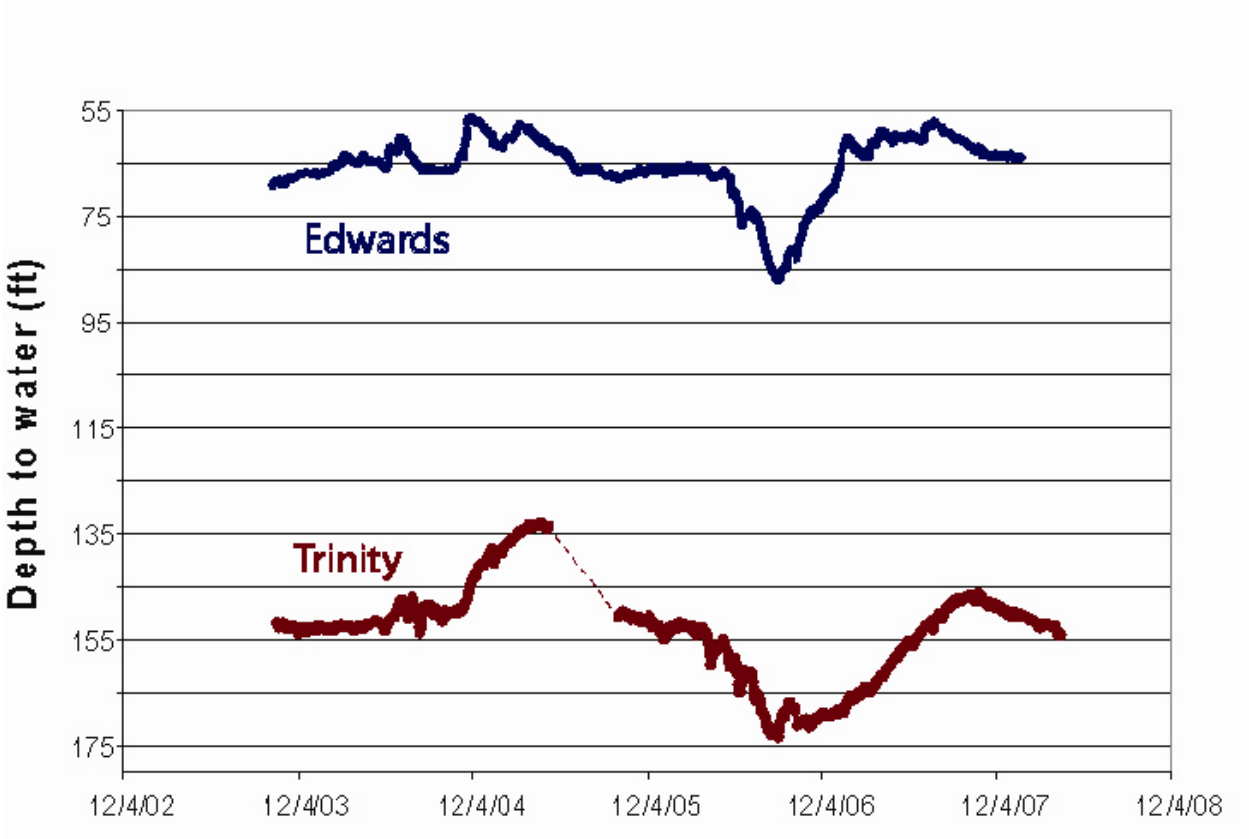


Figure 3. Hydrograph from the Borhiem-Wentzel Quarry well pair indicated by the circle showing 85 feet in Figure 1.

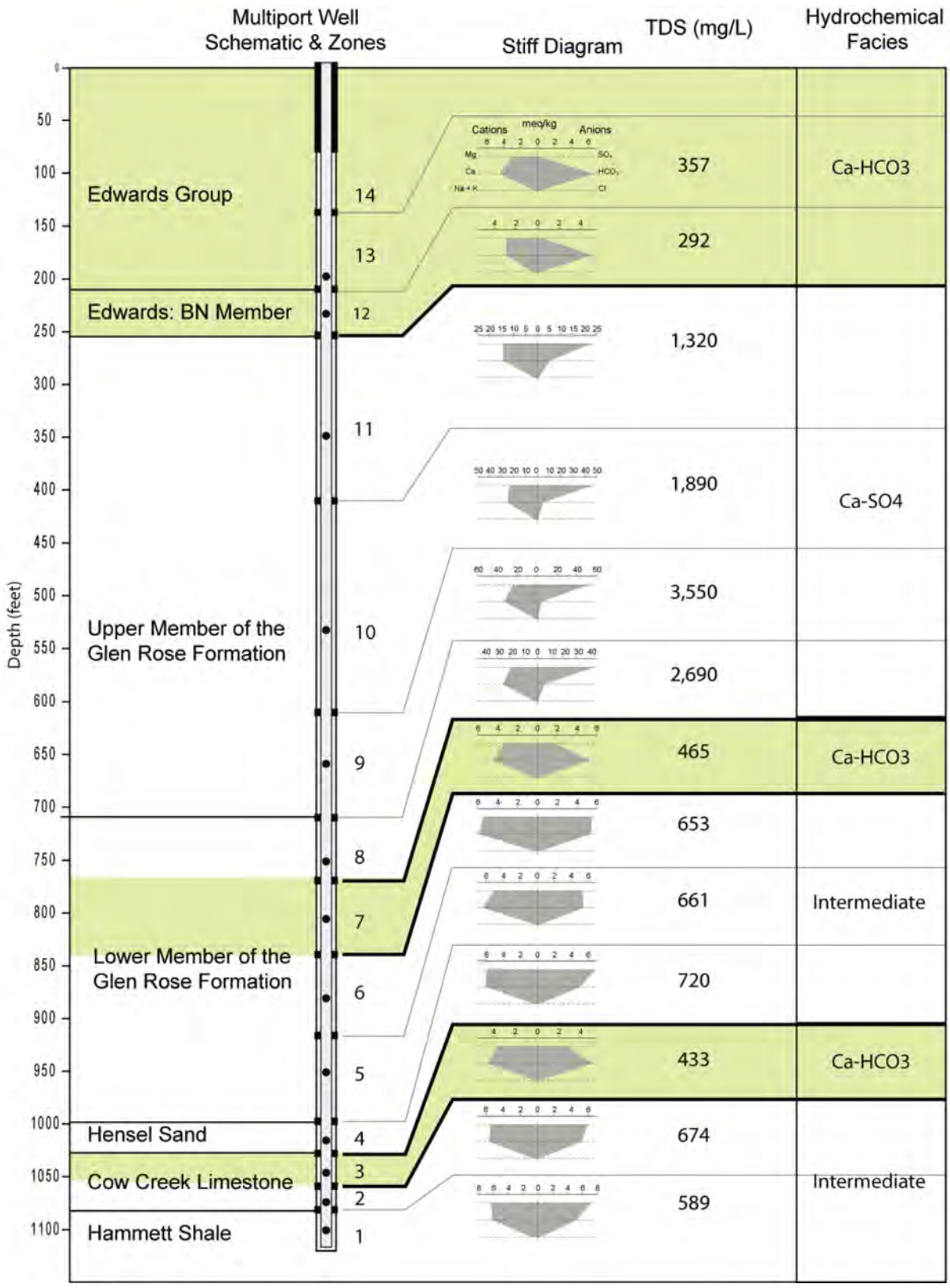


Figure 4. Well schematic, geologic formations, and water chemistry in the multiport well.

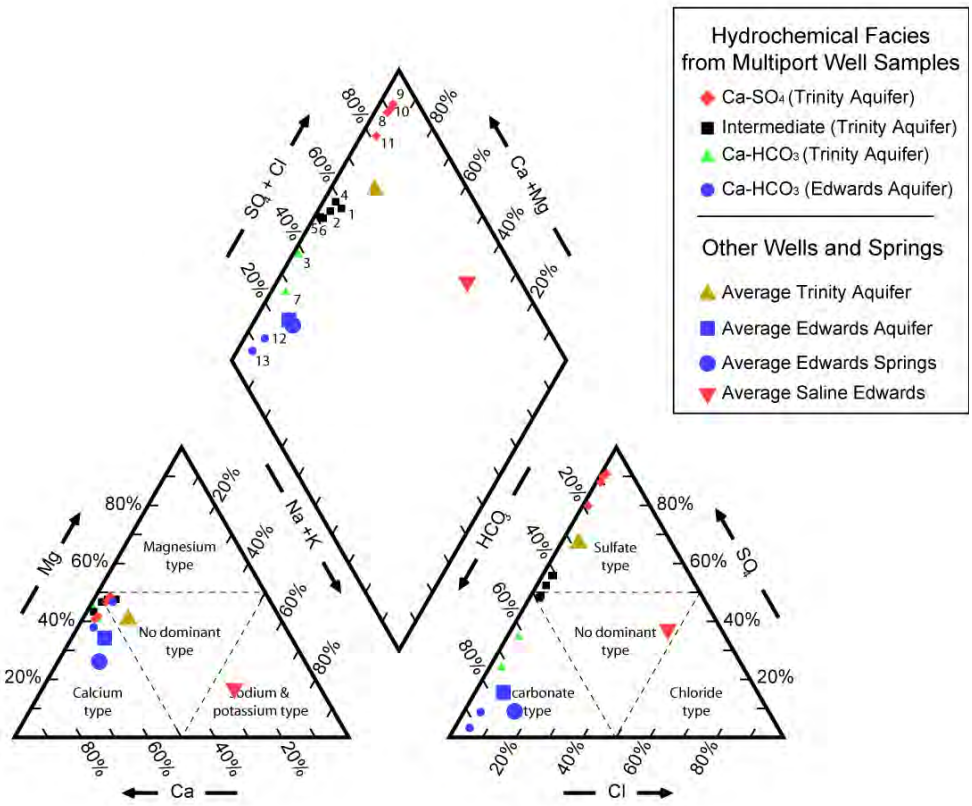


Figure 5. Piper diagrams illustrating the hydrochemical facies within the 13 multiport zones compared to average values.

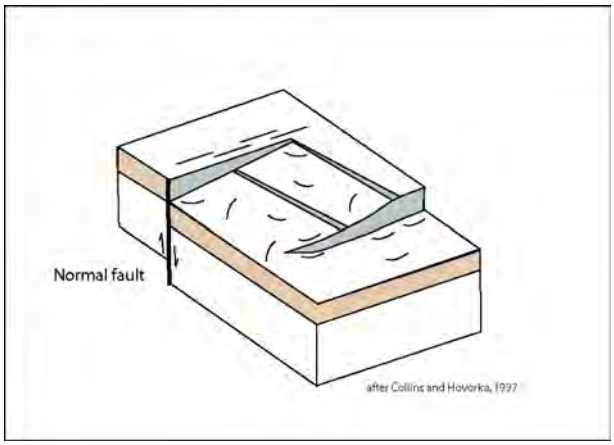


Figure 6. Schematic diagram of a relay-ramp structure from Collins, E. W., and Hovorka, S. D., 1997, Structure map of the San Antonio segment of the Edwards Aquifer and Balcones Fault Zone, south-central Texas: structural framework of a major limestone aquifer: Kinney, Uvalde, Medina, Bexar, Comal and Hays Counties: The University of Texas at Austin, Bureau of Economic Geology, Miscellaneous Map No. 38, scale 1:250,000, text, 14 p.

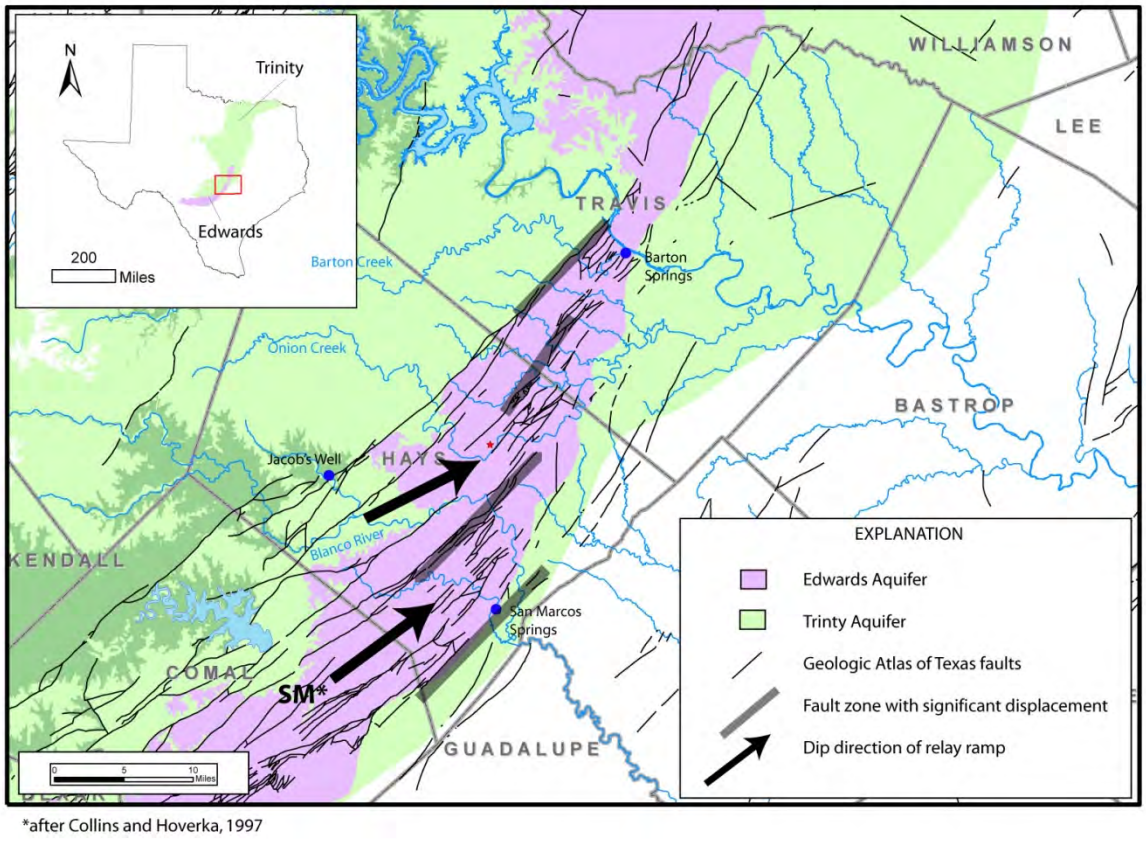


Figure 7. Regional aquifer map showing mapped fault zones and dip direction of the relay-ramp structures. The multiport monitor well is shown as a small red star in the center of the figure. This figure illustrates that structural style may allow lateral continuity of geologic units from the Trinity units exposed in the Hill Country with Trinity units deeper in the subsurface within the Balcones Fault Zone.

presentation

december 1, 2008, bureau of economic geology

Fire on the Water: Impacts of Firefighting Activities for the Helotes Mulch Fire on the Edwards Aquifer

Ms. Rosemary M. Wyman
Baer Engineering and Environmental Consulting

On December 25, 2006, a fire was reported in a debris pile located at a construction company in Helotes, Texas. The debris pile covered approximately 4.1 acres, was approximately 80 feet tall, and contained approximately 171,000 cubic yards of material. Smoke from the fire contained particulates 2.5 microns in diameter and smaller (PM2.5) at levels considered to be unhealthy for humans to breathe. At one time up to 400 residents were evacuated from their homes due to the impact from the smoke.

The debris pile was located over the Edwards Aquifer Recharge Zone. When firefighting began it was determined that there was a direct connection between the debris pile and the Edwards Aquifer. The firefighting methodology was altered to minimize impact on the aquifer. A balance was reached between aquifer protection and the human health and safety issues created by the smoke. Firewater contaminants (semi-volatile organic compounds and polycyclic aromatic hydrocarbons) were ultimately detected in seven sole-source domestic drinking water wells in the local area. The impacted residents were provided with alternate sources of water until the contaminants had reduced to pre-fire conditions.

presentation

february 2, 2009, bureau of economic geology

ICESat: Measuring Global Change Using Satellite Laser Altimetry

Tim Urban, Ph.D.
The University of Texas at Austin
Center for Space Research

NASA's Ice Cloud and land Elevation Satellite (ICESat) has been measuring the topography and changes of the Earth in unprecedented detail since launch in 2003. The first laser altimeter satellite, ICESat's primary mission is to detect long-term changes in the polar ice sheets. Secondary and supplemental objectives have examined sea ice, ocean, and land areas. This talk introduces the ICESat mission, goals and current status. The widespread value of the data from this new satellite tool is illustrated using a variety of geographical areas around the globe. Examples include rivers and lakes, salt flats and sand dunes, forests and oceans, as well as the major Greenland and Antarctic ice sheets in micro and macro detail. ICESat data address a host of global climate change topics including changing/ melting ice sheets, sub-glacial lake movement, thinning and disappearance of sea ice, land deformation, forest/carbon stocks and deforestation, assessment of storm damage, and sea level rise. Discussion includes the value of synergistic missions and potential future missions.

presentation

april 6, 2009, bureau of economic geology

Water Resources and Related Issues for the Texas Hill Country

Raymond Slade, Jr., P.H.
Consulting Hydrologist

The Texas Hill Country bounds vast areas of natural beauty and natural attractions which includes abundant wildlife, rolling hills and valleys, caverns, and wooded areas. Additionally, the area is rich in history and diverse culture, and contains an abundance of springs, beautiful streams, and clear groundwater. The beauty and value of this area are drawing many visitors and much urban development to the area—development which greatly threatens the vulnerable resources that define the beauty and value of the Hill Country.

For example, construction sediment associated with development has caused sedimentation problems in many Hill Country streams, as documented on the Internet at http://www.hillcountryalliance.org/HCA/Presentations. Additionally, the Hill Country area experiences some of the greatest meteorologic and hydrologic diversity in the Nation. Long and extended area droughts have caused severe decreases in water availability. This problem is exacerbated by increased water demands due to growth in the area--for example, several hundred water wells in Hays County have become dry due to the drought and increased water demand. Additionally, the area is identified as having the largest threat from flash floods in the Nation--additional development is locating more people in harms way and causing increases in flood peaks to the extent that additional people are threatened.

Finally, growth projections indicate the Hill Country area will be experiencing continued rapid growth in the future. If the location, extent, and type of future development are limited to be less threatening, the Hill Country could retain the beauty and value that makes this such a unique area.

presentation

may 4, 2009, bureau of economic geology

Caught in the Crossfire: Why Earth Science is Under Attack in Texas

Paul E. Murray

Vice President, Texas Citizens for Science

The Texas State Board of Education is completing its decadal revision to the science standards for K-12 schools in Texas. This year features the addition of standards for the proposed capstone course in Earth and Space Science for a 4th year high school science credit. The headlines around the world regarding the Texas science standards have focused on the debate over the teaching of evolution in biology class, but the same forces on the State Board who wish to weaken biology have now turned their sites on the Earth and Space Science curriculum as well. It is a tale of subterfuge, deceit and political maneuvering that has implications not just for Texas students, but for the textbooks and science standards across the entire nation. This talk is intended to be a primer on the issues, a cautionary tale, and a call to action for geoscientists in Texas.

posters

march 2, 2009, bureau of economic geology

The March meeting of the Austin Geological Society was the annual poster session meeting with numerous posters on display. Unfortunately, a list of authors and titles is unavailable.

Student science festival posters

The Austin Regional Science Festival was help at Palmer Auditorium on February 19, 2009. The following AGS members volunteered their time and talents as judges in the Earth Science and Environmental categories: Linda McCall, Scott Tiller, Les White, Eric Radjef, and John Mikels. Four Austin area students were recognized for their exemplary projects with the AGS Award Package (Certificate of Recognition, Exhibition of their project at the AGS March Poster Session Meeting, a guided tour of the Bureau of Economic Geology, and publication of their project abstract in the AGS Bulletin). These four students include:

- Jonathan Jimenez, Murchison Middle School (Austin Independent School District): "Which Soil Is Most Permeable";
- Michael Mann, 9th Grade, Westwood High School (Round Rock Independent School District): "Carbon Sequestration";
- Eric Van Note, 12th Grade, Vista Ridge High School (Leander Independent School District), "The Theory of Panspermia"; and
- Braeden M. Wright, 12th Grade, Vista Ridge High School (Leander Independent School District), "Coastal Management: A Study of Coastal Erosion and How to Prevent It".

Coastal Management: A Study of Coastal Erosion and How to Prevent It

Braeden M. Wright
Vista Ridge High School

This experiment evaluated which form of coastal management system is the most reliable and efficient way to prevent coastal erosion. With the understanding that this is an economy driven world, research was also conducted, to determine which system is the most cost efficient. Today's coastal erosion barriers are all very capable of preventing erosion, but it is not known which is the most dependable.

To determine which is the most dependable, several coastal management systems were tested in a coastal environment replication. The management systems tested were: sea walls, groynes, wetlands, breakwater methods, and a method created to improve the management of erosion—the collective sea wall. Scale models of each management system were integrated with the same coastal environment setting. Each model was then subjected to simulated oceanic waves and currents, and the erosional effects observed. The percentage of erosion was determined by measuring the slope of the beach and tracking the change in that slope. More drastic changes in beach slope indicated that more erosion took place. It was found that wetlands method best prevented erosion, lasted the longest, and was cost efficient. There would be other environmental benefits from a wetland.

Hopefully, this experiment will contribute to the optimum selection of the most appropriate (effectiveness and cost) coastal management system. With constant changes occurring throughout the world, it is now more important than ever to find the best methods to protect coastal cities and the environment from marine erosion.

Braeden M. Wright is a 12th grader at Vista Ridge High School in Cedar Park, Texas.

The Theory of Panspermia

Eric Van Note
Vista Ridge High School

The theory of Panspermia is an opposing argument to the Primordial Soup Theory on the origin of life that is, currently, widely accepted by scientists. The Panspermia Theory states that life, instead of life originating on a Earth in a "primordial soup" (various setting theories: marine, volcanic, hydrothermal, etc.), originated elsewhere in the cosmos and was brought here by interplanetary objects, such as asteroids and meteorites. Testing the Theory of Panspermia, in its entirety, is nearly impossible; however, it is possible to simulate the conditions of space in a laboratory environment and test different strains of bacteria for their ability to survive these conditions. For this experiment, Geobacillus stearthermophilus, Kocuria rhizophila, Bacillus cereus, Clostridium rubrum, Menthanomonas methlovora, and Oscillatoria were all tested for survival and reproduction in the following three environments: (1) a 100 percent carbon dioxide environment for a 24 hour period, (2) at liquid nitrogen temperatures (-196 degrees Celcius), with testing spanning a week and samples being taken and tested for reproduction each day, and (3) at 150 degrees Celsius for a 10 minute period. The results of this experimentation showed that all tested samples were capable of reproduction after exposure to both liquid nitrogen and carbon dioxide. Only Geobacillus and Clostridium rubrum were capable of surviving 150 degree Celsius exposure. From this data it was concluded that the tested bacteria can survive the conditions of space that are within the test parameters, provided they are shielded from heat caused by radiation and impact.

Eric Van Note is a 12th grader at Vista Ridge High School in Cedar Park, Texas.

Carbon Sequestration

Michael Mann
Westwood High School

The purpose of this experiment was to test if adding nitrogen to soil, affects the carbon dioxide released from soil into the air. Hypothesis #1 is: If nitrogen (in the form of blood meal) is added to soil, the amount of carbon dioxide released by the soil will be lowered because some carbon dioxide will be sequestered in the soil. Hypothesis #2 is: If nitrogen is added to soil that contains plants, the amount of carbon dioxide released by the soil will be lowered because some carbon dioxide will be sequestered in the soil and in the plant tissue. Eight bins were filled with organic soil and various amounts of blood meal. Two chrysanthemum plants, each, were placed in bins 2, 4, 6, and 8. Bins 1 and 2 had no added nitrogen. Bins 3 and 4 had added 22.7 g of nitrogen. Bins 5 and 6 had added 45.4 g of nitrogen. Bins 7 and 8 had added 68.0 g of nitrogen. Carbon dioxide concentrations were measured in the air immediately above each bin and in ambient air in the vicinity of the bins. Round 1 measurements were conducted from November 16, 2008 to December 8, 2008. An ANOVA test, with alpha = .05, did not show a significant difference in CO2 concentrations between the between test points. In Round 2, the bins were covered and CO2 testing was then conducted from December 18, 2008 to January 13, 2009. Another ANOVA test failed to reject the null hypothesis. In Round 3, more nitrogen was added to the soil in each bin and CO2 testing was conducted from February 4, 2009 to February 14, 2009. The data showed very little variance between the means confirmed by an ANOVA test. None of the rounds supported either hypotheses—that adding nitrogen to a soil affects the amount of carbon dioxide released from that soil.

Michael Mann is a 9th grader at 9th grader at Westwood High School, Round Rock, Texas.

field trip

Fall 2008 Field Trip

Canyon Dam Spillway Gorge,

Comal County, Texas—

Geologic and Hydrologic Issues

Dedicated to the Memory of James Lee Wilson

trip coordinators:

William C. Ward, Ann Molineux,

Shane Valentine, and C.M. Woodruff, Jr.

contributors:

Patrick L. Abbott, Edward W. Collins, Rebecca Comeaux, David A. Ferrill, Ann Molineux, Alan P. Morris, James W. Sansom, Jr., Raymond M. Slade, Jr., Kevin J. Smart, William C. Ward, and C.M. Woodruff, Jr.

photography:

Shane Valentine

The AGS Field Trip on Saturday, October 25, 2008, to view the Canyon Dam Gorge was a splendid success. On a stunningly beautiful day, we traversed the gorge that was created by an enormous cascade of water (circa 70,000 cubic feet per second) when the dam's spillway overtopped in July 2002. An analysis of the hydrology of the flood event was presented by Raymond Slade. The walk through the gorge focused on detailed stratigraphy, lithofacies analyses, and paleontology of the Glen Rose Limestone as presented by Bill Ward, Ann Molineux, and Pat Abbott. Structural geology of the Hidden Valley Fault was presented by Kevin Smart. In addition, Jim Sansom provided a historical summary and engineering attributes of Canyon Dam. A road log for the route that included travel to the dam via IH-35 and a return via scenic back roads of the Hill Country was prepared by Chock Woodruff and Eddie Collins. The field trip guidebook (AGS # 30) was dedicated to the memory of Professor James Lee Wilson, who was a preeminent expert on carbonate rocks (Shell Oil, Rice University, and The University of Michigan). Final layout of the guidebook was done by Shane Valentine.

Raymond Slade, Bill Ward, Kevin Smart and Chock Woodruff giving background information for the fieldtrip.

Kevin Smart discussing the types of faulting expressed in the Canyon Dam Gorge.


View of the Canyon Lake Spillway from the park overlook. The spillway is ~1,200 feet wide.

View of the lower Canyon Lake Spillway looking upstream.

Bill Ward describing the stratigraphy and sedimentology of the lower Glen Rose Formation.

Beautiful upstream view of the Canyon Dam Gorge.

Interesting bedding plane trace fossils or proof of 110 million year old military jeeps.

Ann Molineux leading a discussion on the gorge's rich fossil fauna.

Oscillation ripples preserved on a bedding plane in the *Corbula* marker bed.

Looking roughly down strike along the Hidden Valley Fault.

Kevin Smart standing on a fault bound, rotated lozenge of rock within the Hidden Valley Fault complex.

Beautiful fault scarp in the upper section of the gorge.

Refreshments at the bus! Whew!

annual report to GCAGS
gulf coast association of geological societies

Meetings

First Monday of the month, 7:00 pm, Bureau of Economic Geology, Pickle Research Center, Austin, Texas (http://www.austingeosoc.org/), September through May, no meeting in January or during the summer. Infrequently we have luncheon meetings rather than evening meetings. Attendance at meetings averages about 60 members with a substantial increase since the initiation of the continuing eduation requirements.

Comments about certain meetings:

- August/September is our ethics talk, intended to satisfy the professional geoscientist ethics requirements
- March is traditionally a poster session meeting (this year we had 12 professional posters, and 4 science fair student posters).
- May is the last meeting of the year and when our elections are held.

Publications

In addition to the monthly newsletter AGS now publishes an annual Bulletin that summarizes the year's talks, society activities, and is a place for publication of regional- to local-interest technical notes and papers.

AGS has also produced about 35 fieldtrip guidebooks to date. Guidebooks are available for purchase at the BEG, and about a dozen out-of-print guidebooks are available on the UT-Austin website for free.

- http://www.austingeosoc.org/publications.html
- http://www.lib.utexas.edu/books/landscapes/browse_pubs.php

Membership

The membership of the AGS has increased. It now stands at about 150. We have 7 honorary, and only a few student members.

Signup sheets and certificates documenting Professional Geologist professional development hours seem to have increased membership.

Scholarships

This year we will award two scholarships totaling $1,300 to University of Texas students from our endowed fund at the Austin Community Foundation.

Maps for Schools

We received a grant of $1,000 from GCAGS for as a pilot project in the Austin area. After discussion with area science teachers John Mikels (Education Chair) laminated 12 of the U.S. Geological Survey's Tapestry of Time and Terrain maps for area schools. John has 12 teachers already lined up for the maps and has begun presenting the maps to the teachers. The maps have been received with much enthusiasm, and we expect AGS to continue the effort. We anticipate setting up a fund at the Austin Community Fund for businesses and people to make tax-deductible donation for this project (as we are not a non-profit group, yet).

Website

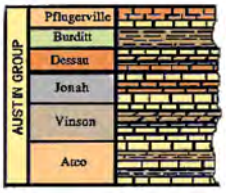
The Austin Geological Society Website is in the process of being revised and updated.

- http://www.austingeosoc.org/

The functionality and content have been greatly improved. The website contains about a dozen pages you would normally expect (such as home, membership, and publications). The current focus on the website will be adding a web pay option for membership dues and donations.

Fieldtrips

AGS tries to host at least one fieldtrip per year. In October 2008 AGS led a fieldtrip to the Canyon Lake Gorge. The published guidebook is currently is currently available through the Bureau of Economic Geology. Our Fall fieldtrip for 2009 is anticipated to be held in October and focus on Urban Hydrology in central Texas.



austin geological society bulletin

instructions to authors

- **topics:** The focus of technical papers shall be on Central Texas geoscience topics or issues (geology, hydrogeology, environmental/engineering geology, and so on). If you are unclear if your idea for a technical paper will meet this requirement, please contact the Editor for guidance. We also welcome comments, notes, and reflections that would be of interest to our membership.
- **who can submit?** Anyone from anywhere can submit a paper. However, AGS members are given preference for publication if the number of pages in the Bulletin becomes an issue. Non-AGS members will need to pay a $20 fee, plus any applicable page charges, if a paper is accepted for publication. Editors of the AGS Bulletin can submit papers but can not be involved in the review or assessment of their papers. No more than two papers per lead author can be published in any given year.
- **page charges:** Page charges apply for any color graphics that require color for comprehension. If a graphic is in color but can be understood in grayscale, there will be no charge. The graphic will be in color in the online version of the paper but in grayscale in the printed version (unless the author pays the page charges to have the graphic in color in the hard copy version). The Editor will decide what is understood in grayscale and what is not. The page charge will be $10 per page of color. The page charge will be used to pay for the added cost of reproducing hard copies of the Bulletin with color figures to be included in AGS files and sent to the libraries of (1) the Bureau of Economic Geology, (2) the Department of Geological Sciences at The University of Texas at Austin, (3) Texas State University, (4) Austin Community College, (5) Geology Department at Texas A&M University, (6) U.S. Geological Survey Office in Austin, and (7) American Association of Petroleum Geologists.
- **graphics:** All graphics and tables must fit on an 8.5 by 11 inch page with appropriate margins (one inch on each side). We will not publish plates.
- **style guide:** The AGS Web page (www.austingeosoc.org) includes the style guide and suggestions to authors. Please read this guide and try to follow its suggestions.
- **length:** Papers shall not be longer than 20 pages including tables and figures. We encourage shorter papers if possible.
- **peer reviews:** Papers need to be reviewed by two reviewers before submission to the journal. They must be willing to be named as reviewers in the acknowledgments section of the paper.
- **copyright:** Authors are required to submit a signed copyright form located at the AGS Web site. The form gives AGS the assurance that the work you are submitting is not previously copyrighted and does not contain copyrighted material or, if the paper does contain copyrighted material, you have written permission from the copyright holder to use the material in your paper. The copyright form leaves the copyright of your work with you and grants AGS permission to reproduce your work in the Bulletin.
- **deadlines:** Papers and other unsolicited contributions need to be submitted to the Editor before the **end of May**, preferably sooner, to be considered for publication in the next Bulletin. Digital versions may be sent to editor@austingeosoc.org or hard copies can be mailed to: Bulletin Editor, c/o Austin Geological Society, P.O. Box 1302, Austin, Texas 78767-1302.

publications

AGS publications are available through the Bureau of Economic Geology, Publication Sales, University Station, Box X, Austin, TX 78713-8924; (512) 471-1534; www.beg.utexas.edu.

Urban Flooding and Slope Stability in Austin, Texas by V. R. Baker, L. E. Garner, L. J. Turk, and Keith Young, Leaders. Guidebook 1, 1973, 31 p. **AGS 001, $7.50**

Cretaceous Volcanism in the Austin Area, Texas by Keith Young, S. C. Caran and T. E. Ewing. Guidebook 4, Revised Edition, 1982, 66 p. **AGS 004, $13.00**

Geology of the Precambrian Rocks of the Llano Uplift, Central Texas–Field Trip Notes by J. R. Garrison, Jr. and David Mohr. Includes road log and articles. Guidebook 5, 1984, 50 p. **AGS 005, $10.00**

Hydrogeology of the Edwards Aquifer-Barton Springs Segment, Travis and Hays Counties by C. M. Woodruff, Jr. and R. M. Slade, Jr., Coordinators. Includes road log and articles. Guidebook 6, 1984, 96 p. **AGS 006, $15.00**

Edwards Aquifer–Northern Segment, Travis, Williamson, and Bell Counties, Texas by C. M. Woodruff, Jr., Fred Snyder, Laura De La Garza and R. M. Slade, Jr., Coordinators. Includes road log and articles. Guidebook 8, 1985, 104 p. **AGS 008, $15.00**

The Cityscape–Geology, Construction Materials, and Environment in Austin, Texas by F. R. Snyder, Laura De La Garza and C. M. Woodruff, Jr., Coordinators. Includes road log and articles. Guidebook 9, 1986, 78 p. **AGS 009, $12.00**

Paleozoic Buildups and Associated Facies, Llano Uplift, Central Texas by S. C. Ruppel and C. Kerans. Includes road log and articles. Guidebook 10, 1987, 33 p. **AGS 010, $10.00**

Hydrogeology of the Edwards Aquifer–Northern Balcones and Washita Prairie Segments by J. C. Yelderman, Jr., Coordinator. Includes road log and articles. Guidebook 11, 1987, 91 p. **AGS 011, $12.00**

Congress Avenue, Austin, Texas–Lessons in Economic Geology, Architecture, and History by C. M. Woodruff, Jr., Coordinator. Includes several articles and street log of Congress Avenue. Guidebook 12, 1988, 56 p. **AGS 012, $10.00**

Faults and Fractures in the Balcones Fault Zone, Austin Region, Central Texas by E. W. Collins and S. E. Laubach, Coordinators with an experimental demonstration by B. C. Vendeville and a summary of the regional fracture patterns by W. R. Muehlberger. Includes road log. Guidebook 13, 1990, reprinted 2004, 34 p. **AGS 013, $12.00**

Water Quality Issues for Barton Creek and Barton Springs by D. A. Johns, Field Trip Leader. Guidebook to field trip containing road log of eight stops, excerpts from the report of the Barton Springs Task Force to the Texas Water Commission, and five articles on Barton Creek and Barton Springs. Guidebook 14, 1991, 95 p. **AGS 014, $15.00**

Edwards Aquifer–Water Quality and Land Development in the Austin, Texas, Area by D. A. Johns and C. M. Woodruff, Jr. Includes six articles and a road log to six stops in the Austin area. Guidebook 15, 1994, 66 p. **AGS 015, $10.00**

Fractures Caused by North-South Compression, Eastern Llano Uplift, Central Texas: **A Field Guide** by David Amsbury, Russell Hickerson, and Walter Haenggi. Includes road log and details of six stops. Guidebook 16, 1991, 31 p. **AGS 016, $8.00**

Zilker Park Walking Tour Guidebook: A Recreational Visit to the Edwards Limestone by J. L. Walker and P. R. Knox. Includes the geologic setting of the Zilker Park area with a guide to Zilker Park trail (11 stops) and a guide to the Barton Creek greenbelt (8 stops). Well illustrated. Guidebook 18, 1994, 48 p. **AGS 018, $10.00**

A Look at the Hydrostratigraphic Members of the Edwards Aquifer in Travis and Hays Counties, Texas by N. M. Hauwert and J. A. Hanson, Coordinators. Seven articles and a field trip road log that represents an update of research focusing on the Barton Springs segment of the Edwards Aquifer. Guidebook 19, 1995, 81 p. **AGS 019, $15.00**

Urban Karst: Geological Excursions in Travis and Williamson Counties, Texas. C. M. Woodruff, Jr. and C. L. Sherrod. Road log for one-day field trip with seven stops. Guidebook 20, 1996, 73 p. **AGS 020, $16.00**

The Hill Country Appellation: A Geologic Tour of Selected Vineyards and Wineries of Central Texas by C. M. Woodruff, Jr., P. R. Rose, and J. W. Sansom, Jr. Guidebook 18, 1998, 56 p. **AGS GB018, $10.00**

Rocks, Resources, and Recollections: A Geologic Tour of the "Forty Acres:" The University of Texas at Austin Campus by C. W. Woodruff, Jr., and B. L. Kirkland, coordinators. Guidebook 19, 1999, 62 p. **AGS GB019, $12.00**

Geology and Historical Mining, Llano Uplift Region, Central Texas by Chris Caran, Mark Helper, and Richard Kyle, Leaders. Guidebook 20, 2000, 111 p. **AGS GB020, $15.00**

Austin, Texas, and Beyond? Geology and Environment: A Field Excursion in Memory of L. Edwin Garner by C. M. Woodruff, Jr., and E. W. Collins, Trip Coordinators. Guidebook 21, 2001, 120 p. **AGS GB021, $15.00**

Time, Land, and Barton Creek—An Excursion to Shield Ranch, Travis and Hays Counties, Texas by C. M. Woodruff and Edward W. Collins, Trip Coordinators. Guidebook 22, 2003, 71 p. **AGS GB022, $13.00**

Lignite, Clay, and Water: The Wilcox Group in Central Texas by Robert E. Mace and Berney Williams, Trip Coordinators. Guidebook 23, 2004, 96 p. **AGS GB023, $10.00**

Tectonic History of Southern Laurentia: A Look at Mesoproterozoic, Late-Paleozoic, and Cenozoic Structures in Central Texas by April Hoh and Brian Hunt, Trip Coordinators. Guidebook 24, 2004, 90 p. **AGS GB 24, $18.00**

Geology, Frontier History, and Selected Wineries of the Hill Country Appellation, Central Texas by P. R. Rose and C. M. Woodruff, Jr. Guidebook 25, 2005, 109 p. **AGS GB 25, $15.00**

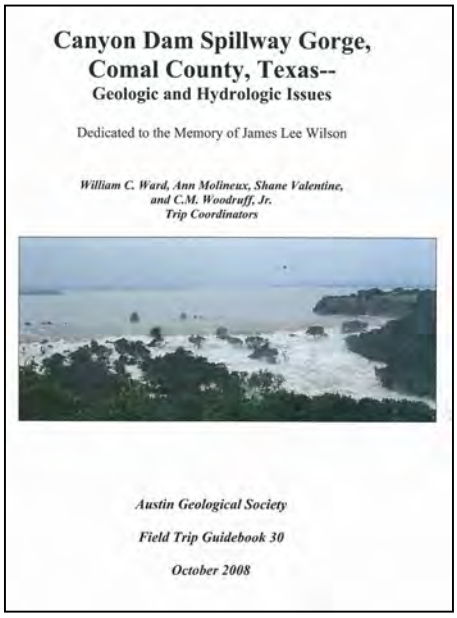
Volcanic Features of the Austin Area, Texas, by S. C. Caran, Todd Housh, and A. J. Cherepon. Guidebook 26, 110 p., 1 CD, Spring 2006. **AGS GB 26, $25.00**

Geology of the Karnes Uranium District, Texas, by A.J. Cherepon, J.E. Brandt, and W.E. Galloway, Guidebook 27, 2007, 85 p., 1 CD **AGS GB 27, $22.00**

Reimers Ranch and Westcave Preserve—Landscapes, Water, and Lower Cretaceous Stratigraphy of the Pedernales Watershed, Western Travis County, Texas, by B.B. Hunt, C.M. Woodruff, Jr., and E.W. Collins, 2007, **AGS GB 28**

Hill Country Appellation Revisited, by P.R. Rose and C.M. Woodruff, Jr., 2008, **AGS GB 29**

Canyon Dam Spillway Gorge, Comal County, Texas—Geologic and Hydrologic Issues, by William C. Ward, Ann Molineux, Shane Valentine, and C.M. Woodruff, Jr., 2008, **AGS GB 30**



members

honorary members

Robert E. Boyer
William L. Fisher
William R. Muehlberger
James W. Sansom
Jerry Wermund
Charles M. Woodruff

general membership

Margaret Allen
Ann Ardis
William Asquith
Andrew Backus
Noreen Baker
Nathanael Banda
Rene Barker
Diane Barnes
Heather L. Beatty
Joe Beery
Charles Belerle
John Berry
Joan B. Blainey
Robert H. Blodgett
Robert L. Bluntzer
Jon Brandt
A.S. Broun
Chris Caran
Dwight E. Cassell
William (Chet) Clarke
Sigrid Clift
Kitty Coley
Edward W. Collins
Kenneth L. Crider
Scott Crouch
Toya Jones Dale
Tim Dale
Bruce Darling
Kevin Denson
Bereket M. Derie
Roger Dockery
Randy Duffy
Fred Duffy
Dallas Dunlap
John Dupnik
Shirley Dutton
Margaret Earnest
Mark Edwards
Edward Ficker
Bruce Fink
Henry Fleischhauer
Ann Flemings
Gary Franklin
David Froehlich
Julia F. W. Gale
Sarah Gilbert
David H. Glenn
Phil Goodson
Andrew E. Gorton
Doug Granger
David Greene
Edgar H. Guevara
Ursula Hammas
Ted Harriger
Susan Havorka
Mark Hemingway
Kirk Holland
Janie Hopkins
Robert F. Huch
J.D. Hughes
Brian Hunt
Julie Jenkins
Hilary D. Johns
Doug Johnson
Ian Jones
Bob Kier
James Killian
Charles Kreitler
Conrad Kuharic
J. Richard Kyle
Mats Lagmanson
Randy Larkin
Ann Hoadley Leist
Paul S. Lewis
Marilyn Long
T.E. Longgood

Angela Ludolph
Ernest Lundeluis
Judy Lundeluis
Frank C. Mabry
Brian Mann
David Mason
Eric Matzna
Gordon D. May
Winfield Mcatee
Linda Mccall
Steve Mcvey
John Mikels
Kitty Milliken
Ann Molineux
Terry Moody
Chris Muller
Paul Murray
Mary Musick
Steve Musick
Danny M. Neal
mark Norman
Kenneth Owens
Kevin Pasternak
Jeffrey Pender
Roman C. Pineda
Peter Pope
Diane Poteet
Dewey Poteet
Eric Radjef
Stephanie reed
Sue Rogers
Robert Ropers
Robert Ruggiero
Sally Ruggiero
jimmie N. Russell
Maryann Ryan
James W. Samson, Jr.
Jim Scaief
Wayne Schild
Karen F. Scott
Rainer Senger
Steven Seni
Jack Sharp
Robin Shaver
Alan Shield
Raymond M. Slade, Jr
Brian Smith
Rebecca C. Smyth
Jonathan W. Snatic
Jonathan snatic
Kathy Sokolic
Bill Stein
Clark Thompson
Clark Thompson
Scott Allen Tiller
Robert Traylor
Ramon Trevino
Dennis Trombatore
Kan Tu
James Underwood
Shane Valentine
Nataleigh Vann
Joe J. Vickers
Radha Vyas
Timothy Walter
Thomas Weirich
Leslie P. White
Jerry Wick
Doug Wierman
Charles R. Williams
Chock Woodruff
Doug Zarker
Mark Zell

Austin Geological Society Membership Application:

Please enroll me in the Austin Geological Society as (check one): *Date:* _____

- O Renewal Active Member ($20 dues/year)
- O Renewal Student Member ($5 dues/year)
- O New Active Member ($20 prior to November, $15 Nov.-Jan., $10 Feb.-April, $5 May-July)
- O New Student Member ($5 prior to November, $3.75 Nov.-Jan., $2.50 Feb.-April, $1.25 May-July)

• *Name*: _____

Renewing Members:

- O Check here if your previous year membership information in AGS files is current. If your information is current, you do not need to fill out the rest of the form.

New Members or Renewing Members With Changes:

• *Telephone*: (Office)_____(Home)_____

• *Mailing Address*:

Street or box: _____

City:_____ Zip: _____

• *Email Address*: _____

- O Check here if you would prefer having the AGS Newsletter emailed to your email account.
- O Check here if you do not want meeting notices emailed to your email account.
- O Check here if you do not want your email or mailing address releases to other geological entities.

• *Background:*

Employer: _____

College Education (degree and field, year, school):_____

_____

Present Focus*:* _____

Disciplines of Interest: _____

Mail this form and payment to:
Treasurer, Austin Geological Society, P.O. Box 1302, Austin, TX 78767-1302

We invite you to become a member of the Austin Geological Society and share in our programs. Your membership will bring you:

- notice of AGS meetings with speakers.
- notice of AGS field trips to sites of geological interest.
- social gatherings of geological professionals in the Austin area.
- a monthly newsletter to keep you informed of Society and regional news of interest to geologists.
- the opportunity to become acquainted with other geologists in the Austin area.

The requirements for membership are:

- To be eligible for Active Membership, an applicant shall have a degree in geology from a recognized college or university, or the equivalent experience, or have been actively engaged in the application of geology or related scientific or professional work for a minimum of two years.
- Consideration of Honorary Membership shall be based on continued dedication and service to the Austin Geological Society. Honorary members shall be selected by the Executive Board. Any Active Member may submit the name of an individual to the Executive Board for consideration as an Honorary Member.
- Any person who is a student in good standing, studying for a degree in geology or related science, is eligible for Student Membership. Student Members shall not be eligible to vote or hold elective office.

AUSTIN GEOLOGICAL SOCIETY

CONSTITUTION

Approved October 7, 1965
Revised December 21, 1990
Revised August 14, 1995
Revised May 1, 2000
Revised August 27, 2007

ARTICLE I

Name and Objectives

Section 1. This organization shall be named "Austin Geological Society."

Section 2. The objectives of the Society are:

(1) to stimulate interest in and promote advancement of geology;
(2) to facilitate discussion and dissemination of geologic information;
(3) to encourage social and professional cooperation among geologists and associated scientists;
(4) to maintain a high professional standing among the members; and
(5) to enhance public understanding of the professional activities of the members.

ARTICLE II

Membership

Section 1. The members of the Society shall consist of persons concerned with the science and practice of geology.

Section 2. Various classifications of memberships and qualifications thereof shall be established by the Bylaws of the Society.

ARTICLE III

Government

The government of the Society shall be vested in five (5) elected officers and an Executive Board. The composition of this government, the manner of selection, the terms of office, the specific duties, responsibilities, and other matters relevant to such bodies and officers shall be as provided in the Bylaws of the Society. Any responsibility and authority of government of the Society not otherwise specified in these governing documents shall be reserved for the Executive Board.

ARTICLE IV

Amendments

Amendments to this Constitution may be proposed at any time by petition signed by at least 20 percent of the Active Members or by the Executive Board. Adoption of such amendments shall be by ballot in which approval is given by at least three-fourth of the total number of Active Members. There shall be an intervening Regular Meeting before the balloting and subsequent to the submission of the amendment.

ARTICLE V

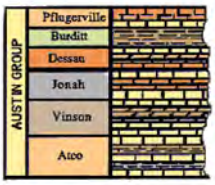
Dissolution of Society

In the event it should be deemed advisable to dissolve the Society, all assets at the time of dissolution shall be donated to a worthy geologic cause, as selected by the Executive Board.

ARTICLE VI

Bylaws

The Bylaws, consisting of six (6) articles as appended hereto, are adopted and may be amended, enlarged, or reduced as provided in the Bylaws.



austin geological society

AUSTIN GEOLOGICAL SOCIETY

BYLAWS

ARTICLE I

Membership

Section 1. The membership of this organization shall be made up of Active, Honorary, and Student Members.

(1) To be eligible for Active Membership, an applicant shall have a degree in geology from a recognized college or university, or the equivalent experience, or have been actively engaged in the application of geology or related scientific or professional work for a minimum of two (2) years.

(2) Consideration for Honorary Membership shall be based on continued dedication and service to the Austin Geological Society. Honorary members shall be selected by the Executive Board. Any Active Member may submit the name of an individual to the Executive Board for consideration as an Honorary Member.

(3) Any person who is a student in good standing, studying for a degree in geology or related science, is eligible for Student Membership. Student Members shall not be eligible to vote or hold elective office.

Section 2. Any member who is in arrears of dues or legally incurred indebtedness to the Society shall be suspended from the Society. The Executive Board shall restore former membership status to any such suspended member when the indebtedness has been liquidated.

Section 3. All Active, Honorary, and Student Members shall be guided by the highest standards of business ethics, personal honor, and professional conduct. Any member who, after proper investigation by the Executive Board, is found guilty of violating any of these standards of conduct may be admonished, suspended, allowed to resign, or expelled from membership at the discretion of the Executive Board.

Section 4. Applicants for membership shall submit an application and dues to the Treasurer. Membership applications shall include the following information:

(1) Professional affiliation,
(2) Education, and
(3) A statement of how the prospective member qualifies for membership.

New members shall be announced in the next newsletter and introduced to the Society at the next meeting.

ARTICLE II

Dues and Special Assessments

Section 1. The annual dues for Active Members and Student Members of the Society shall be established at the beginning of each administrative year by the Executive Board. Dues shall be payable on or before November 1 each year. No dues shall be required of Honorary Members.

Section 2. Dues for new members who join the Society after the beginning of the administrative year shall be prorated according to the quarter of the administrative year.

Section 3. Members who are in arrears for dues and/or special assessments for a period of three (3) months shall be deemed suspended and may be dropped from the rolls at the discretion of the Executive Board. Such former members may be reinstated by the Executive Board upon payment of dues and/or special assessments in arrears plus a reinstatement fee of 25 percent of the amount owed.

ARTICLE III

Officers

Section 1. The officers of this organization shall be the President, President-Elect, Vice-President, Secretary, and Treasurer. The tenure of these officers shall be one (1) administrative year.

Section 2. The duties of the President shall be to preside at all meetings, call Special Meetings, appoint such committees as are not provided for in the Bylaws, and, jointly with the Secretary and Treasurer, sign all written contracts and other obligations of the Society. The President shall assume the duties of Chairperson of the Executive Board and supervise the business of the Society. The President

shall also be responsible for making arrangements for a meeting place for Regular Meetings and providing for an annual audit of financial records.

Section 3. The duties of the President-Elect shall be to participate in Executive Board meetings and serve as understudy to the President. The President-Elect will assume the office of the President the following year. The President-Elect shall also serve as Chairperson of the Election Committee.

Section 4. The duties of the Vice-President shall be to assume the office of president when a vacancy for any cause occurs and assume the duties of the President during the absence or disability of the President. In addition, the Vice-President shall serve as Chairperson of the Technical Program Committee.

Section 5. The duties of the Secretary shall be to keep the Minutes of all meetings, to attend to all correspondence and press notices, to receive and be custodian of all documents and papers of the Society, and to notify all Executive Board members of each Executive Board Meeting. The Secretary shall also serve as Chairperson of the Newsletter Committee. The Secretary, jointly with the President and Treasurer, shall sign all written contracts and other obligations of the Society and shall assume the duties of the President in the absence of the President and Vice-President.

Section 6. The duties of the Treasurer shall be to receive and disburse all funds as authorized by the Society, to keep accurate accounts thereof, and to submit annually a report of the Treasurer's records for auditing. The Treasurer shall be present or delegate a substitute to be present at each Regular Meeting to collect monies and membership applications. The Treasurer, jointly with the President and Secretary, shall sign all written contracts and other obligations of the Society, and shall assume the duties of the President in the absence of the President, Vice-President, and Secretary.

Section 7. The Executive Board shall consist of the President, President-Elect, Vice-President, Treasurer, and the last available past President. The Executive Board's duties shall be to appoint officers to fill vacancies occurring during the administrative year, except the office of President to which the Vice-President shall succeed; and to have general supervision of the organization.

Section 8. The election of officers shall be held at the Annual Meeting. Nominations shall be made by the Election Committee consisting of the President-Elect and at least two members appointed by the President-Elect. This Committee shall nominate two or more candidates for each elective office to be announced in the Society Newsletter prior to the Annual Meeting. At the Annual Meeting, additional nominations may be made from the floor following the report of the Election Committee. The Election Committee shall be responsible for preparation, distribution, and collection of the ballots at the Annual Meeting, and the tabulation of the results of said balloting. The committee shall present the results

of the balloting to the President of the Society during the Annual Meeting so that the newly elected officers may be presented to the Society. Voting shall be by secret ballot. Ballots shall be distributed during registration at the Annual Meeting and shall be returned to the Election Committee upon completion. If none of the candidates for a particular office obtains a majority of the votes cast, the candidate with the least number of votes shall be eliminated and a second ballot taken. If there is a tie between two candidates, a second ballot shall be taken at the Annual Meeting. If, after the second ballot, there is still a tie, the winner shall be decided by the flip of a coin.

ARTICLE IV

Standing Committees

Section 1. There shall be the following Standing Committees within the Society:

- Publications Committee,
- Technical Program Committee,
- Newsletter Committee,
- Field Trip Committee,
- Membership Committee,
- Web Committee,
- Election Committee,
- Awards Committee,
- Education Committee, and
- AGS Bulletin Committee.

The President shall appoint a Chairperson to those committees not already chaired by an officer. These appointments shall be for one administrative year. The Chairperson of a Standing Committee may, in turn, appoint any additional members in good standing with the Society to his or her committee.
In addition to the aforesaid standing committees, there is the Nominating Committee, as previously set forth in Article III, Section 8, of the Bylaws. The President may appoint any special committees as the Executive Board may authorize.

Any Committee Chairperson or member may be removed and replaced by a new appointee upon majority action of the Executive Board.

Section 2. The purpose of the Publications Committee is to oversee the sale of Society publications and assist in the publication of any other manuscripts or documents the Executive Board may authorize.

Section 3. The function of the Technical Program Committee is to provide a program for the Regular Meetings of the Society and to make necessary arrangements for that program.

Section 4. The function of the Newsletter Committee shall be to prepare and mail a newsletter to serve as an announcement of Society Meetings.

Section 5. The purpose of the Field Trip Committee shall be to organize the Society field trips on a suggested schedule of one in the fall and one in the spring.

Section 6. The Membership Committee shall encourage membership, assist the Treasurer and Newsletter Chairperson, maintain a list of active members, and prepare the Society Directory.

Section 7. The Web Committee shall be responsible for the design and upkeep of the Society Web page.

Section 8. The Awards/Scholarship Committee shall nominate and recommend award and scholarship candidates to the Executive Board.

Section 9. The Education Committee shall be responsible for promoting and facilitating AGS involvement in earth science education in Austin-area schools and outreach to the general public.

Section 10. The AGS Bulletin Committee is composed of an Editor (Chairperson) and an editorial team responsible for the annual publication [of the Society] summarizing significant news and events from the preceding year, including the abstracts of talks given at the monthly meetings. It is also a forum for publication of geoscientific papers and notes of regional interest.

ARTICLE V

Meetings

Section 1. The meetings of the Society shall be of three classes: Regular, Executive Board, and Annual.

Section 2. The Society shall hold at least one Regular Meeting each month from August through April except that, by vote of the Executive Board, additional Regular Meetings may be held or Regular Meetings may be discontinued for a period not to exceed three months. The appropriate time and place for Regular Meetings shall be selected by the President or a delegated Committee.

Section 3. Executive Board Meetings shall be held at such times and places and for such purposes as the Executive Board deems necessary and as announced by the President.

Section 4. The Annual Meeting shall be held during the month of May at a place and time designated by the Executive Board. The purpose of this meeting will be to complete the business of the administrative year and shall include the following order of business:

(1) Report of the Executive Board, the President, the Treasurer, and the Standing Committees. Standing Committees may be considered with the report from the President.
(2) Old or unfinished business.
(3) New business.
(4) Election of new officers.
(5) Program.
(6) Presentation of new officers.

Section 5. The administrative year shall be from August 1 of one year to July 31 of the following year.

ARTICLE VI

Awards

Section 1. The Awards Committee shall submit recommendations to the Executive Board for the Public Service Award, the Distinguished Service Award, and for scholarships to be awarded by the Society.

Section 2. The Public Service Award shall be given to recognize contribution of members to the Society to public affairs and to encourage geologists to take a more active part in such affairs. The recipient shall be a member of the Society, but may be in any class of membership. This award may be given without regard to previous awards. Granting the award in any year shall be discretionary.

Section 3. The Distinguished Service Award shall be given to members who have distinguished themselves in singular and beneficial long-term service to the Society. The emphasis shall be on long-term and, at the same time, meaningful service to the Society. The term singular does not necessarily mean without precedence, but rather that the activity be specific as distinguished from general service. More than one member of the Society may be considered in any one year for the award, but Honorary Members should generally be excluded.

Section 4. Scholarships shall be awarded from an endowed scholarship fund. The Executive Board shall select scholarship recipients from candidates recommended by the Awards Committee. Granting scholarships in any year shall be discretionary.

ARTICLE VII

Amendment to Bylaws

Amendments to the Bylaws shall be made by vote of three-fourths of the Active Members present at any Regular Meeting, provided that due notice of the proposed amendment has been submitted to the members of the Society at least two weeks in advance of the date on which the ballot is taken, and provided a quorum (twenty-five percent of the Active Membership) is present at said meeting.