Annual Report 2007

Bureau of Economic Geology

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Cover photo:
Somewhere in the Milky Way, the Earth spins in one of that galaxy's spiral arms. The galaxy image is a mosaic of thousands of short exposures taken by Spitzer's Infrared Array Camera. NASA/JPL-Caltech/S. Stolovy (Spitzer Science Center/Caltech). Exposure dates: 9-3-2004 and 9-15-2005.

Director's Message

For Christmas I received a book, *The Art of Happiness at Work* by the Dalai Lama with Howard Cutler. Perhaps someone thought I needed it! To help explain the title word *Happiness*, the Dalai Lama focused on an emotion that I have felt for some time is more meaningful—contentment. The happiness meter cannot be maxed out every day, so a more reasonable approach is to envision a scale with happiness on one side and unhappiness on the other. On average, if the balance tips toward the happiness side, we are content, and we are fortunate.

What kinds of things, according to the Dalai Lama, result in contentment at work? Social climate ranks close to the top. Are you respected and appreciated by your co-workers for your contributions, and is there an environment of mutual respect and support? Also near the top resides social impact. On the whole, do results of work done by the organization have a positive impact on the world? Other things—flexibility, recognition, physical environment, intellectual challenge, and salary—also rank high on the contentment scale. Interestingly, all of these contentment measures are, for the most part, global, transcending culture and social class.

Our Bureau family comprises a diverse, international workforce, as highlighted in this *Annual Report*. If you walk the halls of the Bureau, I believe that you will observe first-hand an interdependent climate of respect and compassion that bridges cultural and political boundaries. Bureau staff work together, support one another, and impact fundamental issues of global importance. As the Dalai Lama emphasizes, we in America must never take for granted the luxury of the freedoms in the workplace that we enjoy; there are countless in the world less fortunate.

Thanks to each of you in the Bureau family and to those who support our efforts. I appreciate you very much.

Contents

Bureau Highlights

Preparations for Bureau Centennial Celebration

The Bureau is busily preparing for next year's Centennial Celebration. Several committees have been formed, and committee members have been planning, among other things, displays around the Bureau, a time capsule, virtual tours of Bureau facilities, a speaker series, a symposium/volume, and lots and lots of fond memories, ephemera, and fun!

FutureGen Update

In July, the FutureGen Texas team submitted its Best and Final Offers for both proposed Jewett and Odessa sites. Although the Mattoon, Illinois, site was selected for the project, negotiations continue between the Department of Energy and the FutureGen Alliance of Companies as to the ultimate nature of the FutureGen project. Regardless of eventual outcome, the process in Texas broadened the Bureau's exposure to Federal and State decision makers and industrial players in clean coal power and carbon sequestration.

Jackson in Paris

A photo, taken in Iran by Bureau scientist Martin Jackson, has been selected for multimedia presentation at an exhibition titled "Séismes et Volcans" in the Palais de la Découverte [French Education Ministry], in Paris. The exhibition opened on October, 1, 2007, and will run for 10 years.

Bureau Fame Spreads—from TV to the Worldwide Web

Bureau Director Scott Tinker was featured in the television show *State of Tomorrow* on Texas PBS stations July 5. The 13-episode series examined some of the biggest challenges facing Texans today. The episode featuring Dr. Tinker, titled "The Future of Energy," delved into how we can sustain energy supplies, not only of our own country, but other countries as well. Dr. Tinker is one of the experts across Texas who have been interviewed and who are working on recovering existing oil, finding alternative sources (such as nuclear and solar energy), and encouraging innovations (such as cleaner-burning coal plants). This summer also saw the airing of *Faces of Earth* on the Discovery Science Channel, which featured the AGL and RCRL teams.

Sue Hovorka was recently interviewed by Mason Jones, Videographer, UT Office of Public Affairs, as part of a series of videos that will appear on a new OnCampus website. Sue's discussion of Bureau research on geologic storage to reduce atmospheric emissions of CO_2 will be part of a segment on alternative energy.

Bureau in the *Monitor*

Will carbon sequestration provide a respite from increased concentrations of atmospheric CO_2? That is the question posed by the *Christian Science Monitor* in its lead story of July 31 featuring BEG's Rebecca Smyth, Sue Hovorka, Ian Duncan, and Daniel Ortuño. The story, titled "Earth Too Warm? Bury the CO_2," highlights ongoing research by Smyth and Hovorka on carbon sequestration, especially long-term mobility of sequestered CO_2, in Synder, TX.


1975 Bureau group photo


FutureGen group


Kuh-e-Namak salt diapir, SW Iran


PHOTO COURTESY OF ALPHEUS MEDIA, INC.

Scott Tinker


Susan Hovorka


Rebecca Smyth in Snyder

Global Bureau Research

RCRL in Saudi Arabia

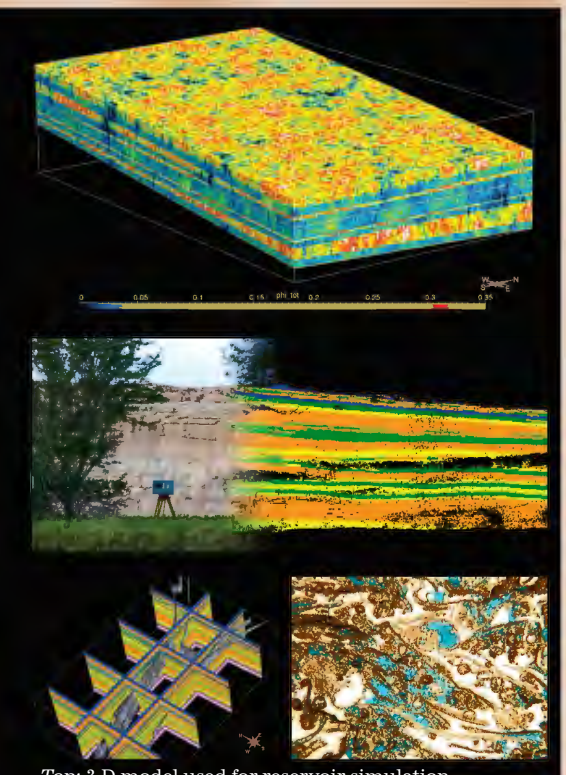
A Khuff Formation outcrop analog was studied in Saudi Arabia by the Reservoir Characterization Research Laboratory (RCRL) for Saudi Aramco to build a 3-D geocellular model of Permo-Triassic Khuff deposits to characterize lateral and vertical facies and petrophysical variability at the production scale. The model investigated influence of lateral and vertical facies and petrophysical heterogeneities on effective permeability calculation for reservoir simulation.

In 2004, Xavier Janson and Jerry Bellian had conducted geologic mapping and 3-D laser outcrop analysis on Khuff-equivalent outcrops of the Khartam Member of the Khuff Formation. Besides conventional geologic mapping, 147 laser scans were acquired with >140,000,000 points, at an average spacing of 1.7 cm, as well as 200 1-inch-diameter minicores from the outcrop. Mapped stratigraphic horizons were digitized on lidar data to create 12 3-D surfaces to form the framework of a ~4-million-cell 3-D geologic model. Using six measured sections and lateral facies variation mapped on photo panels, facies were extrapolated using both deterministic filling between two surfaces and Sequential Indicator Gaussian simulations. Extrapolated facies were painted back onto the lidar data to compare with outcrop stratigraphy. Most outcropping grainstone intervals (>1 m thick) are larger than the modeled outcrop area, are assumed to have a lateral extension of >600 m, and were extrapolated throughout the 3-D model.

Principal rock fabrics found in this outcrop are class 1 oomoldic grainstone, with 22% porosity and 0.7 md permeability; class 3 mudstones and wackestones, with 8% porosity and <0.1 md permeability; and class 1 and 2 dolostones with 18% porosity and 52 md permeability. The outcrop also contains ooid/peloid grainstone lacking permeability in one channel-deposit layer. Calcitization of dolostones and anhydrite is considerable, so flow properties will probably be dominated by dolostone beds.

The 3-D geologic facies model was converted into a 3-D rock fabric facies model, and stochastic simulation was used to generate grids of porosity and permeability according to observed rock-fabric-dependent porosity and permeability relationships. Effective horizontal and vertical permeabilities of the model averaged 3.6 and 0.05 md, respectively. The resulting effective permeability anisotropy ratio of 0.013 is caused by petrophysical-rock layering in the model.

This model illustrates geologic heterogeneities and their influence on fluid flow in a volume equivalent to a single cell in the 3-D subsurface model commonly used to simulate large Khuff reservoirs in the Middle East.



Top: 3-D model used for reservoir simulation.
Middle: Outcrop with lidar scanner in foreground blending into reconstructed 3-D facies model.
Bottom left: Fence diagram of 3-D facies model.
Bottom right: Khuff oomoldic grainstones.

Center for Energy Economics (CEE) in Africa

Since 2004, CEE has worked with African partners to support energy commercialization for export and domestic advancement. CEE teaches energy-value-chain economics and investment frameworks to industry professionals and the public. CEE improves awareness of global energy trends and content in energy-news reporting and enhances performance among ministries, regulatory agencies, national companies, universities, nongovernmental organizations, and media. CEE partners and programs have an impact on policies in countries of interest.

CEE focuses on *training emerging and midcareer professionals* in countries along the West Africa Gas Pipeline (WAGP)—Nigeria, Benin, Togo, and Ghana—as well as Côte d'Ivoire, Equatorial Guinea, and Angola. Our program attendees include professionals from Algeria, Congo, Namibia, Gambia, Tanzania, and Kenya. We want to expand the indigenous work force, help companies meet local content requirements, and help "professionalize" institutions. We benefit countries locally through capacity building in energy sectors, enhancing international trade, and improving political stability in sensitive areas; we also get Africans involved in global energy investment and trade. In Nigeria, for instance, we assist specialists in learning how to monetize natural gas resources and harmonize these interests with local developments.

CEE also develops *public understanding of the energy industry* in Africa and educates the Houston area about African energy-sector issues. We collaborate with local partners in outreach (public education materials, seminars, journalist programs, natural gas workshops) that educates WAGP communities. We help consumers push for better energy-sector policies and management to resolve internal energy shortages, system failures, etc. Our African forums in Houston enlighten professionals about challenges in countries crucial to global oil and gas industries.

CEE has long relied on partnerships with

- *Resource Center for Energy Economics and Regulation, established by CEE at the Institute of Statistical, Social and Economic Research, University of Ghana at Legon, in September 2004, through CEE's Smart Development Initiative Grant from the U.S. Agency for International Development.*
- *Kumasi Institute of Technology, Energy and the Environment (KITE), a nongovernmental organization based in Ghana engaging in research and outreach across Africa.*
- *Nigerian National Petroleum Corporation, which supports CEE in the WAGP region.*
- *Catholic University of Angola, Luanda. CEE cooperates with the Angola Educational Assistance Fund in building energy economics and research at the Center for Investigative and Scientific Studies.*

Our programs and partnerships continue to disseminate information on energy-value-chain economics and regulation, promote efficient and transparent energy sectors in Africa, and strengthen international ties.

CEE Africa Partnerships Training and Outreach Events in FY07

September 27–28, 2007—International Energy in Angola Conference, Luanda.

July 9–13, 2007—Regional Natural Gas Workshop: "What Makes a Natural Gas Marketplace Work?" Accra, Ghana

July 2–6, 2007—Oil and Gas Value Chain Workshop, Abuja, Nigeria

May 7–18, 2007—New Era in Oil, Gas & Power Value Creation Program, 7th Annual Session, Houston

February 5–9, 2007—Regional Natural Gas Workshop, Abuja, Nigeria

November 2006— CEE/Gulf Publishing co-sponsorship of KITE Director Harriette Amisah-Arthur, Women's Global Leadership Conference in Energy & Technology, Houston

November 2006—CEE Think Day on Africa, Houston

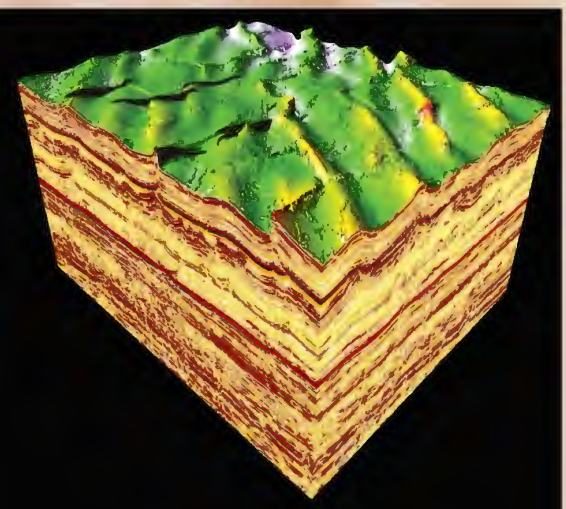
October–November 2006—Study Tour on Natural Gas, Houston

September 15, 2006—Launching of the *Guide to Natural Gas in Ghana*, International Press Centre, Accra

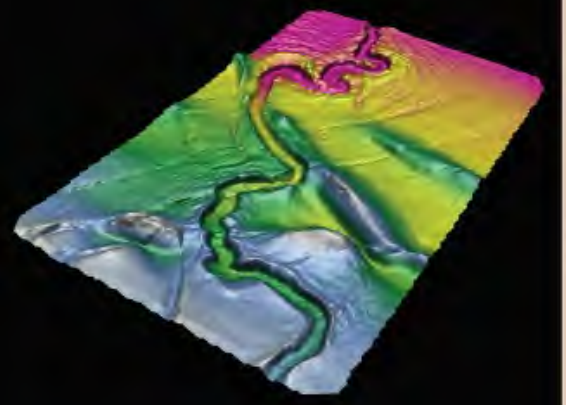
September 12, 2006—Natural Gas Workshop, Accra, Ghana

For more information, see http://www.beg.utexas.edu/energyecon/IDA/

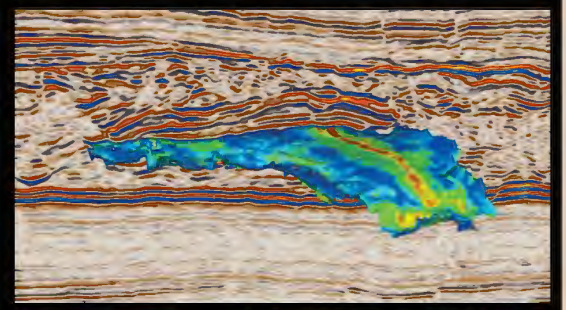
CEE's Michelle Foss (center), along with BEG Associate Director Eric Potter (right), meet with African visitors at the Bureau.



Cube extracted from 3-D seismic survey, showing geometry of a suprasalt horizon. Ridges trending toward the viewer are compressional folds, whereas oblique cuts through the folds are from conjugate strike-slip faults. Seismic courtesy of BG Group.



Perspective view of a suprasalt horizon, showing a channel diverted around a rising fold.



3-D image of a single megablock contained within an Upper Cretaceous mass-transport deposit in offshore Morocco, showing undeformed, 100-m-wide, channel-levee elements mapped using minimum absolute amplitude extraction on intrablock surfaces. Data provided by Vanco Energy, Inc., and the Moroccan Government. Analysis by QCL scientist Dallas Dunlap.

Applied Geodynamics Laboratory (AGL) in the Mediterranean

One of the most intriguing events in Earth's history was the drying up of the Mediterranean Sea during the Messinian Period (late Miocene, 5–7 million years ago). At that time it may have been possible to walk directly from Africa to Europe across the desiccated, low-lying Mediterranean salt basin. As much as 1,800 m of interbedded evaporites were deposited in the salt basin in the eastern Mediterranean. These evaporites were subsequently tilted by basin subsidence and uplift of the Dead Sea Rift, producing ideal conditions for gravitational failure of the sediments lying atop the evaporites.

AGL's Martin Jackson, together with Joe Cartwright and Simon Higgins of Cardiff University, Wales, is studying the geometry of fault patterns resulting from this gravity slide. The team is using a regional 2-D grid of seismic data supplied by the Israeli Ministry of Energy, together with two smaller 3-D surveys supplied by BG Group. These data show that extensional breakaway faults closely follow the updip edge of the original salt basin. Deformation in the compressional toe of the system is more complex, featuring a combination of compressional folding and conjugate strike-slip faulting (*top*). Compressional folds formed bathymetric highs during their growth, as shown by diversion of channels around fold crests (*middle*). The presence of multiple evaporites within the sequence was an important control on structural style because at least four detachment levels appear to have been operating simultaneously. Future work will focus on the partitioning of strain between these detachments and on the details of linkage between extensional and compressional features.

International Research in Clastic Continental Margins

The Quantitative Clastics Laboratory Industrial Associates program (QCL) is undertaking research in clastic continental margin development and seismic geomorphology in numerous onshore and offshore basins globally, including the Gulf of Mexico, the Eastern Mexico margin, Morocco, Trinidad and Barbados, New Zealand, Indonesia, onshore Fort Worth Basin, and the basins of the U.S. Western Interior. Our 13-member sponsor-companies' geoscientists access the research results through a digital archive called the Sedimentary Analogs Database (SAND) and maintain access through annual membership. To understand the larger processes active on continental margins, as well as the variety of depositional elements and processes that make up margins, we must look at a variety of margin types and settings. We are currently studying shelf sands, lacustrine basins, and channel morphology in data from the Sunda Shelf in offshore Indonesia; sediment transfer in complex margin settings in the distal Gulf of Mexico, Morocco, Trinidad, and eastern Mexico; coarse-grained turbidites in Barbados; and the nature and origin of mass transport deposits in Morocco, Trinidad, eastern and northern Gulf of Mexico, and New Zealand. Thanks to the generosity of numerous companies and national governments, as

well as the time and patience of several company geoscientists, we have been able to obtain more than 50,000 km^2 of 3-D seismic for academic research in various basins around the world.

The diversity of projects and locations ensures a variety of research for our numerous foreign and domestic students and provides young scientists a look at the world beyond our national borders. In 2007, Lorena Moscardelli received her Ph.D. and has elected to remain at the BEG to pursue her research as a Research Associate. We hosted a successful annual meeting in Trinidad and Barbados and taught short courses for member companies in India and Mexico. In addition, QCL IA graduated three Master's students in 2007, and researchers published five papers in peer-reviewed journals, presented research at meetings in Long Beach, California; Marrakesh, Morocco; Mumbai; and Pune, India, and will be presenting over a dozen talks at the upcoming AAPG in San Antonio, Texas. The research program currently supports nine student research projects around the world and is a leader in the geoscientific community in generating innovative digital products for conveying science to the larger community. On any given day, QCL can be found somewhere in the world doing geology!

FRAC in Latin America

The Fracture Research & Application Consortium (FRAC) has an active program in Latin America. Supported by Ecopetrol (Colombia), PDVSA (Venezuela), Petrobras (Brazil), IMP (Mexico), and Repsol (operations throughout South America), FRAC has been involved in research and application studies in support of exploration and development in many basins. FRAC has also had steady participation from graduate students from Colombia, Venezuela, and Mexico, as well as a postdoctoral fellow from Brazil. The program has also hosted several semester-long visits in Austin from representatives of member companies eager to learn about and participate in development of FRAC methods. FRAC has longstanding field-based research programs in northeast Mexico, where the group makes annual field trips, and in northwest Argentina. FRAC is planning to hold its annual research meeting and field trip in Argentina in 2008 or 2009.

Carbonate Project with Petrobras in Brazil

The Campos Basin project on Lower Cretaceous carbonates uses collaborative research to define and produce new depositional, architectural, and, ultimately, reservoir models of this unique succession by implementing methodologies and workflows established and perfected by the BEG/JSG carbonate group. Four four-person, rotating teams of Petrobras staff are working in partnership with BEG/JSG researchers to analyze and interpret data from a 150- × 60-km subarea of the offshore Campos Basin. This project provides BEG/JSG researchers rare access to a complicated carbonate succession in an area where published research is limited. The project (initiated June 2007) will span 20 months, with Phase 1 working to establish regional- and reservoir-scale stratigraphic models for the Barremian-Aptian and Albian successions.

Field party on the QCL Annual Field Trip led by Nysha Chaderton (Ph.D., 2008) examining the deep-water levee deposits of the Scotland Formation, onshore Barbados.

FRAC has a history of research in Argentina, among other Central and South American countries.

Members of Sergipe-Alagoas Field Trip in Brazil examining Albian platform carbonates for Petrobras.

Phase 2 (2008) will build upon Phase 1 and develop integrated high-resolution reservoir models at the field scale. The project is structured to work from the rock up, involving core description (~2,000 m), field trips to assess possible analogs (e.g., Sergipe-Alagoas Basin, Brazil; Pecos River, Texas), petrography, structural interpretation, petrophysical log analysis, and extensive 3-D seismic interpretation.

As of October 2007, new regional depositional and stratigraphic models for the Albian succession had been developed and presented to Petrobras, and more recently a second phase of core description of the Barremian-Aptian succession was undertaken. In conjunction with data collection, Petrobras researchers led a field trip to age-equivalent successions in Sergipe-Alagoas onshore basins. This field excursion allowed vital transfer of knowledge between the two Petrobras groups, as well as discussion of models in the context of potential outcrop analogs to the Campos Basin.

Diversity and complexity of the Cretaceous Campos Basin succession are high and require integration and fundamental understanding of rift, sag, and halokinetic structures and evaporite formation, as well as lacustrine/marginal marine and open-marine carbonate and siliciclastic sedimentological processes. This project provides a unique opportunity for both BEG/JSG and Petrobras to advance a mutual understanding of carbonate systems.

Members of Sergipe-Alagoas Field Trip in Brazil examining Albian fan-delta sediments for Petrobras.

Bureau Global CO_2 Collaborators

Texas and the Gulf Coast serve as a global source of expertise in more than one aspect of carbon capture and storage (CCS) technology. That expertise is found in (1) CO_2 capture at refineries, which are today some of the large sources of anthropogenic CO_2; (2) CO_2 shipping by pipelines, which are concentrated in this region; (3) CO_2 injection, which has been tested widely in this region and sustained over decades in West Texas; and (4) regulation to ensure safe and environmentally responsible underground injection, which occurs extensively in this region.

Japanese press visiting the Frio test site.

The Gulf Coast serves as an international test site as well, in the form of the Frio brine pilot, in which a well-characterized brine-bearing sandstone of the Frio Formation at South Liberty oil field east of Houston has become the first closely monitored CO_2 injection test site. The test, led by the Bureau, drew research participants from Australia and Canada, allowing it to be recognized as a project of the U.S.-led Carbon Sequestration Leadership Forum. The test hosted observers from Japan and Germany, and results were presented in India, Italy, Japan, Ireland, Saudi Arabia, and Norway.

Sue and CCS review group from Canada, the U.S., and the U.K. visiting the Nagaoka project in Tokyo.

Another impact of the Gulf Coast on worldwide deployment of CCS is through companies who sponsor the Gulf Coast Carbon Center. These sponsors use information learned through this collaboration to develop their businesses internationally. GCCC sponsors currently include BP, Chevron, Entergy, Kinder Morgan, Marathon, NRG, Praxair, and Schlumberger. GCCC team members are Sue Hovorka, Ian Duncan, Tip Meckel, J. P. Nicot, Seay Nance, Rebecca Smyth, Cari Breton, Jeff Paine, Ramón Treviño, and Joseph Yeh.

International Travel

Director **Scott W. Tinker**, accompanied by Associate Director **Jay Kipper** and Bureau Scientist **Hongliu Zeng**, made an activity-packed trip to China April 8–15. At the Chinese University of Petroleum (CUP), they met with the Vice President for Research, deans, and faculty at the university's two main campuses. The meeting culminated in a signed cooperative agreement between CUP and UT. At PetroChina, a major national oil and gas company, they met with the Executive Vice President and senior managers, and at Research Institute of Petroleum Exploration and Production (RIPED), the PetroChina research affiliate, they met the President and senior managers. Both Scott and Jay made presentations. The visit opened the door to other possible cooperative agreements between the Bureau and Chinese higher education and industry.

Signing ceremony, cooperative agreement between CUP and Bureau of Economic Geology, The University of Texas at Austin.

Angela McDonnell and **Bob Loucks** gave 2 of the 30 invited talks at a special symposium in Postojna, Slovenia, "Time in Karst," at the Karst Research Institute of the Slovenian Academy of Sciences and Arts. The symposium was held March 14–18 and was attended by 130 researchers from 28 countries. Angela presented the research she had done with Bob Loucks and **Tim Dooley** titled "Quantifying Paleocave Collapse from 3-D Seismic Data: Examples from the Paleozoic Section in the Northern Fort Worth Basin, Texas," and Bob presented his research on "Megascale Architecture and Regional Distribution Patterns of Coalesced, Collapsed Paleocave Systems." Bob also gave two poster talks.

Angela McDonnell in a 20-km-long cave system in Slovenia (Postojna cave shown), a world-class research center for karst phenomena, including speleogenesis and subterranean fauna.

In May, **Steve Laubach** and **Julia Gale** presented at the Geological Society of London Continental Tectonics and Mountain Building Conference in Scotland. The conference celebrated the centenary of the British Geological Survey memoir, *The Geological Structure of the North-West Highlands of Scotland*, a landmark in structural geology. The event drew many notables, including John Ramsay—the father of modern structural geology. Ramsay chaired the session on fracture research, in which Laubach presented a paper using field examples from NW Scotland. Afterward a UT group led by Laubach retraced a geologic traverse famous in the annals of highlands geology.

The FRAC field party is pictured here. Jon Olson, Ann Laubach, Maggie Ellis, Pete Hargrove, Rob Lander, and Linda Bonnell

Also in Scotland, FRAC scientists participated in a field symposium designed to bring together scientists involved in fracture and diagenesis studies to discuss future directions in cross-disciplinary research and graduate education. The 4-day field meeting was held far from the nearest roads, amidst lochs, rivers, mountains, and bog in the western Highlands of Scotland. **John Hooker**, BEG, and Randy Marrett, Geological Sciences, also participated. Ann Laubach was in charge of logistics.

FRAC at Structural Diagenesis Field Symposium. *From left to right,* Julia Gale, BEG; Peter Hargrove and Magdalena Ellis, Ohio Wesleyan University (students soon to join the Unconventional Resources program at BEG); Linda Bonnell, Geocosm; Steve Laubach, BEG; Rob Lander, Geocosm; Peter Eichhubl, BEG; Jon Olson, Petroleum & Geosystems Engineering; and Wayne Narr, Chevron.

FRAC team members include **Steve Laubach**, Randy Marrett, Jon Olson, **Peter Eichhubl**, Jon Holder, **Julia Gale**, Larry W. Lake, **Rob Reed**, **John Hooker**, Linda Bonnell, Robert H. Lander, and Virginio Neumann.

In July, **Michelle Foss** and **Gürcan Gülen** of CEE led the West Africa Regional Natural Gas Workshop in Accra, Ghana. The event was organized by the Resource Center for Energy Economics and Regulation and supported by the Nigerian National Petroleum Company (NNPC), and Kumasi Institute of Technology, Energy and the Environment (KITE). The workshop welcomed delegates from Ghana, Nigeria, Togo, Benin, and Côte d'Ivoire. It was one in a series of training programs for capacity building of energy professionals and public education on energy issues in West Africa, undertaken by CEE through a Smart Development Initiative for Energy Sector Governance grant from the U.S. Agency for International Development (USAID). In September, **Dr. Foss** presented "Electricity Sector Restructuring" and "Global LNG Developments" at the international Energy in Angola conference, which was held in Luanda. The 2-day event was organized jointly by the Centro de Estudos e Investigação Cientifica (CEIC) at Universidade Católica de Angola and CEE and sponsored by USAID, OSISA, ESSO, and Angola Educational Assistance Fund (AEAF). CEE and AEAF have a partnership in Angola, working with CEIC on joint publications (such as the *Angola Energy Guide*), conferences, and energy curriculum development.

In the fall, **Michelle Foss** sat on a panel titled "What Are the Trade-Offs/Consequences/Options?" panel at the Latin American Forum III, which was held in Huatulco, Oaxaca, Mexico, September 30 through October 2. The panel, which was chaired by Bureau Director **Scott W. Tinker**, was part of the Energy Matrix for Latin America session in the Forum. The event was the latest in a series of activities sponsored by the Jackson School. As Dean Eric Barron says, "This forum is a unique program that addresses a critical need to bring together government and industry decision makers, scholars and scientists, to foster dialogue around energy and environmental issues. The friendships and partnerships being formed by participants will, if properly maintained, impact our future ability to educate students, transfer knowledge, and make a difference for our hemisphere." Other Bureau folks involved with the forum are **Ian Duncan**, **Steve Laubach**, and **Luis Sanchez-Barreda**. For more about the forum, visit http://www.jsg.utexas.edu/laforum/. Dr. Foss also spoke at the Fourth Annual Meeting of the Science and Technology in Society forum (STS Forum), which was held from October 7 to October 9 in Kyoto, Japan.

On June 15, Maersk Oil and Gas AS hosted a lecture by **Martin Jackson** in Copenhagen, which was attended by Maersk staff and members of Copenhagen University, the Geological Survey of Denmark, PGS, Altinex, and Dong Energy. The talk, titled "Tectonic Squeezing of Salt Stocks: Field Observations from Arctic Canada and Laboratory Simulations," included AGL scientist **Tim Dooley's** modeling results and field mapping with Chris Harrison of the Geological Survey of Canada.

JSG Latin America Forum delegates.

Left, Maersk Oil and Gas AS office building, Copenhagen, where Martin Jackson gave his talk, and *below,* picturesque Copenhagen harbor.

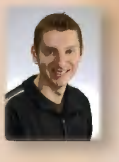
Diversity of International Research Staff

BEG IS PROUD OF ITS DIVERSE STAFF, WHO HAIL FROM EVERY CORNER OF THE GLOBE.

Florence Bonnaffé—
Flo has an M.A. in Applied Geophysics from the University of Paris. She specializes in 3-D outcrop mapping using ground-based lidar technology and 3-D seismic interpretation and 3-D visualization.

Romulo Briceno—
Romulo joined the Bureau fresh from M.S. work at The University of Texas at Austin, after having received his undergraduate degree in Chemical Engineering at the Universidad Simon Bolivar in Caracas, Venezuela. Romulo is an expert in database management, project and asset evaluation, accounting and financial statement analysis, Monte Carlo simulation, international petroleum agreements and concessions, and contract negotiation.

Jules Browaeys—
Jules, a native of France, is a Postdoctoral Fellow on Sergey Fomel's team. Jules has a B.A. and an M.S. in Mathematical Physics (with honors) from Ecole Normale Supérieure, Cachan, France, and an M.S. and a Ph.D. in Geophysics (the former with honors) from Institut de Physique du Globe, Paris. Currently Jules is involved in research projects on seismic migration and angle-domain common image gathers and anisotropy in seismic wave propagation.



Ruarri Day-Stirrat—
A Postdoc from England, Ruarri received his Ph.D. from University of Newcastle, Newcastle-upon-Tyne. Research interests include porosimetry and pore-size distribution, sedigraph for grain-size distribution, maturity modeling using Genesis 4.8, hi-res X-ray texture goniometry, SEM, TEM, and XRD.

Tim Dooley—
A native of Waterford, Ireland, Tim has a Ph.D. from the University of London, Royal Holloway and Bedford New College. Tim pursues structural geology, strike-slip tectonics, and experimental modeling of geologic structures (strike-slip, extensional, contractional, and salt and shale tectonics).

Ian Duncan—
Hailing from Sydney Australia, Ian arrived at the Bureau after working at the Virginia Department of Mines, Minerals, and Energy—Division of Mineral Resources. His Ph.D. is from the University of British Columbia, Vancouver, Canada. Ian is Associate Director for Earth and Environmental Systems.

Peter Eichhubl—
Peter has been stateside for a number of years, having received his Ph.D. from the University of California, Santa Barbara. But his Master's he acquired at the University of Vienna in his native Austria. Peter's fortes include fault and fracture mechanics, diagenesis and low-temperature geochemistry, and fluid flow and transfer processes in sedimentary basins.

Sergey Fomel—
A native of Russia, Sergey has a doctorate from Stanford. He specializes in exploration and computational geophysics, seismic imaging, wave propagation, seismic data processing, and geophysical estimation.

Julia Gale—
Another Bureau scientist to hail from the UK, Julia Gale has a Ph.D. from the University of Exeter. Her work focuses on fracture and vein systems (growth, mineral fill, and transmissivity), shear zones (processes and products), and structural geology and tectonics (Anglesey, N. Wales, and N.E. Scotland).

Gürcan Gülen—
Gürcan, an economist on the staff at CEE in Houston, received his undergraduate degree from Bosphorous University, Istanbul, Turkey. His doctorate, however, he received at Boston College. Gürcan's specialties include energy sector reform and commercial frameworks, efficacy of energy regulators, and electricity market design.

Mariano Gurfinkel—
Mariano graduated from the Universidad Simon Bolivar in Caracas, Venezuela, before receiving an M.S. and a Ph.D. from MIT. Mariano specializes in heavy oil and unconventional resources, process scale-up (emulsification, mixing, and handling), physicochemical hydrodynamics, and value chain economics and uncertainty and risk analysis.

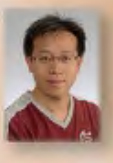
Ursula Hammes—
Uschi has an M.S. from Geologisches/Paläontologisches Institut, Universität Erlangen, Germany, although she received her Ph.D. from the University of Colorado. Uschi's talents lie in sequence and seismic stratigraphic interpretation, electrical imaging analysis, basin modeling and hydrocarbon systems, and carbonate sedimentology and diagenesis.

Fares Howari—
Two of Fares's degrees are from Yarmouk University in Jordan, where he studied environmental geology. His Ph.D. is from UT El Paso. Fares has 10+ years' experience in geosciences and environmental research in international academe and industry.

Martin P. A. Jackson—
Bureau stalwart, founder of the Applied Geodynamics Laboratory, and co-compiler of the digital atlas *The Salt Mine*, Martin came to us via Cape Town, South Africa, and London, England, where he received, respectively, doctoral and bachelor degrees. Martin has become a legend in the world of tectonics, specializing in salt tectonics, thin-skinned deformation, and related petroleum traps; structural analysis and seismic interpretation of sedimentary tectonics; and experimental modeling.

Xavier Janson—
Xavier is another French émigré, having received undergrad degrees from J. Jourier University, Grenoble, France. His Ph.D. is from the University of Miami, Coral Gables, however. Xavier lists among his research interests carbonate sedimentology and sequence stratigraphy, petrophysics of carbonates, seismic signature of carbonate rock, seismic modeling, and carbonate modern depositional environment.

Keumsuk Lee—
Keumsuk is a Postdoctoral Fellow, who received his Ph.D. at The University of Texas at Dallas in the fall of 2005. His M.S. in Geological Oceanography comes from Kunsan National University, Korea. Keumsuk is interested in seismic sequence stratigraphy, along with GPR characterization and application of GPR to various environments.



Yang Liu—
A recent arrival at the Bureau as a Postdoctoral Fellow, Yang matriculated at Jilin University in China. Yang's expertise lies in seismic imaging, seismic data processing, and geotectonics.

Ruzanna Makaryan—
CEE Senior Energy Analyst Ruzanna hails from Turkmenistan, where she received an undergraduate degree in Linguistics. Her M.B.A. was bestowed by the University of Houston. Ruzanna has more than 10 years' experience in research, management consulting, project/program management, and administration. Specialties include Central Asia and former Soviet Union energy sectors, as well as international development assistance projects.

Sojan Mathew—
Sojan, another new Postdoc, has degrees from University of Guelph in Ontario (Ph.D.), University of Hohenheim in Stuttgart (M.S.), Tamil Nadu Agricultural University in Coimbatore, India (M.S.), and Allahabad Agricultural University, Allahabad, India. Sojan's interests are mostly coastal in nature: physical geology and coastal geomorphology, modeling coastal evolution, shoreline mapping and change analysis, beach dune morphodynamics and sediment budget, and Holocene coastal evolution in context of climate change.

Angela McDonnell—
Angie's education, both undergraduate and graduate, was received in Ireland, University College Dublin and Cork. Sequence stratigraphic analysis of 2D and 3-D seismic data is her forte, along with seismic facies mapping to delineate sedimentary architecture; sequence development; reservoir, source, and seal facies; and well log interpretation and integration into seismic facies analysis.

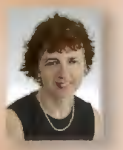
Lorena Moscardelli—
A brand-spanking-new Ph.D. from UT, Lorena has been at the Bureau a number of years while working on that degree. Originally from Venezuela, she is interested in the study and characterization of mass transport complexes around the world, application of quantitative seismic geomorphology techniques in shallow- and deep-water deposits, subsurface mapping of depositional systems, and basin analysis.

Abhijit Mukherjee—
Abhijit is a Postdoc from India, having received three of his five diplomas from there. His M.S. and Ph.D. are from the University of Kentucky in Lexington. Abhijit specializes in physical and chemical hydrogeology, groundwater flow and transport modeling, application of stable isotopes in hydrogeology, surface water–groundwater interaction, computer applications in environmental studies, and slope stability.

Jean-Philippe Nicot—
J. P.'s bachelor's degree is from Ecole Nationale Supérieure de Géologie Appliquée, Nancy, France, but his postgraduate degrees are from UT. He is an expert in numerical modeling of multiphase flow and contaminant transport in both unsaturated and saturated zones, geochemical modeling and reactive transport, optimization (e.g., water resource management/inverse modeling), and risk assessment and analysis.

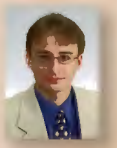
Chris Ogiesoba—
Chris began his higher education at the University of Benin, Benin City, Nigeria, where he received a Bachelor of Science degree in Geology in 1979. He has an M.Sc. DIC in Geophysics from the Imperial College of Science and Technology, Royal School of Mines, London, which he received in 1983. His September 2007 Ph.D. in Earth and Planetary Sciences comes from McGill University, Montreal. With such a background, it is only fitting that Chris would wind up in Texas, working for BEG's STARR program!

Diana Sava—
One of BEG's telecommuters, Diana has an undergraduate degree from the University of Bucharest, Romania. Her graduate degrees in geophysics are from Stanford. Statistical rock physics for reservoir characterization is her passion, along with quantitative integration of geological and seismic data, seismic fracture characterization, and gas hydrates.



Bridget Scanlon—
This year's GSA Birdsall-Dreiss Distinguished Lecturer, Bridget has a B.S. from Trinity College Dublin, Ireland. Her Ph.D. comes from the University of Kentucky in Lexington. Bridget's myriad areas of expertise include evaluation of the impact of climate variability and land use change on groundwater resources, application of numerical models for simulating variably saturated flow and transport, and assessment of natural and anthropogenic contamination of aquifers, including arsenic and nitrate.

Gil Strassberg—
Gil, one more UT Postdoctoral Fellow, has an undergraduate degree in civil engineering from the Israel Institute of Technology. Gil focuses on application of geographic information systems in surface water and groundwater hydrology, as well as GIS data models and environmental informatics.



Dimitry Volkov—
Dimitry is an energy analyst for CEE with a B.S. from Moscow State University and an M.B.A. in accounting and finance from the University of Houston. Dimitry's expertise lies in Russian and new independent states (NIS) energy sector development and related issues and trends; global energy sector development, investment, and market trends; data acquisition and analysis across the energy value chains, including fiscal and tax arrangements; and energy business and business-government relationships.

Fred Wang—
Holder of a B.S. degree in Mining Engineering from Cheng Kung University in Taiwan, Fred has M.S. and Ph.D. degrees from UT and Stanford, respectively. His specialties include integrated reservoir studies, petrophysical evaluation, production and reservoir data analysis, reservoir geostatistics, seismic-data-guided 3-D modeling, reservoir simulation, 4-D seismic evaluation, and enhanced oil recovery.

Joseph Yeh—
Joseph has a B.S. in Chemistry from Fu-Jen Catholic University, Taipei, Taiwan, which he received in 1977. His 1990 M.A. is from The University of Texas at Austin. Joseph is a 2007 recipient of a University of Texas Staff Excellence Award, which you can read about later in the report.

Hongliu Zeng—
Hongliu received his doctorate from UT, but his B.A. and M.A. are from Petroleum University, Dongying, China. Master of all things seismic, Hongliu is particularly interested in seismic sedimentology; seismic and sequence stratigraphy; 3-D seismic processing, modeling, and inversion; and characterization of thin-bed reservoirs.

Public Outreach and Education

CEE Hosts MBA Students from Alberta

The Center for Energy Economics hosted an exchange visit of 28 students from the University of Alberta MBA program February 19–23. The students, who specialize in Natural Resources and Energy, were in Texas for 1 week visiting CEE, energy companies and law firms, regulatory agencies, and The University of Texas at Austin. On the opening day of the UA visit, CEE senior staff made presentations on world outlooks for natural gas and its impact on North America, natural gas and LNG projects, and Texas electricity market restructuring. During their visit to the UT-Austin campus, students heard presentations by Drs. Ehud Ronn, Chip Groat, and Chris Jablonowski, as well as McCombs School of Business students. Canadian students also presented their research papers on various issues of energy development in Alberta and Canada in general.

Bureau Welcomes Middle/High School Winners of AGS Poster Contest

In March, Austin Geological Society's annual poster session featured four local middle and high school students who conducted experiments on the basis of earth science topics and who had competed at the 2007 Austin area regional science fair competition. They displayed and discussed their award-winning science projects with AGS members. The Bureau of Economic Geology, host of the monthly AGS meetings, provided a tour for students and their parents, during which they could learn about current studies from BEG researchers. Those researchers who gave presentations were Becky Smyth (shown in photo), Corinne Wong, Angela McDonnell, and Eddie Collins. Sigrid Clift served as tour guide.

Becky Smyth giving AGS poster contest winners and their parents a demonstration of the concept of carbon sequestration.

Explore UT Bureau Contribution

Hundreds of busloads of students from around the state and thousands of others attended *Explore UT* to find out for themselves about this great school and all it has to offer. The entire UT community was out in force, including Bureau folks, who had activities for kids, teachers, and parents—panning for gold (pyrite), making pet rocks, and looking deep into the Earth's surface using 3-D seismic. These educational activities let the public know about the important contributions that geologists make to our society. Geoscience activities were organized by the Jackson School, and more than 1,500 people came through the School to participate. Volunteers from the Bureau included Sharon Campos, Sigrid Clift, Jeannie Farahnak, Ursula Hammes and her children Nora and Max, Sue Hovorka and her daughters Maggie and Theresa, Jennifer Logan, Scott Rodgers, and Becky Smyth.

BEG scientist Sue Hovorka (center) and daughter Maggie (right) show how density of minerals works when panning for pyrite.

Bureau Hosts Scientific Software Day

In April, the Bureau and the Texas Advanced Computing Center (TACC) hosted Scientific Software Day—a day designed to provide practical

introductions to several software packages relevant to research and science communities. Speakers from The University of Texas at Austin and local companies showcased mostly open-source software of general use to scientific researchers. The software packages are not limited to any one area of science. Talks during the day-long event covered linear algebra software, workflow, and programming languages and environments. Sergey Fomel was a co-convenor of the event.

Conference for the Advancement of Science Teaching

The 50th annual *Conference for the Advancement of Science Teaching* (CAST) was held at the Austin Convention Center November 15–17, 2007, and more than 6,000 Texas K-12 science teachers attended. The event, organized by the *Science Teachers Association of Texas* (STAT), included more than 400 exhibits and almost 700 short courses, workshops, and field trips. The conference, a meaningful event for teachers, provides them with professional development and networking opportunities, resources and products for the classroom, and discussions on crucial policy issues and changes related to Texas public schools.

CAST was well attended by Jackson School researchers, faculty, and staff, who volunteered their time at the Jackson School exhibit and provided professional development opportunities for teachers that included

- **Dean's Office**, *The Changing Debate on Global Warming,* a lecture presented by Dean Eric Barron at the monthly Environmental Science Institute *Hot Science—Cool Talks* Lecture Series
- **Bureau of Economic Geology,** *Down to Earth at McKinney Falls State Park,* a field trip led by Sigrid Clift and Jessica Gordon (Dean's Office); *Teaching Geoscience Concepts with DVD Media,* a workshop presented by Scott Rodgers and Dallas Dunlap.
- **Department of Geological Sciences:** *Geology of the Llano Uplift,* field trips led by Leon Long and Jenny Cook
- **Environmental Science Institute**, *Central Texas Sedimentary Environments and Fossils* led by Jay Banner, Christian George, and Lynn Kirby; *Hot Science—Cool Talks!* The Environmental Science Institute's Outreach Lecture Series workshop presented by Jay Banner, Rob Borowski, Brian Zavala, and Lynn Kirby
- The **Jackson School booth,** which was well attended by teachers looking for professional development and graduate studies opportunities, as well as resources for the classroom. Jackson School and ESI staff who volunteered included

  Bureau of Economic Geology – Jennifer Logan, Sue Hovorka, Scott Rodgers, and Sigrid Clift

  Institute for Geophysics – Kathy Ellins, Hilary Clement Olson, and Daria Godfrey

  Dean's Office – Julie Spink and Jessica Gordon

  Environmental Science Institute – Trish Jarrott, Lynn Kirby, and Acacia Gaski

The Jackson School attends CAST every year. The 2008 CAST will be held in Fort Worth November 6–8. For more information, visit the STAT website at http://www.statweb.org/index.html.

Hilary Clement Olson, Kathy Ellins, and Daria Godfrey from the Institute for Geophysics recruit teachers at CAST for the TeXas Earth and Space Science Revolution (TXESS Revolution), a professional development program aimed at 8th grade and high school teachers that will prepare them to teach the senior capstone course in Earth and Space Science.

Teachers learn about geological principles and process at the Bureau's Down to Earth at McKinney Falls State Park field trip led by Sigrid Clift and Jessica Gordon (Dean's office) as part of the CAST conference.

Dallas Dunlap (far left) and Scott Rodgers entertain and enlighten students about earth sciences via the magic of virtual reality.

Sigrid Clift welcomes students to Earth Science Week/ Career Fair Day activities at the Commons on the Pickle Research Campus, near Bureau headquarters.

Julia Gale gets students to respond during a talk about her travels around the world in a session called "Career: Field Geologist: The Earth is My Office," Earth Science Week.

Port Isabel High School students conducting a beach profile at Isla Blanca Park on South Padre Island for the Texas High School Monitoring Program.

Port Aransas High School students are measuring how far their float (notice the orange on the beach) traveled in 50 seconds. This distance will help them calculate longshore current speed.

Earth Science Week

The ninth annual Earth Science Week (ESW) was observed around the U.S. October 14 through 20. As part of ESW, on October 19, the Bureau sponsored and hosted the eighth annual Austin ESW Career Fair for 250 middle school students from the Austin and Central Texas area. Many Bureau scientists and staff volunteered as presenters, exhibitors, and tour guides. Students learned about exciting career opportunities and took advantage of the myriad hands-on exhibits. The Austin ESW Consortium made up of industry, earth science education organizations, State and Federal agencies, and local colleges and universities raised $2,300 to pay for volunteers' lunches and supplies. The Bureau thanks the more than 70 volunteers from the Austin area and sponsors for their continued support.

Texas High School Coastal Monitoring Program

The Texas High School Coastal Monitoring Program (THSCMP) is an ongoing Bureau project designed to help coastal residents develop a better understanding of dune and beach dynamics on the Texas coast. Bureau researchers work with high school and middle school students and teachers, showing them how to measure topography, map vegetation lines and shorelines with Global Positioning Systems (GPS), and observe weather and wave conditions. As participants in an actual research project, the students enhance their science education and provide coastal communities with valuable data on their changing shoreline.

The THSCMP is currently in its tenth year of operation. Participating schools are Ball High School on Galveston Island (10 years in the program), Port Isabel High School in South Texas (9 years), Port Aransas High School on Mustang Island (9 years), Van Vleck Middle and High Schools (3 years), Palacios High School (2 years), and students participating in the Spanish Science Club at Tidehaven Middle School (3 years).

THSCMP is a unique educational program in that students in a real-world setting collect data that are used by working scientists to address coastal issues. We emphasize to the students that they are working on a real research project and are collecting scientifically valid data that will eventually appear in a scientific publication. This is a major point that makes this program different from most other field trips or laboratory exercises. Asking students to conduct experiments that have real consequences seems to make a difference to them, and it probably improves the quality of the data.

Benefits from this project accrue to the people who live on the coast who are directly affected by beach erosion and related public policy. Data from this project are accessible through the THSCMP website, CMP project reports, and scientific journal articles. Bureau scientist Tiffany Hepner (in visor in photo to the left) heads up the program. For more information, please visit the program's website at http://coastal.beg.utexas.edu/thscmp/.

Bureau Welcomes Science Teachers

In June, teachers from Aldine ISD in North Houston visited the Bureau for a teacher workshop. Kathy Ellins from the Institute for Geophysics and Jessica Gordon from the Jackson School, along with Sue Hovorka, Tiffany Hepner, Eric Potter, Scott Rodgers, and Sigrid Clift from the Bureau gave presentations and supervised classroom activities throughout the day. Scott Tinker gave the welcoming address. Thanks to the presenters and all of those who worked so hard behind the scenes to make this event a great success!

Aldine ISD, Houston, teachers pause for a group shot after their workshop at the Bureau.

HRC Hosts First Annual Houston Geoscience Day

In September, BEG's Houston Research Center (HRC) hosted the First Annual Houston Geoscience Day for 140+ people. Co-sponsored by the Geophysical Society of Houston and the Houston Geological Society, the sold-out event targeted professionals in the petroleum industry with less than 5 years' experience. The occasion provided a chance for new-hires in the industry to observe an array of geological and geophysical methods and included live geophysical demonstrations, presentations by industry leaders, core displays, tours of the Geophysical Society of Houston Museum, and interactive displays. BEG Director Scott Tinker gave a rousing opening address titled "The Energy Geoscientist of the Future: What Will Make Me Worth My Very Big Salary?"

Les Denham (far right), vice-president of Interactive Interpretation and Training, Inc., addresses a group during Geoscience Day at the Houston Research Center.

Identification Day at Texas Natural Science Center

Twice each year, hundreds of nature and science enthusiasts bring their rocks, minerals, fossils, insects, reptiles, archeological finds, and other natural objects to the Texas Natural Science Center (formerly the Texas Memorial Museum) to find out what treasures they have collected. Scientists and experts from The University of Texas at Austin and elsewhere offer the public a unique educational experience on how scientists go about identifying their specimens. Examination of rock and mineral specimens falls to geologists from the Jackson School of Geosciences, with Robert Reed from the Bureau being a frequent participant. Many of the specimens brought for identification present a challenge to identification, and Rob and other geologists from the Jackson School use their skills and expertise to answer the visitors' questions.

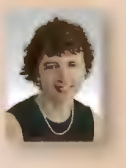
Bureau scientist Rob Reed (left foreground) examines a rock for one visitor, while Jackson School scientist Kitty Milliken (left background) consults with another.

Houston Kids Tour Austin

On October 10, 5th grade students from Valley West Elementary, a Houston ISD magnet school, visited Austin for a geology field trip led by Sigrid Clift. The day started out bleak—cold with lots of rain—so they began with a trip to the Texas Natural Science Center on U.T. campus and took in the exciting displays of rocks, minerals, and fossils. By the time they left the museum, the rain had stopped, and they could visit Zilker Park and Barton Springs and the State Capitol. Back at the Bureau, students enjoyed a demonstration by Scott Rodgers of virtual reality models. Everyone had a great day. Valley West hopes to come back next year.

Valley West Elementary, Houston, 5th graders on excursion to the Texas State capitol.

Awards and Honors



The GSA 2007 Birdsall-Dreiss Distinguished Lecturer was **Bridget Scanlon**. At 30 universities throughout the spring, Bridget presented one of two lectures on hydrology—"Impacts of Changing Land Use on Subsurface Water Resources in Semiarid Regions" and "Implications of Climate Variability for Groundwater Resources and Waste Disposal in Semiarid Regions—A Look at Ecological Controls from Annual to Millennial Timescales."

Bureau Research Scientist **Mike Hudec** completed his second 2-week tour as a 2006–07 AAPG Distinguished Lecturer. During the tours, Mike made presentations to the Asociación Mexicana de Geólogos Petroleros A.C. (Delegación Poza Rica); New Mexico State University; The University of Texas, El Paso; Montana State University; the Montana Geological Society (Billings); University of Wyoming; Dalhousie University; Bowling Green State University; Ohio State University; Northern Illinois University; Indiana University; University of Missouri, Rolla; University of Kentucky; and Florida International University. Mike's two talks were titled "Advance Mechanisms of Allochthonous Salt Sheets: Implications for Predicting Subsalt Pore Pressure" and "Evolution of Suprasalt Minibasins in the Deepwater Gulf of Mexico."

Wayne Wright was awarded one of the two 2007 Best Poster Presentations for SEPM at the AAPG meeting that was held in Long Beach, California, in April. The poster, "Paleogeography and Depositional Geometries of the Pennsylvanian/Late Carboniferous Succession of the Greater Permian Basin Region, Texas and New Mexico," reflects Wayne's work on the Bureau's Permian Basin Geological Synthesis Project. Wayne tied with Christopher G. St. C. Kendall, Gene Shinn, and **Xavier Janson** for the award with their poster, "Holocene Cyanobacterial Mats and Lime Muds: Links to Middle East Carbonate Source Rock Potential."

The Bureau celebrates Scott Tinker's becoming AAPG's President-Elect.

In May **Scott Tinker** was voted President-Elect by the AAPG membership. He will serve as AAPG president in 2008–09. AAPG is currently the world's largest professional geological society, with more than 30,000 members. The original purpose of AAPG, to foster scientific research, to advance the science of geology, to promote technology, and to inspire high professional conduct, still guides the Association today. Scott began his duties on July 1 by serving as President-Elect on the AAPG Executive Committee.

SEG president Leon Thomsen presents Best Paper in TLE Awards to Milo Backus, Bob Graebner, Paul Murray, and Bob Hardage.

Milo Backus (lead author) and **Paul Murray**, **Bob Graebner**, and **Bob Hardage** (co-authors) received awards for "Best Paper in *The Leading Edge*" at the 2007 Annual Meeting of the Society of Exploration Geophysicists in San Antonio. Their paper, "High-Resolution Multicomponent Seismic Imaging of Deepwater Gas-Hydrate Systems," was developed from the team's research of deepwater hydrates. It appeared in the May 2006 issue of the SEG journal.

The Society of Exploration Geophysicists (SEG) awarded senior research scientist **Bob Hardage** an Honorary Membership at the 2007 SEG Annual Meeting in

San Antonio. Honorary Membership is the oldest and the second-highest award granted by SEG. Only 139 Honorary Memberships have been bestowed in the 78 years since the award was established in 1930. SEG requirements for Honorary Membership are laid out in the following: "Honorary Membership is conferred upon persons who, in the unanimous opinion of the Honors and Awards Committee and the Executive Committee, have made a distinguished contribution, which warrants exceptional recognition, to exploration geophysics or a related field or the advancement of the profession of exploration geophysics through service to the Society." The description fits Bob Hardage to a T!

Yet another Bureau winner at the SEG meeting was **Sergey Fomel**, who received the award for Best Poster Paper Presented at the 2006 SEG Annual Meeting. The title of Sergey's poster—"Local Seismic Attributes." All three presentations he gave at the meeting were chosen for inclusion in the "Top 30 Presentations at the SEG Annual International Meeting." Because more than 700 papers were given at the meeting, this is quite an honor. "Part of the credit should go to [computer illustrator] John Ames for his outstanding design work on the poster," Sergey said. "High-quality graphics is a definite part of the BEG brand, and I am very grateful for all the support from the Media Group. This is also a chance to thank Bob Hardage and Milo Backus for getting me to work on the multi-component image registration problem, which led to the idea of local attributes. The poster made an extra appearance this year at the EGL sponsor meeting." Sergey and co-authors Evgeny Landa and Tijmen-Jan Moser also won the European Association of Geoscientists and Engineers' 2006 Loránd Eötvös Award for their paper, "Path-Integral Seismic Imaging." The award is presented to the authors of the year's best paper published in *Geophysical Prospecting*.

In May, **Shirley Dutton** received the prestigious Joseph C. Walter Jr. Excellence Award, "in recognition of demonstrated excellence in any or all of the areas of the [Jackson] School—research, teaching, service, professional activity, and administration." Said the Dean: "Shirley is internationally known for her work on sandstone diagenesis and reservoir quality. Her contributions have a great deal of breadth, from fan deltas to deep-water sandstones, organic geochemistry, basin analysis, resource assessment, and the origin of salt dome cap rock. She has received three A.I. Levorsen Memorial Awards for the quality of her research. Her publications span key journals such as the *AAPG Bulletin* and the *Geological Society of London*, but she also directs her efforts toward outreach, regional societies, and corporations. She is currently PI on a $1.5-million consortium investigating deep reservoir quality in the Gulf of Mexico. Shirley represents the Bureau with distinction: name an important JSG activity—from leadership searches to the appointments committee—and there's Shirley. She was Senior Technical Advisor to the Director of the Bureau 2003–2004. Her service to the profession is equally noteworthy—from program chair to AAPG delegate, to associate editor, to service in three societies—we find Shirley sharing her time and wisdom to enable the geosciences. She has mentored 36 Research Assistants in their professional development. Her nomination letter included the following words all in the same paragraph—'instinctive, unafraid to voice opposing points of view, level-headed,

SEG president Leon Thomsen presents Honorary Membership to Bob Hardage before Bob's statement of acceptance.

Sergey Fomel

Dean Eric Barron and Shirley Dutton.

good judgment, unfailingly responsible, non-self-centered, acts for the good of the university.' Those words don't always go together, but together they represent a significant compliment. I am pleased to honor Shirley with the Joseph C. Walter Jr. award for 30 years of excellence."

L. Frank Brown Jr., Bureau Research Professor and member of the STARR team, was named recipient of the Gulf Coast Section SEPM's 2007 Doris Malkin Curtis Medal, which recognizes significant career contributions in the development of new concepts for understanding the geology of the Gulf of Mexico Basin and other basins globally. Frank was also recently informed that he is the 2008 recipient of the American Association of Petroleum Geologists Pioneer Award. On the plaque is engraved "long and valued service to AAPG"—a minimum of 35 years of membership is, after all, required before a candidate is even considered. Frank has earned a laudable reputation in geological research for his trail-blazing work in stratigraphy and mapping. "[The Pioneer Award] is a prestigious award, richly deserved…and bringing honor to the Bureau," Scott Tinker remarked.

CEE
CENTER FOR ENERGY ECONOMICS

For the second year in a row, **CEE** was named a finalist for the prestigious World Oil Awards in the Best Outreach Program category. CEE's 2007 nomination featured its "Africa Partnerships," which focus on helping younger generations of energy industry professionals and informing the general public in Africa and the Houston community about Africa energy sector issues. As recognized by the World Oil Advisory Board and the Next Generation Committee, the award is designed to "applaud and showcase innovative thinking and next-generation leadership."

Researchers **Mike Hudec** and **Martin Jackson's** 2007 paper, "Terra Infirma: Understanding Salt Tectonics," Earth Science Reviews, May, p. 1–28, was recently included in *Science Direct's Top 25 Hottest Articles*. The paper came in at number 18 on the chart. Congratulations, guys!

Bureau researchers were the recipients of three awards from the Energy Minerals Division of AAPG at the 2007 Annual AAPG Convention held in Long Beach in April: **Robert M. Reed** and **Bob Loucks** received the EMD Best Poster Award for their presentation "Imaging Nanoscale Pores in the Mississippian Barnett Shale of the Northern Fort Worth Basin." **Julia Gale** and **Robert M. Reed** received the EMD President's Certificate for Excellence in Presentation for their poster presentation titled "Natural Fractures in the Barnett Shale: Why They Are Important." **Bill Ambrose** nabbed second-best EMD oral presentation for his "Near- to Mid-Term Energy Mineral Sources: Bridging the Future to Alternative Energy."

Steve Laubach and co-author Meghan Ward, a FRAC student now at Chevron, were the recipients of an AAPG Award of Excellence "Top 10 Oral Presentation" for their paper titled "Structural Complexity in Structurally Simple Fractured Reservoir Analogs." The presentation, recognized at the 2007 AAPG Convention in Long Beach, described results of Ward's Master's thesis research on tight gas sandstone analogs in NE Mexico and FRAC research in reservoirs in West Texas.

In late December **Steve Laubach** was elected to the Petroleum Group Committee of the Geological Society of London, which, among other things, sponsors GSL's petroleum-related conferences and publications (some in collaboration with AAPG and SPE). Although Steve will be attending in person a committee meeting in February in London, he'll participate in committee activities mostly via conference call.

The 2007 AAPG oral presentation by Mark Tomasso, David Pyles, **Flo Bonnaffé**, and Dave Jennette, "3-D Geological and Seismic Forward Modeling of a Sinuous Slope Channel Complex, Brushy Canyon Formation, West Texas," has also been recognized as a "Top 10 Oral Presentation" for this conference. The paper will be presented at EAGE in Rome in June as part of a "Best of AAPG Long Beach" session.

Angela McDonnell was selected to receive AAPG's A. I. Levorsen Memorial Award for Best Oral Presentation at the 2007 Gulf Coast Association of Geological Societies Meeting, held in Corpus Christi in October. The paper (coauthored by Mike Hudec and Martin Jackson) is titled "Importance of Allochthonous Salt in Texas State Waters: Paleo-Canopy Presence and New Exploration Paradigms." The A. I. Levorsen Memorial Award is in recognition of an outstanding paper, with particular emphasis on creative thinking toward new ideas in exploration.

Ursula (Uschi) Hammes was named second-place recipient of the 2007 Thomas A. Philpott Excellence of Presentation Award for her paper "All Fill—No Spill: Slope-Fan Sand Bodies in Growth-Faulted Subbasins: Oligocene Frio Formation, South Texas Gulf Coast," which was presented at the 2007 GCAGS/GCSSEPM convention in Corpus Christi in October. Her paper was co-authored by Hongliu Zeng, Bob Loucks, and Frank Brown.

Hongliu Zeng was recently informed that he is the first-place recipient of the 2007 Gordon Atwater Best Poster Award, for his poster "Seismic Sedimentological Expression of Higher-Order Lowstand Slope Fans and Prograding Deltas in the Frio Formation, Corpus Christi Bay, Texas," which was presented at the 2007 GCAGS/GCSSEPM Convention in Corpus Christi. Hongliu and co-author Bob Loucks thank John Ames, graphics, and Lana Dieterich, editing, for helping them win this award.

One of Lesli Wood's graduate students, **Nysha Chaderton**, was awarded Outstanding Student Presentation of the 4th Conference of the Geological Society of Trinidad and Tobago, which was held in June in Port of Spain, Trinidad. The oral presentation dealt with her research on the structural and stratigraphic evolution of the Tobago Forearc Basin, Tobago, West Indies.

Grad student **Ned Frost** netted two AAPG student awards—Best Poster Presentation at the 2006 Perth ICE meeting (for "Platform-Margin Trajectory as a Control on Neptunian Dike Distributions, Devonian Reef Complexes, Canning Basin, Western Australia") and Shell Best Oral Presentation at the 2007 Long Beach Annual Convention (for "Geologic Modeling of Frasnian and Famennian Carbonate Platforms, Canning Basin, Western Australia").

Vishal Maharaj, one of Lesli Wood's students, won first place for his poster among more than 20 posters presented at the annual JSG Geology Foundation Meeting, which was held at the Austin Grand Hyatt on November 18. The poster, titled "Seismic Geomorphology of Atoka Channels, Fort Worth Basin, Texas," showed preliminary work on Vishal's Master's research, and the prize made Vishal $500 richer.

Ph.D. candidate **Bryce Wagner** was awarded three scholarships: (1) ConocoPhillips SPIRIT Scholarship, (2) Michael Bruce Duchin Endowed Presidential Scholarship, and (3) SEG Foundation Scholarship (renewed). Bryce has started his research on salt tectonics in the Applied Geodynamics Laboratory, supervised by Martin Jackson and Mark Cloos; his committee includes AGL's Mike Hudec as well.

Chad Weisenburger, graduate research assistant with the Quantitative Clastics Laboratory and Master's candidate at the Jackson School of Geosciences, received a 2007 Chevron Fellowship. The $5000 award will be used to continue his research in salt tectonics and evolution of the northwestern Moroccan margin. Chad is using an extensive 3-D seismic data set belonging to the Moroccan Government and provided to the Bureau through a research partnership with Vanco Energy in Houston.

Jamie H. Coggin received the Jackson School Staff Excellence Award. The Dean had this to say: "Jamie has long been the go-to person at the Bureau for graphics and publication design. Her extensive knowledge of graphics software and the printing process complements her knack for visually appealing layouts, enabling her to consistently produce professional-grade publications that effectively portray our scientific, outreach, and public relations efforts. Jamie is a self-motivated individual who works well independently or with others. She is always willing to work long hours and weekends in order to meet deadlines and to see that all publications for which she is responsible carry the Coggin trademark of quality and innovation."

Joseph Yeh, Information Technologist extraordinaire, won a 2007 University of Texas Staff Excellence Award. Joseph is 1 of only 30 university staff recognized with this award because of their "significant impact on the University through outstanding dedication, competence, and conscientious performance." A BEG staffer for almost 20 years, Joseph maintains a low profile, but never disappoints during "crunch time." His background is what puts him in such high demand because he has degrees in science (organic and analytical chemistry), but his specialties are computer related: well-logging interpretation and correlation, as well as programming in numerical methods used in solving equations involved in oil, gas, and water pollution and transport.

Bureau Transitions

Bye-Bye, Bill!

Bill White retired for good this year, after lulling us into a false sense of security by coming back part time following his official retirement a couple of years ago. Bill started out as an Earth/Life Science teacher for AISD back in the 70's but wound up at the Bureau and stayed with us for 30+ years. His interests included modern coastal processes, such as sedimentation, erosion, faulting, subsidence, and sea-level rise and their influence on natural coastal resources such as salt, brackish, and fresh marshes, fluvial woodlands, and wind-tidal flats. These interests developed over the years during long-term investigations of the status and trends of wetlands in major bay-estuary-lagoon systems, studies of submerged coastal lands of Texas in which benthic sediments were mapped and characterized in terms of their textural and geochemical properties, studies of faulting and subsidence and their impacts on marshes, and studies of fluvial-deltaic systems in which wetland sedimentation rates were measured and correlated with rates of relative sea-level rise. Interests in remote sensing were highlighted by studies of land cover and deforestation in Belize, Central America, and geo-environments of the Orinoco Delta in Venezuela that were based on Landsat TM imagery. Studies of land cover and deforestation in Belize included a NASA project to evaluate a new satellite imaging system launched in November 2000 as part of NASA's New Millennium Program Earth Observing series (EO-1).

New Research Staff

Postdoctoral fellow **Stephen Becker** joins BEG as part of the Bureau's structural diagenesis initiative. Stephen comes to us from Virginia Tech, where he received his Ph.D. working on fluid inclusions in porphyry copper deposits. Stephen will apply fluid inclusion analysis to unraveling the fracture history of tight-gas sandstone reservoirs alongside Peter Eichhubl and Steve Laubach.

David Carr has returned to the Bureau! A petroleum geologist, his primary interests lie in clastic sedimentology and stratigraphy. Dave has served as a consultant, performing a variety of reservoir characterization and exploration projects that have required solution of complex stratigraphic problems and quantification of geological information for use in reservoir simulators. He has also explored for oil and gas with onshore U.S. independents, and early in his career with majors, generating prospects in the Gulf Coast, Midcontinent, and Rocky Mountain regions.

Paul Ching signed on at the Bureau as Executive Advisor with the Advanced Energy Consortium on Nanotechnology. With a degree in Geological Engineering from South Dakota School of Mines and Technology, Paul spent 34 years of his life with Shell, and he's still involved in the fields of energy and technology. A former member of the Advisory Committees for both the Jackson School and the Bureau, Paul felt that he had one more hat to try on!

A research scientist for UTIG, Professor for DGS, and Jackson Chair in Geosystems, **Peter Flemings** is spreading his talents around the Jackson School, and he has signed on part time with the Bureau.

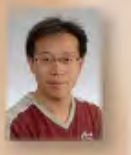
John Gates, a new Postdoc at the Bureau has as his main research interests groundwater resources and environmental change across a range of temporal and spatial scales, including the impacts of land use and climatic changes on groundwater quality and quantity. John's Ph.D. work focused on aquifer recharge patterns and Quaternary hydrological trends in China using geochemical tracer techniques.

Scott Hamlin has returned to the Bureau as well! Scott has been assigned to the Permian Basin Geological Synthesis Project, which includes characterization of slope and basin reservoirs in the Spraberry Trend. Scott worked at the Bureau in the 1980's and 1990's and completed his Ph.D. at UT Austin in 1999. Recently he worked at the Texas Water Development Board building groundwater flow models of Texas aquifers.

Fares M. Howari has signed on to a joint appointment with the Bureau and with U.T.'s Center for International Energy and Environmental Policy. Fares has more than 10 years' experience in geosciences and environmental research in international academic and industrial positions. He has a broad, interdisciplinary grasp of geological and environmental topics and their technical, human, policy, and social dimensions.

Rebecca Jones is back, too, albeit by long distance some of the time. Part of the time she's here in Austin, but part of the time she telecommutes from Minnesota. Rebecca is splitting her time between STARR and the Permian Basin Geological Synthesis Project. Her duties include describing core and thin sections, correlating wireline logs, and constructing stratigraphic cross sections and maps.

Cary King, new Postdoc in the hydrology group, says that his job responsibilities are to provide data and projections for planning of water usage for electricity generation in the State of Texas. The result of this work will be incorporated into the Texas Water Development Board water planning strategy. Cary has degrees in Mechanical Engineering from The University of Texas at Austin.



Yang Liu is a new Postdoc on Sergey Fomel's team, working on seismic data processing. Yang received his M.S. (2003) and Ph.D. (2006) at the College of Geoexploration Science and Technology, Jilin University in China. Yang was a lecturer at the College of Geoexploration Science and Technology, Jilin University, before coming to the Bureau. Yang is currently involved in research projects on seismic data regularization and noise attenuation using novel transform methods.

Sojan Mathew, new Postdoc in the Coastal Program, is interested in physical geography and coastal geomorphology; GIS and remote sensing techniques; and beach dune morphodynamics and sediment budget. Sojan's Geography Ph.D. is from the University of Guelph, Ontario. He also has M.S. degrees in Soil and Water Conservation Engineering and Agricultural Sciences, Food Security and Natural Resource Management, from Tamil Nadu Agricultural University, Coimbatore, India, and University of Hohenheim, Stuttgart, Germany, respectively.

Douglas McCowan is another new member of Sergey Fomel's team, albeit a part-time member. Doug's expertise lies in seismic modeling, synthetic seismograms, and earthquakes. He has degrees in physics and geophysics from MIT and Penn State, respectively. Doug has received the Gordon Bell Prize twice, once as Co-Honorable Mention and once as Co-Recipient in Parallel Computing.

Lorena Moscardelli is new to the Bureau, insofar as she was finally hired as a full-time employee. Up until 2007, before receiving her Ph.D. from UT, Lorena was working as a graduate student research assistant in Lesli Wood's QCL group. Her strengths are in the study and characterization of mass transport complexes around the world, application of quantitative seismic geomorphology techniques in shallow and deep-water deposits, subsurface mapping of depositional systems, and basin analysis.

Sean Murphy joined the bureau in November to get a head start on the 2008 opening of the Advanced Energy Consortium, headquartered at BEG's Houston Research Center in Houston. For the last 23 years Sean has lived in Austin and worked in the semiconductor industry, first for Motorola and most recently with research consortium SEMATECH. Sean earned an M.S. in Geology from the University of Georgia and an M.B.A. from The University of Texas at Austin.

Ian Norton will be splitting his time between the Bureau and the Institute for Geophysics. An expert in plate tectonics and reconciliation of observations from structural geology with regional tectonics, Ian is a computer programmer extraordinaire in Fortran, C, and additional graphics languages; Geoframe; Schlumberger seismic interpretation packages; and ArcGIS mapping system. He received his Ph.D. from the University of Witwatersrand in South Africa in 1978, and after 20+ years at ExxonMobil, he retired this past August. The Bureau is lucky that Ian's retirement was only temporary!

Chris Ogiesoba, Research Associate, will be busy doing seismic interpretation for the STARR team in the South Texas, Gulf of Mexico region, specifically in the Frio Formation. The goal is to develop a regional structural and stratigraphic understanding of the acreage and identify possible prospective locations for exploration ventures. Chris lists as his areas of expertise hydrocarbon prospecting, 2-D and 3-D seismic interpretation, and structural and stratigraphic mapping. He recently completed his Ph.D. at McGill University.

Postdoc **Jeffrey S. Vincent** is a recent émigré from Alaska, who has signed on at the Bureau to work in the coastal group. Jeff received his Ph.D. from the University of South Carolina at Columbia in Geography, and his specialties include GIS, coastal zone remote sensing using hyperspectral and high spatial resolution imagery, data fusion techniques, coastal land use/land change detection and mapping, and terrestrial vegetation mapping.

Christopher Zahm joined the Bureau to work with the Carbonate Reservoir Characterization Research Laboratory (RCRL). His work includes characterizing fracture and other discrete features in analog systems and working to understand how these features influence fluid flow in the subsurface. Chris received his Master's degree from The University of Texas at Austin and his Ph.D. in Geology from the Colorado School of Mines.

New Support Staff

Jennifer Hicks, a member of the administrative staff, performs a wide range of duties in Human Resources, including student hiring, UT Driver authorizations, key authorizations, International VISA issues, and other HR-related issues. A graduate of New Mexico State University with a degree in Business Administration in Human Resources Management, Jennifer worked at NMSU in the Human Resources Department prior to arriving in Austin.

Katherine Jolly, the newest member of the administrative staff, works with Wanda LaPlante and Scott Tinker performing various administrative duties, including backup for the Executive Assistant in the Director's office, draft/format correspondence, research, coordination of meetings/conferences, and other administrative assignments as requested. Katherine received her Master's degree from Texas State and her undergraduate degree from The University of Texas at Austin. Prior to arriving at the Bureau, Katherine worked for a representative at the Texas Capitol.

Devin Krieg is another recent addition to the administrative staff—he is an Administrative Assistant in Accounting. A graduate of The University of Texas at Austin with a degree in English, Devin processes IDT's, issues invoices, and manages nonmonetary gifts and receiving.

The Bureau's new Contract and Grant Specialist, **Cory B. Welch**, is a 2000 graduate of the University of North Texas and recipient of a Master's in Education from Texas State University in 2006. Cory also brings with him 6 years' experience from the Air Force as a Senior Research Technician.

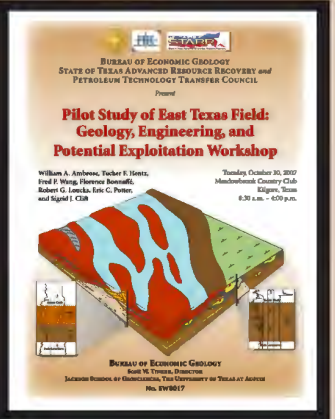
Bureau Publications

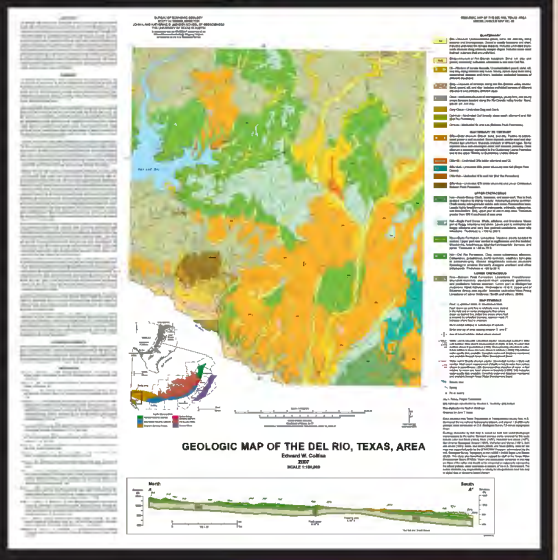
The Bureau produced three new publications in 2007:

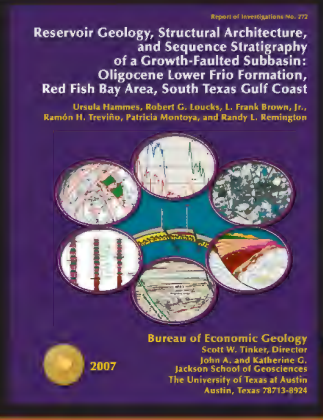
Ambrose, W. A., Hentz, T. F., Wang, F. P., Bonnaffé, Florence, Loucks, R. G., Potter, E. C., and Clift, S. J., convenors, 2007, Pilot Study of East Texas Field: Geology, Engineering, and Potential Exploitation Workshop, held October 30 in Kilgore, Texas: The University of Texas at Austin, Bureau of Economic Geology, No. SW0017, variously paginated.

Collins, E. W., 2007, Geologic map of the Del Rio, Texas, area: The University of Texas at Austin, Bureau of Economic Geology, Miscellaneous Map No. 45, scale: 1:100,000.

Hammes, Ursula, Loucks, R. G., Brown, L. F., Jr., Treviño, R. H., Montoya, Patricia, and Remington, R. L., 2007, Reservoir geology, structural architecture, and sequence stratigraphy of a growth-faulted subbasin: Oligocene Lower Frio Formation, Red Fish Bay Area, South Texas Gulf Coast: The University of Texas at Austin, Bureau of Economic Geology Report of Investigations No. 272, 28 p. + plate.







Outside Publications (Peer-Reviewed)

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Bellian, J. A., Beck, R. A., and Kerans, Charles, 2007, Analysis of hyperspectral and lidar data: remote optical mineralogy and fracture identification: Geosphere, v. 3, p. 491–500.

Bonnaffe, Florence, Jennette, Dave, and Andrews, John, 2007, A method for acquiring and processing ground-based lidar data in difficult-to-access outcrops for use in three-dimensional, virtual-reality models: Geosphere, v. 3, p. 501–510.

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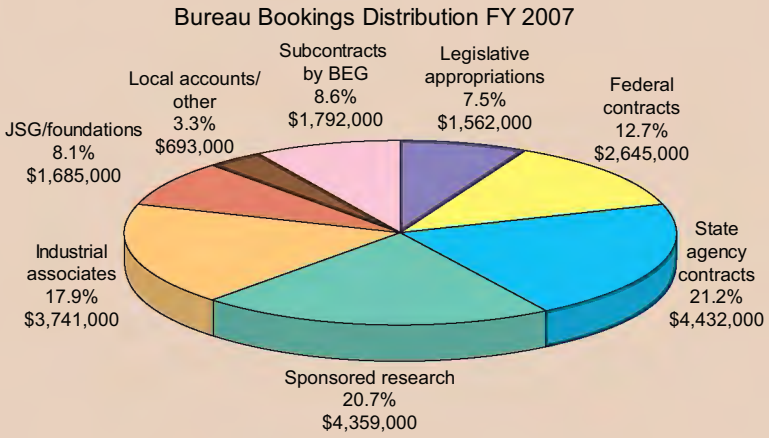
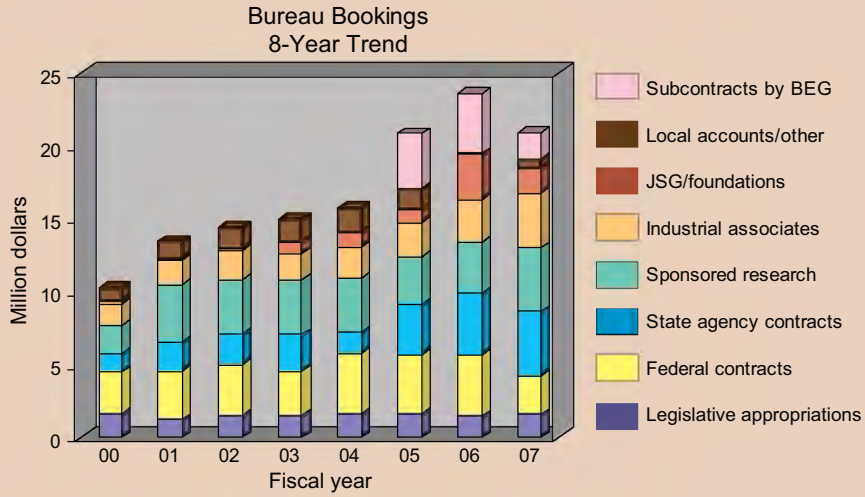
Bureau Finances

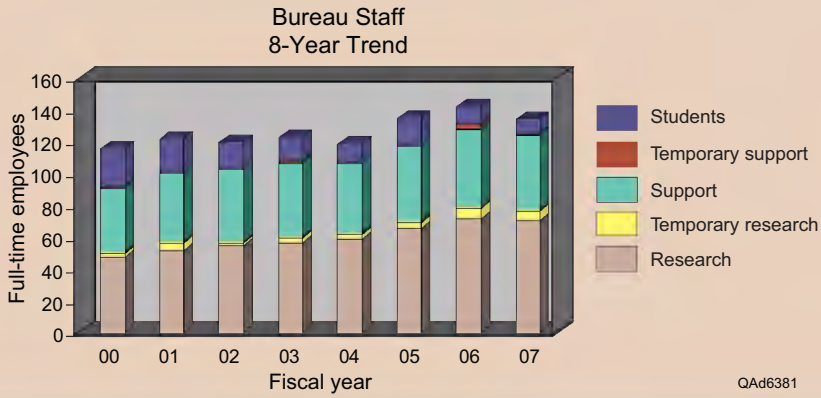
Sources of Funding



Six-Year Budget Trends



Staff Trends



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Bureau funding comes from four sources—Federal, State, and private industry, as well as JSG. Bureau funding was down slightly (~10%) in FY07 from FY06. This decrease is attributed to a midyear cut in DOE fossil-energy programs and discontinuation of JSG research initiative programs. Although the Bureau tries to maintain a balance in funding categories, the decrease in DOE funding has led to an FY07 increase in relative percentage of industry support. In FY08 we will seek to work toward balancing percentages with increased Federal and State funding.

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