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Houston Geological Society
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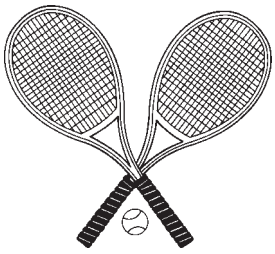

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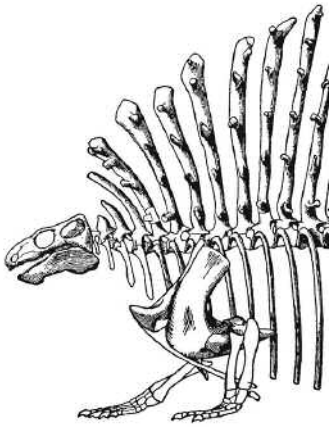

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by ***Steve Brachman***

Relax!

As President of the Houston Geological Society, one of my functions was to attend the AAPG Leadership Conference held in Tulsa in February. During the conference, I had the opportunity to brag about the HGS and all of the things we do right. As the "800 pound gorilla" of all member societies, what the HGS does and thinks carries a great deal of weight around AAPG. As always, it is easy to boast about our great volunteers and the tremendous job they do in running the wide variety of activities covered by the HGS umbrella. But I also try to share with other member societies some of what I have learned by being active in the HGS over the years. I have found that a great deal of our success comes from our reaching out to the greatest number of members and providing them with services and activities that keep them wanting to pay their dues every year. Foremost among those services are our great social activities.

During the conference presentations, I use the line, "In order to run a great luncheon meeting, you have to run a great golf tournament." The HGS holds annual golf and tennis tournaments, a Skeet Shoot, and the Shrimp Peel. I believe these activities are just as critical to the success of our society as our technical meetings. A well-run social event provides three things. First, it offers a venue for relaxed interaction among the members. Second, it provides an opportunity to make business contacts outside of the more rigid atmosphere of a technical meeting. Third, a social event provides income to the society to help offset other activities that operate at a loss and, therefore, helps keep member dues low.

…in order to run a great luncheon meeting, you have to run a great golf tournament … these activities are just as critical to the success of our society as our technical meetings.

The committees that run these activities are among the busiest in the HGS. Unfortunately, I can not recognize everyone, but I hope that the committee chairmen will pass on our thanks to their contributors. Mark Dennis of Petrolog, Inc will now oversee the Golf Tournament Committee, long- and ably-chaired by Al Filipov. The Golf Tournament is a huge undertaking. It occupies three courses at the Kingwood Country Club and has over three hundred and fifty participants. The tournament is a daylong scramble with refreshments during, a buffet after and numerous door prizes and awards. Held in September, the HGS Golf Tournament has long been one of the premier golf outings in the Houston area.

The Skeet Shoot Committee, run by Tom McCarroll of Patriot Exploration, is a wonderful event held over Father's Day weekend in June. More than 100 shooters participate. Tom, with the help of Gary Martins of Live Oak Environmental, holds the shoot at the Greater Houston Gun Club in Missouri City. They provide refreshments, door prizes, awards and an excellent BBQ lunch. Shooters from novice to expert compete in different categories, so spirited competition and a great time are had by all.

In May, Ross Davis and his assistant Heidi Nasser of Davis Brothers put on the remarkable Tennis Tournament at the Houston Country Club. This event is a half day of "playing until you drop" with lunch, refreshments and door prizes. Participants play round-robin doubles, rotating partners each round, with no elimination. The top game winners at each skill level team together for a championship round. Having played in this tournament myself for many years, I can safely say it is as enjoyable as the many higher cost tournaments played in Houston. Ross has been organizing and staging the Tennis Tournament for an amazing 12 years.

Last, but certainly not least, is the Shrimp Peel, organized by Lee Shelton with Knowledge-Reservoir. The infield of Sam Houston Race Track is the venue for this great event. Not only do the over 500 participants get to eat shrimp in conjunction with guzzling their favorite liquid beverage, they can also try their luck with the ponies. Lee has a great deal of help from his committee, which includes Kent Horstman, also of Knowledge-Reservoir, Terry Neffendorf and Mack Olsen of Subsurface Computer Modeling (SCM) and Michele Wood of CGG-Veritas. Due to their superb efforts, the Shrimp Peel has become a most enjoyable fixture on the HGS social calendar.

Critical to the success of these social events is the tremendous sponsorship and support provided by numerous local companies and individuals. Each committee chair gave me a long list of loyal sponsors. Since I can not do justice to all of the sponsors individually in this limited space, I instead want to collectively thank each of them for their generous contributions to our social events and to the HGS.

So please attend these great events, thank the organizers and sponsors for the tremendous job they do, and most of all, relax and have fun! ■

HGS *Bulletin* Instructions to Authors

All materials are due by the 15th of the month, 6 weeks before issue publication. Abstracts should be 500 words or less; extended abstracts up to 1000 words; articles can be any length but brevity is preferred as we have a physical page limit within our current publishing contract. All submissions are subject to editorial review and revision.

Text should be submitted by email as an attached text or Word file or on a clearly labeled diskette in Word format with a hardcopy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator, Freehand, Canvas or CorelDraw. Files should be saved and submitted in .eps (Adobe Illustrator) format. Send them as separate attachments via email or on a diskette or CD if they are larger than 1 MEG each, accompanied by figure captions that include the file name of the desired image. DO NOT EMBED them into your text document; they must be sent as separate files from the text. DO NOT USE POWERPOINT, CLIP ART or Internet images (72-DPI resolution) as these do not have adequate resolution for the printed page and cannot be accepted. All digital files must have 300-DPI resolution or greater at the approximate size the figure will be printed.

Photographs may be digital or hard copy. Hard copies must be printed on glossy paper with the author's name, photo or figure number and caption on the back. Digital files must be submitted in .jpg or .eps format with 300-DPI or greater resolution at the printing size and be accompanied by figure captions that are linked by the file name of the image. The images should be submitted as individual email attachments (if less than 1 MB) or on CD or zip disk.

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We also offer a Banner ad across the top of our monthly Newsletters sent to registered users of the Website. Job postings are available for $100 for 30 days on the Website but they must be geoscience jobs of interest to our members. Current HGS members may post their resumes at no charge. If you have a product or service available at no charge, you can post it in the Business Directory at no charge. Geo-related Business Cards and job openings may be posted directly by any registered user and members may post their own resumes. They will be activated as soon as practical.

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One year	$750.00		$60.00	$150.00	$2,000.00	Free	
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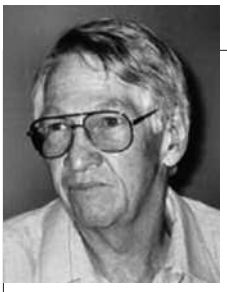


by ***Bill Rizer***
editor@hgs.org

A Busy Month

The month of May evokes feelings of warmth, green things and rebirth. Of course as I write this it is early April and we just had one of the coldest weekends of the year. Add to that the fact that I finally put to bed the ninth *Bulletin* of my tenure and what I feel like is far closer to a cold wrung-out wet bar rag than somebody's idyllic image of spring. It really has not been that bad…never mind!

This month features what we hope will be a new column **Recollections** *with a tale by George Klein aptly titled "Recollections of a Cold War Experience"*

This *Bulletin* features a new column, one I hope catches on big, called Recollections. In this month's column George Devries Klein tells us one of the (what I am asure are) many interesting stories of his career in "Recollections of a Cold War Experience." I hope the column catches on because I know there are so many stories out there that the membership would love to read. I might even have one or two myself. So, if you like the column and have something of interest to say, please send it on in.

This month there is a continuing education short course on petroleum economics—how to determine the viability of oil and gas projects. The Geophysical Society of Houston (GSH) is hosting a golf tournament and dinner at the Kingwood Country Club and their Annual Awards Banquet at the Lakeside Country Club. Leon Thomsen, President of SEG, will give a presentation on the role of SEG in the development of geophysics in the 21st century.

The HGS General Dinner features a presentation on Pinedale Field that promises to be interesting because it demonstrates how a major can improve tight economics and increase recovery in a geologically complex and environmentally sensitive area by the intelligent use of existing technology and the innovative development of new technology. This month also features a very interesting article by Mustafa Saribudak and Bob Van Nieuwenhuise on how they used various near-surface geophysical techniques to successfully locate and image an active fault in northwest Houston. Their work demonstrates how the new generation of geophysical tools and software provides a new suite of viable techniques for near surface site characterization and mapping.

Two letters to the Editor are published this month, one by Jim Bishop and the other by Rick Garza. In conjunction with Rick's letter is a letter to the editor of the Wall Street Journal by Senator Jim Inhoff of Oklahoma and an introduction to a power point presentation by Lee Gerhard. Rick had asked me to publish the Inhoff letter along with his and had told me about the Gerhard introduction. For the sake of parity I included a short section summarizing some of the results of the series of 4 Intergovernmental Panel on Climate Change assessments, issued in 1990, 1995, 2001 with the most recent (2007) being released in parts this year. I keep reading how scientists must argue from the data, so this summary includes 3 figures (yes the hockey stick is one) used by adherents and some skeptics alike to back their conclusions on climate change.

Keep those letters coming and think about submitting one of the stories each of you has about your life in the oil patch! ■

In the News

by ***Bill Rizer***

When Did Plate Tectonics Begin?

Hubert Staudigel of Scripps Institution of Oceanography at University of California San Diego was part of an international team that discovered evidence for plate tectonics in outcrops of some of the oldest preserved crustal rocks on earth near the southwestern coast of Greenland, according to a March 22 media alert from NASA and an article by Furnes et al. (2007).

Locked within the 3.8 billion-year-old Isua Supracrustal Belt are ophiolites and seafloor pillow lavas intruded by basalt sheets (dikes) associated with seafloor spreading. This discovery means that tectonic activity as we know it began at least as far back as 3.8 billion years ago, much earlier than previously thought (2.5 billion years ago).

For further information, visit the NASA Newsroom at http://earthobservatory.nasa.gov/Newsroom/MediaAlerts/2007/2007032224607.html.

Reference

Furnes, Harald, Maarten de Wit, Hubert Staudigel, Minik Rosing and Karlis Muehlenbachs, 2007: "A Vestige of Earth's Oldest Ophiolite," *Science*, Vol. 315. no. 5819, pp. 1704–1707 DOI: 10.1126/science.1139170

In the News *continued on page 28*

Letters to the Editor

January 4, 2007
Dear Mr. Rizer,
It was helpful that this month's HGS *Bulletin* included both the AAPG's and the AGU's policy statements regarding climate change. In spite of the information contained therein, you persisted at the end of your comments in concluding that "global warming is a reality, we caused it, and we had better deal with it and deal with it now." While I agree that global warming is a reality, I very much disagree with your conclusion that "we caused it" and am alarmed by politicians and others who believe "we had better deal with it and deal with it now" via actions that may make some feel better about themselves but which at best are likely to be futile and at worst most certainly would be detrimental to many.

It would have been helpful to also include, or at the very least reference, the following additional items in the HGS *Bulletin*:

1) Senator James Inhofe's (Republican, Oklahoma) short letter to the editor of the Wall Street Journal published on Monday, December 18, 2006 with the title "What Green Activists Don't Want You To Know", and

2) the power point presentation prepared by Mr. Lee Gerhard, which can be downloaded at the following link: http://ff.org/centers/csspp/docs/gerhardppt.ppt. The file is large, about 11 megabytes or so, and is best reviewed together with the notes included in the pdf file attached. An article written by Mr. Gerhard regarding this topic appears on page 37 of the January 2007 issue of the *AAPG Explorer*.

Best regards,
R. E. Garza, P.E.
Solo Engineering, Inc.
Houston, TX 77040, 713-896-1340
Member of SPE, AAPG, and HGS

EDITOR'S NOTE: *Rick Garza and I have been talking about this issue since his letter in January. We will likely continue to ~~argue~~ talk about it for some time to come. He asked that I publish the following Letter to the Editor of the* Wall Street Journal *by Senator Jim Inhofe in conjunction with his letter. I decided to also publish another article that Rick had told me about, the introduction to a PowerPoint presentation by Lee Gerhard; for the sake of fairness in representing the "skeptic" side of the climate change issue. To be honest I believed that including Gerhard's introduction allowed me to publish a short piece for the In the News column and still feel like I was being fair.*

Letter To The Editor: What Green Activists Don't Want You To Know
By Senator Inhofe, (R., Okla.)
Chairman of the Senate Environment and Public Works Committee
The Wall Street Journal,
December 18, 2006

I write to applaud your Dec. 4 editorial "Global Warming Gag Order http://online.wsj.com/article/SB116518745569439462.html?mod=article-outset-box." I also read with interest the responses from your readers ("Senators' 'Chill Out' Letter to Exxon Creates a Heated Reaction http://online.wsj.com/article/SB116597688558448529.html?mod=article-outset-box," Letters to the Editor, Dec. 13).

As chairman of the Senate Committee on Environment and Public Works for the past four years, I have held several hearings examining the fears of man-made catastrophic global warming, and I have spoken publicly on this issue more than any other senator. Those who wish to quell opposing viewpoints on man-made global warming do so because of a number of inconvenient facts about both the science of climate change and the economic harm their proposed "solutions" would cause the American people. What the activists and special interest groups don't want you to know is that 60 scientists wrote an open letter to Canadian Prime Minister Harper this year stating, "If, back in the mid-1990s, we knew what we know today about climate, Kyoto would almost certainly not exist, because we would have concluded it was not necessary."

They don't want you to know that Claude Allegre, a leading French scientist who is a member of both the U.S. and French National Academies of Sciences, recently defected from the alarmist camp, and now says the cause of global warming is "unknown." They don't want you to know that the U.N.'s Intergovernmental Panel on Climate Change is expected to revise downward significantly its estimate of man's contribution to global warming in its upcoming Fourth Assessment Report or that another U.N. report recently found that emissions from cows were more damaging to the planet than $C0_2$ from cars.

And they certainly don't want you to know that their favored solution, the Kyoto Protocol — often referred to by supporters as merely a "first step" — would cost the average American family more than $2,700 a year while having no measurable impact on global temperature.

Despite enjoying a huge advantage in funding over skeptics, liberal special interests groups have had almost no impact in convincing policymakers to pass economically destructive climate legislation in the U.S. Now it appears those same alarmists are panicking and adopting a new agenda: to silence those who disagree with their views. I find it troubling that two of my colleagues in the Senate would join the campaign to shut down the ongoing debate on the science of global warming.

Letters to the Editor *continued on page 69*

Thursday, May 3, 2007

Lakeside Country Club • 100 Wilcrest Drive
Houston TX 77042 • Phone: (281) 497-2222
Social Hour 6:00-7:15 p.m.
Dinner 7:15 p.m.

Cost: $45.00 per person or $400.00 for a table of 10 with prepaid reservations necessary to accommodate the guarantee requirements of Lakeside Country Club.

Presidential Address
by ***Leon Thomsen***
President of SEG

Applied Geophysics in the 21st Century: the Role of the SEG

On Thursday, May 3, 2007, the Geophysical Society of Houston (GSH) will host its Annual Honors and Awards Banquet in the Ball Room of the Lakeside Country Club. The GSH will be presenting awards to our friends and colleagues who have 25 years of membership in the SEG. Those who have achieved 50, or 60 years of membership in the SEG along with this year's GSH Honorary and Life Members will be guests of the society. Bring your spouse and guests and enjoy cocktails (cash bar) from 6:00 to 7:15 PM. Then at 7:15 PM, enjoy an elegant seated dinner and music. SEG President Leon Thomsen will give the Presidential Address and assist GSH President Kathy Hardy in presenting the awards.

With the end of the era of Cheap Oil in sight, the world will need applied geophysics more than ever … the SEG will necessarily play a large role in this effort.

The cost for the dinner is $45.00 per person or $400.00 for a table of 10 with prepaid reservations necessary to accommodate the guarantee requirements of Lakeside Country Club.

With the end of the era of Cheap Oil in sight, the world will need applied geophysics more than ever. As the world's pre-eminent organization of solid-earth geophysicists, the SEG will necessarily play a large role in this effort. The magnitude of the task means that the SEG will need to expand its activities substantially, to better serve its worldwide membership. I will give you a preview of some of the exciting new things that you will be seeing shortly, and of some of the challenges that we will have to overcome to bring this off. ■

Biographical Sketch

Leon Thomsen, Principal Geophysicist at BP, holds degrees in geophysics from Caltech (BS, 1964) and Columbia (PhD, 1969). His academic career began with postdoctoral appointments at The National Scientific Research Center (CNRS) in Paris and at Caltech, followed by tenured faculty appointments at the State University of New York at Binghamton (1972–80).

His industrial career began in 1980 at Amoco's Tulsa Research Center. In 1995, he moved to Amoco Worldwide Exploration in Houston to help implement the ideas that he had earlier helped to develop. Leon now works in BP's Exploration and Production Technology Group in Houston.

Thomsen has been a leader in technical development through innovation in vector seismics: polar anisotropy, azimuthal anisotropy, azimuthal AVO, converted-waves, Life-of-Field-Seismics and pore pressure prediction. He has authored numerous SEG publications, given numerous presentations and holds several patents.

Thomsen was an early recipient (1960–64) of an SEG scholarship. He received the SEG Fessenden Award in 1994. He served as SEG Distinguished Lecturer in 1997 and as SEG/EAGE Distinguished Instructor in 2002. He is an honorary member of the Geophysical Society of Houston and of EAGE. He served SEG as vice president in 2003–04, and became an SEG Foundation Trustee Associate in 2004. He was appointed a foreign member of the Russian Academy of Natural Sciences, and given their Kapitsa Medal in 2004.

He currently serves as SEG President.

Houston Geological Society
Continuing Education Committee
PRESENTS

Removing the Mystery from International Petroleum Economics

by

Dennis Smith, IHS

NPV, Government Take, Profit Split – these are all terms commonly used to describe the characteristics and viability of upstream oil and gas projects. Learn what they really mean! This one-day course will remove the mystery of worldwide oil and gas economics. It will begin with a review of the concept of cash flow and time value of money and will progress through an explanation of royalty/tax systems and production sharing contracts. This is a "hands-on" course with concepts being reinforced through the working of problems using paper, pencil and a calculator. If you want to take the mystery out of worldwide economics in a single day, this course is for you.

Participants in this course will learn:

- Differences between royalty/tax & production sharing agreements
- Why to be cautious of Government Take Indices
- Worst Fiscal Regimes
- Identifying progressive and regressive fiscal regimes
- Calculation of economic indicators
- Best Fiscal Regimes

Thursday May 10, 2007
8 am – 4:30 pm (Registration opens at 7:30 am)

Noble Energy Conference Center
100 Glenborough Suite 100
Houston, TX 77067

Registration Form
Removing the Mystery from International Petroleum Economics
Visit www.hgs.org for details and on-line registration. Pre-registration Deadline is May 7, 4pm.
Registration form can be faxed or mailed to the HGS office.

14811 St. Mary's Lane, Suite 25
Houston, Texas 77079
Fax (281) 679-5504

Registrant Information:
Name: _____ Company: _____

Address: _____ City: _____ State: ____ Zip: _____

Phone(s): _____ E-mail: _____

Payment (USD$): _____ check or credit card (please fill in credit card information below)

Members:	**$95, before the registration deadline**	**$115, thereafter**
Non-Members:	**$125, before the registration deadline**	**$150, thereafter**
Student Members:	**$70, before the registration deadline**	**$85, thereafter**
Non-Members:	**$85, before the registration deadline**	**$105 thereafter**

Price includes continental breakfast, lunch and afternoon snack

Credit Card type (circle one): VISA MASTERCARD AMERICAN EXPRESS DISCOVER
Name on Card: _____ Billing Address: _____

Card Number: _____ 3 or 4 digit security code: _____ Exp Date (mm/yy): _____

Signature: _____ Date: _____ Card Holder Phone: _____

* Membership prices are extended to any member of (circle one): Member Number: _____
HGS GSH API Houston HAPL SIPES Houston SPE Gulf Coast SPEE Houston SPWLA Gulf Coast

Monday, May 14, 2007

Westchase Hilton • 9999 Westheimer
Social Hour 5:30-6:30 p.m.
Dinner 6:30 p.m.

Cost: $28 Preregistered members; $35 non-members & walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

by Bryan Lastrapes
Shell E&P, Pinedale Development Manager
John A. Bickley
Shell E&P, Tight Gas Task Force Manager

Pinedale Anticline Development Overview and the Role of Technology

Shell re-entered the Rocky Mountain region in 2001 as part of the company's global strategic goal to expand its presence in onshore North America gas. This effort involved both the rejuvenation of an active exploration effort and the successful acquisition of a significant interest in the Pinedale Anticline, Wyoming. It was clear from the start that, to maximize Shell's opportunity in Pinedale's tight natural gas reservoirs, drilling and completion costs had to be reduced and gas recovery improved. This would require the application of both existing and new technologies in the drilling and completion operations and an in-depth understanding of the field's reservoir characteristics.

…drilling and completion costs had to be reduced and gas recovery improved. This would require existing and new drilling and completion technologies and a deeper understanding of the field's reservoir characteristics.

Although Shell USA has previous experience developing tight gas fields in the south Texas and Michigan areas, Pinedale's reservoir characterization and performance presented challenges beyond existing capabilities. These challenges were further compounded by highly variable drilling and completion conditions and very demanding environmental restrictions. To meet these challenges, in August 2002 Shell formed an internal Tight Gas Task Force, a team of technical experts who were charged with working closely with the Shell Rocky Mountain Asset to find ways to apply or modify both existing and new technologies to help reduce costs and maximize reservoir recoveries. This effort is proving successful, with task force and asset team members identifying and applying more efficient and cost-effective development methods. Well performance is improving and the recovery of reserves is increasing in this very complex reservoir. ■

Biographical Sketches

Bryan has spent 25 years with Shell E&P in various assignments. He began as a petrophysical engineer, working in the Gulf of Mexico and Gulf Coast region and then international exploration and development projects. Following assignments in corporate planning and administration, Bryan managed field and business development activities in Cameroon, Brazil, Eastern Europe and Central Asia. After leading the effort to acquire the Pinedale Anticline assets in 2001, Bryan assumed his current position in Denver as Development Manager for Shell's Pinedale Anticline assets.

John holds a BS in Geology (1974) from Baldwin-Wallace College and an MS in Geology (1976) from Akron University. He has over 30 years of industry experience including the last 21 years at Shell. At Shell he has worked in a variety of domestic and international, technical and supervisory positions in both operational and research settings. Since 2003 he has led a multidisciplinary team of senior technical experts working to improve Shell's development capabilities in and understanding of unconventional gas reservoirs.

Tuesday, May 15, 2007

Crowne Plaza Hotel (formerly Hotel Sofitel) • on Beltway 8 near IAH airport
Social 11:15 a.m., Luncheon 11:30 a.m.

Cost: $30 Preregistered members; $35 non-members & walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

HGS Northsiders Luncheon Meeting

by ***Frank Mango***
Petroleum Habitats
and ***Daniel Jarvie***
Humble Instruments

Catalytic Gas in Deltaic Basins

Thermodynamic equilibrium is a fundamental characteristic of a catalytic reaction sustained over time. The proposal that natural gas is largely catalytic (Mango, 2000) would suggest that natural gas should be at or very close to thermodynamic equilibrium, particularly when gas resides in active reservoirs over geologic time. In the Gulf of Mexico, deltaic reservoir rocks with interbedded marine shales (Paine, et al. 1968) show high levels of catalytic activity in our laboratory experiments. If equally catalytic in the subsurface, their gas compositions should be near thermodynamic equilibrium K (T) for reservoir temperatures T according to:

$$([C_2]^2 / [C_1][C_3]) = K(T) \qquad (1)$$

There is now substantial evidence that non-biogenic gas is largely catalytic as opposed to thermogenic … gas compositions should be near thermodynamic equilibrium … for reservoir temperatures."

This proved to be the case for the 64 gas deposits published in Paine, et al. (1968). Since the equilibrium compositions corresponded to reservoir temperatures, they suggest in situ catalytic oil-to-gas at reservoir temperatures. We estimate >> 10^9 years to attain equilibrium thermally at these temperatures, and < 10^6 years catalytically and therefore must rule out in-reservoir thermal cracking as the source of equilibrium.

There is now substantial evidence that non-biogenic gas is largely catalytic as opposed to thermogenic. Thermal cracking is inherently a low-methane process, typically yielding gas with between 30 and 60 % wt CH_4 (C1-C4), while natural gas is rarely found with this composition and more typically contains ~ 85% CH_4, the composition of catalytic gas generated in marine shales. One hypothesis for the discrepancy is that gas is somehow fractionated between source and reservoir (Price & Schoell, 1995; Snowdon, 2002). Although methane enrichment can be obtained through physical fractionation, thermodynamic equilibrium cannot. Because gas compositions from thermal cracking are far from equilibrium, it is impossible to explain deltaic gas compositions at equilibrium without invoking robust catalytic intervention. ■

References

Mango, Geochim. Cosmochim. Acta. 64, 1265-1277 (2000).
Paine et al., Memoir 9, Vol I, AAPG (1968).
Price & Schoell, Nature 378, 368-371 (1995).
Snowdon, Org. Geochem. 32, 913-931 (2001).

Biographical Sketch

Frank D. Mango received his PhD in 1963 in organic chemistry at Stanford University. He joined Shell Oil Company that year working in metal catalysis, petroleum chemistry and geochemistry. He retired from Shell in 1991 and joined the Department of Geology and Geophysics at Rice University as an adjunct professor. He was a research scientist and the principle investigator on consecutive DOE grants (Transition Metal Catalysis in the Generation of Oil and Natural Gas) in the Department of Chemical Engineering from 1992 to 2002. He has 36 publications and 9 patents in catalysis and geochemistry, and was awarded Best Paper in Organic Geochemistry in 1990, by the Geochemical Society. He is the founder and CEO of Petroleum Habitats, a service company that predicts oil or gas in target reservoirs based on a proprietary rock assay for oil-to-gas catalytic activity (US Patent 7,153,688).

Tuesday, May 15, 2007

Environmental and Engineering Group Dinner Meeting

New Location Cheddar's • 10601 Westpark Drive
(the southwest corner of Westpark and Beltway 8)
Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 non-members & walk-ups

Make your reservations now on-line through the HGS website at www.hgs.org, by calling 713-463-9476 or by e-mail to Sandra@hgs.org (include your name, meeting you are attending, phone number and membership ID#).

by ***Paul S. Lewis***
Texas Commission on Environmental Quality

Texas Risk Reduction Program Rule Revisions

The Texas Risk Reduction Program (TRRP) rule, found at Title 30 Texas Administrative Code Chapter 350, was first promulgated in 1999. The TRRP rule combined elements of two previous rules to create a unified risk-based approach to be used by all regulatory programs in the Remediation Division, such as waste unit closures and cleanups, underground storage tank release sites, superfund sites and (increasingly more common) contaminated sites discovered by due diligence efforts preceding a real estate sale. This year the TRRP rule underwent its first major revision since initial enactment. The rule revision effort started with a list of relatively minor corrections and clarifications to be addressed. The final rule ended up with those as well as a few items of major significance:

… the Texas Risk Reduction Program (TRRP) … rule revision effort started with a list of relatively minor corrections and clarifications … but ended up with those as well as a few items of major significance.

A variance was added to allow certain above ground storage tanks (AST) and underground storage tanks (UST) to exit TRRP regulation and revert to previous rules (Chapter 334) if specific conditions are met. The UST must have been permanently removed from service, or the AST removed from the site, prior to the TRRP applicability date of September 1, 2003. A release had to have been reported after that date. If the tank is located within 0.25 mile of other AST/UST release sites with similar releases and subsurface conditions but are regulated by Chapter 334, the person can request to be regulated by Chapter 334 instead of TRRP. (See revised §350.2(g: 1–7)).

The process for screening chemicals of concern (COC) has been simplified. The TRRP rule does not specify what chemicals must be analyzed in samples of soil or groundwater because COCs are to be specified by the regulatory programs. In practice, site assessors will request suites of analyses, such as VOAs, SVOCs, metals, etc., to be run on samples and sort out later what chemicals are or are not actually present in the release. Frequently, many chemicals not relevant to the release cannot be screened out because the sample detection limits are too high relative to the cleanup levels. The TRRP rule has been modified to eliminate these "ghosts" or non-COCs based on reasonable knowledge of site history and non-detection. The sensitivity of non-detection is no longer tied to a cleanup level. (See revised §350.71(k))

A new section has been added in anticipation of requiring accurate spatial coordinates and associated data attributes, in addition to moving to an electronic reporting system. The Texas Commission on Environmental Quality (TCEQ) is in the process of procuring an electronic data management system, to be known as Texas Environmental Data System, which will facilitate electronic submission of reports. The TCEQ will announce when the system is ready. In the meantime, the TCEQ will still require paper reports but may start to request accurate spatial data for sample locations and water wells, for example, in support of contamination notices required by other statutes. (See new §350.90)

The revised TRRP rule was published in the *Texas Register* on Friday, March 16, 2007 and became effective on Monday, March 19, 2007. The complete TRRP rule and revisions adoption preamble can be downloaded from http://www.tceq.state.tx.us/rules/ indxpdf.html#350. ■

Biographical Sketch

Paul S. Lewis graduated from Widener College with a BS in management in 1972. After two years of military service in Texas, he entered the University of Texas at Austin and received an MA in geology in 1978. Professional employment began with Pennzoil in Houston as a reservoir development geologist in 1977. He joined the Texas Department of Water Resources in 1979. Duties with the Commission and predecessor agencies have varied between technical and management including manager of the Corrective Action Section from 1992 to 1998. He chaired the committee of staff volunteers who developed the 1993 Risk Reduction Rules and was part of the rule-writing team for the Texas Risk Reduction Program rule of 1999. His current assignment as a technical specialist includes developing guidance and training for the Texas Risk Reduction Program rule and review of Voluntary Cleanup Program documents. He is a licensed professional geoscientist in Texas.

Thursday, May 17, 2007

Petroleum Club • 800 Bell (downtown)
Social 11:15 a.m., Lunch 11:45 a.m.

Lunch meetings are $30 per person (until the Tuesday before the meeting); $35 for late registrations and at the door - no shows will be billed. Register online at http://www.sipes-houston.org/.

SIPES
Luncheon Meeting

*by **Richard L. Adams***

Basement Tectonics and the Origin of the Sabine Uplift

The origin of the Sabine Uplift can be found in the same processes that formed the Gulf of Mexico (GOM) Basin. The Sabine Uplift is supported by a large rhombic basement block that originated as a mid-rift high during the Triassic rifting phase of the opening of the GOM. Although this area is referred to as a basement block, it is in reality an area some 90 miles long by 60 miles wide, across which the depth to magnetic basement is up to 10,000 ft shallower than in the middle of the East Texas Salt Dome Basin. The northeast and southwest boundaries of this basement block are major transform (transfer) fault systems that parallel the opening of the Gulf of Mexico. The northwest boundary is the East Texas Salt Dome rift basin and the southeast side steps down into the South Louisiana Salt Dome Basin. Within this mid-rift high, multiple smaller transform faults and horst and graben structures are evident by mapping the base of the Louann Salt on seismic data. These structures have influenced sedimentation on a local level. Further uplift of this mid-rift high occurred during the Middle to Late Cretaceous and Paleocene-Eocene due to Laramide foreland compression from the southwest.

Middle to Late Cretaceous Laramide foreland tectonics involved lateral compression from the southwest that formed a foreland fold pair, the Sabine Uplift and the North Louisiana Salt Basin.

The mid-rift high was nearly covered by Louann Salt. At the same time, an estimated 5,000 to 7,000 feet of salt was being deposited in the East Texas Salt Dome Basin. Salt isochrons can thus tell us something of both the external and internal shape of the mid-rift high. Two notable salt isochron thins are evident on the structure: the Halbouty Ridge along the Smith-Rusk County line and the San Augustine High, both defined by thin or absent salt.

The shape of the mid-rift high has also influenced younger sedimentary depositional patterns. Southwest of the Trinity River and east of the Louisiana state line, the Haynesville-Bossier-Cotton Valley (HBCV) system is aggradational—major system tracts are stacked vertically. But, the presence of the mid-rift high forced the HBCV system to prograde across a flat marine shelf over the mid-rift high. Thus, over the Sabine Uplift the same system tracts cover an area that is nearly three times as wide as their coverage to the southwest or to the east.

The mid-rift high was a shallow marine shelf during the Cotton Valley sand deposition. The Cotton Valley sands across the mid-rift high are shoreface sands that were laid down along a shoreline that extended from southwest to northeast across the shallow shelf. The sands of Overton (Cotton Valley) Field, as well as the sands at Oak Hill, Willow Springs and Carthage, are all examples of this deposition. Thin widespread limestone beds are present within the Cotton Valley across the Sabine Uplift. These limestones are interpreted as transgressive shell lags and back-bay oyster beds. The position of the active shoreface systems prograded through time, with the oldest system to the northwest and the youngest migrated to the southeast.

Middle to Late Cretaceous Laramide foreland tectonics involved lateral compression from the southwest that formed a foreland fold pair, the Sabine Uplift and the North Louisiana Salt Basin. Estimates of the amount and timing of that uplift are consistent with earlier studies dating back to Granata, in 1953. Younger Paleocene-Eocene compression reactivated the uplift again. Pre-Jurassic transform (transfer) fault lineations along NW–SE lines strongly influenced the shape and style of the resultant uplift. The current outline of the Sabine Uplift as defined by the edge of the Wilcox outcrop is very rectangular along a NW–SE axis.

Any exploration program for the Sabine Uplift area should include a serious consideration of Laramide compressional tectonics, sub-salt structuring, and both gravity and magnetic mapping early in the evaluation. ■

Biographical Sketch

Rich Adams was born and raised in northern Indiana. He received a BS in geology (with Honors) from Indiana University in 1973 and an MS in geology from the **SIPES** *continued on page 21*

Sipes Meeting continued from page 19

University of Wisconsin–Madison in 1975. He worked for Exxon Company, USA, in New Orleans from 1975 to 1979. He moved to The Woodlands in 1979 to work for Mitchell Energy and Development Company where he remained until 1999. In 2000 Rich joined Carr Resources, Inc., in Tyler, Texas, where he still works today.

Rich has published several papers on the uses of basement tectonics in both exploration and development geology and has spoken often to local and regional geological societies on that topic. In his current position he is actively exploring the East Texas Basin and surrounding areas using his ideas on basement tectonics to help guide the company's exploration effort.

Rich currently lives near Lindale, Texas, with his wife, Marsha. He enjoys hunting, fishing, golf and, believe it or not, work.

NeoGeos News

by ***Dianna Phu***

Central Texas Field Trip - March 10-11, 2007

On the weekend of March 10-11, as others prepared to set their clocks ahead for Daylight Savings Time, the NeoGeos were gearing up for a fantastic field trip to Central Texas. Designed as an introduction to the geology of Texas and the application of basic geology observational skills, the trip encompassed several traditional geologic landmarks of the Llano Uplift, including Hoover Point, Enchanted Rock and the Llanite Dike. One of the field trip attendees, Taka Kanaya, is our "Reporter from the Field":

"We visited over 10 outcrops from Cenozoic coastal plain through Paleozoic igneous and metamorphic rocks around the Llano area over the weekend. Led by Tom Miskelly (Geology Professor, San Jacinto College South), the group comprised 25 participants including geologists, students and engineers from Houston, Dallas, Austin and College Station. Most outcrops were road-cuts, but the trip also incorporated a hike up Enchanted Rock and within Inks Lake State Park. Most of the group stayed in Fredericksburg overnight and enjoyed German beverages, followed by BBQ for lunch in Llano.

The NeoGeos at Hoover Point: *Front row (left to right): Riv Yadin, Mary Strauss, Vanessa O'Brien, Jennifer Hoyt, Brittney Blake, Cris Hussar, Tom Miskelly. Middle row (left to right): Ron Mart, Pilar Ndong, Heather Harris, Jennifer Sherard, Sue Ellen Jeffers, Laura Lopez, Dianna Phu. Back row (left to right): Josiah Strauss, Taka Kanaya, Kevin Fox, Jerry Lopez, Ben Lopez, Loc Phu, Jason Braden, Greg Carson. On the trip but not present at the time of photo: Seva Egorov, James Cokinos and Raj Eti*

At each stop, we learned how the outcrop fits into the regional tectonic history of Texas. Geology 101-type observation skills were also introduced to non-geologists (a refresher for some!). On the soft rock outcrops there were discussions about the sedimentary architecture of the outcrop compared to the structure imaged by seismic data, i.e. how would this look on seismic. An outcrop of the Wilbern Formation reminded us how the geometry of channel fill sandstones may look in reservoirs in deep water. At Longhorn Caverns, participants with geology and engineering backgrounds shared experiences with common drilling problems associated with carbonates and karst environments. I thought sharing geological and industry knowledge at the outcrops was the most meaningful experience we had on the trip.

The trip also proved an excellent networking opportunity for people at various stages of their careers—working for major oil companies or small service companies, undergraduate students or PhD candidates, and everything from the non-geologist to the experienced professional. Since I just started my professional career this January, it was a great opportunity to get to know how new hires in different companies learn the basics in this industry. We also shared how we could promote activities and communications for young professionals in oil and gas. Overall, I thought a weekend trip like this was a great place to make new friends while learning something applicable to my career."

Photos and discussion regarding this trip are posted on the Message Board in the NeoGeos Announcements forum at http://www.neogeos.org. Keep an eye out for future events like this and for workshops, volunteer opportunities and socials. If you are interested in joining the NeoGeos email distribution list, send a note to neogeos_houston@yahoo.com. Happy Networking! ■

Golf Tournament and Dinner
Geophysical Society of Houston

DATE:	**Monday, May 14, 2007**	**FORMAT:**	**Four Man Florida Scramble**
PLACE:	**Kingwood Country Club**	**COST:**	**$125.00 per person**
TIME:	**9:30 AM Registration** **11:30 AM Tee off (Shotgun)**	**DEADLINE:**	**APRIL 15, 2007**

MAIL ENTRIES TO:
Fairfield Industries
14100 Southwest Freeway
Suite 600
Sugar Land, TX 77478
Attn: George Lauhoff
281-275-7623

MAKE CHECKS PAYABLE TO:
Geophysical Society of Houston
OR Circle one:
AMEX VISA MC

Card # _____
Expiration Date: _____
Signature: _____

GOLFERS READ CAREFULLY

No entry will be accepted until the entry form and fees are received in full. **DON'T BE LATE WITH YOUR ENTRY FORMS AND FEES. AFTER THE APRIL 15TH DEADLINE, THE COST PER PERSON WILL BE $150.00 !!!**

MULLIGANS $5.00 EACH (MAX. 2/PERSON) AVAILABLE AT CHECK-IN

If you are not playing golf but want to join your friends attending the dinner following the tournament, please send in $15.00 per person to cover the cost of the dinner. Make a note at the bottom of the check "Dinner Only". These checks should also be payable to the Geophysical Society of Houston.

GOLF TOURNAMENT FORM
You may select your own foursome, if not you will be assigned to a group. The first name listed will be considered the TEAM SPOKESPERSON.

Name: _____		**Name:** _____	
Company: _____		**Company:** _____	
Phone: _____	**HDCP:** _____	**Phone:** _____	**HDCP:** _____
Name: _____		**Name:** _____	
Company: _____		**Company:** _____	
Phone: _____	**HDCP:** _____	**Phone:** _____	**HDCP:** _____

Course Preference: ISLAND LAKE MARSH
(Circle One)

Thursday, May 17, 2007
Thursday, May 17, 2007 6:30 PM
University of Houston Hilton
For more information go to the HEC Web site at: http://www.houstonenergycouncil.org/

by ***Carl Weston Myers***

Gulf Coast Salt Domes: A Potential Underground Space Resource for the Nuclear Renaissance?

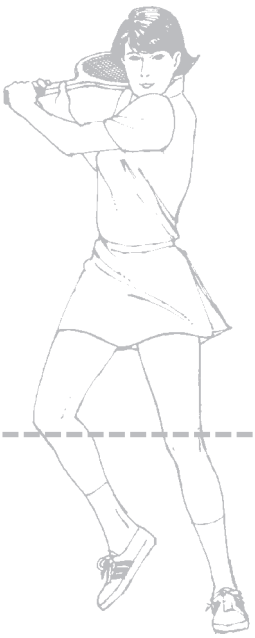
By mid-century, 200 or more new nuclear power plants could be deployed in the U.S. to meet the growing demand for electricity. The conventional approach would be to site these new reactors at the earth's surface. An alternate approach would be to site them underground. Past studies of underground siting indicated a number of safety and security advantages, and no insurmountable engineering problems, but an almost certain cost increase resulting from underground construction. However, a new concept for underground reactor siting—the underground nuclear park—has the potential to actually reduce cost relative to surface siting. Massive salt deposits, both bedded and domal, are a potentially favorable rock type for hosting underground nuclear parks. The shallow piercement salt domes in the Gulf Coast sedimentary basin should be examined for this application. The idea would be to site an array of nuclear reactors, each within its own sealed and isolated chamber, hundreds of feet deep inside one or more salt domes. Nuclear waste management facilities supporting the reactors would be collocated nearby and connected to the reactors by tunnels. Energy conversion equipment could be either underground or at the earth's surface. The heat transfer fluids that move through the reactor cores would be isolated from the earth's surface using heat exchangers. If underground nuclear parks in Gulf Coast salt domes should prove feasible, then they could be used to supply baseload and peaking electricity, and possibly hydrogen, to the region and nation analogous to oil and gas today. ■

If underground nuclear parks in GulfCoast salt domes should prove feasible, then they could be usedto supply baseload and peaking electricity, and possibly hydrogen, to the region and nation analogous to oil and gas today.

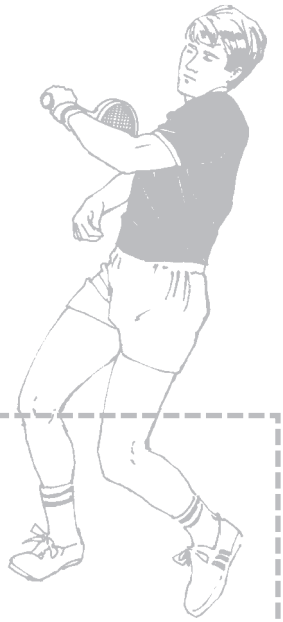
Biographical Sketch

Dr. Carl Weston (Wes) Myers worked at Los Alamos National Laboratory from 1981 to 2005. Wes has held several R&D management positions and founded and served for 12 years as the division leader of the Earth and Environmental Sciences Division. In that position he was involved in scientific and engineering studies of the proposed nuclear waste repository site at Yucca Mountain, and also developed collaborative R&D projects with the U.S. oil and gas industry. He served two years in Washington D.C. where he assisted the Department of Energy with international cooperative activities in geologic disposal of nuclear waste—with emphasis on Russia. Prior to Los Alamos, he worked for 5 years with Rockwell Hanford Operations where he pioneered the application of borehole-based paleomagnetic and wireline logging techniques to identify and correlate basalt units in the deep subsurface of the central Columbia Plateau. Early in his career he was an assistant professor at Appalachian State University in Boone, North Carolina, and development geologist with Chevron in Lafayette, Louisiana. In 2002 he developed the concept of the underground nuclear park as a possible new approach for deployment of nuclear power reactors and their supporting waste management facilities. He retired from Los Alamos in 2005 to expand and promote the concept. He received a BS and MS in geology from the University of Georgia, a PhD in Earth Sciences from the University of California at Santa Cruz, and completed a Post-Doctoral Fellowship at the State University of New York at Stony Brook.

Editor Note: *The Houston Energy Council was founded in 1999 to benefit the associated member societies and to promote communication and cross-discipline programs for societies related to the Houston energy industry.*



HGS Tennis Tournament



Friday, May 18, 2007

Location: Houston Racquet Club
10709 Memorial Drive

Time: 11:45 a.m. to 5:00 p.m.

Prizes: Div. A & B Prizes

Send a check for $50.00 and entry form to: DAVIS BROS.
1221 McKinney, Suite 3100, Houston, Texas 77010
Attn: Ross Davis, Tournament Director
Call (713) 659-3131 with questions; Fax (713) 659-8070
Rossdavis@davisbros.com

Name: _____

Address: _____

Phone: _____ Work Phone: _____

Rank (A, A-, B): _____ E-Mail: _____

HGS Welcomes New Members

Effective April 10, 2007

ACTIVE MEMBERS

Ricky Boehme
Andy Duncan
Chris Fletcher
Steve Georgeson
Kenneth Harkins Jr.
Keith Hatch
Louis Janos III
Robert Kervin
Jessica Maddox
Justin McMahan
Anna Morisani
John Nelson
John Northcott
Vanessa O'Brien
Austin Roelofs
Carlos Spindoca
Michael Sweigart
Howard Titchmarsh
John Skelton

Welcome New Members

Monday, May 21, 2007

HGS International Explorationists Dinner Meeting

Register Now! Registration deadline is Friday, May 18 5:30 PM
Westchase Hilton • 9999 Westheimer
Social Hour 5:30-6:30 p.m.
Dinner 6:30 p.m.

Cost: $28 Preregistered members; $35 non-members & walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

by ***Jack Kerfoot***
Vice President
Exploration GOM
Murphy Exploration and Production

Exploration & Production Trends and the Emergence of the National Oil Companies

University and College Students Please Note: the first 14 students can attend for free, compliments of Swift and ConocoPhillips. Additional students will be charged the emeritus rate, half the regular member rate. Students are encouraged to call the HGS office in advance of the meeting they wish to attend and to make a reservation; but walk-ins are also accepted at events. Students will need to identify themselves and provide school name and ID.

Global market forces have created a dynamic, even volatile business environment for the oil and gas industry. As a result, the oil and gas industry has undergone numerous periods of expansion and contraction that have not always been associated with the price of the commodity.

Historically, the oil and gas industry can be classified into three distinct periods; *"Private Sector Growth—1880 to 1935," "National Oil Company Growth—1936 to 1985" and "Private Sector Consolidation—1986 to Present."*

The rise to prominence of the national oil companies has already resulted in dramatic changes to the global exploration and production trends and energy.

Each period can be characterized by distinct economic drivers that resulted in unique outcomes for the oil and gas industry. As an example, the current Private Sector Consolidation Period marks the precipitous decline of the private sector major operators and the emergence of the national oil companies as the leaders of the global energy industry. The rise to prominence of the national oil companies has already resulted in dramatic changes to the global exploration and production trends and energy. ■

Biographical Sketch

JACK KERFOOT is the Vice President, Gulf of Mexico Exploration, for Murphy Exploration & Production. His thirty year journey in the energy industry has taken him to over twenty geologic basins on five continents. He has over twenty years management experience with both major and independent operators. He has degrees in geology and geophysics from the University of Oklahoma and has also studied law at Oklahoma City University, economics at Wharton School at the University of Pennsylvania and business at Pennsylvania State University.

7th ANNUAL GSH/HGS SALTWATER FISHING TOURNAMENT

Saturday, June 16, 2007

April Fool Point Marina San • Leon, Texas

Galveston Bay Complex and Offshore

This year's Saltwater Fishing Tournament will include an Offshore Division to be held on Saturday, June 16 at the April Fool Point Marina, San Leon, Texas. We are looking forward to a big event this summer and we encourage full family participation.

Galveston Bay Complex Division

Trophies will be awarded for the heaviest individual Redfish (Non-Tagged), Speckled Trout and Flounder. Trophies will also be awarded for the heaviest individual Stringer-1 Redfish, 3 Speckled Trout, and 1 Flounder.

Galveston Offshore Division

Trophies will be awarded for the heaviest individual Red Snapper, King Mackerel, and Dolphin.

Registration fee includes: Launch Fee, GSH Fishing Cap, Fish Fry Meal after weigh-in, Refreshments, Trophies, and DOOR PRIZES.

For more information, please contact:

Bobby Perez (HGS & GSH) • 281-240-1234 ext. 219 Office • 281-240-4997 Fax • 281-787-2106 Cell • 281-495-8695 Home

E-mail addresses: rdphtx@aol.com or r_perez@seismicventures.com

The Geophysical Society of Houston and the Houston Geological Society are non-profit organizations serving the Geoscience Community. Corporate and individual contributions are appreciated and will be acknowledged on several sponsor boards and banners at the Weigh-In Station and Marina. All contributors will be recognized in the GSH newsletter and HGS *Bulletin* following the tournament. This is a great way to entertain friends, family, business associates and clients. So spread the word!

GSH/HGS SALTWATER TOURNAMENT

NAME: _____ COMPANY: _____

ADDRESS: _____

PHONES: (H) _____ (B) _____ (C) _____

E-MAIL ADDRESS: _____

Upon receipt of the registration form, each participant will be provided with a copy of the specific tournament itinerary and rules sheet by e-mail. Please register **EARLY.**

Please return this form with your check for $60.00 per contestant payable to:
GSH/HGS SALTWATER TOURNAMENT and Mail to:
Ms. Lily Hargrave, 14811 Saint Mary's Lane, Suite 250 (Houston, Texas 77079

Registration Fee: $ _____ + Sponsor Contribution: $ _____ = TOTAL $ _____

DISCLAIMER:
I acknowledge that neither the Geophysical Society of Houston nor the Houston Geological Society will be held responsible for injury or accidents during this event. PRACTICE SAFETY!!!!!

Signature: _____ Date _____

Tuesday, May 29, 2007

HGS North American Explorationists Dinner Meeting

Westchase Hilton • 9999 Westheimer
Social Hour 5:30-6:30 p.m.
Dinner 6:30 p.m.

Reservation Deadline: Noon, Friday, May 25, 2007
Costs before deadline: Member 28.00, Non-Member 35.00, Emeritus 14.00
Costs after deadline: Member 35.00, Non-Member 35.00, Emeritus 17.50

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

by ***Matt B. Williams***
and ***E. Blanche Ramsey***
Southwestern Energy Production Co.
Houston, TX

Overton Cotton Valley Sand Field, Smith and Cherokee Counties, Texas: Expansion, Development and Optimization of a Jurassic Tight Sandstone Reservoir

Overton Field is located in Smith and Cherokee Counties, Texas, approximately 20 miles southeast of Tyler on the western flank of the Sabine uplift in the East Texas basin. The field produces from the Taylor interval, the lowest member of the Jurassic Cotton Valley Sand (CVS). The Taylor in the field area has been divided into four mappable sand packages separated by shale intervals. As is typical of most production from the Cotton Valley, these sands have**very low permeability, with the distribution of rock quality controlled by a complex depositional and diagenetic history. Data from the field document the low permeability and stratigraphic nature of the reservoir. Core data confirms deposition of these sands in a shore face environment. Thin section and SEM work highlight the effect of clay linings in inhibiting quartz overgrowths.

Integration of geologic and engineering data … has resulted in significant additional natural gas resource development and production as well as an efficient and comprehensive development of the field.

Discovered by American Petrofina in 1978, the field has experienced both an initial development phase and a more recent significant expansion and infill. Field production is currently in excess of 100 MMCFD with over 300 wells drilled. Integration of geologic and engineering data has resulted in optimized well locations and field extension as well as enhanced completion confirmed the orientation and extent of hydraulic fractures, aiding in optimal field development. This has resulted in significant additional natural gas resource development and production as well as an efficient and comprehensive development of the field. In addition, this field represents a model for low-permeability sandstone reservoir accumulation and development that can be applied in other hydrocarbon producing regions. ■

Biographical Sketch

Matt Williams joined Southwestern Energy in Houston in 1998 and is currently Senior Staff Geologist, responsible for Exploration and New Venture Development in east Texas and north Louisiana. In addition, he has generated new venture projects in Louisiana, south Texas and the Permian Basin for Southwestern Energy. Matt previously worked for Occidental in International and Domestic Exploration and Production, where he was Chief Geologist for Occidental of Oman. In addition, he has worked for ARCO Alaska and Tenneco since beginning his career in 1983. Matt has a BS from Texas Tech University and an MS from Texas A&M. He is a Texas Professional Geologist and a member of the AAPG, HGS and ETGS.

Wednesday, May 30, 2007

Petroleum Club • 800 Bell (downtown)
Social 11:15 a.m., Lunch 11:45 a.m.

Cost: $30 with advance reservations, $35 for walk-ins, space available ($15 for Emeritus and Honorary).

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

*by **Dan B. Steward***
Consulting Geologist
Republic Energy

The Barnett Shale Play: Phoenix of the Ft. Worth Basin, a History

Mitchell Energy performed its first Barnett test in 1982. The well was the C.W. Slay #1 in southeastern Wise County, a failed exploratory deepening for the Viola limestone. Many things had to come together in a timely manner for this test to have been considered. The limited gas recovered on the initial frac gave enough encouragement to pursue a better understanding of this source rock and the technology that might be required to make this almost slate-like rock a producing reservoir.

The Ft. Worth Basin Bend Conglomerate had been a significant source of income for Mitchell Energy and the leases, employees and infrastructure associated with it made up a large part of the company's assets. In 1982, our evaluation of the Bend Conglomerate, the dominant producer in the basin, suggested our production base could be sustained through the early 1990's, but would be impossible to maintain after that time. We were given a charge by George Mitchell to find something to take the place of the "Bend" and maintain our existing assets. Many different exploration targets in the basin were reviewed, the Barnett being one of them.

We were given a charge by George Mitchell to find something to take the place of the "Bend" and maintain our existing assets. Many different exploration targets in the basin were reviewed, the Barnett being one of them.

Over the next 10 years a data base was put together and technology was developed that would allow a small area of Barnett in eastern Wise and western Denton Counties to be commercial under the favorable gas prices provided in our Natural Gas Pipeline contract. However, this contract was a two-edged sword, it provided for a production ceiling that could not be exceeded except on demand. ■

Biographical Sketch

Dan Steward is a consulting Geologist with Republic Energy Inc. in Dallas, Texas. During the period 1981–2001 he worked for Mitchell Energy and was a member of the team responsible for recognizing, evaluating and evolving the Barnett Shale play in the Fort Worth Basin.

In the News *continued from page 7*

For the Record

By now we have all read that climate change occurs continually and with a measure of periodicity over time scales ranging from days to millions of years. Nevertheless, the changes in climate over the latter part of the twentieth century are "unprecedented in hemispherical and most likely global scales" according to Jones and Mann (2004) among many others. The qualifiers *hemispherical* and *global* are important, because changes on a local or regional scale (e.g., the "Little Ice Age" and "Medieval Warm Period") can and have been at least equally dramatic. But, they have occurred on a **regional, not global,** scale and cannot be compared to the global warming observed over the past century (Figure 1). There are portions of the earth that have actually been cooler in recent years, while the global temperature has become considerably hotter.

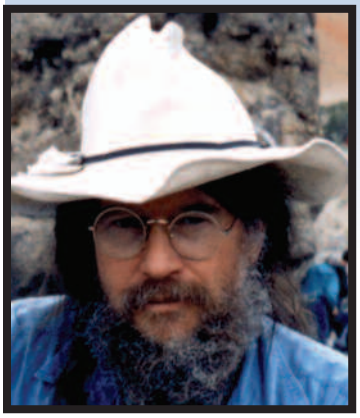
Focusing on the past millennium, natural causes can explain all the larger scale climate changes that have occurred through the 19th century, but it is necessary to include anthropogenic forcing to explain the anomalous warming that has occurred beginning in the latter part of the 20th century (Jones and Mann, 2004). This is documented further in the most recent Intergovernmental Panel on Climate Change (IPCC) Report (2007) discussed below.

In the News *continued on page 35*

HGS Guest Night – Saturday, June 16, 2007

Houston Museum of Natural Science 6:30 P.M.–10:30 P.M.

AMAZING FOSSILS from the Permian of Texas



Speaker: Dr. Bob Bakker PhD

Dinosaur Curator for the Houston Museum of Natural Science

Author of the *Dinosaur Heresies* and *Raptor Red*

The Guest Night program includes door prizes, a buffet dinner and social hour. Use the HGS Website to sign up and pay by credit card. OR fax or mail this form to the HGS office to reserve spaces for this sell-out event. The HGS must receive payment in advance! No sales at the door.

Adults: $30 each, HGS members: please include your member number

Name: _____ Member # _____

Name: _____

Name: _____

Students (grades 1-college) $25 each

Name: _____

Name: _____

Total amount: _____

Send check and form to: HGS Office, Guest Night 2007, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079
or fax this form with credit card number to 281-679-5504

Credit Card number and type: _____

_____ **Expiration Date (required):** _____

Name on Credit Card: _____

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Many thanks to our Guest Night corporate sponsors

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HGS Guest Night June 16, 2007 Amazing Fossils from the Permian of Texas– New Insights and New Ideas on Reptiles and Dinosaurs

article by ***Bill Osten, Linda Sternbach*** *and* ***Kara Bennett,*** *Guest Night Committee*

Featured speaker: Dr. Bob Bakker

This year's HGS Guest Night program will have a paleontological theme and feature Dr. Bob Bakker, a well known expert on dinosaurs and author of the book *Dinosaur Heresies*, as the evening's keynote speaker in the IMAX theatre. Dr. Bakker is sure to inspire and entertain as he discusses his research on dinosaurs and his efforts with the Houston Museum of Natural Science to expand the collection of fossil dinosaurs and Permian amphibians.

The goal is to make Houston the home of a world class collection of Permian dinosaur, reptile and amphibian fossils.

As Visiting Curator of Paleontology for the museum, Dr. Bakker has a key role in the expansion of the fossil collection planned for the next few years. The goal is to make Houston the home of a "world-class collection" of Permian dinosaur, reptile and amphibian fossils.

The 2007 Guest Night program will start at 6:30 p.m. at the Houston Museum of Natural Science. As is traditional, the HGS has the first and second floors of the museum reserved for the evening. After arriving and checking in, HGS members and guests will have about an hour and a half to enjoy the fossils, minerals, oil and gas, and other exhibits. Attendees will enjoy a Texas-sized buffet dinner, beverages and dessert inside the Museum's main hall during a social period. Dr. Bakker will present an entertaining and interactive talk from 8:00 to 9:00 p.m. in the IMAX theatre. To top off the night, lucky Guest Night attendees will be awarded door prizes that include beautiful mineral samples, fossils and dinosaur-themed souvenirs.

The 2007 HGS Guest Night program is limited to 400 people due to seating capacity limitations of the IMAX theatre. Prepayment is required, and and tickets will NOT be available for walk-ins. Register early and pay online using the HGS Website, or pay by check and fill out and mail the registration form published in this issue of the *Bulletin*. Members can also pay by faxing credit card payment information along with their registration to the HGS office. The form and further instructions are on page 30.

Biographical Sketch

Bob Bakker is one of modern paleontology's best known characters. In 1986 he made a huge public splash with his entertaining book *Dinosaur Heresies: Unlocking the Mystery of the Dinosaurs and their Extinctions* (Figure 2) where he explained that dinosaurs were most likely warm-blooded, fast-moving and related to birds. Bakker grew up in New Jersey, studied paleontology at Yale University with professor John Ostrom and received a PhD from Harvard University in 1976. As a PhD student, he was in charge of the Harvard comparative anatomy labs, honing his skills as an illustrator of modern birds and reptiles. He taught at the University of Colorado and has held numerous positions at museums in Colorado and Wyoming, including the Tate Museum, where he was Adjunct Curator. Bob is a talented illustrator and his books are profusely decorated with ancient reptiles and dinosaurs imaginatively brought back to life, running, eating and hunting.

As a Visiting Curator of Paleontology at HMNS, Bakker is actively mounting field expeditions to Permian fossil dig sites in northern Texas to find new fossils for the **HGS Guest Night** *continued on page 33*

Dr. Robert T. (Bob) Bakker, Visiting Curator of Paleontology of the Houston Museum of Natural Science. Dr. Bakker is working with the HMNS to build a "world-class collection" of dinosaur, reptile and amphibian fossils in Houston and create a new exhibit that will be housed in a new addition, Paleontology Hall.

HGS Guest Night continued from page 31

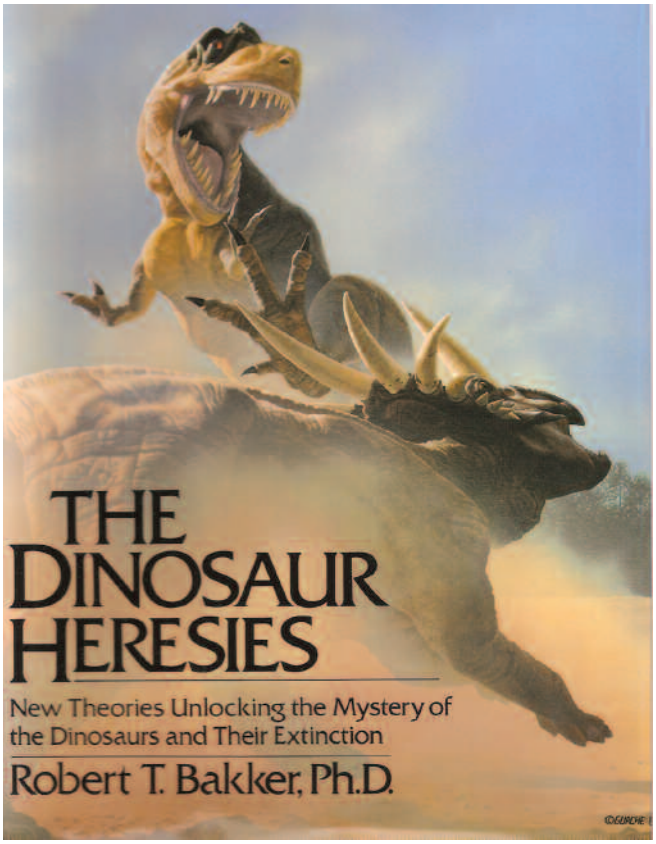


Figure 2 Bakker's 1986 book Dinosaur Heresies. *Bakker changed conventional thinking on the life and environment of dinosaurs by comparing them to living reptiles and birds. This book is available online at Amazon.com.*

museum. These new finds will add to the existing fossil collection that includes the large vertebrate dinosaurs in the main hall. The old and new fossil collections will eventually be housed in a new paleontology hall scheduled to be built adjacent to the current museum. Bakker and HMNS staff and volunteers have focused excavation activities on a historic ranch near Wichita Falls in Seymour, Texas, and have already found pieces of the Permian reptile Dimetrodon for the museum collection. The fossils have been found at Craddock Ranch, near Lake Kemp in Upper Permian near-shore and continental red beds (Figure 3). The Craddock Ranch has long been known as a site rich in Permian fossils. From the early 1900s through the 1930s, museums were eager to collect dinosaur fossils. Amateur fossil hunter Charles Sternberg discovered a fossil-rich layer at the Craddock Ranch that yielded abundant remains of the sail-backed reptile Dimetrodon and its amphibian prey Diplocaulus. The Craddock Ranch is managed today by Sternberg's descendants, who are allowing the HMNS to return to the "bone beds" and look for more fossils. This time, Dr. Bakker is studying the red beds' depositional environment and looking for behavioral clues while excavating the fossils (Figure 4).

Dr. Bakker's long-term research interests include the following:

- A career-long study of the habitats of dinosaurs, reptiles and amphibians of the Permian to Cretaceous. For the past 30 years he has searched for clues and fossils in the Como Bluff dinosaur quarry near Medicine Bow, Wyoming. He wants to sample every paleo-habitat to understand the environment where the fossil species lived.

- Interest in the Cretaceous/Tertiary boundary extinction as well as global extinctions in the Permian and Triassic. Bakker has attracted some controversy with his notion that the dinosaurs were killed off, not by an asteroid or volcano, but by disease. According to Bakker, a comet or asteroid would have killed everything. He believes the answer lies in migration-extinctions occur when large animals are spreading and mixing. Bakker has his own evolution theories—the largest dinosaurs died because they became too large. Diseases could also have caused their demise.

HGS Guest Night *continued on page 35*

Figure 3 A newly discovered spine of the Permian reptile Dimetrodon is being excavated at Craddock Ranch Quarry, Seymour, Texas, for the HMNS museum collection. HMNS employee and field trip volunteer Chris Fliss is shown with the fossil in the red bed dirt before it was wrapped in plaster for transport to Houston.

HGS Guest Night continued from page 33

- Comparison of birds, mammals and ancient dinosaurs. The walking habits of dinosaurs in dicate a high metabolism like that of birds. If you follow the history of mammals and dinosaurs, Bakker says, you can see that the Permian and Triassic mammal-like reptiles were very similar to actual mammals.

In an interview with writer Tony Campagna, Bakker said, "I want to put dinosaurs in context and in their chosen environment. I want you to be able to feel and think and smell what a Stegosaurus experienced or what a Ceratosaurus experienced. I want you to smell fresh fish on your teeth as a Ceratosaurus, then do this with the whole history of dinosaurs, every species. Then I want you to finally understand how and why dinosaurs ruled."

This year's Guest Night promises to be another sellout. Tickets can be purchased on the HGS Website beginning in April and continuing until June 12. No tickets will be sold the night of the event and the seating is limited to 400 people, so sign up before the deadline. ■

For more information on Dr. Bob Bakker, visit the HMNS website: http://www.hmns.org/exhibits/curators/bob_bakker.asp and http://www.s9.com/Biography/Bakker-Robert-T

Read a full interview by Tony Campagna at http://www.cartage.org.lb/en/themes/biographies/MainBiographies/B/Bakker/1.html

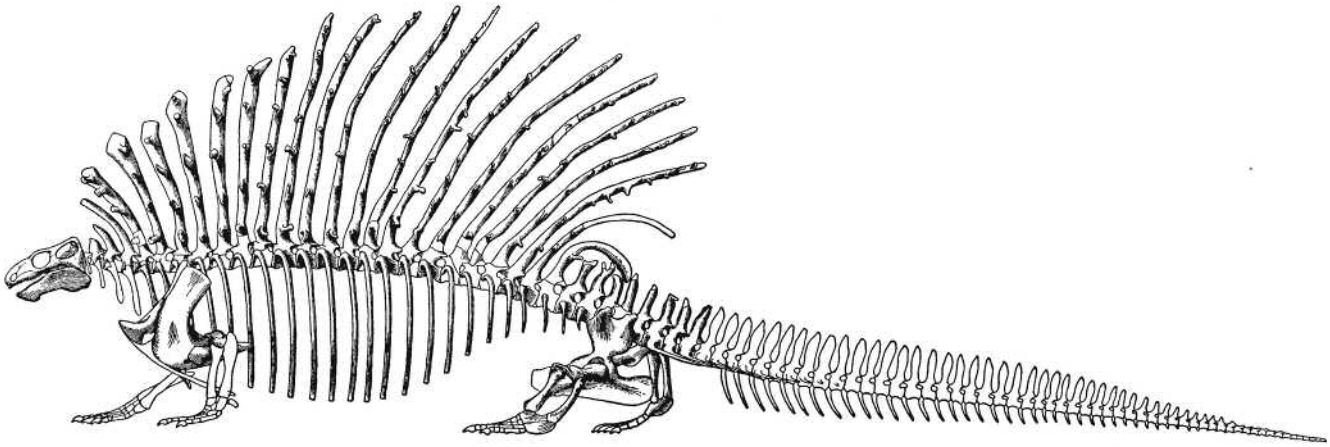


Figure 4 Illustration of the sail-backed reptile Dimetrodon, which lived in and around shallow Permian basins that had extensive tidal flats and pools of shallow water. The Late Permian extinction doomed the species 280 million years ago.

In the News continued from page 28

Reference

Jones, P. D., and M. E. Mann (2004), Climate over past millennia, Rev. Geophys., 42, RG2002, doi:10.1029/2003RG000143.

IPCC Reports

The Intergovernmental Panel on Climate Change (IPCC) has issued a series of four assessments or reports beginning in 1990, the year that most nations signed the Kyoto Protocol. The most recent report is being released in parts throughout 2007; the Summary is now available. Reading the summaries of these reports is not difficult for a non-specialist scientist and is strongly recommended. The summaries of the four documents provide a comprehensive overview of the development of climate research and the conclusions generated for explaining the ongoing climate change and its causes and for predicting the future consequences. These documents provide syntheses of the latest data available at the time that are used by both adherents and skeptics of the so-called debate. Those who do read the summaries will discover that essentially all arguments raised against both the reality of climate change and the role of humans in it were answered in the first three reports of the series, IPCC (1990), IPCC (1995) and IPCC (2001). The most recent report, IPCC (2007), aims not to document what is already accepted by essentially all climate scientists working in the field, but focuses instead on prediction and what we now need to do to mitigate the effects of climate change and when we need to do it.

This is not to say there are no unanswered questions. The skeptics and adherents are correct when they point out that climate is a tremendously complex area of study. What climate scientists have done is develop physics-based modeling capabilities that do a good job in matching **In the News** continued on page 56

Integrated Geophysical Studies Over an Active Growth Fault in Northwest Houston, Texas

by ***Mustafa Saribudak,*** *Environmental Geophysics Associates*
and ***Bob Van Nieuwenhuise,*** *Earth-Wave Geosciences, LLC.*

Active growth faults cutting the land surface in the Gulf Coast area can represent a serious geo-hazard. Considering that the average movement of these faults can be as high as a few inches per decade, the potential exists for structural damage to highways, industrial buildings, residential houses and railroads that cross these features.

Common methods to identify these faults include mapping from aerial photographs and field work; subsurface borehole data (on both the down- and upthrown sides of the faults) including geophysical logs, core and other borehole data; and geophysical surveys including gravity, magnetics, resistivity and conductivity. Historically, the geophysical techniques have not been widely used in engineering-scale fault studies because of concerns about their effectiveness.

However, in the past 10 years advances in the quality of the geophysical instruments and consequently the quality of the data produced have made geophysical methods viable tools for characterizing these faults. Data quality has been significantly improved by the advent of continuous data collection. More advanced software has improved data processing, leading to better subsurface imaging and interpretation.

To test the ability of geophysical techniques to characterize faults, we designed an integrated geophysical survey using ground penetrating radar (GPR), resistivity imaging, magnetics and micro-gravity over the Hockley and Willow Creek faults located in northwestern Houston, Texas. Results of this investigation indicate that all methods successfully imaged significant mappable anomalies across the known fault locations.

Introduction

The coastal plain of the Gulf of Mexico (GOM) is underlain by a thick sequence of largely unconsolidated, lenticular deposits of clays and sands (Kasmarek and Strom, 2002). Growth faults are common throughout these sediments. Based on a study of borehole logs and seismic reflection data, many of the larger of these faults have been mapped to depths of 3,000 feet to 12,000 feet below the surface (Kasmarek and Strom, 2002). Most of these faults are associated with natural geologic processes such as differential compaction and salt movement and many have been active since the Cretaceous. Some of these faults, distributed throughout the coastal plain of the GOM, are currently active and disturb the ground surface (Clanton and Verbeek, 1981).

The Houston area has a very active shallow fault system, as evidenced by surface movement and measurable localized subsidence (Verbeek and Clanton, 1981). Evidence of faulting is visible from structural damage such as fractures and displacement of the ground surface. Fault displacement is predominantly normal, dip-slip and listric, with most growth faults south-dipping (synthetic) and some north-dipping (antithetic). Some faults are clearly active today and disrupt the surface, causing damage to streets and creating scarps across lots, fields and streets.

This paper presents and evaluates the use of four noninvasive geophysical methods for imaging the Willow Creek growth fault that cuts across Highway 249 in the northwest Houston, Texas, area.

The faults that are active today can be the source of damage to pavements, utilities, homes, businesses and other man-made structures in the Gulf region. In the Houston area alone (Harris County), there are more than 300 active or potentially active faults totaling over 300 miles in length (Clanton and Verbeek, 1981). These faults are often zones of sheared ground tens of meters wide rather than discrete breaks in the surface.

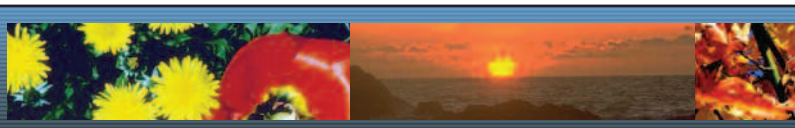
This paper presents and evaluates the use of four noninvasive geophysical methods for imaging the Willow Creek growth fault that cuts across Highway 249 in the northwest Houston, Texas, area (Figure 1).

Geophysical Instruments and Field Survey Design

Ground penetrating radar (GPR), resistivity imaging (2-D and 3-D), magnetic and micro-gravity methods were customized for this study. We used an SIR 2000 GPR unit with a 400-MHz antenna that, considering the soils, was estimated to have a maximum depth of investigation of 8 feet in the study area. A Geometrics G-858 cesium vapor magnetometer allowed automated data collection with samples recorded every 0.2 seconds (or 5 Hz), corresponding to a data point about every 1/3 meter.

Micro-gravity data were acquired using a La Coste & Romberg G-Meter, SN-670. The gravity station spacing was 10 feet across the fault scarp and 20 feet away from the fault scarp. Data were tied to three gravity **Integrated Geophysical Studies** *continued on page 41*

May 2007



Sunday	Monday	Tuesday	Wednesday
		1	2
6	7	8	9 **SPE: Reservoir Simulation for Practical Decision Making** May 9 – 11
13	14 **GSH Golf Tournament** Kingwood Country Club Page 22 **HGS General Dinner Meeting** by Bryan Lastrapes *"Pinedale Anticline Development Overview and the Role of Technology"* Page 13	15 **HGS Northsiders Luncheon** *"Catalytic Gas in Deltaic Basins"* Page 15 **HGS Environmental & Engineering Dinner Meeting** *"Texas Risk Reduction Program Rule Revision"* Page 17	16
20	21 **HGS International Explorationists Dinner** by Jack Kerfoot, *"Exploration & Production Trends and the Emergence of National Oil Companies"* Page 25 **AAPG Short Course** by John Shaw, *"Seismic Interpretation in Fold and Thrust Belts Using Fault-Related Folding Tcchniques"*	22	23
27	28	29 **HGS North American Dinner Meeting** by Matt Williams *"Overton Cotton Valley Sand Field, Smith and Cherokee Counties, Texas: Expansion, Development and Optimization of a Jurassic Tight Sandstone Reservoir"* Page 27	30 **HGS Luncheon Meeting** by Dan Steward *"The Barnett Shale Play: Phoenix of the Ft. Worth Basin, A History"* Page 28

GeoEvents

Thursday Friday Saturday

Thursday	Friday	Saturday
3 **GSH Honors & Awards Banquet** *"Applied Geophysics in teh 21st Century: the role of the SEG"* by Leon Thomsen Page 11	**4** **NOW you can make your reservations on-line at www.hgs.org**	**5**
10 **HGS Continuing Education Short Course** by Dennis Smith *"Removing the Mystery from International Petroleum Economics"* Page 12	**11** **SEG Disc Program on Seismic Imaging by Biondo Biondi**	**12**
17 **SIPES Luncheon Meeting** *"Basement Tectonics and the Origin of the Sabine Uplift"* Page 19 **Houston Energy Council Annual Awards Banquet** *"Gulf Coast Salt Domes: A Potential Underground Space Resource for the Nuclear Renaissance?"* Page 23	**18** **HGS Annual Tennis Tournament** Page 24	**19**
24	**25**	**26**
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Upcoming GeoEvents

Saturday, June 16
HGS Annual Skeet Shoot page 49

HGS Annual Guest Night
Houston Museum of Natural Science
Guest speaker, Dr. Robert Bakker
page 30

Thursday, June 21
SIPES Luncheon
by Skip Hobbs, The Future of Global Oil Industry: Resources, Challenges & the Geoscience Workforce

Reservations:

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event.** If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No shows will be billed.**

Members Pre-registered Prices:

General Dinner Meeting	$28
Nonmembers walk-ups	$35
Env. & Eng.	$25
Luncheon Meeting	$30
Nonmembers walk-ups	$35
International Explorationists	$28
North American Expl.	$28
Emerging Technology	$25

Integrated Geophysical Studies continued from page 36

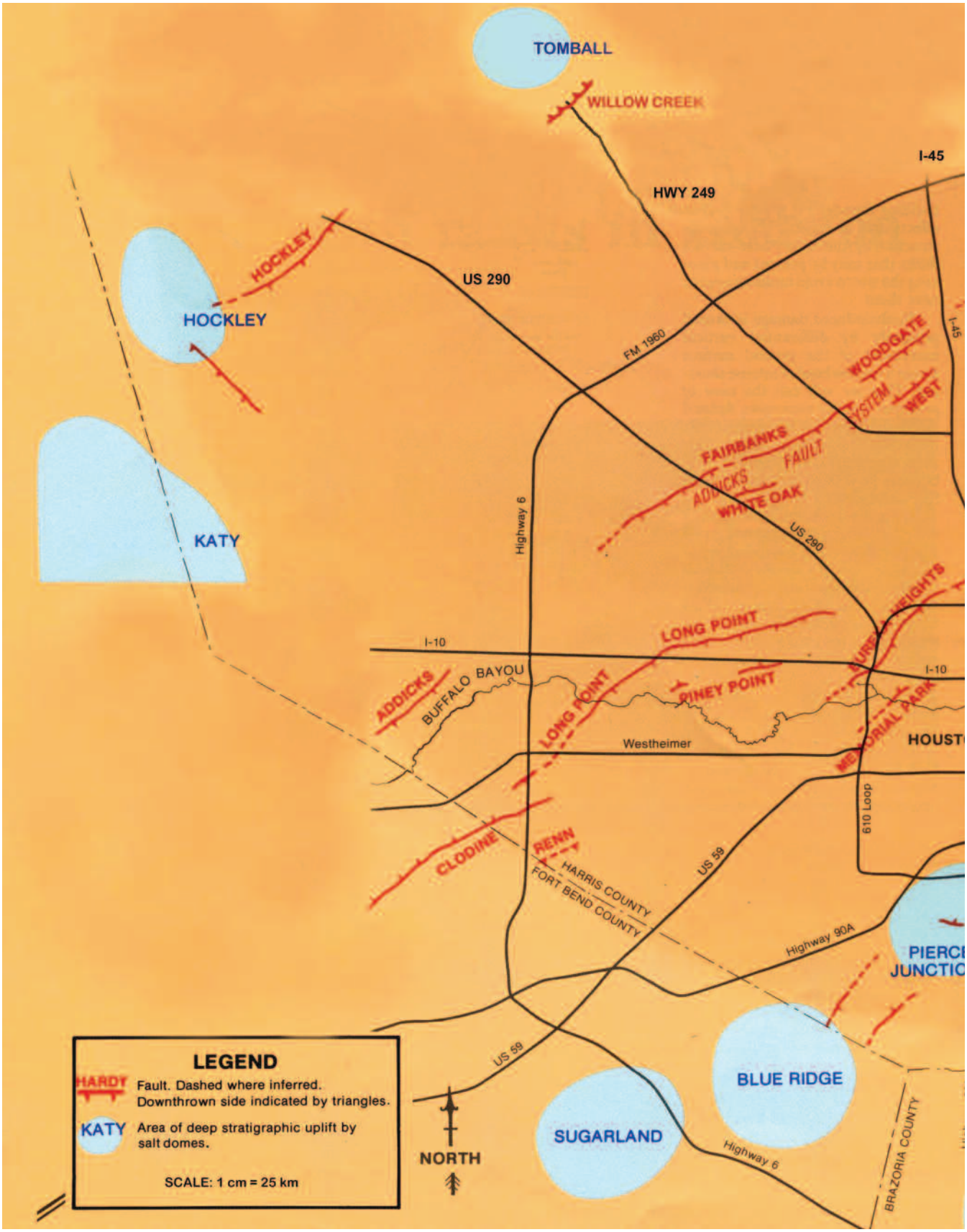

Fig. 1. Willow Creek fault site location, annotated as a green ellipse (after Elsbury et al., 1981).

Integrated Geophysical Studies *continued on page 43*

Integrated Geophysical Studies continued from page 41

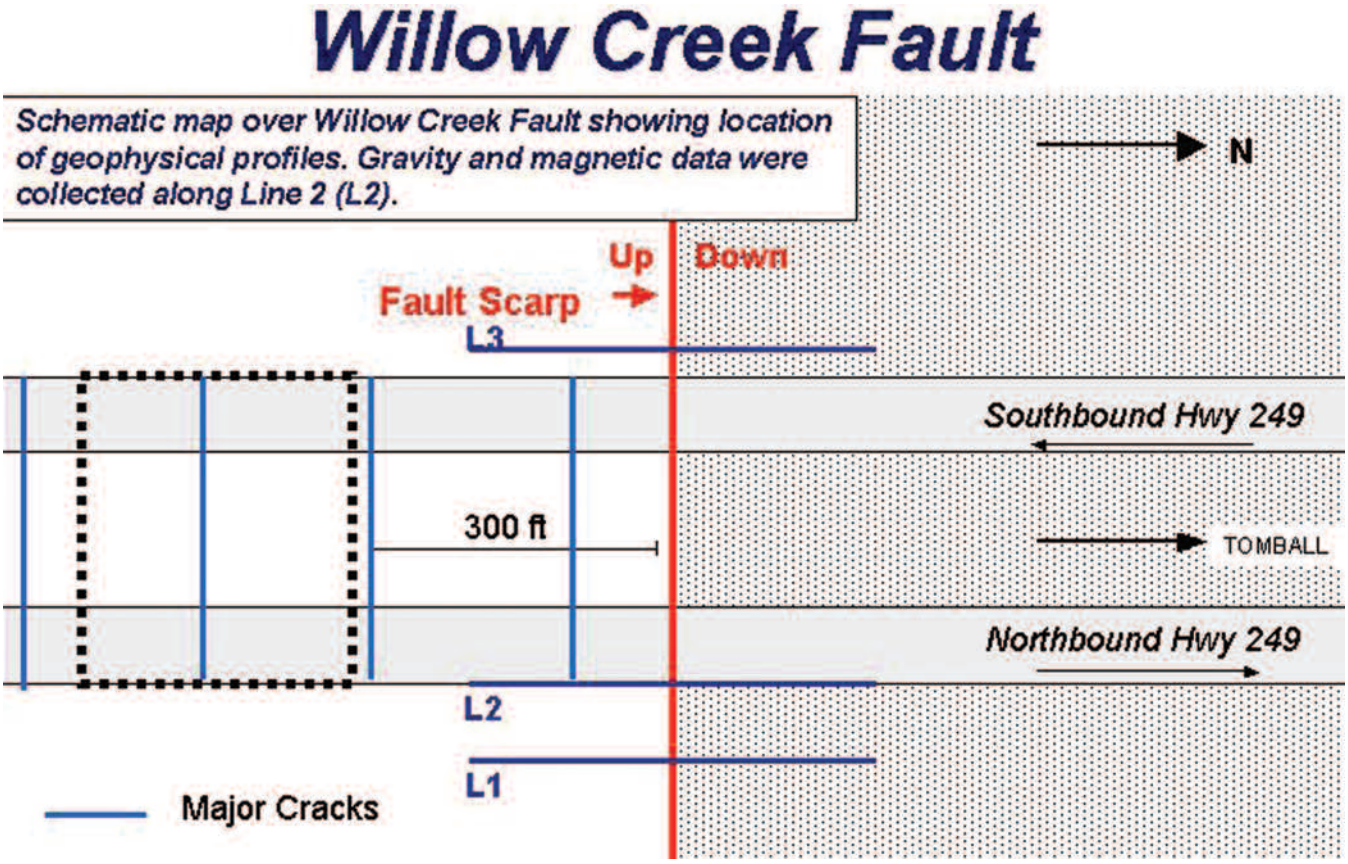

Fig. 2. Schematic map of Willow Creek Fault at Willow Creek Bridge. The thinner blue lines indicate fracture traces. Resistivity data were collected along lines L1, L2, and L3 (dark blue). Microgravity and magnetic data were collected only along line 2 (L2).

base stations located at 1) a building formerly used by Photogravity, Inc. in Houston, Texas; 2) the Willow Creek site; and 3) an intermediary location in Spring, Texas. Having three stations allowed for rapid gravity base station re-occupations and increased gravity data repeatability (< 0.04 mGals) throughout the survey.

For the resistivity survey we used an AGI Super R1 Sting/Swift automatic resistivity unit with a dipole-dipole array of 28 electrodes. This arrangement increases the sensitivity to horizontal changes in the subsurface and provides a 2-D electrical image of the subsurface geology. Electrode spacing was held to 3 meters along all profiles.

Geophysical Results

The Willow Creek Fault crosses Highway 249 about 300 feet north of the Willow Creek Bridge, where it trends in the NE-SW direction and dips to the north (Figure 2). This fault is listric and antithetic to the south-dipping regional Tomball Fault about 5 miles to north. A discrete pavement break crossing both south- and north-bound lanes of Highway 249 clearly marks the presence of the fault (Figure 3).

Many fractures adjacent to and across the bridge may be related to the fault. A GPR survey profile near the north end of the bridge (Figure 4) indicates a significant disturbed zone next to the bridge. We also collected GPR data across the fault scarp, which is visible on the road (see the fault scarp in Figure 3); but the GPR data did not show any anomaly across this scarp. However, the GPR data did detect differential subsidence between the bridge **Integrated Geophysical Studies** continued on page 45

Fig. 3. View looking east of the trace of the Willow Creek fault as it crosses Highway 249. The fault is marked by the pavement cracks and asphalt patches.

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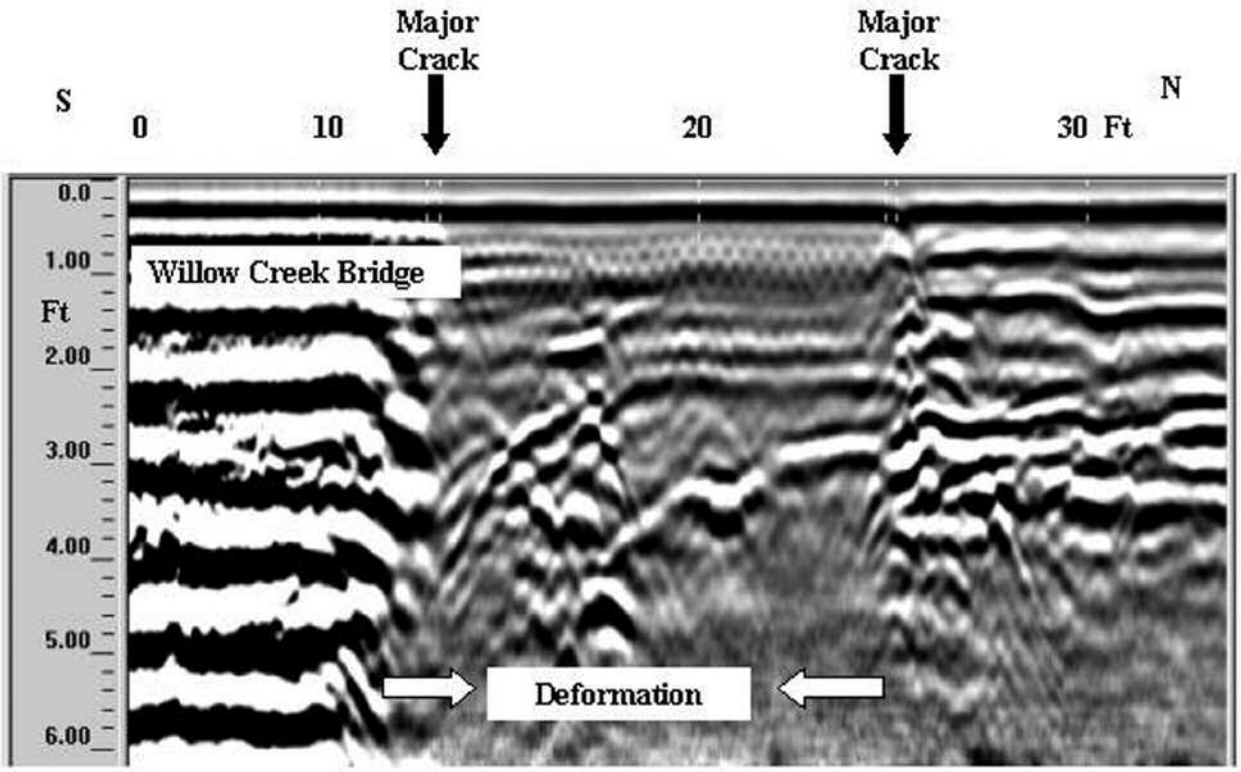

Fig. 4. GPR data taken adjacent to the northern end of the Willow Creek Bridge. Similar GPR results were also obtained at the southern end of the bridge.

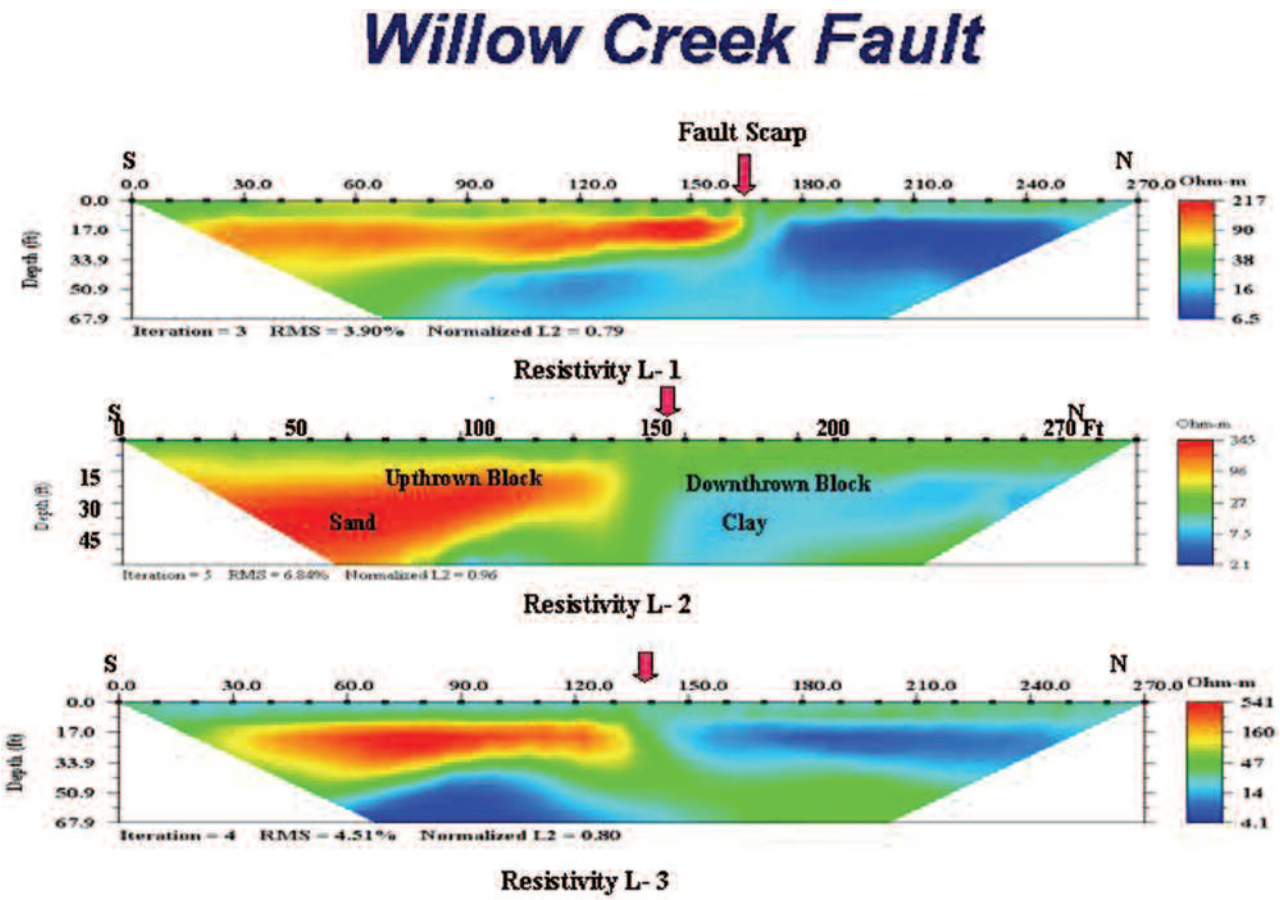

Fig. 5. 2D resistivity profiles L1, L2 and L3 taken along the east- and west-bound lanes of Highway 249 across Willow Creek fault.

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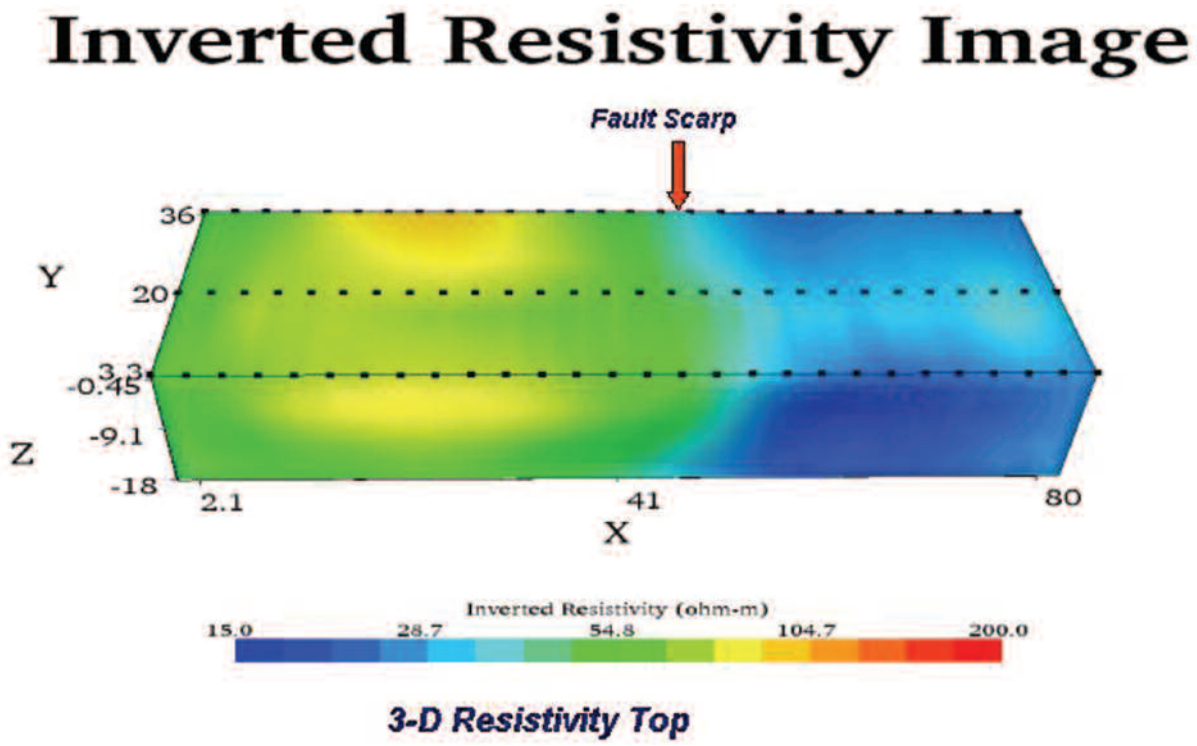

Fig. 6. Inverted 3D resistivity image of the Willow Creek fault.

and the footing, as seen in the disturbed zone adjoining the bridge that may be related to movement on the Willow Creek Fault.

2-D resistivity data (three profiles) collected across the fault along Highway 249 indicate a sharp resistivity contrast over the fault scarp (Figure 5). This contrast may be caused by a combination of increased moisture content and changes in the clay content of the subsurface lithology on the downthrown side of the fault. Increased surface moisture has been observed on the downthrown side of the Willow Creek Fault on every visit to the site.

A 3D resistivity image (Figure 6) was created by combining the three (L1, L2 and L3) resistivity profiles. The fault trace observed at the site corresponds to a plane of significant resistivity contrast in the 3D block diagram. Note the low resistivity on the downthrown (north) side, interpreted to be indicative of more clayey soil with respect to the upthrown block.

Micro-gravity and magnetic data (Figure 7) were acquired along resistivity line 2 (L2 in Figure 2). The simple Bouguer gravity data are referenced to the IGF 1967 and the GRS 1967. The data were terrain and elevation corrected using elevation from a Berger/CST auto-level tied to local reference and bench marks. A Bouguer correction density of 2.2 g/cc was used for the shallow, unconsolidated sediments. Micro-gravity data were filtered using a 20-ft low-pass filter. Data can be interpreted to indicate a gravity high that is correlated to the downthrown side of the fault. The magnetic data, reduced to pole and filtered using a 20-ft low-pass filter, show a magnetic low on the downthrown side of the fault.

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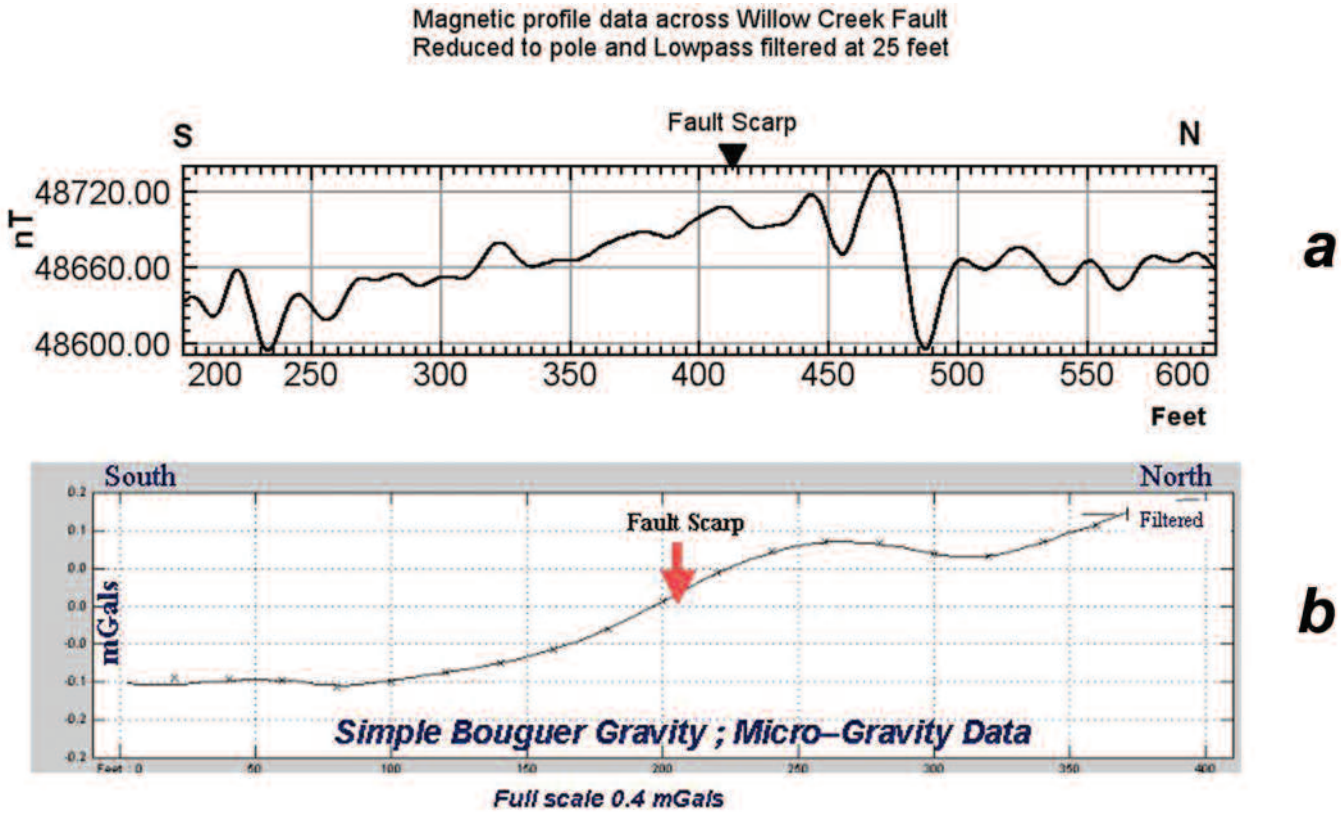

Fig. 7. Comparison of a) magnetic and b) gravity data across Willow Creek fault. Note the gravity high on the downthrown side. The regional gravity field has not been removed.

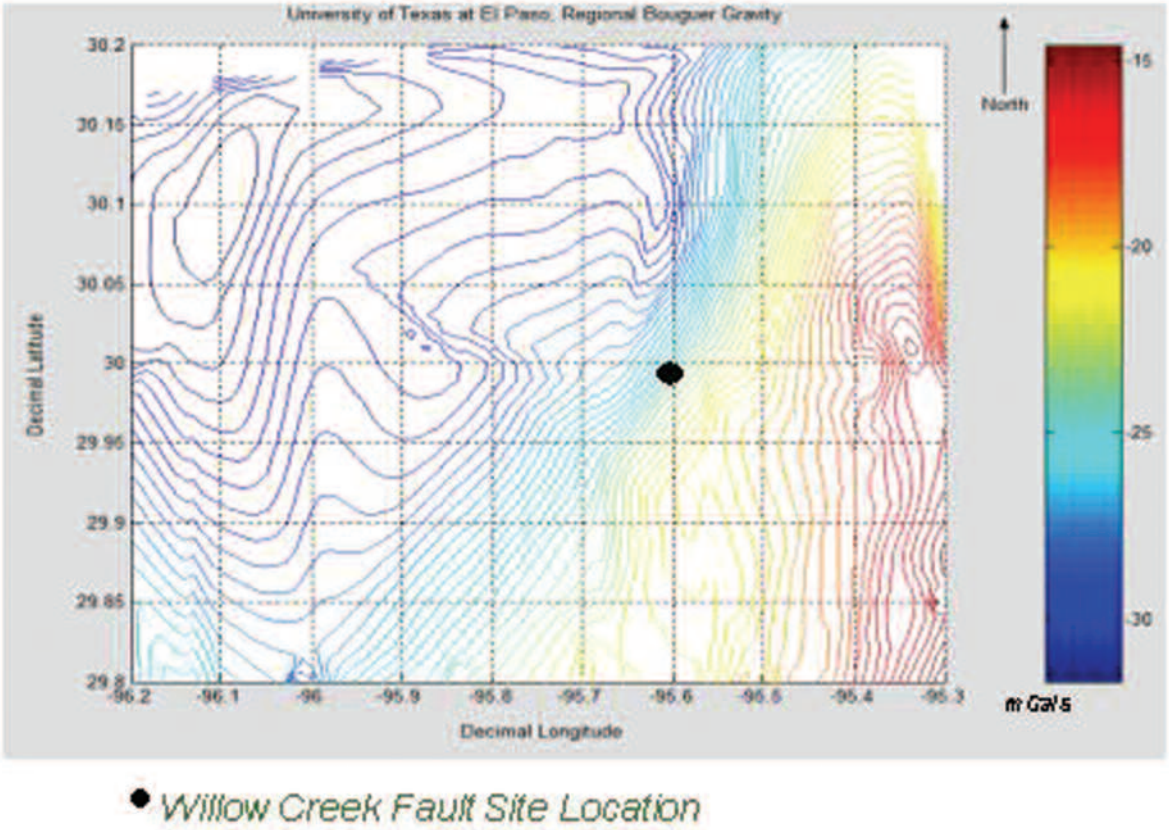

Fig. 8. Map showing University of Texas El Paso regional complete Bouguer gravity of NW Houston. Note the steep gravity gradient at the location of the Willow Creek fault site.

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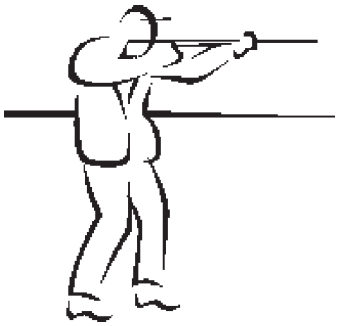
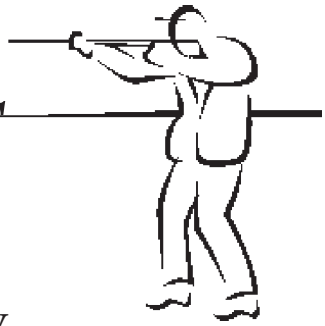


24th Annual HGS SKEET SHOOT



Saturday, June 16, 2007

Greater Houston Gun Club
6702 McHard Road, Missouri City

This tournament is a 50 target event. Shells are provided, however **you must bring eye and ear protection.** Greater Houston Gun Club and National Skeet Shooting Association safety rules will be in effect. Winning shooters will be determined by the Lewis class system. Door prizes will be awarded by blind drawing after the conclusion of shooting. All competitors are automatically entered into the door prize drawing, but you must be present at the time of the drawing to win.

BBQ lunch will be provided from 11:30 a.m. until 1:30 p.m.
Refreshments will be available throughout the day.

IMPORTANT!!

WE ARE LIMITED TO 160 SHOOTERS IN FOUR ROTATIONS. ENTRY FEE IS $60 PER SHOOTER FOR REGISTRATIONS RECEIVED BY FRIDAY, JUNE 8. AFTER JUNE 8, REGISTRATION WILL BE STRICTLY ON A "SPACE AVAILABLE" BASIS AND THE ENTRY FEE WILL BE $80 PER SHOOTER. REGISTER EARLY!!

For more information, contact: Tom McCarroll at (713)419.9414 or hgs_skeet_shoot@yahoo.com.

****

HGS SKEET SHOOT REGISTRATION FORM

Name: _____ Company:_____

Email: _____ Phone:_____

Preferred shooting time: (circle one) 9:00 10:00 11:00 12:00

Indicate ammunition required: (circle one) 12 gauge 20 gauge

Please return form(s) with check for $60.00 per shooter, payable to: ***Houston Geological Society***

Mail to: ***Tom McCarroll • HGS Skeet Shoot • 816 Holton St • Bellaire TX 77401***

Registration Fee: $_____ + Sponsor contribution: $_____ = Total: $_____

If you wish to shoot with a specific squad (5 shooters max.), please submit all forms together.

****

ALL SHOOTERS WILL BE REQUIRED TO SIGN A DISCLAIMER OF RESPONSIBILTY BEFORE THEY WILL BE ALLOWED TO SHOOT!

The 6th PESGB/HGS African Conference

AFRICA'S PETROLEUM SYSTEMS: FROM OUTCROP TO DEEPWATER

Cape Town Convention Centre , South Africa

11-13 September, 2007

Two days of Talks PLUS Field Trips


Cape Town

Preliminary Program

Tuesday 11th September:

- *Opening Address : PetroSA Director*
- *a.m. oral session : Overview and Tectonic Papers*
- *p.m. oral session : East and Southern Africa Frontier Plays*
- *Posters and core workshop*
- *evening : Moyo event*

Wednesday 12th September:

- *a.m oral session : Gulf of Guinea*
- *p.m. oral session : North and Interior Africa*
- *Posters and core workshop*
- *evening : wine tasting event*

Thursday 13th September :

- *a.m : full screening (~ 2 1/2 hrs) of Seb Lunings film on 'Petroleum Geology of Southern Libya'*

Field Trips

- *Wed 12th pm-Sat 14th Sept : Tanqua Karroo Deepwater Facies. Leader ; Dewijk Vickens, staying in Inverdoon game park*
- *Thu 13th Sept; Cape of Good Hope. Leader : J. Rogers (suitable for both geologists and non-geologists)*

A framework oral programme will be issued on the PESGB website by May 10th. Late abstracts for oral papers should be submitted ASAP to duncan.macgregor2@ntlworld.com or duncan.macgregor@neftex.com.

A large number of posters can be accommodated and abstracts for these can be submitted any time up till August, but please note deadline for extended abstracts to be included on the conference CD will be 31 July.

Pre-registration is available on the PESGB Website www.pesgb.org.uk.
Further details will be listed in the PESGB newsletter and website. For sponsorship opportunities and associated exhibition space please contact Jennie at the PESGB office 011 (44) 20 7408 2000, jennie@pesgb.org.uk or visit www.pesgb.org.uk.

The conference is sponsored/co-organised by PetroSA and supported by the Geological Society of South Africa and the Petroleum Agency of South Africa.

Convenors include: Ray Bate, Duncan Macgregor, Varsha Singh, Sumesh Naidoo, Jean Malan, Al Danforth, Ian Poyntz, Steve Henry

PESGB PetroSA Geological Society of South Africa GSSA

Integrated Geophysical Studies

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The fault location interpreted from the magnetic and gravity data correlates very well (+/- 5 feet) with the location of the pavement break (fault scarp) observed on the ground.

Gravity data across the fault have been modeled and interpreted using the analog equation for a thin fault, the thin-slab equation (Dobrin, 1976), and Talwani-type 2-D modeling (Talwani et al., 1959). The results obtained from the thin-slab equation and analog equation for a thin fault indicate that the vertical throw for the shallow fault at Willow Creek could possibly be as small as 10 ft whereas the main fault appears to have a vertical throw of approximately 60 ft. The full vertical throw of the fault is not detectable on the micro-gravity data whereas it appears detectable in the regional data (Figure 8). This difference is due to the scale of the feature detected by the micro-gravity versus that of the feature detected by the regional gravity. The regional gravity field was not removed from the micro-gravity because we are attempting to detect an extremely low-amplitude (< 0.25 mGal) effect.

Discussion of Results and Conclusions

The geophysical data are interpreted to indicate that significant anomalies exist within the known Willow Creek Fault zone. The 2-D and 3-D resistivity data appear to indicate the downthrown side of the fault is less resistive than the upthrown side; i.e., sand on the upthrown side is juxtaposed against either sandy clay or sand with a higher moisture content. A gravity high observed in the micro-gravity data on the downthrown side of the fault may be caused by increased compaction of the downthrown sediments compared with the upthrown. The GPR survey imaged a shallow disturbed zone next to the Willow Creek Bridge. The magnetic data indicate a well-defined low on the downthrown side of the fault, indicating that shallow sediments of similar magnetic susceptibility ($< 200 \times 10^{-6}$ cgs units) are offset by a small fault (< 20 feet offset).

In conclusion, data acquired and used to evaluate the effectiveness of geophysical methods in detecting faults in the northwest Houston area successfully imaged anomalies (contrasts) across a mapped fault zone. Although it is not yet clear that these methods could be used independently to map faults, it is very likely that they can be used to map extensions of known faults, at least in certain areas. Further studies of the geophysical response of these shallow faults will increase interpretation confidence and should eventually lead to more routine use of these methods for detecting and characterizing these important features. Depending on site conditions, future fault studies should consider using as many of the geophysical techniques described here as possible to both improve and extend characterization of the shallow subsurface. ■

Acknowledgments

We thank Bob Neese of Gravity Map Service, Inc. for providing the La Coste & Romberg G-670 meter. We also thank Dr. Carl Norman for showing us the faults in the field and a number of friends and colleagues who helped in the data acquisition. This project was funded by Environmental Geophysics Associates and Earth-Wave Geosciences, LLC.

This paper was originally published in *The Leading Edge* (Saribudak and van Nieuwenhuise, 2006). We are grateful to the SEG for permission to reproduce it (with changes) in this *Bulletin*.

References

Clanton, S.U., and R.E. Verbeek, 1981: Photographic portraits of active faults in the Houston metropolitan area, Texas, in Houston area environmental geology: *Surface Faulting, Ground Subsidence, Hazard Liability*, edited by M.E. Etter, Houston Geological Society, p. 70-113.

Dobrin, Milton B., 1976: *Introduction to Geophysical Prospecting*, 3rd ed. , McGraw-Hill, Inc. p. 377.

Elsbury, B.R., Van Siclen, D.C. and Marshall, B.P., Living with faults in Houston. Soundings, Fall 1980 and Spring 1981.

Kasmarek, C.M., and W.E. Strom, 2002: Hydrogeology and simulation of ground-water flow and land-surface subsidence in the Chicot and Evangeline aquifers, Houston, Texas, U.S. Geological Survey, Water-Resources Investigations Report 02-4022.

Saribudak, Mustafa and Bob Van Nieuwenhuise, 2006: Integrated geophysical studies over an active growth fault in Houston, *The Leading Edge*, Vol. 25, No. 3, p. 332-334, March 2006.

Talwani, Manik, J.L. Worzel and M. Landisman, 1959: Rapid gravity computations for two-dimensional bodies with application to the mendocino submarine fracture zones, JGR, v. 61, p. 49-59.

Verbeek R.E., and S.U. Clanton, 1981: Historically active faults in the Houston metropolitan area, Texas, Houston area environmental geology: Surface faulting, ground subsidence, hazard liability, edited by M.E. Etter, Houston Geological Society, p. 28-69.

2006-2007 Outstanding Student Awards

The following outstanding students were selected by the geology department faculty of their respective universities. The students were presented a check and a commemorative plaque at the April General Dinner Meeting.

Outstanding Student Award

Charles Puryear
University of Houston

Charles Puryear was raised in a small town south of Houston, Texas. He attended the University of Virginia, receiving a BA in 2001. He joined the University of Houston as a post baccalaureate student in the fall, 2002, and received an MS in geophysics in 2006. Charles has been a teaching assistant, research assistant and an intern working summers at Shell exploration and research. His hobbies include sailing, surfing, hiking, snowboarding and traveling.

Outstanding Student Award

Lacy Cooper
Lamar University

Lacy Renee Cooper is currently a senior geology major at Lamar University in Beaumont, Texas. She was born and raised in Dayton, Texas where she was an honor graduate of Dayton High School in 1999. She was a recipient of the Board of Regents Scholarship for Lee College which she attended for two years. There she was a member of Phi Theta Kappa and received the Distinguished Geology Student award. In 2003 Lacy graduated from Lamar with a BS in Earth Science.

After graduating she acquired her secondary composite science certificate and taught Integrated Physics and Chemistry as well as Environmental Systems at Tarkington High School for two years. She left teaching to return to school and pursue her original goal of a geology degree. Her interests include fishing, photography, traveling and gem collecting.

Outstanding Student Award

Joshua Hughes
Sam Houston State University

Joshua is a senior at Sam Houston State University and will graduate in the summer with a major in geology and minor in biology. He is a full time student and also works as a data analyst at Terrapoint, a lidar based GIS and mapping company. While at SHSU, Joshua has been an active member in the Sam Houston Association of Geology Students, and served as vice president in 2007. He has received several awards during his time at SHSU including the Sam Houston Association of Geology Students Scholar award in 2006 and 2007, and the HGS Outstanding Student award in 2007. After receiving his BS Joshua plans to use the geological skills acquired at SHSU and his work experience in graduate school in the fall. He enjoys field work and the research aspects of geology and hopes to focus on structural geology and tectonics for his MS.

Outstanding Student Award

Daniel Imrecke
Stephen F. Austin State University

Daniel is a senior at Stephen F. Austin State University (SASU) and expects to complete a BS in geology in December and then start his graduate work. As an undergraduate Daniel was named to the Dean's list one semester and to the President's Honor Roll for four semesters. He is active in the Geology Student Association, the student chapter of the AAPG, and Sigma Gamma Epsilon, an honorary Earth Science society. Other societies in which Daniel holds memberships include Phi Eta Sigma, Freshman Honor society, Phi Alpha Theta, History Honor society, and Sigma Alpha Mu fraternity, where he served as president from 2005-2006. In addition to club activities, he works as a mathematics tutor for the Academic Assistance and Resource Center at SASU. Daniel's hobbies include camping, hiking, golf and participating in civil war reenactments.

Oustanding Student Award *continued on page 55*

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Outstanding Student Award

Jennifer Denbow

University of Texas

Jennifer was born in Johannesburg, South Africa in 1982 and spent the first four years of her life in Botswana before moving to Austin with her family. During many summers her father, a professor of African archeology, brought the family to the People's Republic of the Congo. The first-hand exposure to rural poverty that she saw left her with a strong sense of the desperate need for foreign aid in the undeveloped world, and a deep motivation to return to Africa as an adult to help in some way.

Jennifer had always been interested in collecting rocks and minerals. But, when she took her first geology class she quickly saw that she could combine her motivation to help, her love of rocks and her passion for science by becoming a hydrogeologist. My current interest in studying, a huge global concern, exemplifies this. Her undergraduate honors thesis research, arsenic contamination in drinking water, will she hopes lead to a better understanding of arsenic cycling, a major problem in the water supply in less developed regions. Jennifer plans to continue her education in geology, at least through an MS.

Outstanding Student Award

Jessica Hawthorne

Rice University

Jessica Hawthorne is a senior earth science major at Rice University. For the past three semesters, she has been working on a research project in seismology with Assistant Prof. Fenglin Niu, attempting to map the topography of a mantle layer overlying the core-mantle boundary. Jessica is currently a teaching assistant for the Field Methods course at Rice. In the fall, she will attend graduate school in geophysics either at Princeton or Berkeley. Jessica is very active outside of her academic activities. She is the captain of the Rice women's ultimate Frisbee team and likes backpacking and rock climbing. On May 11, 2007, Jessica will be initiated into the Rice Chapter of Phi Beta Kappa, in recognition of her outstanding achievements in the liberal arts and sciences.

Outstanding Student Award

Lindsay Farrell

Texas A&M University

Lindsay Farrell is a senior majoring in geophysics at Texas A&M University. Throughout her senior year, she has worked with Dr. David Sparks on a research project that models the thermal evolution and differentiation of ice/rock planetesimals in the Asteroid Belt. Lindsay presented a poster on her research at two professional meetings, the American Geophysical Union Annual Conference and the Annual Lunar and Planetary Science Conference. and she is in the process of writing a paper to publish the research. Lindsay has been involved in the Geology and Geophysics Society since 2005, where she has tutored introductory geology students and has acted as treasurer for the current academic year. After graduation, Lindsay will begin work on her MS at Rice where she intends to study planetary geology, and then continue on to get her PhD in planetary geology or a related field.

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climate history in the past as estimated from proxy data. But, matching past climate history has the benefit of knowing when extreme geological events such as large volcanic eruptions and bolide impacts occurred. A major volcanic eruption in the future could alter the climate significantly for a number of years or even longer if sufficiently large and persistent, rendering as moot any model predictions made today. These events can not be predicted in any deterministic way. The larger events can only be predicted statistically and incorporated into the models with the appropriate periodicity.

The early reports of the IPCC (1990 and 1995) make for interesting reading because they serve to document the progression of our understanding of climate change and its causes. For example, in the Second Assessment, IPCC (1995), sufficient data had been acquired to verify the earlier detection (IPCC, 1990) of a 0.3–0.6°C global warming since the late 19th century.

Other conclusions are as follows.

- They were confident that sufficient data indicated global sea level had risen by 10–25 cm over the past 100 years, largely

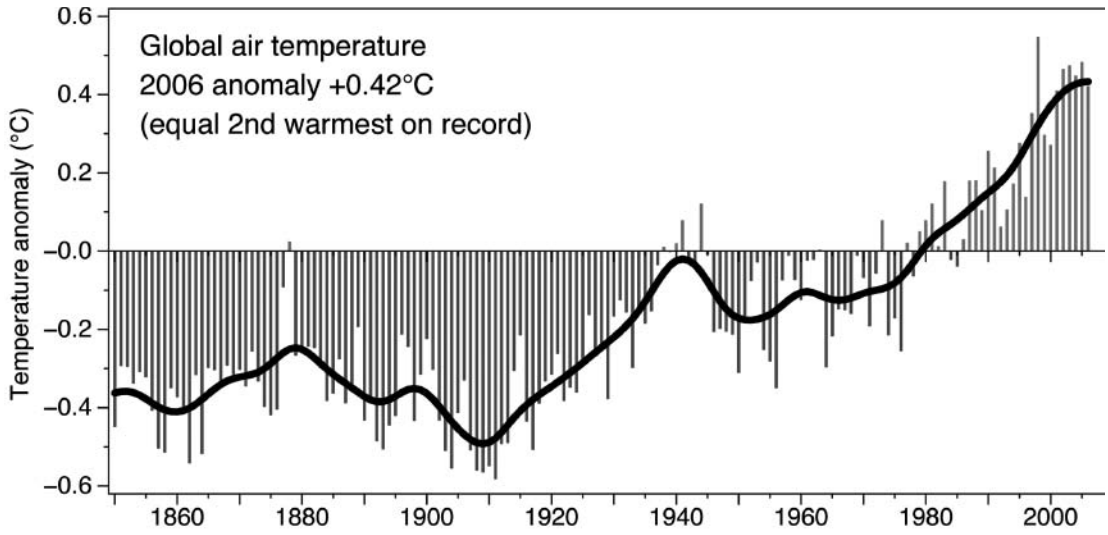

Figure 1a. Smoothed (solid curve) and raw (vertical lines) annual global anomalies of combined land-surface air and sea surface temperatures (°C), 1861–2000, relative to 1961–1990. Modified after IPCC Third Assessment Report: Climate Change 2001. http://www.ipcc.ch/pub/reports.htm

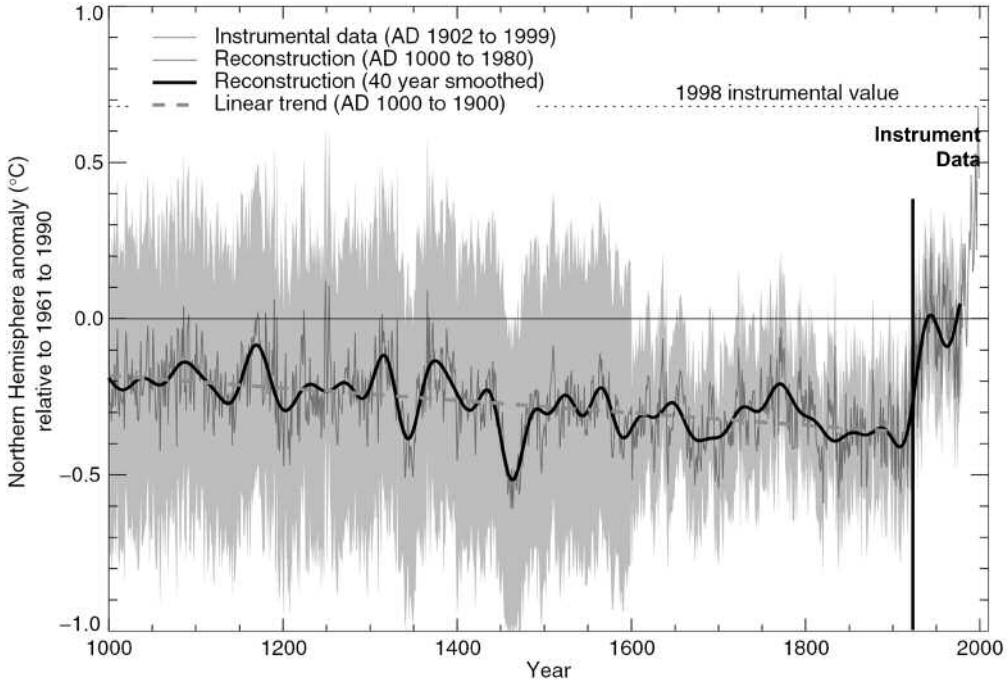

Figure 1b. Millennial Northern Hemisphere (NH) temperature reconstruction and instrumental data (medium gray) from AD 1000 to 1999, adapted from Mann et al. (1999). Smoother version of NH series (black), linear trend from AD 1000 to 1850 (light gray dashed) and two standard error limits (light grey shaded) are shown. From about 1860 (vertical solid line) the data are from instruments. Figure 2.20 from IPCC Third Assessment Report: Climate Change 2001. http://www.ipcc.ch/pub/reports.htm

because of increased temperature.

- They suspected but did not have sufficient data to prove whether consistent global changes in climate variability or weather extremes had occurred over the 20th century.
- Improving modeling capabilities were providing increasing confidence that a **discernable human element** was emerging out of the background noise of natural climate change and variability caused by solar intensity fluctuations and volcanic eruptions.
- The available data was not sufficient to quantify even relatively the amount of the anthropogenic forcing—how much of the warming can we attribute to our actions and how much to natural causes.

The third report, IPCC (2001), answered many of the questions raised by the earlier studies and confirmed or added support to many of the earlier conclusions:

- The global average surface temperature has increased over the 20th century by about 0.6°C. (Figure 1) The years between the second and third IPCC reports, 1995 to 2000, were some of the warmest on record. Consequently, the increase in temperature during the 20th century was 0.6 ± 0.2°C, on the high end of earlier predictions.
- The report concluded that it was very likely that globally "the 1990s was the warmest decade and 1998 the warmest year in the instrumental record since 1861."
- Proxy data for the past 1000 years, limited to the Northern Hemisphere because of data availability, indicated that the warming in the 20th century was likely the largest of any century during the past 1,000 years. Furthermore, at least in the Northern Hemisphere, the year 1998 was likely the warmest year and the 1990's the warmest decade in the past millennium.

With the addition of increasing amounts of satellite data, scientists were now able to measure changes in ice thickness and snow cover.

- Satellite data indicated a likely 10% decrease in snow cover since the late 1960s and a widespread retreat of mountain glaciers
- The extent of spring and summer sea-ice had decreased by about 10 to 15% since the 1950s,

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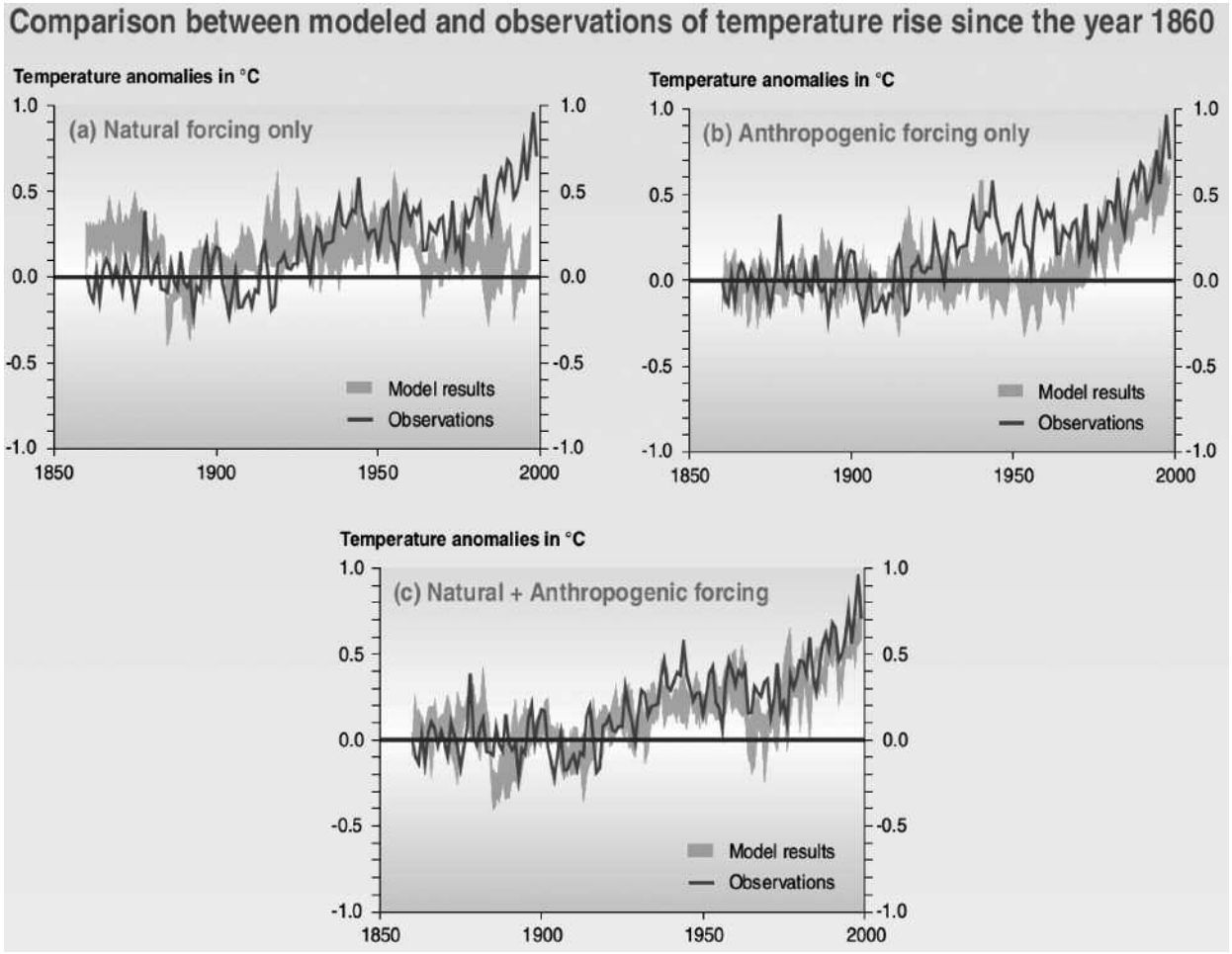

Figure 2: Comparison of the simulated and measured temperature variations for (a) only natural forcings: solar variation and volcanic activity (b) only anthropogenic forcings: greenhouse gases and an estimate of sulphate aerosols, and (c) both natural and anthropogenic forcings included. From (b), it is clear that anthropogenic forcings provide a substantial part of the observed temperature changes over the past century, but the best match with observations is obtained in (c) when both natural and anthropogenic factors are included. After IPCC 2007, http://www.ipcc.ch.

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and late summer to early autumn Arctic sea-ice thickness had declined 40% in recent decades, with a lesser decline in winter.

The report confirmed that global average sea level had risen and ocean temperature had increased.

- Tide gauge data show that global average sea level rose between 0.1 and 0.2 m during the 20th century.
- Global ocean heat content has increased since the late 1950s, the period for which adequate observations of sub-surface ocean temperatures have been available.

Most importantly, the models developed were able to simulate the past temperature rises before the industrial revolution, when all climate change was natural. However, when they attempted to model temperature change after the industrial revolution, they ran into problems (Figure 2).

When they modeled the temperature verses time using natural forcing only, they could not reproduce the temperature profile of the last half of the 20th century (Figure 2a). Similarly, when they modeled anthropogenic forcing only, they could not reproduce the temperature profile for the middle 50 years of the century (Figure 2b). It was only by using both the natural and anthropogenic forcings that they were able to reproduce the observed profile.

Before the Industrial Era, circa 1750, atmospheric carbon dioxide (CO_2) concentration was 280 ± 10 ppm for several thousand years. It has risen continuously since then, reaching 367 ppm in 1999. Many of us have heard the statement that the amount of CO_2 in the atmosphere is so small that it is measured in ppm the implication (often unstated because only an idiot can not see it) is that it is too small to influence climate. I doubt that those who make that statement have ever been around H_2S, which is quite lethal at much smaller concentrations than CO_2.

In 2001 the atmospheric CO_2 concentration had not been exceeded during the past 420,000 years, and likely not during the past 20 million years. The rate of increase over the past century is unprecedented, at least during the past 20,000 years.

The present atmospheric CO_2 increase is caused by anthropogenic emissions of CO_2. About three-quarters of these emissions are due to fossil fuel burning. Fossil fuel burning (plus a small contribution from cement **In the News** *continued on page 61*

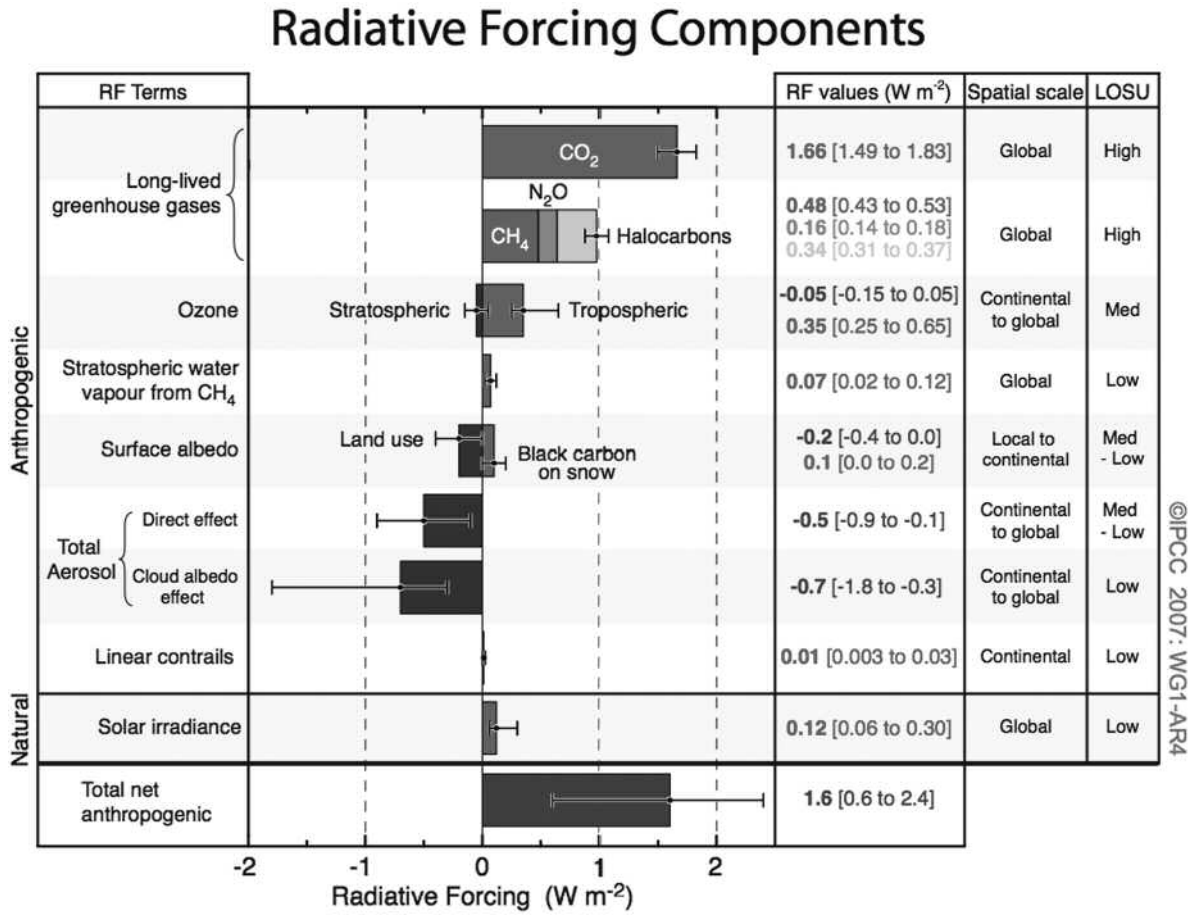

Figure 3. Relative importance of radiative natural and anthropogenic forcing components to climate change. Volcanic aerosols contribute an additional natural forcing but are not included in this figure due to their episodic nature. After IPCC 2007, http://www.ipcc.ch.

International Oil Conference and Exhibition

Veracruz, Mexico, 28–30 June 2007

The International Oil Conference and Exhibition in Mexico is being organized by CIPM, AIPM, AMGE, AMGP, and SPE. These Societies welcome your paper proposal submission to this, their second collaboration for an exciting event in Veracruz, Mexico, 28–30 June 2007.

ORGANIZERS

CIPM - Colegio de Ingenieros Petroleros de México
AIPM - Asociación de Ingenieros Petroleros de México
AMGE - Asociación Mexicana de Geofísicos de Exploración
AMGP - Asociación Mexicana de Geólogos Petroleros
SPE - Society of Petroleum Engineers

This three-day event will offer over 200 technical papers and will address the topics listed below.

- Deepwater Development and Production Issues
- Field Development of Heavy and Extra-Heavy Fields
- Characterization and Production Optimization of Turbidite Reservoirs
- IOR/EOR, Optimal Well Placement, Data Mining and Water Management Issues in Mature Fields
- Reservoir Engineering of Fractured Reservoirs

Rodolfo Camacho Velázquez, Program Committee Chairperson, invites you to submit a paper proposal online at http://manuscripts.spe.org/ams/cgi-bin/main.plex.

The submission deadline is 12 January 2007.

In the News continued from page 59

production) released on average 5.4 ± 0.3 PgC/yr from 1980 to 1989, and 6.3 ± 0.4 PgC/yr from 1990 to 1999, where 1 PgC = peta gram = 10^{15} g. Land use change is responsible for the remainder of the emissions.

CO_2 is the most active of the greenhouse gasses in terms of climate change, as indicated in Figure 3. ■

References

Jones, P.D., and M.E. Mann (2004), "Climate over past millennia," Rev. Geophys., 42, RG2002, doi:10.1029/2003RG000143.

Climate Change 2007: The Physical Science Basis, 2007, IPCC

Climate Change 2001: Working Group I: The Scientific Basis. 2001,
http://www.grida.no/climate/ipcc_tar/wg1/index.htm
http://www.grida.no/climate/ipcc_tar/wg1/index.htm
Climate Change 1995: The Science of Climate Change
Contribution of Working Group I to the Second Assessment of the Intergovernmental Panel on Climate Change
JT Houghton, LG Meira Filho, BA Callender, N Harris, A Kattenberg and K Maskell (Eds)
Cambridge University Press, UK. pp 572
A Scientific Assessment of Climate change – Report of Working Group I
JT Houghton, GJ Jenkins and JJ Ephraums (Eds)
Cambridge University Press, UK. pp 365
Available from Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge, CB2 2RU (or good bookshops)
http://www.ipcc.ch/pub/reports.htm
Summary for Policymakers
IPCC/WMO/UNEP, UK Meteorological Office, Bracknell. pp 26
Available from WGI Technical Support Unit

Available from Cambridge University Press, The Edinburgh Building
Shaftesbury Road, Cambridge CB2 2RU ENGLAND

IPCC First Assessment Report.1990
It was published in three volumes, each with a Summary for Policymakers
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Recollection of a Cold War Experience

by ***George Devries Klein***

During a meeting of the IAS (International Association of Sedimentologists) in 1963, I met the Assistant Minister of Petroleum Geology for the Ukraine (let's call him "Sergei"). The meeting occurred after Secretary of Defense McNamara had announced a USA-USSR scientific exchange program, and we discussed the possibility of a joint research project.

As our discussion concluded, I asked, "I have an interest in architectural history. If we undertake this exchange program, is there any chance I can visit the famous 13th and 14th century architecture in Samarkand and Tamarlane?"

Sergei suddenly frowned and the color in his face changed from red to purple to green. Finally, he gained control of himself and replied, "Vell George, it vould be difficult but not impossible."

Needless to say, the proposed scientific exchange never materialized.

What I discovered later was that Sergei was also a trusted member of the Communist Party, and because of his status, was co-opted by the non-cloak-and-dagger part of the KGB. His task was to collect data on western scientists whom he met at international meetings. In fact, all Soviet scientists during the Cold War who attended such meetings were trusted party members and co-opted for this duty by the KGB. That's the only way they were able to attend the meetings and present their scientific work.

… Sergei was also a trusted member of the Communist Party, co-opted by the … KGB … to collect data on western scientists whom he met at international meetings.

On December 12, 1977, I boarded the *RV Glomar Challenger* in Yokohama, Japan, to serve as co-chief scientist on Leg 58 of the Deep Sea Drilling Project (DSDP). Our departure was delayed because we were waiting for the arrival of "Igor," a Russian igneous petrologist. Igor arrived at the very last minute and as soon as he stepped on board we left.

Igor was not the easiest person to work with. However, he ingratiated himself with his fellow scientists by hosting parties in his cabin serving Russian snacks. Because I asserted my authority once in a way a Russian would not like, I was never invited. However, three days before the cruise ended, he had gifts for everyone, a set of slides showing street scenes and views of Moscow. However, he gave me a set of slides of 13th and 14th century architecture from Samarkand and Tamarlane.

"Igor, tell me how did you know I'd be interested?" I asked.

"Oh George, I don't speak English zat vell" and refused to answer.

I discussed my conversation with the ship's captain who told me Igor was a colonel high in the KGB. So, obviously, Igor had read my KGB file before leaving Moscow.

The cruise ended in Naha, Okinawa, and on arrival, we were met by faculty from the marine geology program at the local university. They invited us to dinner at an ethnic Okinawan restaurant, so we all went there that evening. Like the stereotypical Russian, Igor got drunk.

As the dinner party ended, I realized that as the "foreign" co-chief scientist (the other one was Japanese), I had to undertake a task so the evening could come to a close. I went to one of our Japanese scientists who was talking with Igor and asked what the norms were. The Japanese scientist explained them to me and my comment was "Yeah, just like they do it in Holland, where I was born."

Suddenly, in a drunken rage, Igor exploded and shouted, "You veren't born in Holland, you vere born in Nazi Germany!"

I replied, "Igor, I think I know where I was born. Besides, let me show you my US passport which shows I was born in the Netherlands."

Igor responded, "Ve know zat ze American government forges passports for people like you!"

I told him I would talk to him later, gave a little speech of thanks to the hosts, and we left.

The private dining room where we ate was on the second floor of the restaurant and as we walked down the stairwell, I noticed "Igor" was walking next to me. The stairwell had a curved wooden ceiling, so I tapped Igor on his shoulder and said, "Igor, when you get back to Moscow, please be sure to correct my file."

My comment reverberated up and down the stairwell, and everyone else laughed.

Years later, I shared this experience with a prominent AAPG member who knows the FSU very well. He told me that during World War II, the Russians were paranoid that their southern Muslim republics would be infiltrated by Nazi operatives who would stage an uprising. He explained that my question in 1963 triggered that paranoia and led to the mistaken entry in my KGB file. ■

Government Update

*by **Henry M. Wise, P.G.** and **Arlin Howles, P.G.***

Texas Board of Professional Geoscientists Appoints Four New Members

The Texas Board of Professional Geoscientists (TBPG) announces the appointment of four new members of the Board. Gregory Clayton Ulmer of Houston has been appointed for a term to expire February 1, 2011. Mr. Ulmer is replacing Kimberly Phillips of Houston who resigned. Charles Thomas Hallmark of Hearne has been appointed for a term to expire February 1, 2013. Mr. Hallmark is replacing Murray Milford of Bryan whose term expired. Barbara O. Roeling of Austin has been appointed for a term to expire February 1, 2013. Ms. Roeling is replacing Shiela Burnette Hall of Lubbock whose term expired. Ronald L. Kitchens of Harper has been appointed for a term to expire February 1, 2013. Mr. Kitchens is replacing Danny Perkins of Houston whose term expired.

Railroad Commission of Texas Rule Change

The Railroad Commission of Texas (RRC) adopts new §2.1, relating to Informal Complaint Procedure, in new Chapter 2, entitled Informal Complaint Procedure, of Title 16 of the Texas Administrative Code, with changes to the proposed version published in the October 27, 2006, issue of the Texas Register (31 TexReg 8811).

Through a rider to the 2006–2007 appropriations bill, the Texas Legislature required the RRC to conduct a study that examines and determines the extent to which viable competition exists in the Texas natural gas pipeline industry from wellhead to burner tip. The study was required to recommend solutions to bring market competition to any noncompetitive segments of the industry. The study was also required to include an assessment of the effectiveness of current laws, regulations, enforcement and oversight in addressing abuses of pipeline monopoly power and make recommendations for changes that may be necessary. In addition, the study was to include a comparative review of competition in the Texas interstate pipeline industry administered by the Federal Energy Regulatory Commission. The RRC was required to submit a report of its findings to the Legislative Budget Board and the Governor on or before November 1, 2006, and did so. For more information go to:
http://www.sos.state.tx.us/texreg/sos/adopted/16.ECONOMIC%20REGULATION.html#218

TCEQ LPST Fund Update

Reimbursement-eligible leaking petroleum storage tank (LPST) sites that cannot complete corrective actions by August 30, 2007, may apply to transfer into the Texas Commission on Environmental Quality's (TCEQ's) State-Lead Program. Application must be (a) on a form provided by the TCEQ and (b) submitted to the TCEQ no later than July 1, 2007. This form is now available at
http://www.tceq.state.tx.us/remediation/pst_rp/news.html.

TCEQ Establishes Electronic Submittal of Reports, etc.

The TCEQ adopts new §§19.1, 19.3, 19.10, 19.12, and 19.14. Sections 19.1 and 19.10 are adopted with changes to the proposed text as published in the September 8, 2006, issue of the Texas Register (31 TexReg 7235). Sections 19.3, 19.12, and 19.14 are adopted without changes to the proposed text. The rules establish a system for authorized programs to accept electronic submittal of reports, permit applications and other specified documents using the commission's electronic document receiving system. These rules establish that a person, as defined in 30 TAC §3.2(25), Definitions, who fails to comply with electronic reporting procedures will be subject to the same level of enforcement as one who fails to submit written documents as required. For more information go to http://www.sos.state.tx.us/texreg/ sos/adopted/30.ENVIRONMENTAL%20QUALITY.html#361.

TCEQ Petitioned for Rule Making on Class III Injection Wells

Rule Matters - Item 76. Docket No. 2006-2245-RUL. Consideration of a petition for rulemaking under 30 TAC Section 20.15.

The petition requests changes to the Commission's rules relating to the regulation of Class III injection wells for in situ mining as provided in 30 Texas Administrative Code (TAC) Chapters 305 and 331. Proposed changes would eliminate all current rules in Chapters 305 and 331 that apply to the production area authorization process for in situ uranium mining and replace them with a requirement to submit a report. The petition also requests changes to Section 331.103 to allow up to five years to meet the requirements for monitoring wells. (David H. Murry, Project Manager, Don Redmond, Attorney) (Rule Project No. 2007-010-PET-NR).

AGI Government Affairs Monthly Review (February 2007)

Congressional Cornucopia: Climate Change Aplenty

Congress continued to hold hearings on climate change in both chambers and across many different committees. Geoscientists were key witnesses in many hearings. Perhaps the most provocative and interesting hearing was the February 8, 2007, overview of one part of the findings of the Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report. The House Science and Technology Committee invited four co-authors of the IPCC's summary for policy makers of the first volume of the report, titled "Climate Change 2007: The Physical Science Basis,"

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to testify. In an unusual twist, Speaker Nancy Pelosi (D-CA) was the first witness and she offered strong support for the findings of the IPCC policy summary. Later on in the hearing, NOAA atmospheric scientist Susan Solomon got into a terse conversation with Rep. Dana Rohrabacher (R-CA) about the amount of carbon dioxide in the atmosphere that can be directly attributed to human influence, and Professor Richard Alley delighted the members with a pancake analogy. An archived web cast of the hearing is available from the committee web page. Many more hearings are expected in March, including the testimony of more geoscientists and former Vice President Al Gore.

Partially in response to the IPCC report and to the attention to climate change in Congress, the Senate Republican Policy Committee released a 10-page primer on climate change for policymakers on February 27. The primer, titled "Global Warming: The Settled Versus the Unsettled Science," states that there is scientific agreement that greenhouse gas concentrations in the atmosphere have increased in large part due to fossil fuel consumption, that Earth's average temperature has risen 1.3 degrees F over the past century and that carbon dioxide, methane and other gases exert a warming influence on climate. Beyond these 3 points, the primer states there is considerable uncertainty. The first two uncertainties are that it is difficult to determine how much of the past warming is due to human influence and that it is difficult to determine whether human activities will have a benign or catastrophic effect on climate in the future.

Speaker Pelosi has given the House a June 1, 2007, deadline for crafting comprehensive climate change legislation, but Rep. John Dingell (D-MI), chair of the House Energy and Commerce Committee and Rep. Rick Boucher (D-VA), chair of the Energy and Air Quality Subcommittee have requested more time. In addition to more time, which Speaker Pelosi denied, the chairmen are also seeking more input from outside organizations.

On February 28, 2007, Dingell and Boucher sent a letter to more than 30 organizations requesting input on climate change legislation. The letter states, "We appreciate any help you can provide in furthering our understanding of the significant factual and policy issues involved in the debate concerning potential congressional action on climate change legislation." The letter was sent to the AFL-CIO, American Petroleum Institute, U.S. Chamber of Commerce, American Gas Association, National Wildlife Federation, Environmental Defense, Coal Research Council, National Petrochemical & Refiners Association, National Association of Manufacturers, Alliance of Auto Manufacturers, Renewable Fuels Association and others. Groups have until March 19, 2007, to respond and the chairmen have promised to make the responses public.

Congress is not just holding hearings and requesting information about climate change though. Members have been busy introducing legislation to address the issue, primarily in the Senate. One piece of legislation called for a new national assessment and better federal coordination of climate change research, a bevy of bills address greenhouse gas reductions and a newly introduced bill calls for a national assessment of our carbon sequestration capacity.

On February 7, 2007, Representative Mark Udall (D-CO) introduced the Global Change Research and Data Management Act of 2007 (H.R. 906), which would require the President to "establish an interagency United States Global Change Research Program to improve understanding of global change, to respond to the information needs of communities and decision makers, and to provide periodic assessments of the vulnerability of the United States and other regions to global change." The bill would repeal The Global Change Research Act of 1990.

The measure would be intended to explicitly require a national assessment of climate change research. Currently the Bush Administration is being sued by the Center for Biological Diversity, Greenpeace and Friends of the Earth for deciding not to produce a second national climate assessment in 2005, but instead producing a series of 21 staggered, narrowly defined reports on climate science. The 1990 law requires the government to prepare a scientific assessment every four years of current climate change research and the groups in the lawsuit contend that the Administration is in violation of this requirement.

Udall's measure would also form a working group that would include the Administrator of the National Aeronautics and Space Administration, the Administrator of the National Oceanic and Atmospheric Administration, the Secretary of Energy, the Secretary of Defense, the Director of the National Science Foundation, the Director of the United States Geological Survey, the Archivist of the United States, the Administrator of the Environmental Protection Agency, the Secretary of the Smithsonian Institution, or their designees, and representatives of any other Federal agencies the President considers appropriate.

By the end of February, the following 7 measures to reduce greenhouse gas emissions were introduced in Congress and being compared by members and outside stakeholders:

1. Climate Stewardship and Innovation Act (S.280) from lead cosponsors Senator Joseph Lieberman (I-CT) and Senator John McCain (R-AZ),
2. Global Warming Pollution Reduction Act (S.309) from lead cosponsors Bernie Sanders (I-VT) and Barbara Boxer (D-CA),
3. Electric Utility Cap-and-Trade Act (S.317) sponsored by

Senators Dianne Feinstein (D-CA) and Tom Carper (D-DE),
4. Discussion Draft of Global Warming Legislation sponsored by Senator Jeff Bingaman (D-NM) and Arlen Specter (R-PA),
5. The Climate Stewardship Act (H.R. 620) led by co-sponsors Rep. John Olver (D-MA) and Rep. Wayne Gilchrest (R-MD),
6. Global Warming Reduction Act (S.485) led by co-sponsors Senator John Kerry (D-MA) and Senator Olympia Snowe (R-ME), and
7. National Energy and Environmental Security Act of 2007 (S.6) from lead co-sponsor, Senator Harry Reid (D-NV).

All these measures would require implementation of some type of reduction in greenhouse gas emissions for different sectors of the U.S. economy, including, in some cases, the use of carbon sequestration.

A new and different bill, introduced on March 1,, 2007, would address the capacity for carbon sequestration in the U.S. The National Carbon Dioxide Storage Capacity Assessment Act of 2007 was introduced in the Senate and the House. Cosponsors for the Senate bill, S.731, include Senators Ken Salazar (D-CO), Jeff Bingaman (D-NM), Jim Webb (D-VA), Jon Tester (D-MT) and Jim Bunning (R-KY), while in the House, Rep. Bart Gordon (D-TN) is the lead sponsor of a companion version, H.R. 1267. Both bills task the U.S. Geological Survey, the Energy Department and the Environmental Protection Agency with calculating storage capacity in all 50 states and the risks associated with sequestration, as well as estimating potential volumes of oil and gas that could be recovered after carbon injections.

IPCC's summary for policymakers titled "Climate Change 2007: The Physical Science Basis" is available on the IPCC web site at: http://www.ipcc.ch/SPM2feb07.pdf.

An archived web cast of the House Science and Technology Committee hearing on "The State of Climate Science 2007" is available from the committee web page at: http://science.house.gov/publications/hearings_markups_details.aspx?NewsID=1264.

The Republican Policy Committee global warming primer is available at: http://www.senate.gov/~rpc/.

The full text and summary of each bill are available from Thomas: thomas.loc.gov.

The Bingaman-Specter Discussion Draft on Global Warming Legislation is available from the Senate Energy and Natural Resources Committee web site at: http://energy.senate.gov/public/.

The Dingell-Boucher Letter is available from the House Energy and Commerce web site at: http://energycommerce.house.gov/.

Also see the AGI Government Affairs web page on Climate Change for more summaries of hearings and other actions at http://www.agiweb.org/gap/legis110/climate.html

Energy Policy Propels Geoscience into the Congressional Spotlight

Like the climate change debate, the 110th Congress is also keenly focused on energy policy and in many cases the two are intimately coupled in discussions and proposed legislation. Congress held multiple hearings across many different committees about energy policy and considered measures to diversify the nation's energy portfolio, improve efficiency and conservation, reduce the nation's demand for imported fossil fuel products, reduce the environmental impacts of energy use, improve global energy security and enhance research and development to meet future energy needs. Many of these measures will require geoscientific information and help from geoscientists and engineers working in applied geoscience fields.

Among the many energy hearings, the House Appropriations Subcommittee on Energy and Water Development February 28, 2007, hearing on "A Ten Year Energy Outlook" was particularly informative. Guy Caruso, the Energy Information Administrator, was the first witness and he reviewed the recently released Annual Energy Outlook, 2007. After summarizing some pessimistic numbers about future energy demands, he told the committee he wanted to end his testimony on "a note of optimism" which drew faint laughter. He then noted that EIA's energy outlook in the 1970s had projected energy use in 2006 that was at least 50% off the mark, so future projections for 2030 might also be too high.

Caruso was followed by Jim Wells, Director of Natural Resources and Environment at the Government Accountability Office (GAO). Wells was very pessimistic as he presented the results of the GAO report "Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs." He indicated that the Energy Department's research and development (R&D) has been a failure since 1978 because the nation has not reduced its dependence on fossil fuels by any significant fraction. He concluded that cheap energy is now gone and the future will be "unsettling" for consumers.

The second panel of six witnesses focused on a ten-year outlook for energy R&D. All the witnesses agreed that the federal government and the private sector in the U.S. were not spending enough on R&D. They also agreed that the U.S. needs to consider a diverse energy portfolio to meet future demand and that all energy resources should be adequately supported with R&D funds because all of these resources will be needed now and in the future. Professor Daniel Kammen from the University of

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California, Berkeley documented a disturbing decrease in energy R&D spending by the government and the private sector. He noted that the U.S. invests about $1 billion less in energy R&D than it did a decade ago. All representatives who attended the hearing, including the Chairman Peter Visclosky (D-IN) and Ranking Member David Hobson (R-OH), agreed that energy R&D spending should be increased and their committee would like to support appropriate increases for energy R&D.

The EIA Energy Outlook for 2007 is available at http://www.eia.doe.gov/oiaf/aeo/index.html.

The GAO report on energy R&D is available at the GAO web site: http://www.gao.gov/.

Congress Begins Deliberations on Science Education

Since 2002, the No Child Left Behind (NCLB) Act has been the cornerstone of federal K-12 education policy. Within NCLB, the primary effect on earth science education has been the establishment of Math and Science Partnerships in the Department of Education and the National Science Foundation (NSF). NCLB also requires that states begin assessing science proficiency in the 2007-2008 school year. With this requirement, states have the opportunity to set standards, determine curricula and review education programs. This is also a time for the Earth science community to advocate for and explain the value of Earth science in curricula, testing and standards.

NCLB, the Higher Education Act (HEA), which focuses on federal student aid and contains scholarship and loan relief provisions for math and science students and teachers, and NSF are all up for re-authorization in fiscal year 2008. Congress is likely to consider their overlapping objectives in crafting any changes to these programs. A number of education initiatives have also been proposed as part of a new focus in Congress and the White House on innovation and U.S. competitiveness.

With this backdrop on science education legislation, a bipartisan task force presented more than 70 recommendations for improving the NCLB to members of the House Education and Labor Committee on February 13, 2007. The task force recommended more tests and standards for students, new requirements for teachers, requirements for schools to maintain databases of student progress and new requirements to measure the performance of principals against the performance of their students.

Senate Agriculture Committee Adds New Subcommittee on Energy, Science and Technology

Senate Agriculture Committee Chairman Tom Harkin (D-Iowa) has added a new panel focused on energy and renewables to the Agriculture Committee. Dubbed the "Energy, Science and Technology" panel, the new subcommittee will be led by Senator Kent Conrad (D-ND) and Senator John Thune (R-SD), who are both biofuel advocates. According to a statement by Senator Harkin in an E&E Special Report, the panel's focus will include renewable energy production, energy efficiency improvement on farms and ranches, research and new uses for agricultural commodities.

Key Federal Register Notices

DOE: The Department of Energy (DOE) has decided to cancel the preparation of a Programmatic Environmental Impact Statement (PEIS) for the assessment of potential environmental impacts from DOE's Carbon Sequestration Program, as described in a Notice of Intent published in the *Federal Register* on April 21, 2004 (69 FR 21514). For further information, contact Heino Beckert, National Energy Technology Laboratory, U.S. Department of Energy, P.O. Box 880, Morgantown, WV 26507-0880, by telephone (304) 285-4132, or electronic mail at: heino.beckert@netl.doe.gov.
[*Federal Register*: February 26, 2007 (Volume 72, Number 37)]

HGS Directory of Oil Company Name Changes New Edition

The updated 18th Edition (April 2007) of the *HGS Directory of Oil Company Name Changes* is now available.

This publication is a cross-referenced list of oil and gas exploration and production companies that have merged, been acquired, bought or sold major assets, or otherwise changed their names. The purpose of this publication is to assist geoscientists in their pursuit of logs, paleo, production histories, well files and other data whose location may be obscured by company name changes.
The *HGS Directory Of Oil Company Name Changes* is available for $13.50 plus shipping and handling and 8.25% Texas sales tax if shipped to a Texas address. Prepayment is required, preferably by credit card.

The *Directory of Oil Company Name Changes* can be obtained from the Bureau of Economic Geology in Austin. The Bureau's Web site is located at www.beg.utexas.edu, the email address is pubsales@beg.utexas.edu, or you can contact them by phone at 1-888-839-4365 (USA only) or 512-471-7144. Orders may be faxed to the Bureau at 1-888-839-6277 or 512-471-0140.

Letters to the Editor continued from page 9

This article can be viewed at: The Week That Was, December 23 , 2006 http://www.sepp.org/Archive/week-was/2006/December 23.htm

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Introduction to Geological Perspectives of Global Climate Change

http://ff.org/centers/csspp/pdf/gerhard-notes.pdf Capitol Hill Seminar Sponsor: Center for Science and Public Policy (www.scienceandpolicy.org) September 20, 2006
Lee C. Gerhard, The PowerPoint presentation can be viewed at: http://ff.org/centers/csspp/docs/gerhardppt.ppt

History has seen many memorable public confrontations between belief systems and science data. Despite the scientific merit of the data, belief systems are powerful endemic and forces against which science must struggle. Some modern examples are evolution and global climate change.

In both cases, complexity is added to the debates because scientists bring their own belief systems to the controversy. Although the scientific observations and information make a scientifically correct conclusion clear with respect to both evolution and global climate change, belief systems drive media, politics, and group thinking, keeping alive a debate that has no further useful purpose, but which distracts governments and the people from mitigating the effects of natural processes and enhancing public education.

Much of problem lies in the resurgence of a new cycle of anthropocentrism that started in the 1960's. It did not take very long for anthropocentric self-flagellation to begin and identify human beings as the cause of all things "bad". The next step was inexorable and led to the worship of the "state of nature," with removal of human beings as the ultimate good.

The United Nations, a political organization, is the acknowledged leader in the argument that human beings are the cause of global climate change as a result of their use of fossil fuels.

The mission of the Intergovernmental Panel on Climate Change (IPCC), a United Nations organization, is not to study causes of climate change, but to document only one cause, human impacts on climate.

This kind of mandate validates the recent quote from geologist, Dr. Peter Flawn, President Emeritus of the University of Texas, Austin: "All geologists early in their careers are introduced to solving problems through multiple working hypotheses - of deriving solutions from the data rather than, as is common among some social scientists, settling upon a solution consistent with the reigning theory and supporting it with data selectively chosen." (Flawn, Peter T., 2006, The Compass, v. 79, p.19.)

The attached Power Point presentation documents the current state of scientific information about climate change. The substantial credible scientific evidence establishes that a number of popular assumptions and hypotheses cannot be supported and in some cases are demonstrably false.

Human emissions of carbon dioxide are a significant driver of climate. They are not. Climate change rates and the global warming of today are unprecedented. They are not. However, the data does support a number of less popular hypotheses: _Climate naturally changes constantly, from warmer to cooler and cooler to warmer, and at many levels of intensity over time at many scales.

Variation in Solar activity closely correlates with global temperature variations, suggesting that the amount of solar energy reaching the surface of the earth is a primary climate driver at the time scale of decades to millennia.

Dear Editor,

I am in complete agreement with Mr. Kelly's letter re: 'your personal view' that global warming is 'mostly caused by human activity.' I also agree with his statement that 'many scientists [and especially politicians] have a vested interest in the idea that it is all man's fault and are building careers on it,' i.e. what I would term the 'gravy train/bandwagon' effect. The most egregious example of this, of course, is Albert Gore's 'Inconvenient' epic.

I also commend Mr. Kelly's thought on the HGS Board and EE Committee stating 'the official HGS position on the causes and effects of global warming,' which is qualified by the statement, 'if they feel it is appropriate for the HGS to even take such a position [emphasis added].'

However, I believe that an 'official HGS position' will be difficult to establish, absent a polling of membership opinion or an actual vote on the subject. Also, in my view, the Board, although comprising elected officers, should not make such a statement, unless during the electoral process, each candidate's personal position on the subject is clearly stated. The idea of an appointed committee enunciating an 'official HGS position' is even less defensible. How can a half dozen or so persons presume to represent the opinions of the more than 3600 members?

Cordially,

William F. Bishop
President 1981-82

HGA and GeoWives

continued from page 72

Photographer	Betty Alfred
Parliamentarian	Norma Jean Jones
Directors:	Shirley Gordon
	Norma Jean Bacho
	Margery Ambrose
	Norma Jean Jones
HPAC Liaisons	Winona L. Smith
	Edie Bishop
Notification	Suzanne Howell
Courtesy	Connie Griffith
	Mary Harle

Our year started with a relaxed luncheon at the River Oaks Apartments Club Room. Hellen Hutchison chaired this event, with Jean West of West Designs giving an informative talk about rejuvenating the old jewelry pieces we all have. She also offered some of her unique designs for sale.

Our Christmas event took place December 1 at Sugar Creek Country Club with Shirley Gordon, Norma Jean Bacho and Norma Jean Jones co-chairing. A lovely luncheon was served with entertainment by the Dulles High School Honors Chorus offering songs of the season. Special guest of the board, newly published author and my husband Ray Blackhall signed copies of his novel, *Stealth Planet.*

A major step was taken this year in the unification of the four major Houston Petroleum auxiliaries. Two representatives from each auxiliary formed the Houston Petroleum Auxiliary Council (HPAC). Representing the HGA are Winona LaBrant Smith and Edie Bishop. Linnie Edwards, also an HGA member, is a representative for the Houston Geophysical Auxiliary. The HPAC's plan is to host two or three events each year. To maintain their separate identities, each of the four auxiliaries will have its own Fall and May events. I see it as a win-win situation for all. The January 29 Luncheon and Style Show in the Ballroom of Junior League was the first jointly hosted event. This event, hosted by the Geophysical Auxiliary and chaired by Linnie Edwards, was a great success with more than 250 ladies attending.

Our annual Game Day was held February 12 at the Junior League Tea Room. Daisy Wood and Linnie Edwards co-chaired. Once again the two of them and their committee brought us a day full of enjoyment.

Ladies, we have saved the best for last! Our Annual Meeting/ Installation of Officers Luncheon will be May 2, 2007, at the Houston Racquet Club. Make your plans to attend. Edie Bishop and Sholeh Huber will co-chair. The entertainment will be by My Friends and I. They will present "Southern Belles Gone Bad." Don't miss this program because I hear they are fabulous. What a great way to end a good year.

Again, I thank you for giving me the opportunity to serve as president of HGA. May each new year be better than the one before.

The HGA nominating committee of Norma Jean Jones (chair), Betty Alfred, Sally Blackhall, Edie Bishop, and Mary Harle are submitting the following slate of Officers for the 2007–2008 Executive Board for your approval:

President	Audrey Tompkins
President Elect	Sara Nan Grubb
First Vice-President	Hellen Hutchison
Second Vice-President	Sara Parr
Third Vice-President	Daisy Wood
Secretary	Suzanne Howell
Treasurer	Naomi Watson
Historian/Photographer	Donna Parrish
Parliamentarian	Sally Blackhall
Directors:	Ruby Wagner
	Sally Blackhall
	Norma Jean Jones

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Notification / Phone Committee ☐

Courtesy / Hostess ☐

My home is available for a meeting ☐

Application to Become a Member of the Houston Geological Society

Qualifications for Active Membership

1) Have a degree in geology or an allied geoscience from an accredited college or university; or
2) Have a degree in science or engineering from an accredited college or university and have been engaged in the professional study or practice of earth science for at least five (5) years.

Qualifications for Associate Membership (including students)

1) Be involved in the application of the earth or allied sciences.
2) Be a full-time student enrolled in geology or in the related sciences.

Annual Dues Expire Each June 30. (Late renewals – $5 re-instatement fee)

Annual dues are $24.00; full-time students and emeritus members pay $12.00.

Mail this application and payment to:

Houston Geological Society

14811 St. Mary's Lane, Suite 250 • Houston, TX 77079-2916

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To the Executive Board: I hereby apply for ❑ Active or ❑ Associate membership in the Houston Geological Society and pledge to abide by its Constitution and Bylaws. ❑ Check here if a full-time student.

Name: _____

Address: _____

_____

Home Phone: _____ *Spouse's Name:* _____

Email: _____

Job Title: _____

Company: _____

Company Address: _____

_____

Work Phone: _____ *Fax Number:* _____

Circle Preferred Mailing Address: Home Office

Professional Affiliations:

❑ AAPG member No.: _____

Professional Interest:

❑ Environmental Geology

❑ International E&P

❑ North American E&P (other than Gulf Coast)

❑ Gulf Coast E&P (onshore & offshore)

School _____

Degree _____ *Major* _____ *Year* _____

School _____

Degree _____ *Major* _____ *Year* _____

School _____

Degree _____ *Major* _____ *Year* _____

Earth Science Work Experience _____

_____

_____

Applicant's Signature _____ *Date* _____

Endorsement by HGS member (not required if active AAPG member)

Name: _____

Signature _____ *Date* _____

Membership Chairman _____ *HGS Secretary* _____

rev. 3/13/2007

HGA and GeoWives **News**

Sally's Sweethearts delivered many hands to assist our office staff during the transition awaiting a new hire to assist in all the office duties. Thank you to all the workers: Marilyn Berger, Edie Bishop, Norma jean Jones, Betty Alfred, Barbara Thigpen, Kathi Hilterman, Mary Elizabeth Sims, Lynn Schoenberger and Donna Parrish.

From The HGA President

Sally Blackhall

I can barely believe a year has come and gone since I received the gavel from Norma Jean Jones last May. I am honored to have served as the 2006–2007 HGA President. I am very proud of our Executive Board. We began as a group of individual ladies who I believe brought out the best in each other to make this a successful year. Our programs were good thanks to Sara Nan Grubb, First Vice-President, the wonderful Chairs and their committees. One of the best benefits this year for me was getting to know many more of the wonderful members of the auxiliary as well some of the board members. How nice it has been to be president of HGA and serve with these lovely ladies:

President Elect	Audrey Tompkins
First Vice President (Socials)	Sara Nan Grubb
Second Vice President (Membership)	Camille Amoruso
Third Vice President (SOS)	Donna Parrish
Secretary	Millie Tonn
Treasurer	Vicky Pickering
Historian	Norma Gordon

HGA and GeoWives *continued on page 70*

The Houston Geological Auxiliary was formed over fifty years ago to assist the Houston Geological Society with conventions (such as AAPG and GCAGS), party decorations, mailings, etc., and also to serve as a social connection for HGS members and their spouses. There are four or five social events held during the year: A fall event, a Christmas Event, Game Day, a Spring Event, and the Annual Meeting/Luncheon in May. HGA members are eligible to join Geo-Wives which has various programs and luncheons, day trips and parties held at members homes, occurring monthly starting in September and ending in May. We look forward to your participation in the coming year of fun and friendship.

Sincerely,
Audrey Tompkins, 713-686-0005

You are invited to become a member of
Houston Geological Auxiliary

2007–2008 dues are $20.00
Due by July 15th 2007

Mail dues payment along wtih the completed yearbook information to
Audrey Tompkins, 3007 Stally, Houston, TX 77092

YEARBOOK INFORMATION

Last Name	First Name	Name Tag
Spouse Name	Name Tag	HGS Members Company
Home Phone	Business Phone	Business Fax
Street Address	City	Zip
Email Address	Home Fax	

Please choose a Committee Assignment

☐ Fall Event	☐ Yearbook	☐ SOS	☐ Membership
☐ Christmas Event	☐ Spring Event	☐ Notification	☐ Game Day
	☐ May Luncheon	☐ Courtesy	

Please fill out if you desire receiving a GEO-WIVES membership form.

Name

Address

City/State/Zip

Telephone

ASSOCIATION FOR WOMEN GEOSCIENTISTS HOUSTON, TX ANNOUNCEMENT OF SCHOLARSHIP

The Association for Women Geoscientists (AWG) Lone Star Rising Scholarship provides professional development funding for women in the geoscience profession who wish to resume their geoscience careers after having been out of the work force for at least 2 years.

The awards are intended to cover professional development costs, up to $500, such as enrollment in geoscience training courses or workshops, fees for certifications & licensing, conference fee & expenses, professional membership fees, or any other justifiable costs to help candidates reenter the workforce. The application due date is June 1st, 2007 and AWG membership is not required. More information can be found on our website http://awglonestartx.blogspot.com.

AWG Mission

The Association for Women Geoscientists is an international organization devoted to enhancing the quality and level of participation of women in the geosciences and to introducing girls and young women to geoscience careers. Membership is open to all who support AWG's goals. The Lone Star Chapter was re-established in 2002. The chapter holds monthly networking dinners in and around Houston and supports the "Lone Star Rising Scholarship." ■

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- Asset / Portfolio Evaluation
- Structural and Stratigraphic Interpretation and Mapping
- Seismic / Sequence Stratigraphy Projects
- Post-drilling Evaluations and Assessments
- Structural Analysis
- Reserves and Resources Studies
- Integrated, Multidiscipline (Exploration, Development) Projects

To discuss your next upcoming project with SCA, contact us TODAY!!!

SCA Upcoming Training Programs

Refer to our website, www.scacompanies.com, for our complete list of courses and public schedule, and to REGISTER ONLINE TODAY!!

June		
4 - 8	Petroleum Geology of Deepwater Depositional Systems	
	Houston	*5 day course, instructor Dr. R. Slatt*
11 - 15	AVO and Seismic Attributes	
	Houston	*5 day course, instructor Dr. M. Thapar*
18 - 22	Applied Subsurface Structural Geology	
	Houston	*5 day course, instructor Dr. J. Helwig*
18 - 22	Principles of 3-D Seismic Interpretation	
	Houston	*5 day course, instructor Dr. M. Thapar*
25 - 29	Applied Subsurface Geological Mapping	
	Kuala Lumpur	*5 day course, instructor Mr. S. Agah*
July		
9 - 13	AVO and Seismic Attributes	
	Kuala Lumpur	*5 day course, instructor Dr. M. Thapar*
16 - 20	Applied Subsurface Geological Mapping	
	New Orleans	*5 day course, instructor Mr. J. Brewton*
23 - 26	Basic Reservoir Engineering (Non-Engineers)	
	Houston	*4 day course, instructor Dr. W. McCain*
August		
6 - 10	AVO and Seismic Attributes	
	London	*5 day course, instructor Dr. M. Thapar*
6 - 10	Introduction to Petroleum Geology	
	Houston	*5 day course, instructor Dr. B. Lock*
13 - 17	Applied Subsurface Geological Mapping	
	Houston	*5 day course, instructor Mr. J. Brewton*
20 - 24	Cased Hole and Production Log Evaluation	
	Houston	*5 day course, instructor Mr. J. Smolen*

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SCA is authorized by IACET to award Continuing Education Units (CEUs)

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