APRIL 2007

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8	9	10 May Newsletter Deadline	11 Technical Breakfast	12 Multi-Component SIG GSH Board Meeting	13	14
15	16	17 Technical Luncheon	18 Rock Physics SIG Data Processing SIG	19 SIPES LUNCHEON Petroleum Club 11:15 AM	20	21
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VOL. 41, NO. 8 NEWSLETTER APRIL 2007

Technical Luncheon

Date: April 17, 2007
Time: 11:30 a.m.
Location: Omni Palace (Conference Ctr.)
12121 Westheimer Rd.
Houston, TX
Register Online at www.gshtx.org
Topic: ***"Over/Under Towed Streamer Acquisition: A Method To Extend The Seismic Bandwidth"***
Speaker: Nick Moldoveanu
Abstract:

Seismic resolution of towed marine streamer data is affected by the ghost reflections at the low end and at the high end of the spectrum. The typical solution used to preserve the higher frequencies is to deploy the streamers at shallower depths. The shallow streamers better preserves the higher frequencies but the notch at zero Hz attenuates the lower frequencies. If the streamers are deployed at larger depths, the lower frequencies are preserved better but the ghost notch repeats and destroys the higher frequencies. The source ghost has a similar effect on seismic resolution. The key geophysical issue that must be resolved in order to improve the seismic bandwidth of towed-streamer data is to remove the ghost notches, a process

Technical Luncheon continued on page 20.

Technical Breakfast

Date: April 11, 2007
Time: 7:00 a.m. - 7:30 a.m.
Social
7:30 a.m. - 8:00 a.m.
Presentation
8:00 a.m. - 8:30 a.m.
Q & A
Location: Fugro Building
6100 Hilcroft, Suite 100,
Houston, TX 77274
Note: *Please RSVP to:*
Liz Ivie at Fugro
713-369-5863 or
livie@fugro.com
Title: ***"Improved 4D Repeatability Using Dual Vessel Acquisition: Holstein Field, Gulf of Mexico"***

Speaker:
Chuck Barousse

Abstract:

Towed streamer 4D repeatability is a challenge even during optimum conditions. Add surface obstructions, Gulf of Mexico loop currents up to 3 knots,

Technical Breakfast continued on page 6.

President's Column

by Lee Lawyer

This column will be dedicated to *"preaching to the choir"*, since the people I would really like to communicate with don't get a copy of the Newsletter. We have a pathetically small percentage of GSH members of the total geophysicists in the area. There are probably four or five thousand geophysicists in the Houston Area and less than 25% are GSH members. The current count is 1223 GSH members!

What really got me started on this subject was a tennis game. It was a doubles match at West Side Tennis club. Our opponents were much younger than my partner and I, probably by 30 years each. To be friendly, I asked one of them where he was employed. He told me he was a geophysicist with a major oil company. Continuing our friendly conversation, I asked him if he read TLE (trying to see if he recognized the VIP columnist across the net). His answer was a quick no. Wow! I said I hadn't seen him at the GSH technical meetings. He said he didn't attend. That ended the friendly talk. They beat us soundly, but I really question the judgment of the young geophysicist.

I also question the judgment of other geophysicists in the Houston area that do

President's Column continued on page 20.

Encourage A Friend To Join GSH Today!

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Salt Water Tournament	Bobby Perez	281-240-1234	281-240-4997	r_perez@seismicventures.com
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SIG Processing Meeting continued from page 13.

His main research interests are in seismic imaging and velocity analysis using wavefield extrapolation techniques, computational methods for wave propagation, optimization and high performance computing. He is a member of SEG, EAGE, AGU, SIAM, and RSG. More information about Paul Sava can be found on his webpage at http://www.mines.edu/~psava.

Abstract *(Talk 2)*:

One of the critical aspects to depth imaging of complex structure is velocity model building. Until now, velocity model building for depth imaging has relied exclusively on ray-based tomography, which uses moveout analysis of offset or angle gathers after depth migration for tomographic backprojection. Interestingly, while velocity analysis techniques have continued to rely on raytracing, migration technology for depth imaging has progressed from ray-based methods to wave-equation methods based on downward- or time-extrapolation, since such methods yield significant improvements in images where velocity variations are severe. This dichotomy has lead recently to significant academic research on wave-equation methods to update velocities. These methods have largely focused on two separate techniques. The first is waveform inversion, where forward-modeled data and actual data in time are compared, and their difference is propagated using time or frequency extrapolation to recover a velocity change. The second and more recent technique is wave-equation tomography, where a residual field based on moveout on angle gathers is backprojected using one-way wavefield extrapolation to obtain a velocity update. In the past year, technology transfer of these methods to industry has progressed to the point where we are now beginning to see promising results using wave-equation tomography on 3D field data, and waveform inversion on 2D field data. The most notable successes for these methods have been in the recovery of velocity anomalies for shallow gas in such areas as the North Sea and the Gulf of Mexico, and for localized velocity anomalies in the sediments above and near salt structures in the Gulf of Mexico and offshore Africa. In addition, a variant of wave-equation tomography is well suited to the monitoring of 4D reservoir depletion, by directly converting 4D image differences to changes in velocity in the reservoir. The results of these early trials indicate that wave-equation tomography and waveform inversion have the potential to improve velocity model resolution while reducing the labor involved in the velocity analysis process. In this talk I shall present an overview of wave-equation tomography and waveform inversion, giving particular emphasis on methodology for successful application to field data. A brief overview of the theory behind the methods shall be given, together with synthetic examples demonstrating how the methods work. Subsequently, a number of examples of the application of wave-equation tomography and waveform-inversion to field data for the recovery of velocity anomalies associated with shallow gas, fine layering, and salt will be presented. These examples will demonstrate the effectiveness of wave-equation based methods to improve both the resolution and turn-around time of velocity analysis in highly complex structural areas.

Biography: Uwe Albertin

Uwe Albertin is currently a Senior Research Geophysicist with BP in the Advanced Imaging Team, for the Exploration and Production Technology division of BP. His current research and development duties include the development of imaging and velocity analysis algorithims for complex imaging. Prior to this, Uwe was a Geophysical Advisor, and Team Leader for Houston Depth Imaging Research at WesternGeco, and Western Geophysical, where he was employed for fourteen years. He holds a degree in Physics form the University of California at Berkeley.

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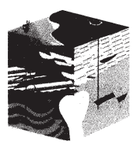
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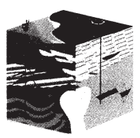
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To ensure your information reaches the GSH society members in a timely manner it must appear in the appropriate newsletter issue. Please note the following deadlines and plan your function's publicity strategy accordingly. Items must be received on or before the corresponding deadline date. Please send any obituary or memorial articles of recently deceased members to the Editor for inclusion in the newsletter. Materials can be emailed to Fernada Araujo, Editor at fernanda@houston.rr.com with a copy sent to Glenn Bear at glenn.w.bear@exxonmobil.com. If you have any questions please call Fernanda Araujo at 832/486-2564, or Glenn Bear at 713/431-6583.

2007 GSH Newsletter Deadlines

Issue ..... May 2007
Deadline ..... April 10, 2007

Issue ..... Summer 2007
Deadline ..... May 8, 2007

Announcements

Technical Breakfast
April 11, 2007

Multi-Component SIG
April 12, 2007

Technical Luncheon
April 17, 2007

Rock Physics SIG
April 18, 2007

SIG Processing Meeting
April 18, 2007

SIPES Luncheon
April 19, 2007

Auxiliary

Guest Speaker Sparks Geophysical Auxiliary Annual Meeting

The Geophysical Auxiliary's Annual Meeting and Luncheon features the election of new officers and a guest speaker from the Houston Fire Department. Auxiliary members at the May 15th meeting will enjoy luncheon at the Braeburn Country Club and an address by Al Bennett of HFD.

The Nominating Committee, chaired by President Susan Bell, will present at this meeting the slate of nominees for officers to guide the Auxiliary through the 2006-2007 year. Members present will then vote and results will be immediately announced.

Auxiliary members who want more information or would like to make reservations for the Annual Meeting and Luncheon should contact Charlcie Dial at 713-771-6297.

Next year's activities will be finalized by the new officers. Among the activities being considered are Opera in the Heights, a couples brunch and another adventure in reading with Blue Willow Books. The Geophysical Auxiliary of Houston will join with other Houston-based exploration auxiliaries for several additional activities.

Membership in the GAH is open to wives of GSH or SEG members and women members of these organizations. Auxiliary members receive monthly newsletters with details on activities. If you, or your spouse, are interested in this organization, please contact Kathy Duncan, 713-467-7915 or kajadu@aol.com, for membership information.

GSH SIGHTINGS

Joan Henshaw, long-time HGS/GSH Office Manager, retired February 15, 2007

SEG Online Committee: Dan, Frank & Susie

Rice Course in Exploration Geophysics

SIG Processing Meeting

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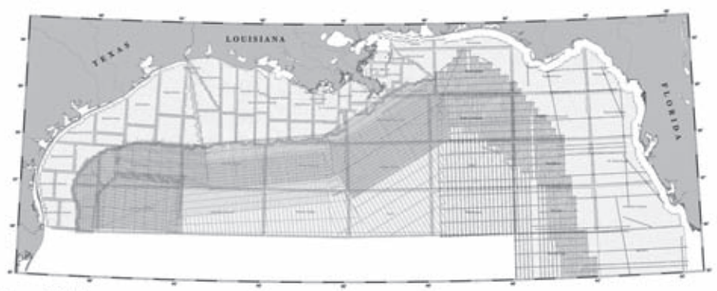

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DAVID SCHWARTZ
Vice President of Marketing

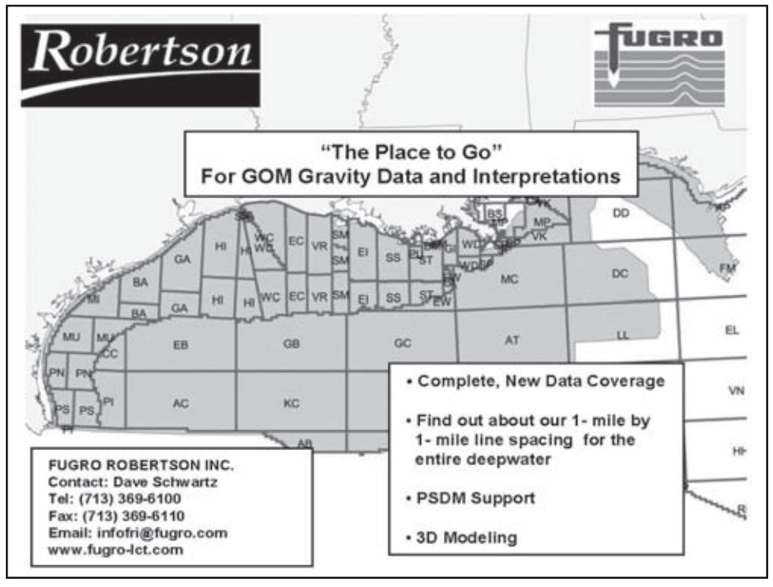
Technical Luncheon continued from page 1.

known as deghosting. Separation of the upgoing seismic wavefield from the downgoing seismic wavefield, which contains the ghost reflections, is a well-known deghosting method. This is routinely done with seabed acquisition, OBC or node systems, by recording pressure with hydrophones and vertical particle velocity with geophones. The over/under acquisition method allows the separation of the up-and down-going wavefield at the receiver, using a vertical pair of receivers, or at the source, by using a vertical pair of sources.

The over/under method was introduced in the early eighties in the North Sea as a mean to reduce the weather downtime By deploying two streamers at large depths, 20 to 30 m, and separated by 5 to 10 m, the weather noise can be significantly reduced and the upgoing wavefield can be separated from the downgoing wavefield. The success of the wavefield separation method for ghost removal depends on the accurately maintaining the over/under streamers in the same vertical plane. This requirement was difficult to fulfill with the marine streamer acquisition technology of the mid-eighties and a very good geophysical idea was "shelved" for several years. New marine towed-streamer technology, developed in recent years, has streamer steering, accurate positioning, fine receiver sampling and point receiver acquisition and these features enable accurate wavefield separation using the over/under streamer method.

2D and 3D experiments were conducted to prove that over/under towed streamer acquisition performs as it was expected and these were followed by 2D and 3D commercial applications. In this paper the basic aspects of over/under acquisition will be discussed and these will be illustrated with real 2D and 3D examples.

Biography:
Nick Moldoveanu received an Ms in geophysics and an Ms in mathematics from University of Bucharest, Romania. He has been with Schlumberger Geco-Prakla and WesternGeco since 1989. He held technical positions with the company in data processing, seismic programming, marine acquisition, and reservoir seismic services being involved in geophysical support for data processing and acquisition, survey planning and the introduction of the new technology. Currently he is a technical advisor in the Integrated Seismic Solution department in Houston.



President's Column continued from page 1.

not take the time and minimal effort to join the GSH and participate in our activities, i.e., Tech. Lunch, SIGS, etc. A few years ago, I did a statistical review of the GSH membership from major oil companies in the Houston Area. I clearly recall the results. Exxon Mobil had far and away the greater number of GSH members although not the highest percentage of GSH members compared to the total SEG membership in the area. Shell had the least. We published the results in the Newsletter. I heard absolutely no feed back from Shell. I have thought about that and have decided it was because no one from Shell ever read the Newsletter! I was preaching to the choir then just as I am now.

What to do? I remember when General Hugh Hardy was Chair of the Membership committee. He was trying for 2000 members. Unfortunately, he didn't have enough time to make his goal but he came close. We need an aggressive campaign with GSH Board leadership. I know, I know....the GSH Board is usually worried about more mundane issues but I can't think of any issue more important that increasing our membership and consequently raising the participation level.

Where do you come in? You are already members of the GSH. Help! Come up with ideas and suggestions. Encourage your fellow employees to join. Let the GSH Board know what we are doing wrong (if we are doing something wrong) so we make corrections. Let us hear from you. You can email me at llawyer@prodigy.net. *I will see that your words are heard by the choir, er ah...I mean the Board.*

GSH Membership Committee Report

March 2007 GSH Board Meeting

Active	886
Associate	217
Emeritis	50
Honorary	29
Lifetime	30
Full Time Students	11
Total GSH Members	**1223**

Golf Tournament and Dinner
Geophysical Society of Houston

DATE: Monday, May 14, 2007
PLACE: Kingwood Country Club
TIME: 9:30 AM Registration
11:30 AM Tee off (Shotgun)

FORMAT: Four Man Florida Scramble
COST: $125 per person
DEADLINE: April 15, 2007

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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.**

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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 made payable to the Geophysical Society of Houston.

GSH 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: _____ **Company:** _____ **Phone:** _____ **HDCP:** _____

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Course Preference: *ISLAND LAKE MARSH*
(Circle One)

SPECIAL ANNOUNCEMENTS

Welcome Aboard Sandra Babcock!

The Houston Geological Society and the Geophysical Society of Houston welcome Mrs. Sandra Babcock as their new Office/Business Accounts Manager. Mrs. Babcock succeeds Joan Henshaw who retired February 15, 2007. Sandra brings more than 16 years experience to the position.

IAGC/OGP Spring 2007 Forum

The IAGC/OGP announces its Spring 2007 Joint Global HSE Forum Meeting to be held at PGS (15150 Memorial Drive, Houston TX 77079) on Tuesday, April 24 and Wednesday, April 25.

Email Yvette@iagc.org for more information.

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Technical Breakfast continued from page 1.

plus weather unknowns due to tropical storms, and achieving necessary levels of repeatability in 4D streamer acquisition becomes a massively complex task. Under these conditions, we employed an innovative 3D acquisition design technique to meet the required 4D repeatability criteria necessary for the Holstein field (Green Canyon 644,645, and 688). By utilizing a secondary source vessel for the entire program, we gained the flexibility to decouple the source from the receivers and better target offset ranges of poor source/receiver positioning on a real-time basis.

In 2001 the Holstein asset completed a 300 sq. km high-resolution baseline 3D survey within the Green Canyon area. No surface obstructions existed at this time. In 2004 the Holstein spar was installed, and prior to production a 1km wide "undershoot" was acquired to assist in 4D repeatability. This data was merged with the original 2001 acquisition to provide a baseline survey with undershoot. In 2006, at the beginning of hurricane season, the Holstein 4D monitor survey began acquisition. The main areas of concern were 1) additional surface obstruction in Block 599 (approximately 5 miles NW of Holstein spar), 2) loop currents within the Green Canyon area, and 3) deteriorating weather conditions with possibility of tropical storms/hurricanes.

We established 4D repeatability criteria for this project prior to the acquisition phase. These criteria were based on a combination of what repeatability was required to allow the reservoir fluid movements to be seen based on pre-survey modeling, combined with what was realistically achievable with the acquisition. This was based on theoretical feather modeling from Concept Systems, and on previous real experience of 4D acquisition within GoM. As a result of the combination of single and dual vessel acquisition utilized in this project, we were able to exceed the required repeatability criteria within our area of interest. This presentation will illustrate the 4D progress throughout the survey and how we varied our acquisition configuration to meet challenging geometric repeatability targets.

Biography:
Chuck started his career with Amoco New Orleans in 1976 as a seismic data processor on the Gulf of Mexico shelf. In 1989 he became responsible for all 3D seismic acquisition and processing for Amoco's GoM producing properties, leading acquisition or purchase of approximately 100 surveys over the next nine years. Since the BP Amoco merger in 1998, he has been BP's seismic coordinator for all Deep Water Gulf of Mexico seismic operations. Chuck also supports the BP Houston 4D Implementation Team for design and operation of time-lapse surveys within the GoM.

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2007 SEG-EAGE Disc Program

One-day Course May 11, 2007

Chevron Bldg., 1500 Louisiana, Houston, TX

"Concepts and Applications in 3D Seismic Imaging"

by Dr. Biondo Biondi, *Stanford University*

Overview

Seismic images are the basis of crucial exploration, development, and production decisions. Optimal use of these images requires a full understanding of the seismic imaging processes that create them, from data acquisition to the final migration. The primary objective of this course is to provide a broad and intuitive understanding of seismic imaging concepts and methods that enables geoscientists to make the appropriate decisions during acquisition, processing, imaging, and interpretation projects. Another objective is to expose the audience to current trends in imaging research and empower them to adopt new technologies quickly.

Summary

The course is organized in four lectures. The first lecture introduces the fundamental concepts of seismic imaging. The remaining lectures focus on the solutions to three crucial problems encountered in practical application of 3D seismic data: 1) choice of the most effective migration algorithm, 2) estimation of the velocity model, and 3) poor image quality caused by irregular and inadequate data spatial sampling and incomplete subsurface illumination.

1. **Introduction to 3-D seismic imaging**
   - o Commonly used data-acquisition geometries and their impact on imaging
   - o Seismic imaging as a data focusing process and Kirchhoff migration methods
   - o Partial prestack migration and other approximations to full prestack migration
   - o Principles of wavefield-continuation equation migration
   - o The relationship between seismic velocity and migration
2. **A user's guide to the migration toolbox**
   - o Time vs. depth migration
   - o Kirchhoff depth migration
   - o Depth migration by wavefield-continuation
   - o Anisotropic migration
   - o Current trends in depth migration (beam, plane-wave, and reverse-time migration)
3. **The never-ending quest for the perfect velocity model**
   - o Basic methods for velocity estimation (velocity spectra, Dix equation)
   - o Velocity estimation and complex structure
   - o Principles of reflection traveltime tomography
   - o Migration Velocity Analysis (MVA)
   - o Introducing geological knowledge in the MVA process
   - o Current trends in MVA (velocity scans, residual migration, wave-equation MVA)
4. **Imaging, aliasing, and incomplete subsurface illumination**
   - o Spatial aliasing and imaging artifacts caused by inadequate spatial sampling
   - o Avoiding aliasing in Kirchhoff migration and wavefield-continuation migration
   - o Imaging artifacts caused by irregular data geometry and incomplete illumination
   - o Illumination maps: how to use and not abuse them.
   - o Application of approximate regularized inversion to imaging enhancements
     - Data-domain methods (data geometry regularization)
     - Model-domain methods (imaging by least-squares migration)

WHO SHOULD ATTEND

All geoscience professionals who use or process seismic data will benefit from attending this course. The course emphasizes conceptual and graphical understanding and minimizes the use of mathematical developments. Therefore the course does not require a theoretical background in seismology and can be taken by a broad section of working geoscientists, including seismic interpreters, processors, and imagers as well as petroleum geologists and reservoir engineers.

Instructor Biography - See http://ce.seg.org/disc/2007/bio.shtml

REGISTRATION

Registration deadline is Wednesday, May 9, 2007.

Registration is $65 for SEG or EAGE members, $140 for non-members (includes associate membership in the SEG). Student volunteers are admitted free. Register at http://www.gshtx.org/en/cev/?363.

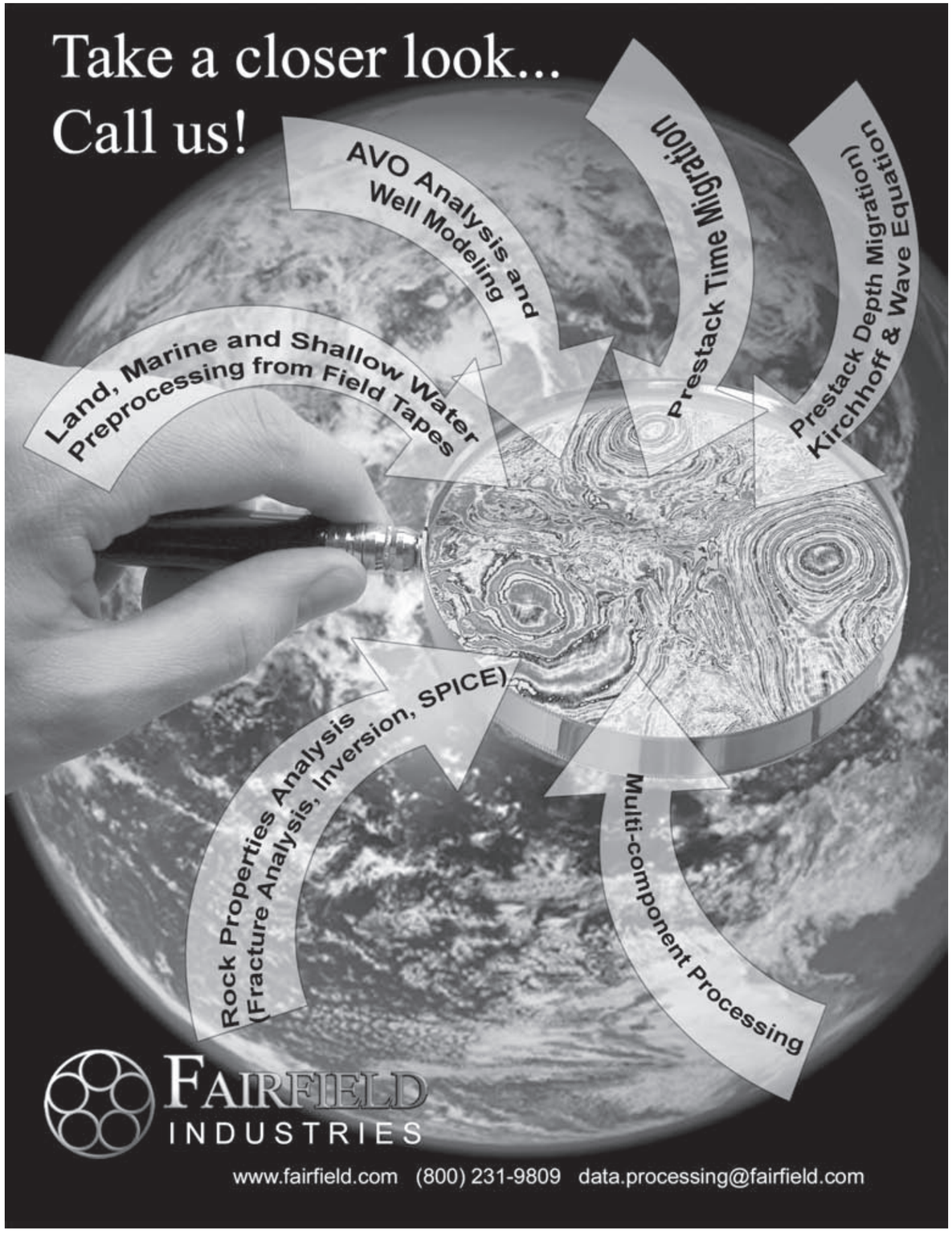
SEG-EAGE DISC PROGRAM

For more information on the SEG DISC program, please visit http://ce.seg.org/disc/2007/

SEG-EAGE DISC PROGRAM SPONSORS

Thanks to *Chevron* for providing the venue. Sponsorships are available for breakfast, lunch and break.

Please contact Mike Graul (713-465-3181) if interested



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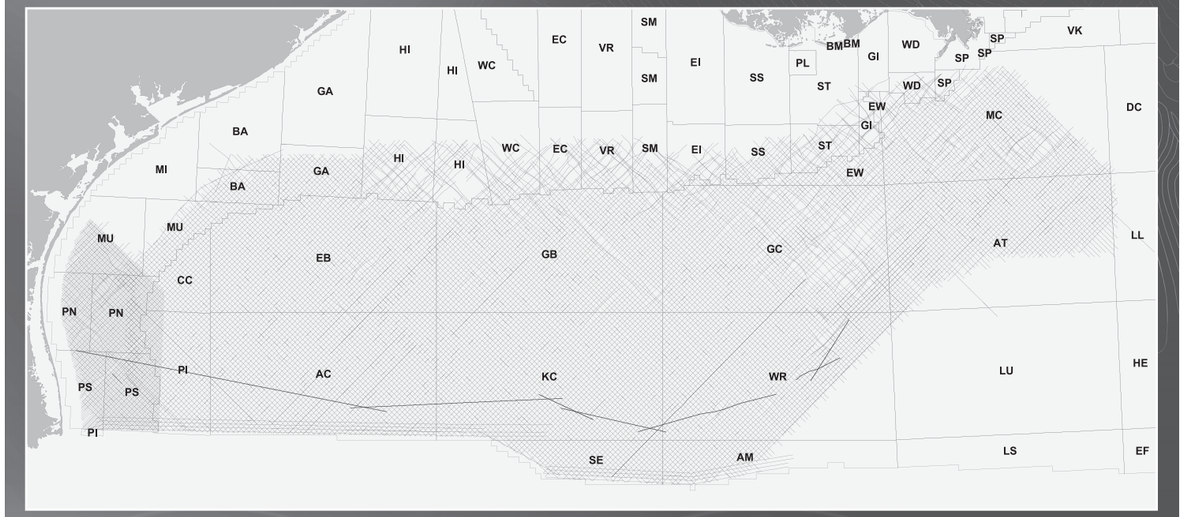

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MEET THE CANDIDATES

Candidate for President Elect:
Frank Dumanoir

After graduating from Rice University (MEE 1974), Frank joined Esso Production Research. He worked in proprietary Marine Instrumentation, Seismic Source and Streamer development areas. He later served as Marine Operations Supervisor at Exxon USA overseeing proprietary marine acquisition in the Gulf of Mexico.

From 1982 to 1998, Frank was at CGG, the last six years as VP of Data Processing in Houston. While there, he oversaw the growth of the center's activity with an emphasis on 3D Time and Depth processing.

After CGG he worked first at Geophysical Development Corp and then at Paradigm Geophysical in Processing Management and Business Development for advanced imaging services.

In 2003, Frank joined TGS IMAGING (following the acquisition of NuTec Energy Services) as Manager of Business Development promoting 3D Pre Stack Time and Depth Imaging.

Dumanoir Continued on page 15.

Candidate for President Elect:
Scott Singleton

Scott has been participating in and serving our local geophysical community for many years. He has been a member of both SEG and AAPG since 1985, and both GSH and HGS since 1995. In 2004/2005 he served on Lee Lawyer's SEG 75th Anniversary Committee which planned the special celebrations surrounding the wonderful convention held that year in Houston. Lee and his committee produced the documentary DVD *Reflections in the Field: Commemorating the 75th Anniversary of SEG*, which chronicles the evolution of applied geophysics. This DVD is available on the SEG website.

In 2005/2006 he served as GSH Treasurer. That year had the dubious distinction of being the point at which the GSH used up its liquid cash reserves and had to rely on long-term funds (from an endowment) managed by Merrill Lynch. The GSH had been running a negative budget for a few years prior to that but we had plenty of cash reserve to handle it. When we ran out of money, we had to start getting

Singleton Continued on page 15.

Candidate for 1st Vice President:
Robert C. Wegner

Bob is a retiree from Exxon Mobil's Upstream Research Company with 32 years of service. He remains active as a teacher. At Rice University, he shares teaching responsibilities with several industry representatives presenting a graduate-level course on modern exploration methods used in petroleum exploration. At the University of Texas' Continuing Education department in the North Harris Community College, he teaches college graduates about exploration's role in the petroleum industry.

Bob graduated with a B.S. in geology from Queens College 1967, M.S. in geophysics from Lehigh University 1972, and a Ph.D. in geophysics from Rice

Wegner Continued on page 15.

Candidate for 1st Vice President:
Randy Nickerson

Randy has 25 years of experience in the Oil and Gas industry. He started with Gulf Oil in Bakersfield in 1980. He has worked with Amerada Hess, Coastal Corp., North Central Oil Corp. and Dominion Exploration & Production. He is currently the Chief Geophysicist of Sanchez Oil and Gas. He has worked California, most basins in the Rockies, Offshore Louisiana, and the Texas Gulf Coast. He has found oil and gas in California, Nevada, Wyoming, Louisiana, and Texas. His specialty is the use of AVO techniques to lower risk, and find exploration prospects.

Candidate Biographies continued on pages 10 & 11.

MEET THE CANDIDATES

Candidate for 2ND Vice President:
J. Haynie Stringer

Haynie graduated from Mississippi State University with a Bachelors of Science degree in mathematics and immediately began work at Western Geophysical Company in Houston, Texas as a computer programmer. After spending most of the first two years of his career traveling among field crews to install and support on-board computer systems, he returned to Houston where his career evolved through programming manager, project manager, and vice president at Western's Aero Service Division. His last positions before retiring at the end of 2004 were Manager of Applied Technology Software at WesternGeco and Product Champion of Seismic Data Management at SIS. After retirement, Haynie founded PromoConnection Promotional Products where he is currently Manager. He holds patents in data management and data delivery techniques, has co-authored and presented papers and served as session chair at the SEG and other conventions, has published several articles, and has served on several geophysical industry committees. He has served on the GSH museum committee since 2005 and became a director in 2006. He is a member of the SEG, EAGE and GSH.

Candidate for 2ND Vice President:
Edgar Raúl Sarmiento

Raúl has 25 years experience in the industry, 11 years with EOG Resources, in international and domestic exploration and development projects. His experience includes acquisition, processing, and interpretation of 2D and 3D seismic data, complex depth conversion using own coded algorithms, reservoir characterization, facies analysis, fracture characterization using seismic data and direct tie to production, AVO, amplitude analysis and structural reconstruction. He has established expertise in both carbonates and clastics.

Raúl graduated with a B.S. in Mechanical Engineering from Universidad Nacional de Colombia 1980, and M.S. in Geophysics from the University of Houston 1987. He is a member of the SEG since 1982.

Time To Vote

Candidate for Treasurer:
Steven Cochran

Steven is a Senior Geophysicist with Petroleum Geo-Services (PGS) in the Marine Data Processing Group. Previously, he worked for Fairfield Industries as a Geophysical Analyst for 4 years. He received his B.S. in Geology from the University of Illinois at Urbana/Champaign in 1997 and his M.S in Geology from Southern Illinois University in 2002.

Steve was the GSH Technical Luncheons coordinator for the 2004-2005 and 2005-2006 seasons. Steve has been a member of the SEG since 2001 and GSH since 2002. In his free time, Steve enjoys spending time with his family, bicycling, backpacking, and kayaking.

Candidate for Treasurer:
C. D. Williams

Cheri has 38 years experience in the industry; 12 years with Chevron serving in various operating, research, and processing units as a research geophysicist and program developer. She spent six years with MRA in charge of geophysical system design, development, and implementation ranging from log analysis to 3D residual statics to multi-dimensional eigenvector analysis. She was instrumental in the development of 3D processing software, which reduced processing to interpretation time by 80%. Her primary interests include the development and implementation of advanced processing techniques.

Cheri's Memberships include SEG, GSH, and DGS. She is a Partner and President of Texseis, Inc.

Frank Dumanoir continued from page 9.
His interests are focused on 3D imaging technology and the promotion of new processing techniques for proprietary clients as well as for TGS' Multi-Client surveys. He also works on recruiting and promoting the geophysical profession outside our industry.

Frank has been an active member of the GSH and SEG since 1979 and is also a member of the AAPG. He served as GSH Treasurer in 2002-2003 and worked several years with the GSH Data Processing SIG committee.

Scott Singleton continued from page 9.
serious about balancing our budget. Scott spearheaded that effort. So far, that effort appears to be paying off, as it seems this year our budget is in much better shape than it was last year. As president, one of his main tasks will be to ensure we run a net-zero budget and do not have to rely on our investments merely to remain solvent.

The other challenge for the GSH is declining membership. This trend has been consistent through the decade and is similar to the US membership of SEG (although SEGs total membership is climbing due to its non-US member base). A similar trend can be seen with our sister organization, HGS. This being the case, it only makes sense to concentrate our limited financial and manpower resources on those activities and events that are appreciated by and in demand from our members. Holding onto money-losing events and activities just because we've always done it that way doesn't make good business sense.

Scott is currently a special projects geophysicist in the R&D group of Rock Solid Images. He is involved in the development of inversion and attenuation technology for seismic reservoir characterization. He has a BS in Geophysics from New Mexico Institute of Mining and Technology and an MS in Geophysics from Texas A&M.

Robert Wegner continued from page 9.
University 1978. He is a member of the SEG since 1969, and the GSH. He has been a member and chairman of the SEG Continuing Education Committee and recently served as GSH Secretary.

While at Exxon he did individual research in seismic modeling and seismic identification of hydrocarbons. He supervised numerous projects in seismic attribute analysis, time-lapse seismic, 3D volume interpretation, seismic migration, velocity analysis, and AVO analysis and interpretation. He retired as a division technical coordinator with shepherding responsibilities for a staff of 70 researchers. He has traveled extensively working in affiliate exploration offices and taught/deaned a number of in-house company schools.

Perhaps with this new opportunity, I can continue repaying a debt to a professional society from which I greatly benefited.

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MUSEUM & HISTORY REPORT *By Tom Fulton*

Glenn Bear's article "On The Value Of Education" suggested that the GSH and other societies invest our time in the education of others. We are doing just that with Lisa Buckner, now our Outreach Chairman. As an additional action in that direction Kathy Hardy, Bill Gafford, and Lisa recently attended a Retreat of the Engineering Council of Houston on the invitation of HGS's Claudia Ludwig. They found that the goals of the organization were common to our own resulting in the GSH Board's decision to join the group. We have also cemented our relationship with the BEG for our status there and for the September 7th GEOSCIENCE DAY. Planning for that event has begun.

Houston Museum of Natural Science Satellite at 12910 University Boulevard in Sugar Land

Our most important news concerns the Houston Museum of Natural Science's Satellite to be near Sugar Land in a former 1930 Prison Building (see picture). We have made contact with Paul Bernhard, Project Manager for the Wiess Energy Hall of HMNS. Paul indicated that "The goals of GSH are aligned with those of HMNS, and I believe that your resources and those of the museum are complementary." Please note that while this is a GSH initiated project (in part to allow the display of our museum artifacts) its sponsor will be the geoscience community of the Houston area. Please help influence those you know in the community to help.

MOORES ORCHARD SALT DOME & BORE HOLE GRAVIMETER

Gulf's Orchard dome in Fort Bend County was mentioned previously as the first dome to be located by seismic. The Seismic Crew was German and used Mintrop instruments like those we displayed at SEG75. The dome also played a small role in the testing of Amoco's downhole gravimeter. Barry Davies (my former Gulf Boss) told at a recent luncheon that Gulf had participated in an industry test by contributing two wells for testing the instrument invented by Noel Rasmussen (known to me while I was at Amoco Research). It seems that Barry and Lawrence W. Gardner were Gulf representatives at the test. It is a small world. Gardner is known for his refraction work including the concept of "delay time", ring shooting with a common offset position, and well shooting making use of three-dimensional aplanatic surfaces.

Gulf had contributed to the use of gravity in our industry and perhaps downhole development by establishing the existence of anomalies in the vertical gradient of gravity by it's measurement in sky scrapers. Sigmund Hammer reported in 1938 of tests in the Gulf building in Pittsburgh, the Empire State in NY and others. I can imagine the large Gulf, wheel mounted, gravity meter we have on display at the BEG (was also at SEG75) in an elevator stopping at every floor to be wheeled out to measure the gravity.

1952 POWER WAGON IDENTIFIED

Gene Womack has assisted Rev. John Waak of Victoria to solve the '52 Power Wagon" mystery that we wrote of some months ago. John came to Houston and with Gene reviewed old Geophysical Directories and discovered that the Power Wagon belonged to Portable Seismic Inc. out of San Antonio (where the vehicle was purchased). The Company had listings in the directory until 1973 and was an offshoot of Petty Geophysical (according to Scott Petty).

Multi-Component SIG continued from page 13.

Abstract:
The importance of pore pressure estimation, both for prospectivity analysis and pre-drill wellbore planning, is well established. Industrial practice for the last 20-30 years has focused on the use of P-wave interval velocities from surface seismic surveys to estimate effective stress (and implicitly, pore pressure). P-wave velocities from surface seismic surveys have their limitations, especially subsalt where effects of critical refraction limit the subsalt angles of incidence, and in the presence of subsurface "gas clouds" (which strongly attenuate P-wave amplitudes). S-wave velocities and C-wave velocities are substantially more sensitive to effective stress than P-wave velocities. Additionally, the ratio of P-wave to S-wave velocity (Vp/Vs ratio) has a strong pressure signature.

The principal limitation in the use of multicomponent seismic data to predict pressure is in the relative paucity of acquired multicomponent datasets. On the bright side, it appears likely that multicomponent seismic datasets will become more common in the future as requirements for ground roll elimination (on land) and vector fidelity assurance (on the seabed) push contractors to acquire 3C and 4C datasets even when P-wave acquisition is the principal aim of a survey. Given the temptations by managers to cut budgets wherever feasible, it will be up to in-house multicomponent seismic "champions" to make certain that "multicomponent datasets of opportunity" are fully utilized and not shelved after the P-wave images are extracted. Recognition of the pressure prediction utility of C-wave velocities, S-wave velocities, and Vp/Vs ratios will aid in the argument for fuller multicomponent interpretation.

Biography:
Dan Ebrom is a geophysicist with BP's Gulf of Mexico deepwater exploration business unit. He is a former president of the GSH (2002-2003), and was honored last year with Life Membership in the GSH. This talk is a continuation of work which has earlier been recognized with the AAPG's Ziad Beydoun award (2002) and BP's Helios award for Innovation (2005). Dan holds a PhD from the University of Houston in geophysics.

MEET THE CANDIDATES

Candidate for Secretary:
Bob Gauer

Bob currently is the Membership Committee Chairman for GSH. He is also the Business Development Manager for the CGGVeritas' Reservoir Group, specializing in outsourced integrated reservoir studies (petrophysics, AVO, inversion, fracture characterization, etc.) for oil and gas companies.

In his current role, Bob works with clients and CGGVeritas Technical Teams to successfully conduct Reservoir Characterization projects on a world-wide basis. Bob accrued most of his technical experience as a Consulting Geophysicist at Fugro specializing in environmental and engineering geophysics where he conducted projects throughout North & South America and in Egypt. One of his last projects at Fugro was conducing ground-penetrating radar on the Sphinx and Great Pyramids in Giza as part of an archaeological expedition from The University of Florida.

In May of 1990, Bob was awarded SEG's "Best O.T.C. Geophysical Paper Award" along with his co-authors at the 22nd Annual Offshore Technology Conference. He has a Bachelor of Science degree in Geophysics from Virginia Tech (1987) and a Master of Science degree in Geotechnical Engineering from The University of Texas at Austin (1990). He is a registered Professional Engineer in the State of Texas and a registered Professional Geologist in the State of Tennessee. Bob is an active member of GSH, SEG and HGS. He currently lives in Sugar Land with his wife (Karen) and three dogs.

Candidate for Editor:
Fernanda Araujo

Fernanda is a Geophysicist at Conoco-Phillips in the Gulf of Mexico Exploration Team. She has a B.S. in Electrical Engineering from the University of Brasilia, and a Ph.D. in Geophysics from the Federal University of Bahia, Brazil. Fernanda started her career at ExxonMobil Upstream Research Company and received the SEG Karcher Award in 2000.

Fernanda's professional interests include sedimentation and tectonics of salt-related basins, reservoir characterization, geophysical analysis, signal processing and noise attenuation. In her leisure time, she enjoys running, cycling and traveling.

Fernanda has been Editor of the GSH Newsletter for the past year, working with Glenn Bear and John Sumner. She is a member of the GSH and the SEG.

Candidate for Secretary:
Jozica Gabitzsch

Jozica graduated from University of Zagreb with a Bachelors degree in physics and a PhD. in experimental nuclear physics. She spent several years at Rice University doing basic research in medium energy experimental nuclear physics.

Her career in geophysics started as a research programmer developing migration algorithms for Teledyne Exploration. After that she worked for Houston Oil and Minerals - Tenneco and Superior Oil, in the G&G department serving the operating divisions. She joined Mobil Exploration and Producing in Houston via merger in 1982 and stayed with Mobil until 1992.

During the 28 years in geoscience, Jozica worked on development and application of seismic technology, monitored industry R&D and university consortia and brought the theoretical knowledge and practical experience to the operating divisions of the oil companies. While at Mobil, Jozica contributed to the business objectives of the exploration and production departments in Houston mostly on the Gulf Coast, by applying the most appropriate technical solutions to the acquisition and processing of seismic data. She was also involved in technology transfer and development between Mobil Research and the operating divisions as well as from the industry contractors and university consortia.

Jozica retired from Mobil in 1992 and continued in the industry as a geophysical consultant. Her consulting work involves a variety of clients in different areas of the world, both domestic and international. Her primary technical interest continues to be seismic imaging and amplitude and phase preservation in data processing. Jozica is a member of SEG and GSH. In the mid 1990's she served as a chair person of the data processing SIG for two years. Jozica has numerous internal geophysical publications with Mobil, and from her basic research at Rice University.

Jozica likes the outdoors, gardening, classical music and opera.

ROCK PHYSICS SIG

Date: Wednesday, April 18, 2007
Time: 5:30 PM
Location: CGG Veritas (10300 Town Park Dr., Houston TX 77072)
Topic: ***Understanding the Rock Physics of Overburden Shale - A Key to Interpretation of 4D Seismics***
Speaker: **Rune M. Holt**, *NTNU (Norwegian University of Science & Technology) and SINTEF Petroleum Research, Trondheim, Norway*[1]

Abstract:

Seismic waves propagate through kilometers of overburden rocks, a significant proportion being shale. The influence of shale on seismic response has become clearly demonstrated by 4D (time-lapse) seismics, where depleting reservoir zones become visible through changes in two-way travel time (TWT) caused by stress alterations in the cap rock and above (e.g. Hatchell and Bourne, 2005; Barkved and Kristiansen, 2005).

In order to understand and interpret quantitatively observed TWT changes, one needs to model stress field alteration in the overburden as a result of pore pressure change (and possible thermal processes) in the reservoir. Furthermore, one needs to understand how seismic wave velocities change with the stress changes predicted from the geomechanical modeling. In most cases, the vertical stress above the center of the reservoir is decreased and the horizontal stress increased, while the vertical stress is increased and the horizontal stress decreased near the edges ("stress arching"). The stress path is in either case characterized by small volume changes (i.e. close to pure shear loading). The slow-down of vertically traveling P-waves observed in the field is attributed to the vertical stress reduction and extensional strain above the depleting reservoir zone.

Laboratory experiments on shale cores permit determination of the stress sensitivity of ultrasonic wave velocities under controlled stress, pore pressure and temperature conditions. Most experiments performed with shale in the past have been done under hydrostatic loading. In that case, we find, from our experiments with field shale cores, a relationship between hydrostatic stress sensitivity and porosity. We also find that porosity change is a major factor contributing to stress sensitivity (Holt et al., 2005). When experiments are performed under constant volume, closer to in situ conditions, we still see significant stress dependence. The velocity changes are anisotropic, reflecting the alteration in stress anisotropy associated with the applied stress path.

The results from the experimental work are used to establish a rock physics model for shale. Through experiments and modeling, one may estimate stress and strain sensitivity, which is directly applicable to interpretation of 4D seismic data.

Biography:

Rune M. Holt is a Professor at the Petroleum Technology & Applied Geophysics Department at NTNU (Norwegian University of Science & Technology) and a part time Senior Scientist in the Formation Physics Department at SINTEF Petroleum Research in Trondheim, Norway. Main research interests are rock physics and rock mechanics applied to petroleum geoscience and engineering. His PhD is in Solid state Physics (from Trondheim in 1980).

[1]Rune is currently on sabbatical leave (2006/07) at New Mexico Tech, in Socorro, NM.

References:

Barkved, O. and Kristiansen, T. (2005) Seismic Time-lapse Effects And Stress Changes: Examples From A Compacting Reservoir. The Leading Edge 24 (12) 1244-1248.

Hatchell, P. and Bourne, S. (2005) Rocks Under Strain: Strain-induced Time-lapse Time Shifts Are Observed For Depleting Reservoirs. The Leading Edge 24 (12) 1222-1225.

Holt, R.m., Nes, O.-M., Fjær, E. (2005) In-situ Stress Dependence Of Wave Velocities In Reservoir And Overburden Rocks. The Leading Edge 24 (12) 1268-1274.

DATA PROCESSING SIG

Date: Wednesday, April 18, 2007
Time: 5:00 p.m. Social • 5:30 p.m. Talks Begin
Location: BP Westlake 1 (501 Westlake Park Drive, Houston TX 77079) • 291-366-2000
The talks will be held in the BP Westlake 1 cafeteria. Parking is available at the Westlake 1 garage. The Westlake 1 building is the tallest building on the campus, at the southeast corner of the campus. Visitor parking is in the Westlake 1 garage, which is just east of the Westlake 1 building. The visitors parking entrance is on the north side of the garage, on Grisby, just off BP Way. Additional parking is available in the Westlake 4 garage and on the surface parking lot west of the Westlake 4 garage.

Talk 1: Paul Sava, Colorado School of Mines
Topic: ***"Extended Imaging Conditions For Wave-equation Migration"***

Talk 2: **Uwe Albertin** (Speaker) and **Laurent Sirgue**, *BP, Houston, Texas*
Topic: ***"Wave-equation Tomography And Waveform Inversion: New Methodologies For Velocity Analysis In Complex Structure"***

Abstract *(Talk 1)*:

A typical imaging condition for seismic reflection data involves source and receiver wavefield matching, e.g. by cross-correlation, at every image location. This statement is true no matter how the two wavefields are reconstructed, for example by one-way wavefield extrapolation, or two-way reverse-time extrapolation, or Kirchhoff integral methods. This statement is also true when the source and receiver wavefields are reconstructed using different velocity models, as is the case for imaging of converted waves. Angle-dependent reflectivity information can be extracted from the source and receiver wavefield by retaining multiple lags of the imaging cross-correlation, i.e. by analyzing the match of wavefields shifted relative to one-another. Wavefields can be shifted in space (3D) or in time (1D), and each shift method has an associated angle-decomposition method. This talk explores the various types of imaging condition using space and time-shifts, derives relations for angle decomposition and suggests extensions that extract additional information from the extrapolated wavefields.

Biography: *Paul Sava*

Paul Sava is an Assistant Professor of Geophysics and a member of the Center for Wave Phenomena at Colorado School of Mines. Prior to arriving to CSM, he was a Research Associate at the Bureau of Economic Geology, University of Texas (Austin). He holds an Engineering degree in Geophysics (1995) from the University of Bucharest, an M.Sc. (1998) and a Ph.D. (2004) in Geophysics from Stanford University where he was a member of the Stanford Exploration Project. He is a recipient of a Stanford Graduate Fellowship (1997-2000) and of three Awards of Merit for best student presentations at the SEG conventions (1999, 2001 and 2004). He has received a Honorable Mention in the category Best Paper in Geophysics (2003) for Angle-domain common-image gathers by wavefield continuation methods, co-authored by Sergey Fomel.

SIG Processing Meeting continued on page 22.

MULTI-COMPONENT SIG

Dan Ebrom

Date: Thursday, April 12th, 2007
Time: 5:30 pm - 6:30 pm
Location: WesternGeco
10001 Richmond Ave, Houston, Texas 77042
Title: ***"Pore Pressure Estimation From Multicomponent Seismics: How Mature?"***
Speaker: **Dan Ebrom**, BP
Co-authors: **Martin Albertin**, BP
Philip Heppard, Retired from BP, now at ConocoPhillips

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