



Geophysical Society of Houston

VOL. 32, NO. 5

NEWSLETTER

FEBRUARY 1997

Technical Luncheon

Date: Monday, February 17, 1997

Time: Register and cash bar, 11:30 a.m.
Luncheon and talk, 12:00 p.m.

Location: The Old H.E.S.S. Location
3121 Buffalo
Speedway

Cost: \$17 to registered members
\$22 to walk-ins and guests

Reservations: Please call 917-0218 no later than 12:00 p.m. Friday, Feb. 14, 1997 to make a reservation.

Speaker: Christopher Ross
PGS Tensor

Topic: Comparison of AVO using ocean bottom seismic and marine streamer data
Christopher P. Ross, David H. Carlson and Joel G. Starr, PGS Tensor, Inc.*

As existing production wanes in mature hydrocarbon basins, deeper structural and stratigraphic reservoirs are routinely being sought after by energy companies. With production infrastructures already in place, finding and development costs can be greatly reduced if additional discoveries can be found in producing leases or on adjacent concessions. However, to continue the technology status quo requires maintaining a sufficient range of incident angles for AVO analysis. This necessitates collection of seismic data with longer offsets. Acquisition requirements for AVO contributions in drilling risk analysis for deeper objectives can most often be met by an alternative to marine streamer surveys- ocean bottom seismic (OBS).

In spite of the obvious advantages in using OBS there are still many geophysicists with reservations or qualms (such as poor data quality associated with inconsistent receiver coupling) related to use of the data for AVO. To counter these reservations, a simple 2D comparison of OBS and marine streamer acquisition techniques performed over a well documented, nonbright Spot AVO reservoir situated in Tertiary strata in the Gulf of Mexico, USA is presented. This comparison of 1990 vintage marine streamer data with 5000 m offsets and a 1995 OBS data with offsets in excess of 6000 m, dismisses many of the arguments against using OBS data for AVO.

OBS provides improved logistics on the congested shelf, improved signal

due to increased multiplicity and dual sensor technology, and an ability to perform AVO on deep targets with long offsets. This makes OBS an attractive alternative to conventional marine streamer shooting under many conditions, especially for characterization and monitoring of deeper reservoirs using AVO techniques.

Speaker's Biography

Christopher P. Ross received a B. S. in geophysics from Virginia Polytechnic Institute and State University (1982), a M. S. in applied physics from the University of New Orleans (1984), and completed his Ph. D. in geophysics at the Georgia Institute Of Technology (1992). Since 1982, he has worked as a geophysicist for Amoco Production Company in New Orleans, and as a Division Geophysicist for Schlumberger Well Services in Lafayette and Dallas. In 1988, he joined Oryx Energy Company's HCI Services group as a geophysicist, where his primary duties were hydrocarbon fluid and thickness prediction using HCI/AVO methods on Gulf of Mexico and international lease acreage. Ross joined PGS Tensor in May of 1995. He is manager of the Reservoir group, responsible for monitoring and characterization using lime-lapse, AVO and converted-wave methods. Current interests include P- and S-wave reservoir characterization and refinement of time-lapse 3D methods for pore fluid measurements. He is a member of AGU, EAGE, NSG and SEG.

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GEOPHYSICAL SOCIETY OF HOUSTON

Joan Henshaw, Office Manager • 7457 Harwin Drive, Suite 301 • Houston, Texas 77036

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Event Reservations Number: (713) 917-0218

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SIGs:				
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TREASURER	Joel Starr	781-4000	fax 781-7858	joel@hstn.tensor.pgs.com
Student Loans	Don Ashabranner	669-3782	fax 669-3725	
EDITOR	Cliff Kelley	368-8103	fax 368-8182	kelley@houston.geoquest.slb.com
Assistant Editor	Dennis McMullin	560-1069	fax 560-1278	dmcullin@lgc.com
Company Contacts	Scott Sechrist	464-8200	fax 856-7445	acoustic@neosoft.com
Electronic Pub.	Victor Koosh	773-2627	fax 773-9620	vkoosh@NewWorldHorizon.Com
Photography	John Freeland	423-7223	fax 423-7801	
Publicity	Scott Sechrist	464-8200	fax 856-7445	acoustic@neosoft.com
Training Notices	Lloyd Weathers	775-2453	fax 775-4123	Lloyd_r_weathers@ccmepus.mobil.com
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.....	Pamela Moore	773-2627	fax 773-9620	pmoore@NewWorldHorizon.Com
.....	Bob Tatham	954-6027	fax 954-6113	TATHARH@texaco.com
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.....	Hugh Hardy	729-9208	fax 726-0456	
.....	Cheryl Stevens	stevens@pakhome.khi.erum.com.pk		

The Geophysical Society of Houston Newsletter (ISSN 1082-0817) is published monthly except July and August by the Geophysical Society of Houston, 7457 Harwin, Suite 301, Houston, Texas 77036. Subscription to the Geophysical Society of Houston Newsletter is included in the membership dues (\$20.00 annually). Periodicals Postage Paid in Houston, Texas.

POSTMASTER: Send address changes to Geophysical Society of Houston Newsletter, 7457 Harwin, Suite 301, Houston, TX 77036.

Editors Note

Due to the deadlines of this issue falling through the holidays it wasn't possible to get any technical papers for publication. I'm hoping for better luck for March.

Please note that Potential Fields and Reservoir Geophysics SIGs do not have meetings in February. They will pick up again in March.

See ya next month.

Clifford Kelley
Schlumberger Wireline
1325 South Dairy Ashford
Houston, Texas 77077
281/368-8103
281/368-8182 Fax
Cliff-Kelley@slb.com

Technical Breakfast

Tuesday, February 11, 1997:

The GSH Technical Breakfast for Tuesday, February 11, 1997.

This GSH Technical Breakfast will be on the west side at British Petroleum's Westlake Area Headquarters at the BP PLaza building 17001 Northchase Drive.

The speaker will be Doug Stauber of BP Exploration, presenting "Stratigraphy at Pompano Field", hosted by BP with a complimentary continental breakfast, served from 7:30 am until 8:00 am, with our speaker at 8:00 am. BP Exploration deserves the society's thanks and appreciation for hosting the speaker, complimentary continental breakfast and the facilities for another GSH Technical Breakfast.

Data Processing SIG

Date: Wednesday, Feb. 19, 1997

Time: Social, 4:30 pm
Presentations, 5:00 pm

Location: S-202, Exxon
Production research
Company 3120
Buffalo Speedway
(between Alabama and
Richmond)

Cost: NO CHARGE Please call 917-0218 no later than Monday, Feb. 10, 1997 to make a reservation.

Parking: There are two visitors parking lots on the west side of Buffalo Speedway. Go to the front desk to register.

Speakers: Simon Spitz and Lee Lu

First Topic: Pre-Stack Interpolation: An Alternative To Costly Acquisition

Speaker: Simon Spitz

The last decade has seen a dramatic increase in the number of streamer sand sources in marine acquisition. In particular, multi-source shooting aims at decreasing the bin size by reducing the distance between acquisition lines. But this is achieved at the expense of in line shot spacing, leading to a reduction in coverage with respect to traditional single source configurations. Unfortunately, coarse sampling of the offset variable can result in spatial aliasing. In regions with strong multiple reflections (for instance generated in the water layer) this aliasing severely impairs the performances of standard multichannel filters and leads to strong "acquisition footprints". In such areas acquisition has to revert to traditional high fold shooting geometries. This paper illustrates a processing method that compensates for the quality degradation related to modern designs.

The method consists in de-aliasing the wavefield by reconstructing the skipped shots. The interpolation is performed on the set of traces that belong to a given sail line and that pertain to a particular streamer and source array. An advanced one pass implementation in the frequency-space domain takes maximum advantage of the redundancy displayed by the recorded traces. Real data examples from all over the world show that the technique preserves the bandwidth, allows removal of multiples with standard multichannel filters and thus benefits to any pre-stack data analysis, AVO included. The method can be seen as a cost effective (and industrial) alternative to costly acquisition in regions characterized by strong multiple

reflections.

Second Topic: 3D flex binning and DMO

Speaker: Lee Lu,

Coauthors: Jeffery Chen, Lee Bell and Rolando Lara,

Irregular spatial sampling has always been a problem in acquisition. For 3D data with moderate irregularities, the combination of flex binning and DMO provides a cost effective approach to obtain improved results of DMO processing.

The flex binning is a low dip and low frequency approximation to a complete data interpolation problem. For 3D marine data, the flex binning techniques have been used successfully as a quality control or data enhancement tool in acquisition and processing in our industry. For 3D land or transition zone data, although the shot and receiver locations are more predictable, the problems of uneven trace distribution are similar and the flex binning techniques also should be applicable. However, any flexing scheme should be used with care. Either Experimentation or QC processing is needed to test the flexing parameters to minimize aliasing. For large 3D surveys, the space variant flex binning techniques are essential. The binning parameters should be allowed to vary from one area to another depending on the local structure dips.

The data after flex binning provides a more uniform distribution of fold coverage. The DMO operation can then be performed on the flexed data. A DMO fold coverage can be defined by summing the weights of DMO operators associated with the geometry of a 3D survey. This DMO fold coverage is a time and space variant function and its information can be used as a tool for normalization to preserve amplitudes in DMO processing. One example in here is to output relative amplitude DMO gathers for 3D prestack common-offset time migration or for further AVO studies. The normalization approach can be generalized for other types of imaging processing, such as 3D prestack time or depth migrations.

Several 3D land and shallow water/marine data examples are shown in this presentation.

INTERACTIVE WORKSTATION SIG MEETING

Date: Thursday
February 27, 1997

Time: 4:30 PM

Place: British Petroleum, 3rd Floor; British Petroleum is located 200 Westlake Park Blvd; this is between the Katy Freeway and Memorial Drive just east of Highway 6. Please park in the BP parking garage which is located to the west of the BP building. The Visitor Parking Entrance is on the west side of the garage.

Cost: No charge; however, please reserve a place by calling the GSH Office (713-917-0218) no later than noon Tuesday, February 25. Seating is limited. A meeting of the SIG Committee will be

held at 3:30 PM prior to the presentation. All committee members are urged to attend.

Topic: Summary of AVO

Speaker: Mark Sbar, British Petroleum

Subject: The speaker will present a summary of the talks on AVO presented at the Research Session of the 1996 Gulf Coast SEPM meeting.

Host Company: Texaco EPTD, 3901 Briarpark (corner of Westpark and Briarpark)

Day 1 features two case studies and technology exhibits:

Case 1) A proposed disposal facility for radioactive waste 40' into sediments near the town of Sierra Blanca, Hudspeth County, Texas. The over view of low-level radioactive waste repositories in Texas by **Ruben Alvarado P.E.**, Texas Low-Level Radioactive Waste Disposal Authority, has been rescheduled from October. Other speakers will present the geologic and geophysical methods used for site characterization.

Case 2) A proposed hazardous waste disposal facility within the Boling salt dome in Wharton County, Texas. Secured Environmental Management, Inc. is the permit applicant, and it has approved the participation of their geophysicist of record H. Roice Nelson, Jr.

Contact Mr. Nelson (713/579-01 72 or E-mail: rnelson@walden3d.com) to see the 3-D seismic reflection data on a computer workstation and/or download

Environmental Applications S.I.G.

Geophysical Society of Houston
Affiliated with the Society of Exploration Geophysics

Special 2-day forum LOOKING INTO THE EARTH:

Commercial Applications of Non-intrusive Geophysical Methods for Site Characterization

Friday and Saturday 21-22 March

Upcoming Meetings and Conferences

Landmark Worldwide Technology Forum

On February 12-14, 1997 Landmark Graphics will hold its annual World wide Technology Forum at the Adam Mark Hotel in Houston, Texas. Keynote speakers at the Worldwide Technology Forum will be Dick Cheney, President & CEO of Halliburton and former U.S. Secretary of Defense under the Bush Administration; and Daniel Yergin, President of Cambridge Energy Research Associates and Pulitzer-Prize winning author of "The Prize: The Epic Quest for Oil, Money, and Power."

For further information about Worldwide Technology Forum registration, visit the Landmark Web site at <http://www.lgc.com>. Or e-mail at forum@lgc.com. Or phone at 281/560-1000.

Emerging Technologies for the Natural Gas Industry in the Spotlight

The U.S. Department of Energy will hold a Natural Gas Conference on March 24-27, 1997, at the Wyndham Greenspoint Hotel in Houston, Texas. The Conference is being sponsored by DOE's Morgantown Energy Technology

Center, lead center for the Natural Gas Research Development Program.

The conference format will include both oral and poster session presentations as well as selected organizational exhibits and pilot technology demonstrations. The conference will kick off on Monday afternoon with natural gas workshops on (1) advanced drilling technologies and (2) evolving geophysical applications for the natural gas industry, and will continue with four geotechnical seminars on Tuesday morning. Seminar topics will include evolving drilling systems and technologies; 3-D seismic applications; the natural gas atlas series involving the Gulf Coast, Offshore, and Appalachian basins; and environmental applications for the petroleum industry. The General Session of the Conference will begin Tuesday afternoon with keynote speaker Kenneth Lay of Enron Corporation.

For continuing updates and further information please contact: Conference Services Morgantown Energy Technology Center 3610 Collins Ferry Road P.O. Box 880, MS-KO7 Morgantown, West Virginia 26507-0880 Telephone: (304)285-4108 Or visit METC on the Internet at: <http://www.metc.doe.gov> - Select METC Calendar of Events

some of the 3-D seismic reflection data. Geological information in permit application TNRCC #34819 is at the Houston TNRCC office. Request the file from Valerie at 281/767-3502 one day before you go to review or copy the report.

Day 2 features field demonstrations of non-intrusive geophysical methods to characterize the underground geology: Seismic reflection and seismic refraction with acoustic (sound) sources, ground penetrating radar (electromagnetic source), electromagnetic/conductivity, resistivity, magnetic, . . . and one invasive tool, the cone penetrometer.

\$35 preREGISTRATION is for both days and includes lunch. \$40 after 15 March and on site.

Make check payable to GSH/FORUM.

Mail check to GSH/FORUM c/o P O Box 925809, Houston, TX 77292-5809.

Friday seating is limited and based on receipt of check. Walk-ins are not guaranteed a seat on Friday.

Saturday field demonstrations will happen regardless of weather (if poor weather, we will be under cover) .

N A M E : _____

ADDRESS: _____

PH O N E: _____

FAX: _____

4th ANNUAL GSH/HGS/HAPL BASS TOURNAMENT

April 5 & 6, 1997

This year the 4th Annual GSH/HGS/HAPL Bass Tournament will once again be held at Pendleton Harbor Marina on Toledo Bend Reservoir. We are looking forward to an even bigger and better weekend of fishing fun and friendly competition along with the traditional Saturday Night Fish Fry with door prize drawing that evening.

Prizes will be awarded for overall first, second, and third place team total weight of black bass as well as individual GSH, HGS, HAPL, and Guest prizes for biggest bass caught from each group. A Big Bass Pool for each day will be available as well. Each participant will be provided with a copy of the specific tournament itinerary, rules sheet, and prize breakdown with their tournament registration. For more information please contact:

Greg Doll (HGS & GSH) (713) 658-8096..Office (713) 951-0343..Fax

Bill Zwiener (HAPL) (713) 650-0903..Office (713) 650-3547..Fax

Once again, **Pendleton Harbor Marina** has reserved a block of rooms for our tournament and several mobile homes are available as well. To make reservations, call (409) 625-4912 and be sure to mention that you are participating in this tournament. The rates are reasonable and there is a limited number of rooms available so **reserve your accommodations as soon as possible!** Frontier Park Marina (409) 625-4712 also has a few cabins and several mobile homes available within one mile of Pendleton Harbor Marina. Please contact Greg or Bill if you want to fish and have a boat but no partner or don't have a boat and want to fish and we will try to put together teams of individuals who want to participate but need either a partner or a boat.

Corporate and individual contributions are appreciated and will be acknowledged on a sponsor board at the weigh in station and in the respective organization newsletters following the tournament. This is a great way to entertain friends, business associates, and clients, so spread the word!

GSH/HGS/HAPL BASS TOURNAMENT REGISTRATION FORM

NAME: _____ PARTNER: _____

ADDRESS _____ PHONES - HOME _____

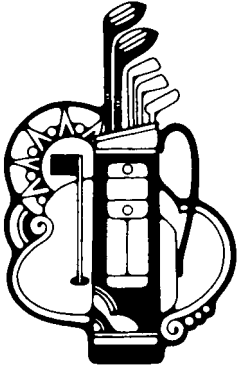
OFFICE _____ GROUP AFFILIATION _____

Please clip this form and return it with your payment, make your check for \$50.00 per contestant payable to:

GSH/HGS/HAPL BASS TOURNAMENT and Mail to:

Mr. Bill Zwiener, Jones & Zwiener, Inc., 1300 Main St., Suite 1920, Houston, Texas 77002

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



Golf Tournament and Dinner

Geophysical Society of Houston

DATE: Monday, March 24, 1997

FORMAT: Four Man Florida Scramble

PLACE: Kingwood Country Club

COST: \$95.00 Members and Guests

TIME: 8:00 AM Registration
10:00 AM Tee off (Shotgun)

DEADLINE: March 1, 1997

MAIL ENTRIES TO: Western Geophysical • 10001 Richmond Ave. • Houston, TX 77042 • Attn: George Lauhoff

MAKE CHECKS PAYABLE TO: Geophysical Society of Houston

GOLFERS READ CAREFULLY

The three courses at Kingwood are available to the first 432 entrants. No entry will be accepted until the entry form and fees are received in full. NO EXCEPTIONS!!!

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: _____

Circle: Member Guest

Circle: Member Guest

Company: _____ Company: _____

Phone: _____ HDCP: _____ Phone: _____ HDCP: _____

Name: _____ Name: _____

Circle: Member Guest

Circle: Member Guest

Company: _____ Company: _____

Phone: _____ HDCP: _____ Phone: _____ HDCP: _____

Course Preference: (Circle One) ISLAND LAKE MARSH

**GSH 1997 Spring
Symposium and SEG
13th Annual Gulf Coast
Technical Meeting**

**April 23, 1997
Houston, TX**

**“The Three E’s of 3D -
Efficiency, Effectiveness,
Economics”**

**First Announcement and
Pre-Registration**

This year the Geophysical Society of Houston is sponsoring the SEG 13th Annual Gulf Coast Technical Meeting in joint session with its Spring Symposium. The meeting will be held on Wednesday, April 23. The exact Houston location will be announced in March. The technical session, consisting of approximately eight presentations on the efficiency, effectiveness and economics of 3D seismic surveys, will be moderated by Malcolm Lansley (Western Geophysical) and Dave Monk (Energy Innovations). Selected SEG Continuing Education short courses will be offered on the days preceding and following the meeting - look for details in next month’s newsletter.

Advance registration is available using the following form. Pre-registrations must be received in the GSH Business Office on or before Wednesday, April 9. There will be on-site registration on the day of the meeting.

Contacts:

Don Herron
General Chairman
(281) 560-3778

Dan Ebrum
Technical Program Chairman
(713) 954-6252

PLEASE READ ME!

*HESS is relocating beginning in March.
All GSH activities starting in March will occur at the
new location*

Registration Form

**GSH 1997 Spring Symposium and SEG 13th Annual
Gulf Coast Technical Meeting**

April 23, 1997 Houston, TX

Name: _____

Company: _____

Address: _____

Phone: (daytime) _____
(evening) _____

Please provide the following supplemental information:

Discipline (circle one): geophysics geology engineering other

Years of experience (circle one): < 1 year 1 - 5 years > 5 years

Primary interest (circle one): exploration exploitation environmental
other

Please send this completed form with a check or money order for \$60 (GSH members, unemployed and students — send proof of full-time enrollment) or \$80 (non-members) to: Geophysical Society of Houston, 7171 Harwin, Suite 314, Houston, TX 77036.

Pre-registrations must be received by April 9, 1997.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Submittals and suggestions should be sent to the GSH Editor at 7457 Harwin, Suite 301, Houston, TX 77036, or call Cliff Kelley, Editor, at 368-8103, or Fax to 368-8182. Deadline for submission is the 1st of the month preceding publication: e.g., September 1 for the October issue. Digital or electronic submittals required.</p>						1
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