

HGS Bulletin

Volume 59, Number 8

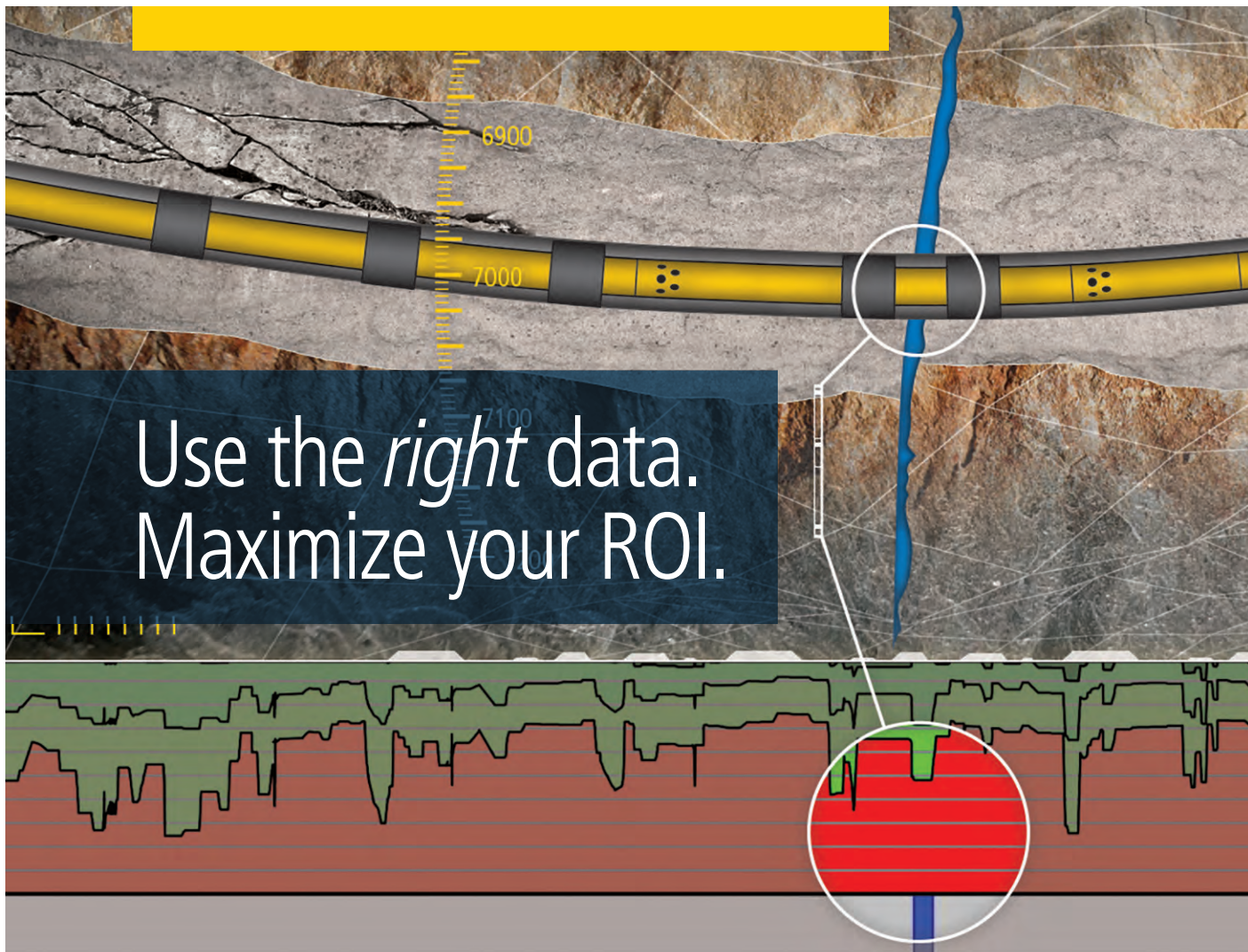
Houston Geological Society

April 2017

ELECTION ISSUE



HGS Welcomes AAPG Centennial ACE



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Volume 59, Number 8

The Bulletin

Houston Geological Society

April 2017

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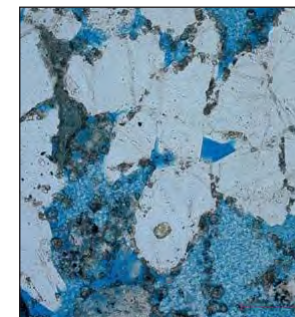
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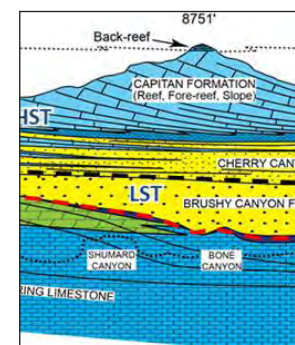
About the Cover: Spindletop image: Texas Energy Museum
George R. Brown photo: Wade Huntsman



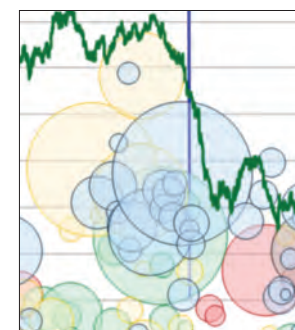
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100TH AAPG ANNIVERSARY

ACE 2017



ANNUAL CONVENTION & EXHIBITION

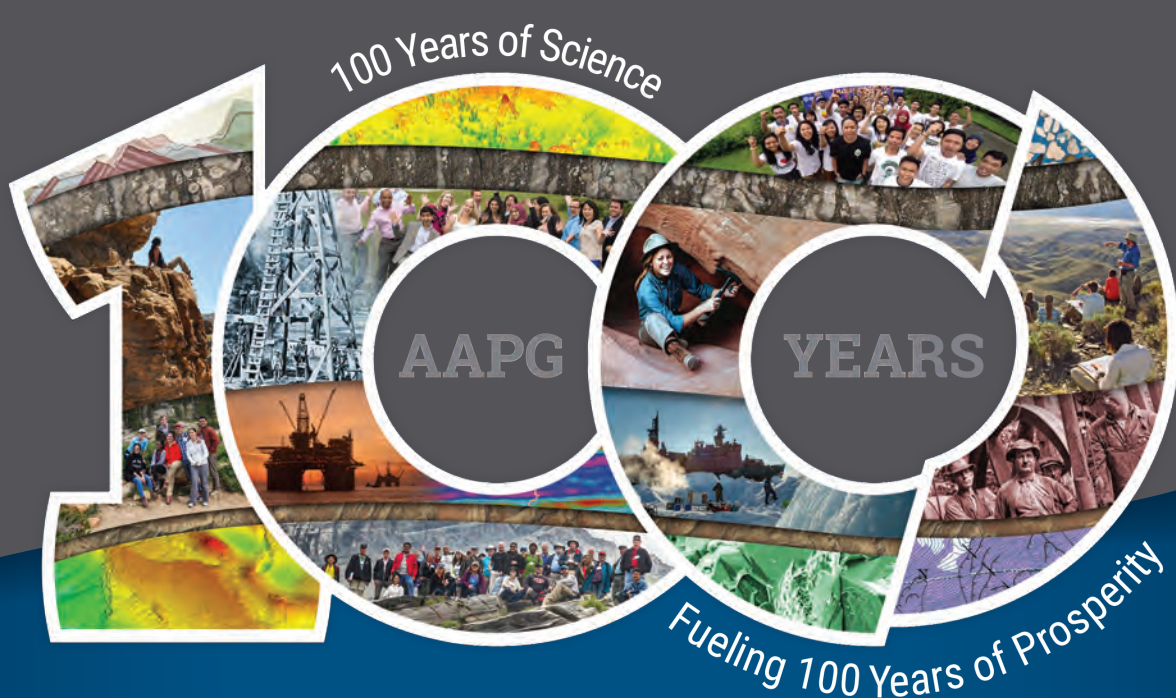
2-5 April 2017 • Houston, TX • George R. Brown Convention Center

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ACE.AAPG.org

In conjunction with:



Experience a remarkable week of science, networking, activities and commemorations celebrating a century of the world's best geosciences.

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- 430 Oral Presentations
- 798 Poster Presentations
- 1,228 Speakers from 41 Countries


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Blockbuster Offshore USGOM Giant Deepwater Field Session – The Really Big Name Fields You've Always Wanted to See 25 Minute Talks On

- PERDIDO Field - Shell
- THUNDERHORSE Field - BP
- JACK-ST. MALO Field - Chevron
- STAMPEDE Field - Hess
- LUCIUS Field - Anadarko
- GUNFLINT Field - Noble

Don't miss seeing this once in a lifetime blockbuster lineup in just one AAPG session on Wednesday morning between 8am–Noon.



Co-Chair: Clint Moore



John Jordan
john.jordan@hgs.org

Is That a Light at the End of the Tunnel or Another Train?

The last couple of years, 2015 and 2016, have been difficult. The geosciences have been hunkered down in the trenches in survival mode with what has appeared to be a downturn with no end in sight. This has also been true at the Houston Geological Society. We have also been implementing many cost-saving changes over the last few years. This has resulted in moving of the Mud Rocks and Geomechanics conferences to corporate venues. Thank you to Anadarko and Southwest Energy for donating your facilities. The Shrimp and Crawfish Peel is also at a new location. The Norris Conference Center at City Center will likely hold the 2018 Africa Conference. If you know of a corporate venue available that can handle 400 people, please inform the HGS office.

In addition to these changes, the HGS Board has voted to move the *Bulletin* to a primarily digital publication. Producing a digital *Bulletin* is a good financial and environmental option. Many technical and popular publications have been making this move for several years. Make sure to read the Editor's page this month to find out more about our plans.

Finally, the annual HGS dues will increase from \$28 to \$30 starting in July. Please renew your dues as soon as you are notified so that the digital *Bulletin* rollout can proceed smoothly. I believe that an HGS membership is still a bargain at the new price.

All of these changes are an attempt to reduce the red ink on the HGS budget. The same red ink all of you have been experiencing. I believe that there is light at the end of the tunnel and it is not a train. Spring is the season of growth and I believe we are seeing signs of a new spring season in the oil patch. Attendance levels at many industry events have shown improvement during the first quarter of 2017. The local petroleum related events so far this year have been a resounding success.

We started off February with the HGS Scholarship night. The HGS received approximately \$40,000 in donations and well over 100 people were in attendance. To use the words of another president, "This is HUGE, people." Scholarships are given each year to outstanding undergraduate and graduate students across the country (not just Texas schools) and these donations are how we make it happen. The next major event was the North American Prospect Expo (NAPE) which was a smash hit with more than 10,000 registrants in attendance at the George R Brown (GRB). The exhibit hall was packed and the energy level was

high. If you haven't been to the GRB since before the Super Bowl, you have not had the opportunity to see how great it looks now that the facility updating is finished. The 2017 Mudrocks Conference in March likely broke last year's donations and attendance records. The theme was "Integrated Approaches of Unconventional Reservoir Assessment and Optimization." The technical committee put together a fantastic two-day lineup of cutting edge presentations on the shale play.

The AAPG Annual Convention and Exhibition (ACE) is happening during the first week of April. It is the 100-year anniversary and the theme is "100 Years of Science Fueling 100 Years of Prosperity." The AAPG was formed by geologists in the petroleum industry working in Oklahoma as a response to rampant fraud and the proliferation of promoters or "snake oil salesmen." Their goal was to share petroleum-related geological practices to improve their members' knowledge-base and credibility. Now 100 years later, it is the premier source for information about finding and developing petroleum resources. This year's ACE spans 430 oral presentations in 117 technical sessions covering 12 themes along with 798 poster sessions. There is nowhere you can receive such a wide variety of valuable information, field trips and specialty courses at such a reasonable cost. The ACE organizing committee also planned many non-technical activities for guests and a 2-day workshop for K-12 grade educators. As I have said before: opportunity favors the prepared. You are responsible for your career – not the company where you currently work.

Following ACE is our annual Shrimp and Crawfish boil on Friday April 21. The celebration will be at Pavilion 6, Bear Creek Park, from noon until 6:00 pm, rain or shine. Whether you are 28 or 82, this is the place to be! It should be an excellent local networking opportunity to reunite with old friends and meet some new ones. If you work nearby, come over for lunch and have some fun. If it is your Friday off, stop by on your way home for a beer and good food and stay awhile.

Please take time to read about the candidates running for HGS office in this issue and vote. As usual, this is a group of qualified and dedicated volunteers and I am certain that whoever wins will do a great job. The HGS Board along with our excellent office staff are the foundation of the HGS organization. Our goal is always to keep the HGS in the best financial position we are able to and to serve our members. ■

From the
President

From the President



Interested in bringing advanced technology, new geologic discoveries, and career pathways for your students into the classroom?

Register Now!

The American Association of Petroleum Geologists invites middle-school, high-school, and community college educators to help celebrate its 100th anniversary!

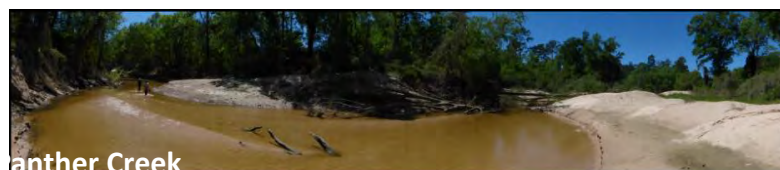
Earth Science Educator Program, April 1-4, 2017



Galveston

Geologic Field Trips (Saturday, April 1)

Spend a day in the field with geoscientists to investigate local geology. Channel your inner scientist: make observations, apply field methods, analyze data, and interpret findings.



Canther Creek

Symposium (Sunday, April 2)

Join colleagues for a day of interactive sessions exploring emerging fields, advances in technology, and careers. Discussions will highlight data, resources, and ways to bring content into the classroom. Topics include:

- **Roving Robots and Extreme Machines, New Frontiers of Earth Exploration**
- **Careers: A Path for Students to a Geosciences Paycheck**
- **Seeking Oil and Gas in 2017 and Beyond**
- **Why Seismic Matters in Our Hunt for Resources**
- **A Changing World for Petroleum**

Participate in the Convention (Monday and Tuesday, April 3 and 4)

Explore exhibits and see the latest in petroleum industry information and technology. Pair up with an industry professional. Interact with representatives from industry, organizations, and universities. View posters and attend technical presentations on cutting-edge industry topics for professional audiences. And more!

Details: <http://ace.aapg.org/2017/networking-and-events/aapg-earth-science-educator-program>

Registration: <https://fs3.formsite.com/AAPGevents/form91/index.html?1481578663623>

Participants will receive Gifted and Talented and Professional Development credit hours.

Complimentary event registrations and daily stipend are available for a limited number of participants.

Questions?

Contact stephanie.shipp.1@gmail.com or amanda.guzofski@chevron.com.

From the
Editor

From the
Editor



Tami B. Shannon
tami.hgs@gmail.com

2017-2018 Digital HGS *Bulletin*: It's Not Easy Being GREEN

Dear HGS Members:

The 2016-2017 HGS membership currently provides each member with a hard copy, printed version of the HGS *Bulletin*, which is mailed on a monthly basis to the address in the member's profile. As a courtesy for the last few years, the HGS also provides a Digital PDF version of the *Bulletin* online which can be accessed by logging into the HGS website at www.hgs.org.

However, in continued efforts to become more fiscally and environmentally responsible, the HGS Board of Directors has voted to transition to only the digital version for the 2017-2018 fiscal year. The 2016-2017 hard copy *Bulletin* will continue to be automatically mailed to current members through June 2017.

Starting July 1, 2017 (fiscal year of 2017-2018), all members will default to the "Digital Only" *Bulletin* option. This will provide each member (after paying 2017-2018 renewal dues) with online access to the HGS website, which subsequently gives you access to the current *Bulletin* and all the *Bulletin* archives.

Members who wish to receive a hard copy publication will need to "opt-in" for an additional fee for this service.

The Board did not make this decision lightly, and is committed to continue to provide the high-quality *Bulletin* which all of you have come to expect. This decision will allow our publication to become more evergreen by providing shorter deadlines and turn-around times, and allow our volunteers to work to supplement our journal with new, more current content, pages, and features that were previously limited due to the financial restrictions of our hard copy publication.

The HGS *Bulletin* will be accessible to our members by visiting our website at www.hgs.org and navigating to the HGS *Bulletin* image on the right-hand side of the Home page. Download it to your computer, tablet, or smartphone and you can have access to it at any time. If you have any concerns or comments/thoughts regarding our Digital *Bulletin*, please contact me at tami.hgs@gmail.com. ■

2016-2017 Editor
Tami B. Shannon

The Jack Shirley Memorial SIPES Scholarship – Lafayette Chapter

Scholarship Eligibility

Scholarship shall be awarded at the Lafayette Chapter's May meeting. The Foundation Board of Trustees* shall make selection of the winning candidate prior to the scholarship award from a listing of all applicants and after communication with the chairman of the respective department of study of the winning applicant. Application deadline will be April 23rd, 2017.

Applicants must be a currently enrolled upper division or graduate student in an earth science discipline of Geology, Geophysics, Petroleum Engineering or closely related field at any accredited University and have maintained a minimum

3.0 grade point average out of a 4.0 scale, both overall and in the major field of study, and which must be maintained to remain eligible for additional consideration. The applicant must submit a fully completed Foundation application with three (3) recommendations.

Application and details available on the HGS website.
Scholarship webpage: https://www.hgs.org/education_scholarships
Application form: https://www.hgs.org/sites/default/files/SIPES_JSM_SCHOLARSHIP.PDF



Candidates for the 2017–2018 Executive Board

Houston Geological Society Officer Election

The candidates put forth by the Nominations Committee are:

- President - Elect:** Cheryl Desforges, Justin Vandenbrink
- Vice President:** Scott Sechrist, Bob Weiner
- Secretary:** Rachel Todkill, Annie Walker
- Treasurer-elect:** Ryan Yarrington, Tarek Ghazi, Donna Davis
- Editor-elect:** Jim Tucker
- Directors (2 positions):**
Carl Steffensen, Steven Shirley, Gregory Halvatzis, Maggie Dalthorp

HGS Election Voting Instructions

- Members will be able to vote in one of two ways:**
1. Return the paper ballot that will be delivered in the mail,
OR
 2. Vote online following instructions that will be delivered by e-mail.

PLEASE VOTE – Upon receiving the paper ballot or the e-mailed instructions!

The voting period opens April 10, 2017 and continues to May 10, 2017.

President-elect (two candidates)



Cheryl Desforges

Education
M.B.A. Finance/International Business/ Decision & Information Sciences, University of Houston
M.S. Physical Science/Geology, University of Houston CL
B.S. Geology, Texas Christian University

- Experience**
- | | |
|--------------|---|
| 2015-present | Consultant |
| 2013-2014 | Geological Manager - Eagle Hydrocarbons |
| 2006-2013 | Geological Manager/Senior Geologist - Sabco Oil and Gas Company |
| 2004-2006 | Consultant - Ryder Scott Company, SCA |
| 1998-2004 | Geologist - Randall & Dewey, Inc. |
| 1995-1998 | President/Principal Geoscientist - Environmental Evaluation Partners, Inc., President |
| 1989-1995 | Consultant – in both the Petroleum and Environmental Industries |
| 1982-1989 | Senior Geologist - J.M. Huber Corp. |
| 1979-1981 | Senior Geologist - Diamond Shamrock Corp. |
| 1977-1979 | Geologist - Sonat Exploration Co. |
| 1975-1977 | Geologist - Atlantic-Richfield Co. |

Professional Affiliations
Licensed Professional Geoscientist, State of Texas # 2174
American Association of Petroleum Geologists - Certified

Cheryl Desforges continued on page 14



Justin Vandenbrink

Justin Vandenbrink is currently a Director on the HGS Board for the 2015-2016 term.

He is a professionally designated Geologist based in Houston who has been volunteering with the HGS and AAPG for over 20 years.

Justin has held various volunteer assignments during his time with the HGS including Vice President, Director, Chair of International Explorationists Group and Committee member for the Africa conference.

In addition to his work with the HGS, Justin has expanded his volunteering to the AAPG. He is currently an AAPG Delegate and has been a past Foreman for the House of Delegates. His goal is to keep both societies working together to benefit Geology in Texas and North America.

Justin looks forward to continuing volunteering his time when and where the HGS needs it. ■



Candidates for the 2016–2017 Executive Board *(continued)*

Vice President (two candidates)



Scott Sechrist

Education
Houston Community College, Houston, TX. – Post Baccalaureate Courses
1985-86, for University of Houston/MS Geology program.
S. F. Austin State Univ., Nacogdoches, TX., Bachelor of Arts Degree 1975- 1977

Electronic Communication R-T-F/Marketing
Southwest TX State Univ., San Marcos, TX., Bachelor of Arts Degree 1972-1974 Geography/Remote Sensing
Trinity University, San Antonio, TX., Baccalaureate Courses, 1970-1972 Geology/Geography

Professional Affiliations:
American Association of Petroleum Geologists
Society of Exploration Geophysicists
Society of Independent Professional Earth Scientists
Continuing Education Committee, Houston
Houston Geological Society – Board of Directors, Shrimp Peel Committees
Geophysical Society of Houston – Electronic Publications, Publicity Committees

- Experience**
- | | |
|--------------|--|
| 2015-present | Acoustic Geoscience Consulting |
| 2014-2015 | Grand Gulf Energy Geophysical Consultant |
| 2012-2014 | Subsurface Consultants / Noble Energy Deepwater Geophysical Consultant |
| 2006-2011 | Various Firms – Geophysical Consultant |
| 2002-2005 | Calpine Natural Gas – Senior Geophysicist |
| 2002-2002 | JM Huber Geophysical Consultant |
| 1997-2001 | Panaco, Inc. Chief Geophysicist |
| 1985-1996 | Acoustic Exploration, Inc |
| 1980-1984 | Seiscom Delta United, Petty-Ray Geophysical |
| 1978-1979 | Bendix Field Engineering / DOE NURE Program |

Statement
During my 39 years of experience, the HGS was there for me every step of the way. As an HGS member, I have volunteered to staff the luncheon registration tables, participated in Science Fair judging, served as an Oral Session judge at the Africa Conference, stuffed convention bags, served on the HGS Board of Directors, provided liason with other local geoscience societies, helped design early website efforts and participated in every possible event, across nearly four decades.

Scott Sechrist continued on page 15



Bob Weiner

Education/Key Dates
(1795 James Hutton establishes the modern science of geology; no matter what Sheldon Cooper says)
BSc Geology from University of Rhode Island and hired by Cities Service Company, 1975

- | | |
|-----------|---|
| 1978 | Move to Houston with Cities International and join the HGS |
| 1983-1988 | Foreign assignments with Conoco |
| 1988 | Move back to Houston to begin Goh Seismic Interpretation Services and Goh Exploration, Inc. |
| 2017 | Still in the game |

Professional Affiliations
HGS (co-chair North American Interest Group)
AAPG (member Geophysical Integration Committee)
Geophysical Society of Houston
Society of Exploration Geophysicists
Texas Professional Geoscientist (3888)

Experience
I was raised in the bucolic coastal town of Narragansett, Rhode Island and while growing up our family was able to travel throughout our great country and Europe. These trips lead to my appreciation of geology. After I graduated from the University of Rhode Island with a BSc in Geology, I was able to join the exciting business of oil and gas exploration, compliments of the Arab Oil Embargo. While working for Cities Service International Oil Company, I moved to Houston in 1978. That is the year I joined the Houston Geological Society. After career changes and a stint overseas with Conoco, my family and I moved back to Houston in late-1988. At that time I realized I am not a corporate person. So, on purpose, I began my independent consulting and prospect generation business, Goh Seismic Interpretation Services, and later Goh Exploration, Inc. When you work outside the corporate world, the industry looks very different and professional societies, especially local societies such as the HGS, become more important. Through continuing education courses and networking I have found friends and mentors who have helped guide me to understand the geological, technical, commercial, and human aspects of exploration deals so I can provide better ideas and more accurate risk assessments to clients and investors. And, fortunately along the way I have been able to help find substantial amounts of oil and gas.

Bob Weiner continued on page 15



Candidates for the 2016–2017 Executive Board *(continued)*

Secretary (two candidates)



Rachel Todkill
Education
B.S., Geology, Texas A&M University, 2012
M.S., Geology, University of Texas at San Antonio, 2015

Experience
2016-Present Drillinginfo, Technical Account Manager
2015-2016 Drillinginfo, Account Development Manager
2013-2015 University of Texas at San Antonio, Teaching Assistant: Historical Geology and Paleontology Laboratories

Professional Affiliations
2017 Houston Geological Society, Secretary
2012-Present AAPG, Member
2011-2012 Texas A&M University College of Geosciences Recruitment Student Council, Member
2010-2012 Texas A&M University Recruitment Team for the College of Geosciences, Recruiter
2010-2012 Texas A&M University Geology & Geophysics Society, Member
2010-2012 Texas A&M University College of Geosciences Peer Mentor Program, Mentor

Statement
I am pleased to have been nominated again for the office of Secretary of the Houston Geological Society, and I would be honored to also serve as a member of the AAPG House of Delegates. I hope to serve as keen presence during HGS events and meetings. As a young member of both the Geologic and Oil & Gas communities, I believe that the Houston Geological Society plays an important role by acting as a networking organization, providing resources for unemployed members during downturns, as well affording youth the opportunity to learn more about geological sciences. I hope to increase awareness of the amazing work that is done by the society. It is an honor to be a part of this organization. ■



Annie Walker
Education
MSc, Structural Geology & Tectonics
University of Tennessee–Knoxville
BSc, Natural Systems Science
Le Moyne College

Experience
2015–2017 Director, Houston Geological Society
2013–present Structural Geologist, ION Geophysical
2012–2013 Research Assistant, Structural Geology & Tectonics Research Group, University of Tennessee
2010–2012 Graduate Teaching Assistant, University of Tennessee
2009–2010 Executive Assistant (civilian) CG93, The Columbia Group & United States Coast Guard
2006–2008 Research & Field Assistant, Le Moyne College

Professional Affiliations
Houston Geological Society
American Association of Petroleum Geologists, PSGD
Geological Society of America
The Geological Society, London
Sigma Xi, The Scientific Research Society

Statement
Spending the last two years serving the HGS as a Director of the Board has been a fantastic experience—I’ve truly enjoyed learning the ropes from our Committee members, my fellow Board members, and all of you along the way. As a group, we’ve weathered a challenging couple of years through this exhausting downturn. But we’ve also pulled together—at every level of participation—to preserve and sustain the educational, professional, and outreach activities that are the core of the HGS community. I’m very grateful I’ve had this opportunity to get to know the HGS, and I’d be honored to serve you again as the 2017 Secretary. ■



Candidates for the 2016–2017 Executive Board *(continued)*

Treasurer-elect (three candidates)



Donna Davis
Education
B.S. Geology, Ohio State University

Experience
1993 - present Geologic/Geophysical Consultant at various Houston oil firms.
1986 - 1993 Petroleum Information Exploration Systems Senior Geologist
1982 - 1986 Mobil Oil Geologic Consultant

Awards
2010 HGS President’s Award
2014 HGS President’s Award

Professional Affiliations
AAPG, GSH, HGS, SEG, SEPM

Professional Activities
2012 - present HGS North American Explorationists Co-Chair
2008 - 2012 HGS North American Explorationists Treasurer
2010 - present HGS Judge Energy Council Science Fair
2003 - present HGS-PESGB Africa Conference Houston Planning Committee
1993 - present HGS Continuing Education committee
1986 - 1993 HGS *Bulletin* assistant editor
Judge AAPG Conventions/Poster Sessions
Judge GCAGS Conventions/Poster Sessions
Session Monitor Volunteer SEG convention, OTC convention

Statement
When I first came to Houston I attended the HGS dinner meetings, short courses, and networking events. At these I made friends and expanded both my technical geological knowledge and practical understanding of the petroleum industry. I have been an active volunteer in the HGS since 1986 when I joined the HGS bulletin committee. Being a volunteer on various committees behind the scenes in the HGS has been wonderful. I have gained a varied and practical background in how the HGS functions. The events and activities of our society run the gamut of very technical, like the conferences, short courses, and *continued*

Donna Davis continued on page 15



Tarek Y. Ghazi
Tarek Y. Ghazi graduated from Stanford University with a B.S. and M.S. in geology, after which he enjoyed a 20-year career with Conoco in uranium exploration and production, oil and gas exploration research, and global new ventures in Casper, San Antonio, Ponca City, Dubai, and Houston. After Conoco, Tarek held various positions at the interface of geology and information technology, the last of which was VP of Technical Services at C&C Reservoirs. He has also been an active volunteer for the HGS, AAPG and SPE in a variety of elected and appointed roles. His HGS positions have included Treasurer and Chairman of the International Explorationists, Website Manager and Board Director. In addition to volunteer work, Tarek enjoys exploring the back roads of South Texas with the BMW Motorcycle Club of Houston. ■



Ryan Yarrington
Ryan Yarrington currently works at MultiClient Geophysical in the Houston Office. MultiClient Geophysical also has offices in Norway and Asia Pacific. He is a Marketing Representative for North and South America and works with his many clients on 2D and 3D Seismic Acquisition offshore internationally and domestically. Prior to working at MultiClient Geophysical Ryan has also had experience in fields ranging from 2D and 3D Onshore Seismic Acquisition, Microseismic, Data Processing and HSE. He has spent the last 2 years volunteering for the HGS International Committee where he is currently the Treasurer. Ryan looks forward to working with the HGS and serving in many different roles in the future. ■



Candidates for the 2016–2017 Executive Board (continued)

Director – Two-year term *Vote for two candidates*



Maggie Dalthorp

Maggie Dalthorp is currently working as a consulting geologist and has recently evaluated acquisitions in the SCOOP/STACK, Delaware, Williston and Gulf Coast Basins for clients. She is a SCOOP/STACK expert for Third Bridge Consultants, and teaches the

Introduction to Petroleum Geology course for SPE. Prior to consulting, she served as Exploration Manager for a Williston Basin operator, Murex Petroleum Corporation, where she was actively involved in assessing the Three Forks play. Her experience also includes running her own company, Moorhouse Associates, Inc. – a natural resource planning and oil and gas exploration company that generated prospects by shooting 3D seismic surveys in underdeveloped areas. Dr. Dalthorp also served as project manager for several watershed studies, pollution outreach activities and water planning projects both domestically and internationally. She began her career with Exxon Company USA and served in a variety of geological, exploitation and management roles working both onshore US and offshore Gulf of Mexico. Dr. Dalthorp holds a Doctorate in Coastal and Marine System Science from Texas A&M University - Corpus Christi, an MBA from Texas A&M University - Corpus Christi, and a Bachelor's in Geology from The University of Texas at Austin.

Maggie has been a member of HGS since moving to Houston in 2012. She gave a talk and chaired a session at the 2016 GCAGS meeting, and has served as Secretary and Councilor for the Corpus Christi Geological Society. ■



Greg Halvatzis

Education

Master of Science in Geology, University of Florida, 1975
Bachelor of Science in Geology, Waynesburg University, 1973
MBA, Mississippi College, 1979

Experience

- 2016 – Present Vice President of Exploration – Recoil Resources
- 2012 – 2016 Senior Geologist – Exploration Group – Halcon Resources
- 2009 – 2012 Chief Executive Officer and President – RHC Energy
- 2004 – 2009 Exploration Manager – Gulf Coast – National Energy Group/SandRidge Energy
- 2001 – 2004 Senior Vice President of Exploration/Land – TransTexas Gas Corporation
- 1993 – 2001 Exploration Manager – Gulf Coast – JN Oil and Gas
- 1982 – 1993 Vice President of Exploration – First Energy Corporation
- 1976 – 1982 Senior Geologist/Planning & Evaluation Manager – Southeastern Region – Cities Service Corporation

Professional Affiliations

Texas Licensed Professional Geologist (#128)
Louisiana Licensed Professional Geologist (#180)
Certified Petroleum Geologist (#2579) AAPG
Certified Professional Geological Scientist (#5038) AIPG
Houston Geological Society

Professional Awards and Activities

- 2015 – Present Board of Trustees – Waynesburg University, Waynesburg, Pennsylvania
- 2010 Board Member – Epsilon Energy, Ltd.
- 2000 Thomas A. Philpott Excellence of Presentation Award Third Place Recipient at Gulf Coast Association of Geological Societies 50th Annual Convention
- 2000 Gordon L. Atwater Best Poster Award Third Place Recipient at Gulf Coast Association of Geological Societies 50th Annual Convention

Greg Halvatzis continued on page15



Candidates for the 2016–2017 Executive Board (continued)

Director – Two-year term *Vote for two candidates*



Steven Shirley

Steven Shirley is currently the Exploration Portfolio Manager in Chevron Global Upstream and Gas. Steven has been a part of the E&P industry for over 30 years spanning 4 companies Chevron, Unocal, Union Pacific Resources (Champlin) and Marr Co. with primary emphasis on

domestic and international exploration. He is a second generation oil finder. He has held a number of domestic US and international positions in technical and business management including Regional Project Manager, Global Earth Science Hiring Manger, and Exploration Manager Positions.

Steven holds a BS degree in Geology from Louisiana State University in Baton Rouge and a MS of Geology from The University of Oklahoma in Norman. He is a member of AAPG, DPA and SPE and holds professional certification in Texas and Wyoming.

Professional Society Activites

AAPG Certificate of Merit 2014
AAPG Sponsorship Chairman 2014 ACE
Houston Geological Society President's Award for Outstanding Service 1995
Houston Geological Society Directory Chairman 1993 - 1995
AAPG House of Delegates 1992 -1997
Gulf Coast Association of Geologic Societies (GCAGS) Committee Chairman 1991 Convention
Alumni Advisory Council, University of Oklahoma 1990 - 1997, 2015 - Present
Houston Geological Society Ballot Chairman 1987 - 1989, 1991 - 1992
Houston Geological Society Treasurer 1996-1997
Certified Professional Geologist Texas
Certified Professional Geologist AAPG ■



Carl Steffensen

Geologist Carl Steffensen (BS. Geology '80, Illinois; MS Geology '82, Texas A&M) has 35 years industry experience with ARCO, Vastar, BP America, Inc., and as a consultant and founder of Viking GeoSolutions LLC. During his career he has worked a variety of Tertiary,

Mesozoic, Paleozoic, and Pre-Cambrian exploration and production projects in the Gulf of Mexico (shelf and deepwater), onshore Gulf Coast, Midcontinent, Midwest, and the southeastern US, with a focus on basin analysis, carbonate sedimentology/ stratigraphy, and petroleum systems. For the past 13 years Carl has been working on new country access opportunities in Mexico and Latin America, and has been involved in technical evaluation of global exploration opportunity risk, resource, and prospect ranking. Carl has more than 15 years' experience in college recruiting and mentoring, has served in many positions with both the HGS and AAPG; he has been a member of HGS for nearly his entire professional career and served in multiple positions in the HGS North American Exploration group (1993-2000) and is currently a member of the AAPG Distinguished Lecturer Committee and an AAPG Fellow and Associate Editor. Carl is a Technical Program Vice-chair for the 2017 AAPG ACE, a position he also held for the 2011 AAPG ACE. Carl has co-authored numerous publications on carbonate and siliciclastic diagenesis and petrology, petroleum systems, and geochemistry, and is a native of Chicago, Illinois.

HGS History

North American Exploration Group Chairman, 1998-2000; Co-chairman, 1996-1998; Arrangements Chairman, 1991-1993 ■



Candidates for the 2016–2017 Executive Board (continued)

Editor-elect (one candidate)



Jim Tucker

Education

BA Geology, Rice University
MS Geology, Texas A&M University

Experience

2012-Present Geological Consultant
2002-2012 Geologist – Saudi Aramco

(North American Producing Division, ARCO Oil & Gas Company, ARCO Exploration Company, ARCO International Oil & Gas Company)
1975 Field Assistant
1972 Fabrication and service of shale shakers, mud centrifuges, and desilters – Milchem Drilling Controls

2000-2002 Chief Geologist – Computational Geology
1997-1999 General Manager, Interpretation and Reservoir Services – CGG Americas, Inc.
1978-1995 Geologist, Exploration Planning Director – Various divisions of the AtlanticRichfieldCompany

California Registered Geologist-License#4386
Texas Licensed Geologist-License No. 2182
AAPG Certified Petroleum Geologist #3427
AIPG Certified Professional Geologist CPG-7224

Jim Tucker continued on page15

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Cheryl Desforges—Candidate for President-elect

Petroleum Geologist #2925
Houston Geological Society
SEPM Society for Sedimentary Geology
Society of Exploration Geophysicist

Honors and Awards

2008 HGS Distinguished Service Award
2006 HGS Volunteer of the Month (February)
2005 HGS President’s Award and Volunteer of the Month (February)
1990 Arthur J. Ehlmann Award for TCU Geology Alumni
1974 Sigma Gamma Epsilon, geology honor society, University of Houston
1974 Gayle Scott Award for the Outstanding Geology Senior, Texas Christian University

Professional Activities

2015-2016 HGS Vice President
2007-present AAPG House of Delegates
2008 Gulf Coast Association of Geological Societies Treasurer
2004-2006 HGS Treasurer/Treasurer-Elect term
2005 Co-Chairman “Coastal Subsidence, Sea-level and the Future of the Gulf Coast Conference”
2003-present HGS Continuing Education Committee, Chairman 2003-2004
2002 AAPG Convention Volunteer Liaison Committee

1985-1989 Chairman HGS Publication Sales Committee
Chairman

Statement

Since 1975, when I joined the Houston Geological Society, the largest local geological society in the world, I have come to realize that it is really an organic professional fraternity of volunteers who share a passion for the study and application of Geology. Through meetings, continuing education courses, field trips, and social events, as well as outreach to our larger community to promote geosciences, and mentor future Geoscientists, our organization serves our membership as an important venue for networking, and the exchange of technical ideas. The role of the Executive Committee, the elected Officers and Board, is to support and encourage the myriad of volunteers who conceive and execute all the events that serve our membership, as well as to ensure the prudent use of all revenue. Ultimately, the President coordinates the efforts of the Executive Board. I recognize that serving as the HGS President-elect, followed by being the President, bears the responsibility of leading the Society, so that it can serve our current member needs, and will continue to serve our members far into the future. The viability of our Society revolves around providing net positive value for our members.

I am honored to run for President-elect. Under my leadership, should I be elected, I will encourage utilizing fresh thinking and innovation to tackle all challenges to serving our membership, and to growing our organization to include substantially more of our colleagues. I will continue the long tradition of ensuring that our organization is in tune with the needs of our community, and that it provides opportunities to address those needs. ■



Candidates for the 2016–2017 Executive Board (continued)

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Scott Sechrist—Candidate for Vice President

Serving, participating and volunteering in the HGS and affiliated Professional Societies and their related signature events, including the AAPG ACE, NAPE, OTC and GCAGS have been sources of inspiration throughout my career as a geoscientist. Continuing Education events, Social events, Educational Outreach and Annual Conventions allow HGS members to experience the benefits of “Giving it Forward” in support of those we work with, and the community around us.

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Bob Welner—Candidate for Vice President

Statement

I am aware of what it means to volunteer. Throughout my 30+ years living in Houston I have been an active volunteer at church, at school, with Boy Scouts, my town, and with professional societies. And I enjoy participating in these endeavors. With regards to professional societies, currently I am co-chairing the HGS’s North American Interest Group and I am a member of the AAPG’s Geophysical Integration Committee. When the children were young I helped coach little kids sports (soccer and baseball with Spring Branch Memorial Sports Association). I helped with music lessons (Bunker Hill Elementary Fiddling Lions through Memorial High School Orchestra, associated Region Orchestras,

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Donna Davis—Candidate for Treasurer-elect

dinner meetings to the more social networking like the Museum Guest Night, skeet tournament, and Shrimp Peel. The HGS also finances scholarships, educational awards, and engages in community educational activities. The HGS has always been a

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Greg Halvatzis—Candidate for Director

1982-1989 Participating author in American Association of Petroleum Geologists Annual World Oil and Gas Developments Issue
1977-2000 Published author: AAPG, GCAGS Transactions, Leading Edge, Shreveport Geological Society, and AEG

continued from page 14

Jim Tucker—Candidate for Editor-elect

Member of Houston, Los Angeles Basin, and Dallas Geological Societies
Member of AAPG, GSA, AGU, AIPG, SPE, and YBRA.

Statement

I have been an HGS member since 1980, and have enjoyed reading the *Bulletin*, maintaining my membership while living in Los

Angeles, Plano, and Dhahran, in order to keep up with HGS activities. I look forward to continuing the tradition of *Bulletin* excellence, even as the world of publishing evolves. Past HGS activities have included Ballot Committee (member and chair), International Explorationists (member and chair), and on the committee for the PESGB-HGS Africa Symposium. ■

In humble recognition of all the benefits HGS membership has provided to me, I would be honored to serve my fellow Houston Geological Society members as Vice President. My first priority will always be to maintain and extend the quality of the technical presentations at HGS Luncheon and Dinner meetings. I pledge to all HGS members my best efforts to continue the HGS tradition of providing outstanding speakers and topics to benefit the entire HGS membership. I thank you for your consideration and would appreciate your vote. ■

diverse community of people of different ethnicities, skills, ages, interests, and backgrounds. I am very honored to run as Treasurer for the HGS. If you elect me I will diligently do my best to serve our HGS community to the best of my ability and with all my HGS experience. ■

Statement

As an HGS member for more than 30 years, I am honored to be asked to run for the position of Director. HGS is the largest local geological society in the world with nearly 4,000 members and its impact is global. The role of our Society in promoting geoscience whether in industry, education, or the local and global community continues to be of vital importance. I look forward to utilizing my experience in the oil and gas industry and contributing my leadership and organizational skills to support and serve the HGS membership. ■

and Virtuosi of Houston Chamber Orchestra). Then there was high school Lacrosse. Frankly it was a relief when the kids went to college. My wife was an amateur belly dancer, which was fairly involved, too, but in a good way. I currently volunteer with my town (Hedwig Village Planning and Zoning Commission and now City Council). Did you know there are 34 separate towns within Harris County and another 4 that are split between Harris and an adjacent county? So, when John Tubb asked me to consider running for Vice President of the HGS, I checked my schedule and gave it serious thought. I decided to say yes, not only because John is a gentleman who you don’t really want to say no to (LOL). But because at this stage in my career, I thought I should give back a little more to a great organization that has helped me throughout my professional life. ■

HGS Undergraduate Scholarship Foundation Presents Six Scholarships

The HGS Undergraduate Scholarship Foundation has provided over \$291,000 in scholarships to deserving geoscience students since 1984. This year the Foundation awarded scholarships totaling \$19,000 to students from six universities participating in our program. Melanie Bowen from Texas A&M University was awarded the Maby Scholarship, presented each year to the Foundation's top applicant. Foundation Chairman John Adamick presented the scholarships to recipients at the February 13th HGS Scholarship Night dinner meeting. The Foundation was also fortunate to have a large number of sponsors support HGS scholarship programs. Over \$42,000 in scholarship funding was raised from 21 different sponsors.

Sponsors for 2017 included

Platinum Level

Chevron

Gold Level

ExxonMobil, Shell

Silver Level

Apache, EOG Resources, Noble Energy, Statoil, and SM Energy

Bronze Level

Thunder Exploration, Occidental, EP Energy, TGS, Vitruvian Exploration, W&T Offshore, Marathon Oil Corporation, and Cabot Oil and Gas

Individual Level

Core Lab, Auburn Energy, Dick & Edythe Bishop, Dave Miller, and John Tubb.

Thank you sponsors for your generous support!

Vitae for our scholarship winners are listed below. These students are to be commended for their accomplishments.



Melanie Bowen

Maby Scholarship recipient
Texas A&M University

Melanie Bowen is a senior geology major at Texas A&M University. She is currently A&M's AAPG student chapter secretary, and previously served as social chair.

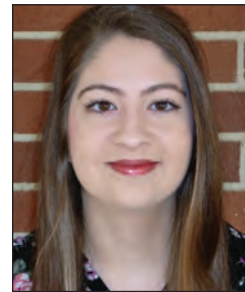
She is a seminar co-chair for the Geology and Geophysics Graduate Student Council, and coordinates weekly lectures for the department. Melanie researches Miocene carbonate variations in reference to paleoproductivity with Dr. Denise Kulhanek, staff scientist at IODP (International Ocean Discovery Program). Additionally, she is a student worker for Dr. Julia Reece who focuses on sediment mechanics. After graduation in December 2017, Melanie plans to get her Ph.D. in sedimentology, and later work in the oil industry as a petroleum geologist in exploration.



Scarlette Hsia

University of Texas

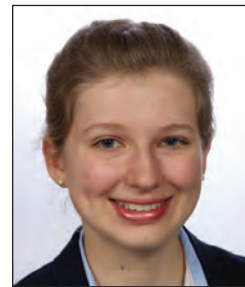
Scarlette is a senior at the University of Texas at Austin studying geological science in the Jackson School of Geosciences. From living abroad in Ecuador, mapping lava flows in Hawaii to conducting independent research with Dr. Charlie Kerans in the Cayman Islands, she is always on the move. She is an undergraduate research assistant for Dr. Jay Banner, leads monthly cave drip sampling trips, and conducts column chemistry between classes. Outside of traditional academic spaces, Scarlette was also Co-Captain and founding member to Longhorn Stream Team, a water quality monitoring organization at UT that canoes to remote locations in Texas. In pursuit of her research interests, Scarlette wants to continue studying carbonate geology and karst geomorphology in graduate school. Eventually she would like to be a sedimentary geologist and manage her own research station. In addition to her dedication to research, she is an avid whitewater paddler, caver, and scuba diver and aims to incorporate her love for adventure into her research interests.



Elizabeth Klovenski

University of Houston

Elizabeth Klovenski is a senior at the University of Houston majoring in Environmental Science with minors in geology and atmospheric science. She is the Secretary for Association of Environmental and Engineering Geologists at UH. She is also the President for the American Meteorological Society Student Chapter at UH. Elizabeth has received EAS department awards such as the 2015 Furbunch Award – Outstanding Student in Field Methods and 2016 EAS Outstanding Student in Environmental Science. She has received scholarships from the NSM College & the EAS department including the Jack L. and Peggy Bay Battle Scholarship. Elizabeth is preparing for a career in environmental geology using remote sensing and combining this interest with atmospheric science. After graduation, she plans on an internship in environmental consulting prior to attending graduate school in the fall of 2017.



Sarah Gerenday

Rice University

Sarah Gerenday is a senior at Rice University. She is currently the webmaster for the Rice Undergraduate Geosciences Society. In summer 2015, Sarah completed a DOE-sponsored internship in the Applied Geoscience and Environmental Management Section of Argonne National Lab, in which she compiled information on geologic cores taken during two decades of site investigations and assisted with groundwater monitoring. At this time, she is working on a senior thesis with Dr. Cin-Ty Lee on the evolution of peridotite xenoliths from the Kaapvaal craton. When not studying rocks, she enjoys reading and making miniature sculptures. Sarah will complete her bachelor's degree in May and is looking forward to graduate school.



Sarah Zagurski

Stephen F. Austin State University

Sarah Zagurski is a junior at Stephen F. Austin State University and is pursuing a degree in Geology and Environmental Science. She is an officer for the Association of Environmental and Engineering Geologist as well as the fundraising director for a nonprofit safe ride program. She is a member of the honors program and has assisted graduate students in a variety of field work and research including cave mapping in the Chihuahuan Desert and various types of soil analysis projects. She has GIS experience and enjoys using her knowledge for geologic analysis. She enjoys hiking and camping in her free time and looks forward to a career where she can combine her hobbies with her knowledge of geoscience. Sarah graduates in the spring of 2018 and hopes to pursue a career in exploration geology after attending graduate school.



Kimberly Moore

Sam Houston State University

Kimberly Moore is a senior at Sam Houston State University with a major in geology and minor in mathematics. She is currently involved in undergraduate research of chert nodules found in carbonates of the Michigan Basin, under the supervision of Dr. Jonathan Sumrall. She will be presenting her poster with preliminary findings at the GSA-South Central meeting in March 2017. She is also presently a lab instructor for Physical Geology laboratories at SHSU, and enjoys tutoring her students. Ms. Moore is the Social Media Chair of the Sam Houston State University chapter of AAPG, and is an active member of the Sam Houston Association of Geology Students. Ms. Moore enjoys spending time with her family and friends. She enjoys camping, hiking local trails with her dogs, reading, and crochet. After graduating in August of 2017, Ms. Moore plans on attending graduate school, and pursuing a career in petroleum geology. ■

John Adamick
HGS Foundation Chairman

HGS Shrimp Peel & Crawfish Boil

April 21, 2017
12:00 noon – 6:00pm

Bear Creek Pioneers Park

3535 War Memorial Street, Houston, TX
77084

Boiled Shrimp - Boiled Crawfish
(Corn & Potatoes)

Beer & Beverage - Live Music

HGS Member pre-order \$30

Non-member pre-order \$35

Walk ups (if available) \$45

Register online at WWW.HGS.org

<https://www.hgs.org/civicrm/event/info?id=1783>

Sponsorship Opportunities

Shrimp Sponsor \$2000.00 - 4 Complimentary event tickets

Crawfish Sponsor \$2000.00 - 4 Complimentary event tickets

Beer & Beverage Sponsor \$1000.00 - 2 Complimentary event tickets

Live Music Sponsor \$1000.00 - 2 Complimentary event tickets

Platinum Corporate Sponsor \$1000.00 – 2 Complimentary tickets

Gold Corporate Sponsor \$750.00

Silver Corporate Sponsor \$500.00

Bronze Corporate Sponsor \$250.00

*To be a Sponsor please call Andrea Peoples at the HGS Office 713-463-9476
or email andrea@hgs.org*



Monday, April 10, 2017

Westchase Hilton • 9999 Westheimer
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: \$45 Preregistered members; \$50 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS General Dinner Meeting

*Andrew R Thomas, Tom Dunn,
Wade Williams, Rosario Scheerhorn,
Julie Rivera and Bill Lawrence
Chevron Energy Technology Company
Houston, TX
Alan Morrison, Hal Riordan
Perth Gorgon Asset Team
Perth, Western Australia*

Man Made Diagenesis and the Law of Unintended Consequences. Geochemical Evaluation Prevents Productivity Loss in Gorgon Field, Offshore Western Australia

Gorgon's eight gas wells contain completions which range in temperature from 144C to 163C (291F to 325F), cover 900 meters of section, and top depths range from 3500 to 4000 m tvdss. Reservoir sands vary in thickness from 5-65 meters. In Gorgon, Triassic Mungaroo Formation sands contain abundant authigenic kaolins as pore fillings and grain replacements. Prior to completion operations, formation integrity was questioned because of expected completion brine losses, high interval temperature, brine chemistry, and multi-year stand time after batch completion. Native kaolin minerals were speculated to

be capable of dissolving and back-precipitating zeolites because initial completion brine pH was designed at 9.8. Zeolite growth can be a porosity-loss process if they precipitate at the expense of higher density parent minerals. This near-wellbore formation damage risk was thought to warrant further investigation.

Laboratory experiments were designed and run at 160C, and SEM analyses were conducted pre and post experiment. Experiments were modelled with Geochem Workbench. All eight flow-through experiments were run with brine made up from

Gorgon supplier materials, and pH was varied from 9.8 to near neutral. Zeolite growth was confirmed in high pH lab tests and shown to be viable in chemical modelling. Measured post-flood permeability ranges from 100% to 72% of initial. Although perm loss was not correlated specifically to observed zeolite growth (analcime produced in only 1 of 8 tests), the lab tests were conducted in only 4 weeks which is 4% of actual Gorgon soak time. Zeolite morphology and chemistry are consistent with analcime, a Na zeolite type.

Lab tests were finished in time to consider results before Gorgon wells were completed. Completion brine pH, viewed as a critical factor in formation reactivity, was changed to a near neutral pH as a result of this testing. Field procedures were modified

HGS General Dinner continued on page 21

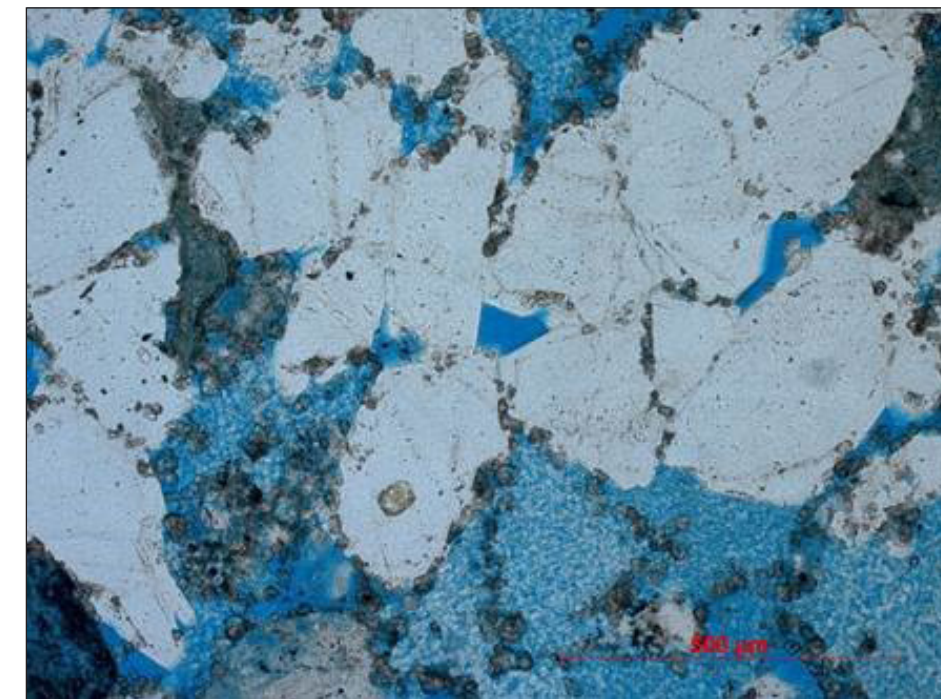


Figure 1: At Gorgon Field, the Triassic Mungaroo Formation was uplifted in the Jurassic, kaolinized, and buried to present day depths and temperatures. In this thin section view, kaolin pore fillings and grain replacements together with quartz and siderite cement constitute the bulk of the natural diagenetic changes.



16th AFR CAN E&P CONFERENCE
31 August - 1 September 2017
Business Design Centre, London

'New Thinking, New Technology, New Hydrocarbons'

CALL FOR PAPERS

Still time to submit your abstract for the 16th African E&P Conference!
Submissions already recieved from BP, Total, Ophir, Kosmos, Cairn & ENI on hotspots such as Senegal/Mauritania, Egypt, West Africa deepwater and the Rovuma Basin.

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Extended abstracts are normally written once your paper is accepted and will be issued on a conference CD. There will be awards given for Best Oral Presenter and Best Poster.

Abstracts (up to 2 pages and can include diagrams) should be sent as soon as possible and no later than 15 March 2017, to Helen Doran at helen.doran@ophir-energy.com

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The 2015 London conference was the largest event to date with 624 delegates in attendance including operators, consultants, governments and academia. There were 34 technical papers presented in a high quality oral programme, 30 poster presentations, complemented by a bustling show floor with 61 exhibitors.

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HGS General Dinner continued from page 19

further to allow the neutral pH fluid in the 7" liner and 7 5/8" tubing during perforation, while the pH 9.8 brine remained above the production packer for corrosion control. Completion perforation operations were conducted successfully, and post-completion flowbacks produced as expected.

In summary, this set of geochemical experiments illustrated a downside risk for the field clearly enough that completion plans were altered. We believe that the integrity of the gas-producing formation and the revenue stream was maintained through thoughtful characterization and geochemical planning, execution, and knowledge sharing. ■

Biographical Sketch

Andy has a BS in Geology from the University of Georgia (1979) and an MS in Geology from Indiana University (1981). Andy has worked in and run several geologic analytical facilities for Texaco and Chevron in both New Orleans and Houston. Additionally, Andy has conducted rock-centered investigations that have changed exploration, appraisal, and development strategy in Africa, Australia, Northern Atlantic Margin, Southern Asia, and South America. Andy has received several awards from the AAPG for presentation excellence and has also been the President of the Clay Minerals Society in 2009. He currently works in Chevron's Strategic Research Unit in Houston.

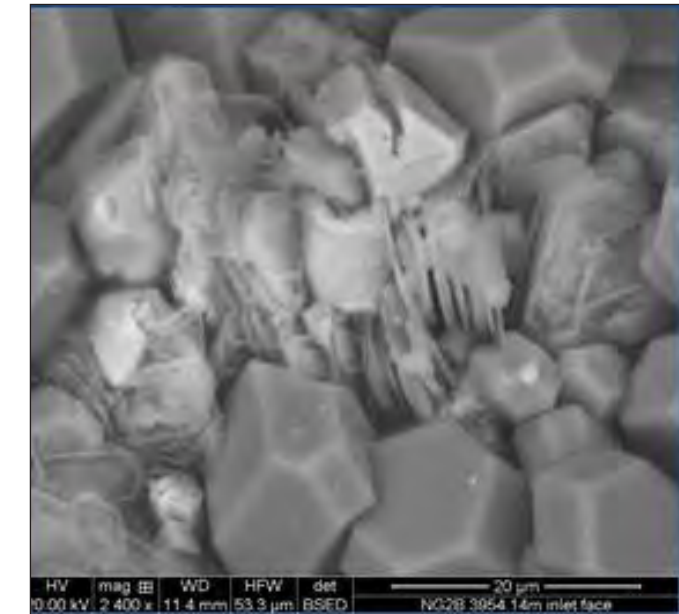


Figure 2: SEM examination after lab bench tests of simulated-completion reveals that the original completion fluid design causes mineral change in Gorgon. Kaolins dissolved and zeolites precipitated. These man-made diagenetic phases are not viewed as healthy for reservoir producibility or stability, so fluids were redesigned to become docile at high temperatures. The new modified design was deployed at Gorgon.

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Tom Sporn

Monday, April 17, 2017

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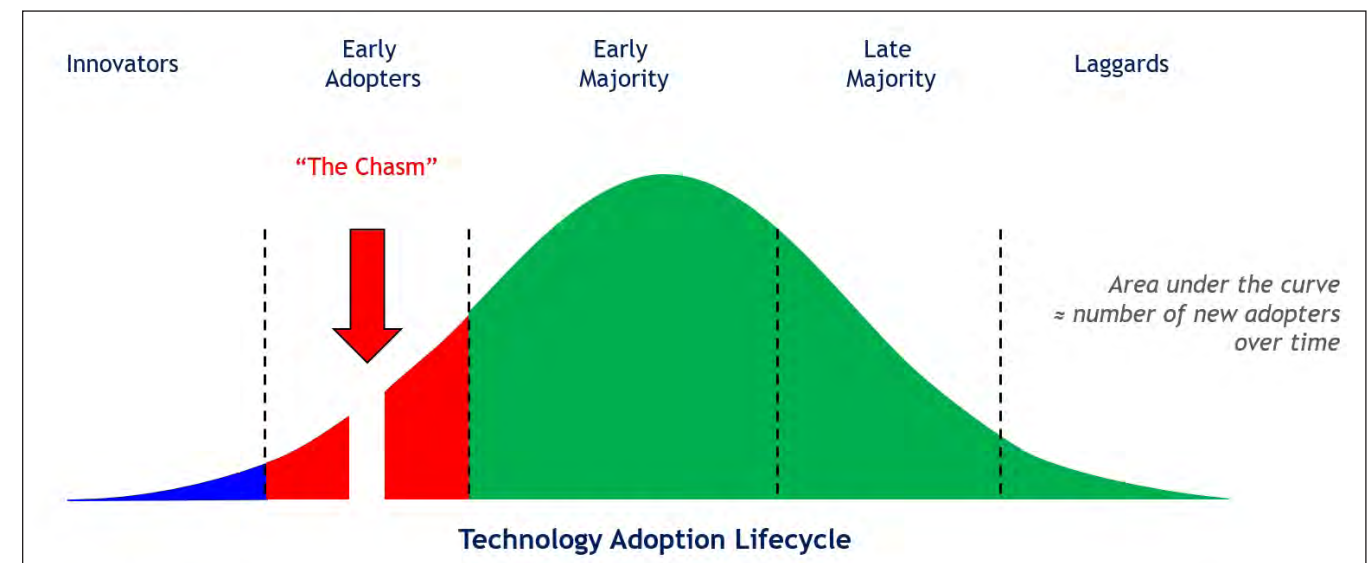
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HGS International
Dinner Meeting

Andrew C. Silver
Chief Geologist & Data Scientist
Adret LLC

Analytics: Understanding the Hype and Predictive-Modeling Basics



Many have heard of analytics (a.k.a. “data science”) yet have not had a proper introduction to the basic terminology and capabilities of data science. Terms such as “Analytics,” “Business Intelligence,” “Big Data,” “Machine Learning,” “Neural Networks,” and “Deep Learning” are being used with increasing frequency across many industries and academic disciplines. Furthermore, these buzzwords are often used to hype services, sometimes with inconsistent usage, creating feelings of uncertainty and distrust among decision-makers delaying the implementation of this beneficial technology.

It is not uncommon for a chasm of doubt to inhibit individuals and organizations from adopting new technologies in the early phases of deployment. This is a well-documented part of the *technology-adoption lifecycle*. Unfortunately, this delay works counter to the imperative for businesses to be early adopters of useful technologies in order to remain relevant and gain an advantage over the competition. In academia, there is an imperative to implement the most useful tools available to improve our collective understanding of nature. In both realms,

the remaining barriers to the implementation of data science may be best overcome with a proper introduction to its capabilities. This talk provides some guidance to those interested in beginning a journey into analytics, helping them bridge and cross the chasm between their uncertainty and benefitting from data science.

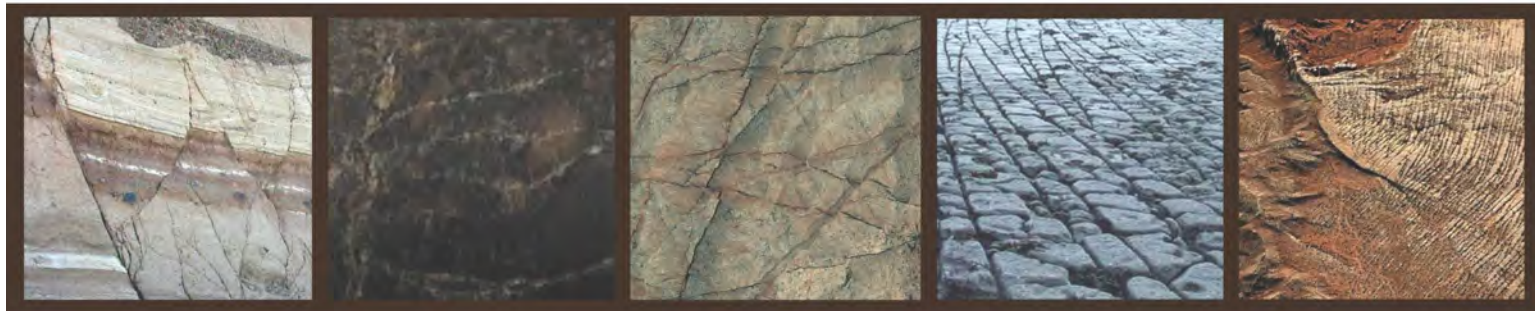
Many elements of data science (e.g., multivariate linear regression) have existed for the better part of a century. However, technological advances of the last decade coupled with new statistical tools have improved their implementation and enabled their application to much larger datasets. Analytics currently is a core component of what is being termed “the fourth industrial revolution” by accelerating research insights and integrating machine learning into other technological advances. The imperative to integrate analytics will likely increase over time.

The journey of developing predictive analytics has multiple segments including data collection, visualization, and modeling. Each of these segments have industries dedicated to them, and

HGS International Dinner continued on page 25



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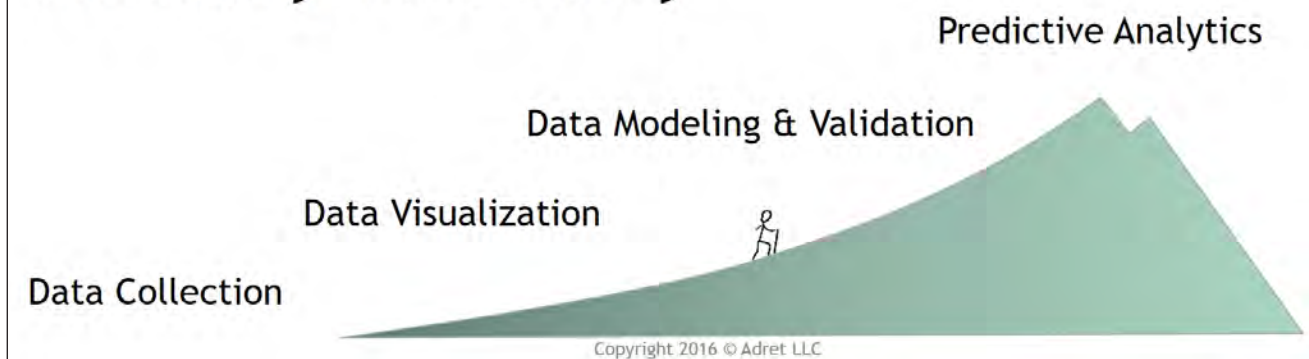


For more information please visit: www.hgs.org or contact Andrea Peoples: andrea@hgs.org

HGS International Dinner

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The Analytics Journey



there are many software options in each segment. Interested parties are often faced with choosing between expensive software/consulting services with lower competency hurdles or free, public-domain software which have very high competency hurdles. Organizational objectives might require parametric modeling, non-parametric modeling, or a mix of the two. In each scenario, it is important to understand some basics about data science to choose a proper approach and properly interpret the resulting insights.

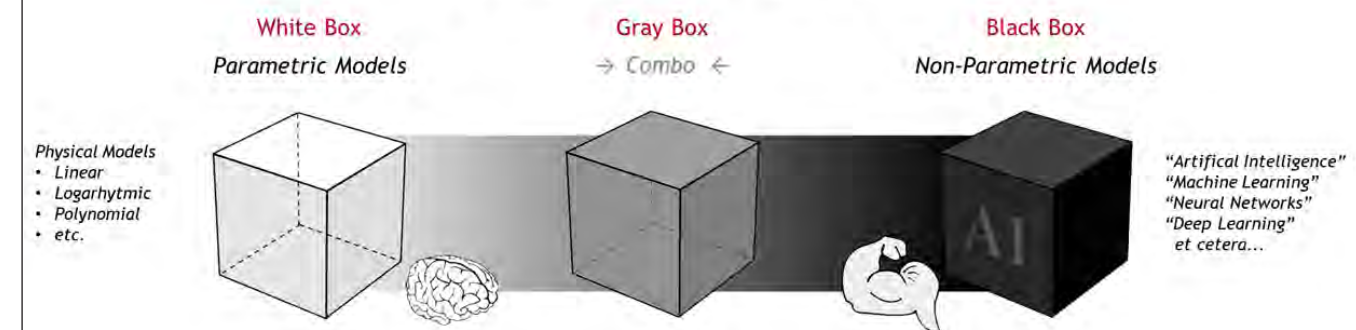
Big Data is a highly-publicized target of analytics applications, but is not a prerequisite. Analytics is equally relevant to smaller, business-critical projects. *Any multivariate problem* is a candidate for benefiting from data science. ■

Biographical Sketch

ANDREW SILVER is the founder of Adret LLC where he provides geoscience and data science consulting services targeted at onshore US basins. Andrew is also currently in the MS Analytics program at Texas A&M University (a part-time program for working professionals) and already holds a MS Earth Science (Rice University, 2008), a BS Geology (BYU, 2002), and a BS Food Science (think *thermal maturity*; BYU, 2002). He has previously worked at Southwestern Energy, SM Energy, Paloma Resources, and W.D. Von Gonten & Co. in a variety of exploration, development, and consulting roles.



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HGS North American Dinner Meeting

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Dinner 6:30–7:30 p.m.

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Art Saller

Cobalt International Energy
Houston, TX

Delaware Basin Carbonates: Shelf to Basin, Outcrop to Subsurface

Deposition of Permian strata in the Delaware Basin was dominated by “reciprocal sedimentation” with carbonate sediments accumulating on the shelf during periods of high sea level, and siliciclastic sand and mud deposited in the basin during low sea level (Figures 1, 2); though it is a little more complicated than that. Mineralogically, the shelf and slope were dominated by limestone during the Wolfcampian, and dolomite during much of the Leonardian and part of the Guadalupian. Most carbonate in the basin was generated on the shelf during high sea level

(transgressive and highstand systems tracts). Carbonate sands (packstones and grainstones) and megabreccias were deposited at the toe of slope several miles basinward of the contemporaneous shelf margin. Carbonate mud from the shelf was carried down the slope and out into the basin during episodic gravity flows. Mud was also deposited on the upper slope at times, allowing stratigraphic traps to form in porous, toe-of-slope packstones, grainstones and megabreccias.

HGS North American Dinner continued on page 29

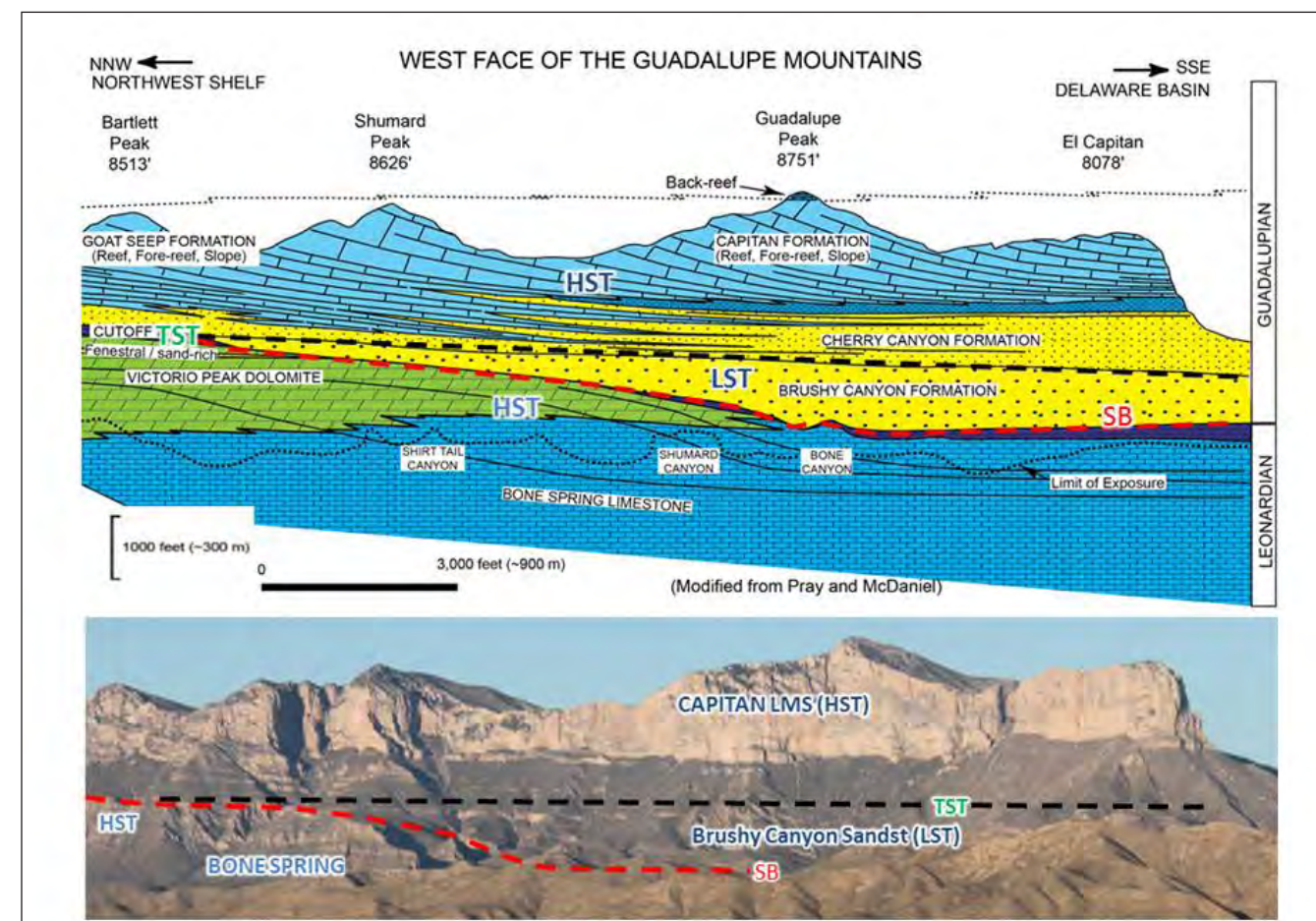
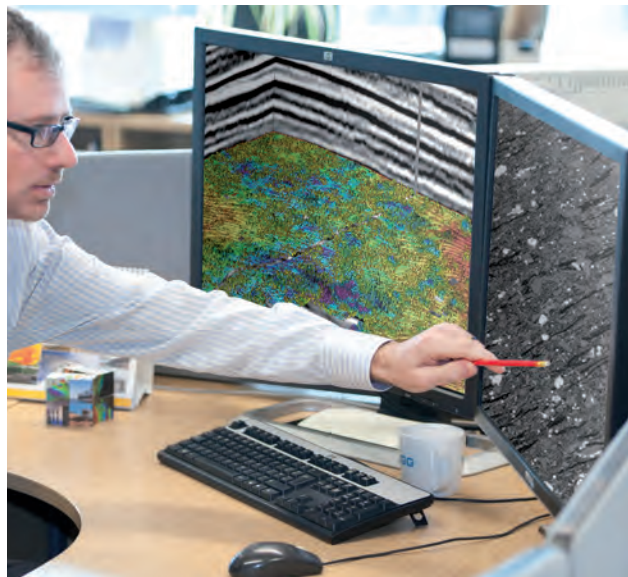


Figure 1. Outcrop photo and cross section of the Permian shelf to basin on the West Face of the Guadalupe Mountains.

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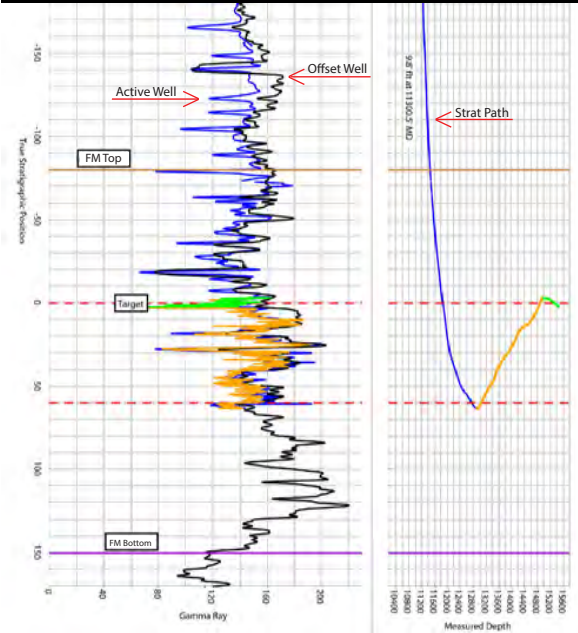
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HGS North American Dinner continued from page 27

Basinal deposition varied with time and distance from the shelf. Sandstones and siltstones are common in the basin in the Leonardian and Guadalupian (**Figures 1, 2**), whereas the Wolfcampian is clay-rich with less sand. During the Leonardian and Guadalupian, very-fine sand blew across the shelf in dunes that migrated southward until they were blown into the Delaware Basin. Sands were deposited in deepwater channel complexes and fans. Silt and clay were transported as air-borne dust that fell into the basin forming siltstones and shales. Biogenic silica and clay increase toward the middle of the basin. Organic-material was concentrated in basinal siliceous mudstones that were deposited slowly in the anoxic basin. Planktonic radiolaria and siliceous sponges contributed metastable silica that dissolved and reprecipitated locally forming thin, discontinuous relatively brittle silt-rich mudstones.

High-quality conventional reservoirs occur at the toe-of-slope where dolomitized peloid-bioclact packstone-grainstones and megabreccias accumulated (**Figure 2**). Unconventional reservoirs occur in low-permeability sandstones and organic-rich, siliceous mudstones in the basin (**Figure 2**). Mudstones vary from relatively pure limestone to silty, argillaceous and/or cherty. Lime mud-rich intervals are commonly organic-poor and poor reservoirs,

but organic-rich siliceous muds tend to be good unconventional reservoirs. ■

Biographical Sketch

ART SALLER is a sedimentologist and stratigrapher for Cobalt International Energy in Houston, Texas. He received geology degrees from the University of Kansas (BS, 1978), Stanford University (MS, 1980), and Louisiana State University (PhD, 1984). From 1984 to 1986, he was employed at Cities Service Oil and Gas in Tulsa, Oklahoma. Art joined Unocal in 1986 and worked with Unocal and then Chevron until 2012 when he joined Cobalt. Art has been part of exploration and development teams working in the Permian Basin of west Texas, Alberta Basin of Canada, Indonesia, Brunei, Angola, and China. In 2007, he was part of a team that received Chevron's Chairman's Award for oil discoveries in offshore Angola. Art has published articles, taught courses and led field trips related to carbonate deposition, diagenesis and stratigraphy since 1984. He was an AAPG Distinguished Lecturer in 2012-2013.

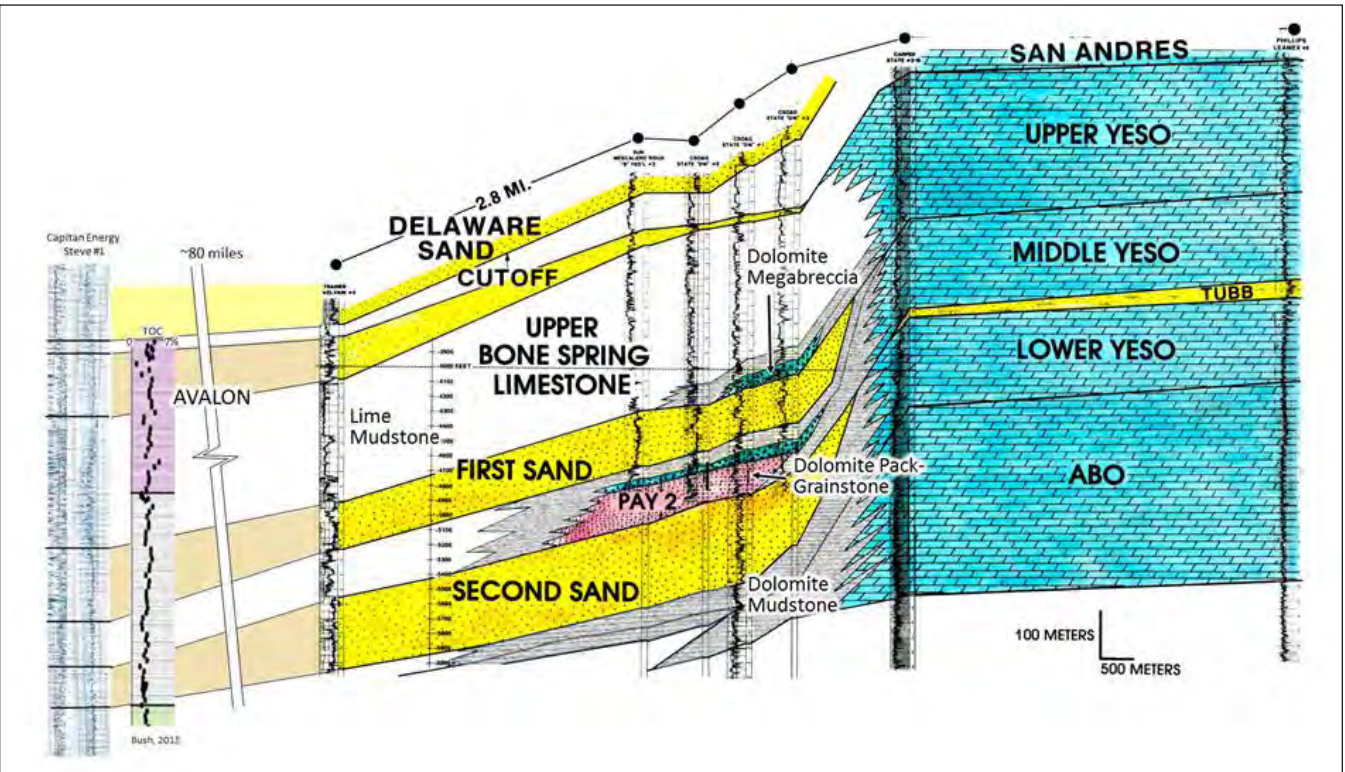


Figure 2. Well log cross section from the northern margin of the Delaware Basin to the center.

Wednesday, April 26, 2017

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Social 11:15 a.m., Luncheon 11:30 a.m.

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Rare Earth Element Geochemistry of Shallow Carbonate Outcropping Strata in Saudi Arabia: Application for Depositional Environments Prediction

The interpretation of depositional environments provides important information to understand facies distribution and geometry. The classical approach to interpret depositional environments principally relies on the analysis of lithofacies, biofacies and stratigraphic data, among others. An alternative method, based on geochemical data (chemical element data), is

advantageous because it can simply, reproducibly and efficiently interpret and refine the interpretation of the depositional environment of carbonate strata.

Here we geochemically analyze and statistically model carbonate samples (n = 156) from seven sections of the

Arab-D reservoir outcrop analog of central Saudi Arabia, to determine whether the elemental signatures (major, trace and rare earth elements [REEs]) can be effectively used to predict depositional environments. We find that lithofacies associations of the studied outcrop (peritidal to open marine depositional environments) possess altered REE signatures, and that this trend increases stratigraphically from bottom-to-top, which corresponds to an upward shallowing of depositional environments. The relationship between REEs and major, minor and trace elements indicates that contamination by detrital materials is the principal source of REEs, whereas redox condition, marine and diagenetic processes have minimal impact on the relative distribution of REEs in the lithofacies. In a statistical model (factor analysis and logistic regression), REEs, major and trace elements cluster together and serve as markers to differentiate between peritidal and open marine facies and to differentiate between intertidal and subtidal lithofacies within the peritidal facies. The results indicate that statistical modelling of the elemental composition of carbonate strata can be used as a quantitative method to predict depositional environments and regional paleogeography. The significance of this study lies in offering new assessments of the relationships between

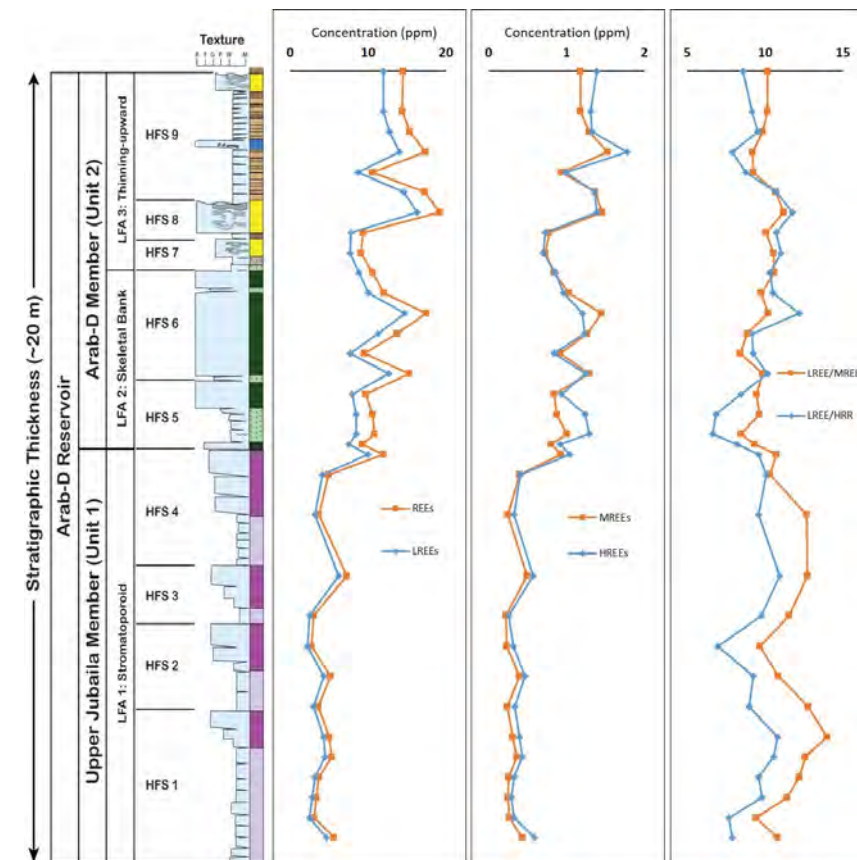


Figure 1. Section 1 and the corresponding outcrop photographs showing textures, lithofacies, lithofacies association, lithofacies units, depositional cycles and geochemical logs of outcropping strata equivalent to the Arab-D outcropping reservoir analog at Wadi Nisah (modified from Myer et al. 1996). Note the stratigraphic variation in REE, LREE, MREE, HREE concentration and their calculated ratio (LREE/MREE and LREE/HREE) of Arab-D outcropping reservoir analog at Wadi Nisah.

HGS General Luncheon Meeting

Hassan Eltom

Kansas Interdisciplinary Carbonate Consortium
University of Kansas, Department of Geology
Lawrence, Kansas

lithofacies and geochemical elements by using advanced statistical analysis, a method that could be used elsewhere to interpret depositional environment and refine facies models. ■

Biographical Sketch

HASSAN ELTOM graduated from Khartoum University (Sudan) in 2001 with BSc degrees in Geology and Chemistry. He earned MSc and PhD degrees in Geology from King Fahd University of Petroleum and Minerals (KFUPM) in Dhahran, Saudi Arabia. His PhD is about an outcrop analog of the Arab-D reservoir in Saudi



Arabia. Hassan has a total of 12 years of experience integrating field, lab, and modeling techniques to better understand past paleoenvironments and paleoceanography through study of ancient carbonate strata. Hassan experience includes four years with Schlumberger overseas as a Borehole Geologist and four years with KFUPM as a researcher. Currently, Hassan is working with Kansas Carbonate Interdisciplinary Carbonate Consortium (KICC) as a researcher, a post he holds since 2014. Hassan has been involved in and led research activities including the investigations of Paleozoic and Cenozoic carbonates of Saudi Arabia, Sudan, and Kansas. His research interests include carbonate sedimentology, stratigraphy and geochemistry and the characterization and modeling of reservoirs based on outcrop analog and 3-D geostatistical modeling.

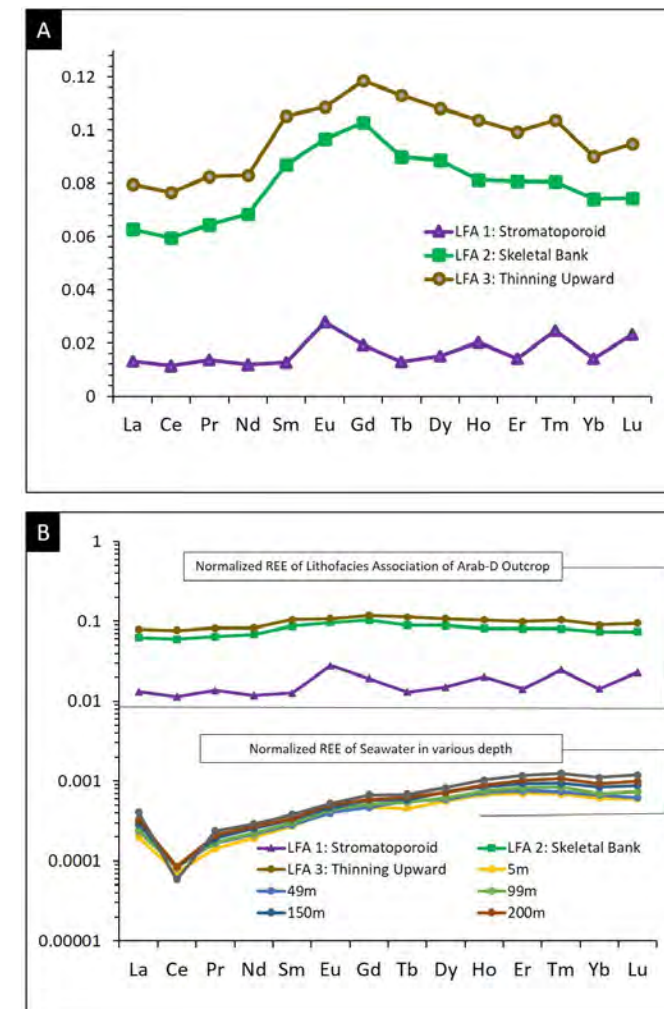


Figure 2. (A) PAAS-normalized REE patterns for lithofacies (LFA) from Arab-D outcrop analog (B) compared to PAAS-normalized REE patterns of seawater from different water depths (5 to 299 m) (Alibo and Nozaki, 1999). Note that LFAs have a similar pattern but do not have seawater-like patterns.

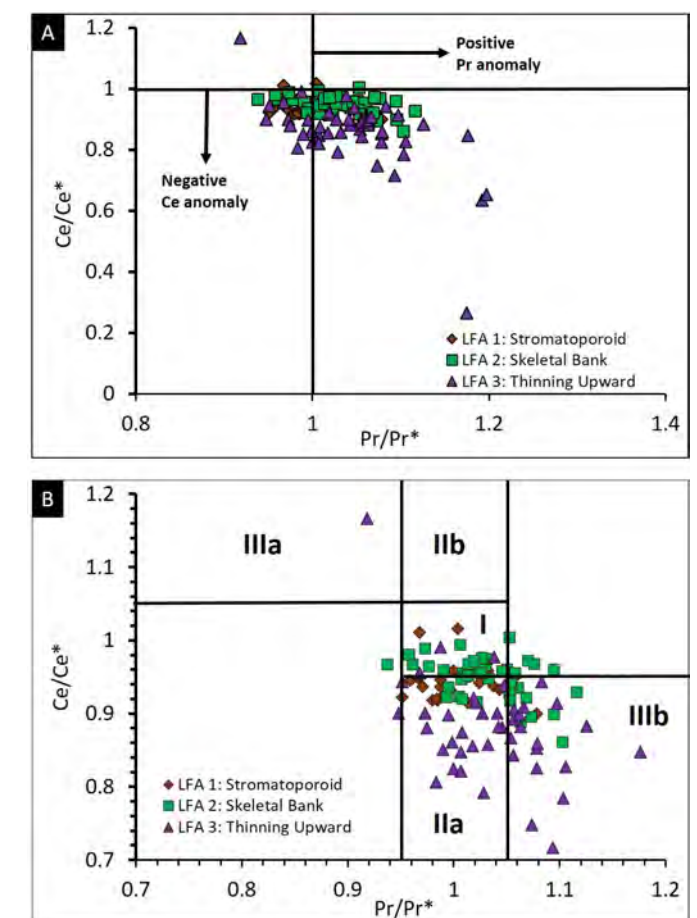


Figure 3. Cross plot showing the relationship between Ce/Ce^* and Pr/Pr^* for 121 samples from Arab D outcrop analog at Wadi Nisah using the method by Bau and Dulski (1996). (A) "Field I: neither CeN nor LaN anomaly; field IIa: positive LaN anomaly, no CeN anomaly; field IIb: negative LaN anomaly, no CeN anomaly; field IIIa: positive CeN anomaly; field IIIb: negative CeN anomaly." Note that except for three points, our data clustered in both fields IIa and IIIb, indicating that the Ce/Ce^* ratio resulting from the true anomalous Ce (IIa) mixed with the negative Ce/Ce^* ratio resulted from the positive La anomaly. (B) Data are clustered away from the classical clustering region of modern seawater.

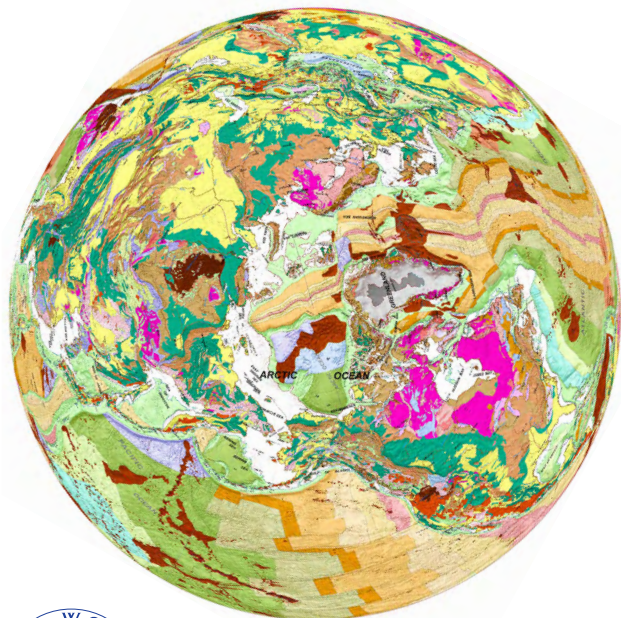
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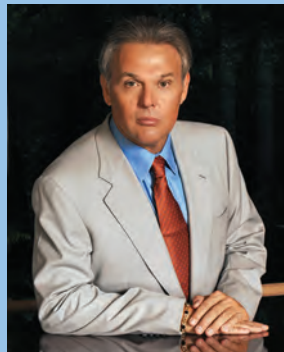
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Delaware Basin Thoughts

By Phillip Dunning, Technical Advisor and Mark Nibbelink, CoFounder and Director of University Outreach, Drillinginfo

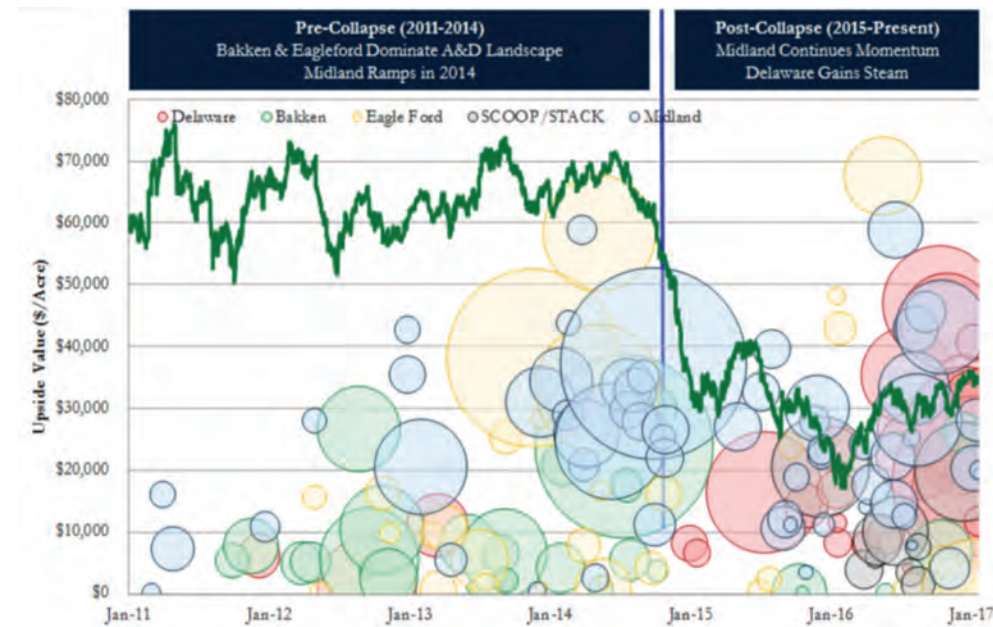


Figure 1. Interest in Delaware Basin spikes.

As CAPEX and development/acquisition dollars continue to pour into the Permian Basin, it's easy to assume that all multi-bench reservoirs perform equally and that margins, no matter what reservoir is drilled, will be consistently good.

Moreover, folks that follow the business prospects of operators ramping up their positions in the Permian sometimes fail to take note of the fact that Permian is actually two basins—the Delaware and the Midland.

Given the shift in interest and valuations from the Midland to the Delaware, let's take look at the Delaware from the perspective of deconstructing reservoir performance to individual stratigraphic benches.

What Does this Shift in Interest Look Like?

Part of the shift may be driven by somewhat lower drilling costs in the Delaware (\$25/ft< Midland Basin); however, completions costs per foot are higher in the Delaware by about the same amount. Current normalized completion operations in the Delaware perforate about 4200'-7500' of section, whereas Midland basin perforated

intervals range from about 7000'-9800', so even though the completion costs are higher in the Delaware, total well costs look to be lower.

As in other resource plays, the operators in the Delaware have continually improved their operations to the point where Peak Rate volumes have improved 46% from 2014 levels, to the point where Delaware Basin 2016 Peak Rates were nearly 30% better than 2016 Peak Rates in the Midland basin. This is obviously going to drive better front end returns and reduce time to payout, thereby bolstering cash flow and earnings while defending bank loan covenants.

Delaware Basin Thoughts continued on page 36

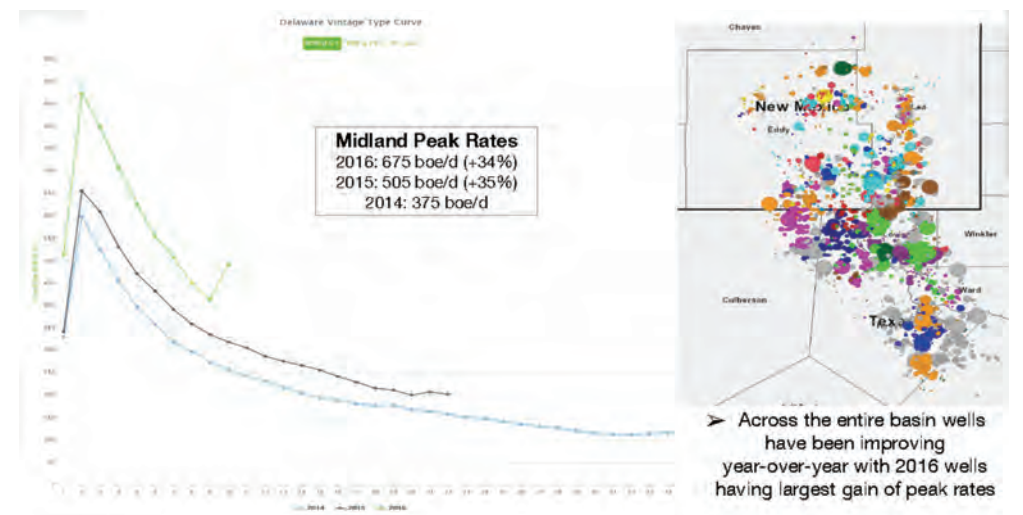


Figure 2. Comparative-drilling costs: Delaware vs other basins.

Delaware Basin Thoughts *continued from page 35*

Moreover, whereas about 30% of Midland basin wells in Bone Springs, Wolfcamp, and Spraberry reservoirs are breakeven at \$44 oil and \$3 gas, just over 70% of wells in the Delaware basin producing from these reservoirs are breakeven at these prices—or at even lower levels.

It’s very important when characterizing the economics of a play—especially the Permian—to understand the variability in yield by reservoir within a formation. For example, if you were looking at EOG’s Yates Petroleum acquisition and happened to focus on the returns from the Bone Springs 2nd carbonate, you would unfairly discount other Bone Springs bench recoveries by large amounts.

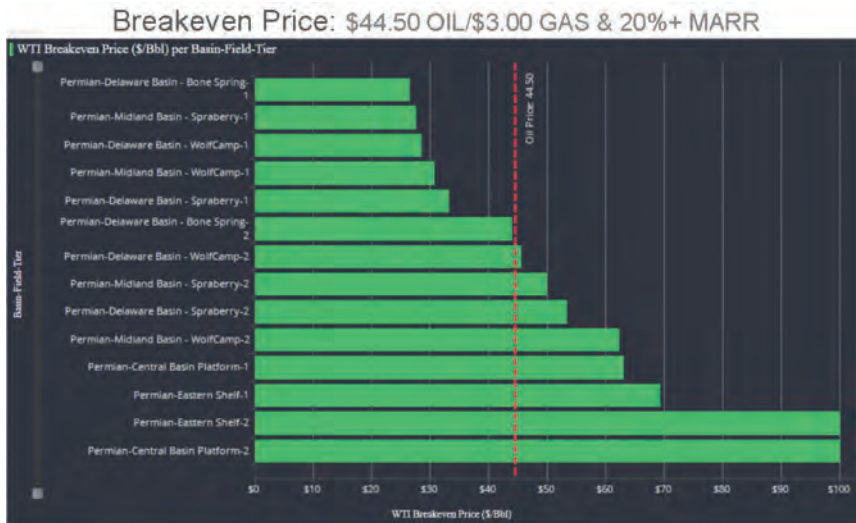


Figure 3. Delaware year-over-year productivity improvements.

EOG/Yates Delaware Basin AOI

Formation	Oil P50 (BBL)	Gas P50 (MCF)	MBOE (BBL)	Estimated Well Cost	Estimated 3 Yr Revenue
Avalon	121,000	1,335,000	343,000	4,536,000	1,143,375
Bone Springs 1 st Carbonate	122,000	922,000	275,000	4,257,000	673,650
Bone Springs 1 st Sand	114,000	472,000	192,000	4,108,800	(231,300)
Bone Springs 2 nd Carbonate	69,000	510,000	154,000	4,200,000	(1,432,500)
Bone Springs 2 nd Sand	161,000	620,000	264,000	4,596,000	792,750
Bone Springs 3 rd Carbonate	152,000	400,000	218,000	4,392,000	348,000
Bone Springs 3 rd Sand	159,000	301,000	209,000	4,368,000	370,125
Wolfcamp A	166,000	514,000	251,000	4,776,000	545,250
Wolfcamp B	197,000	2,110,000	548,000	4,542,000	4,585,500

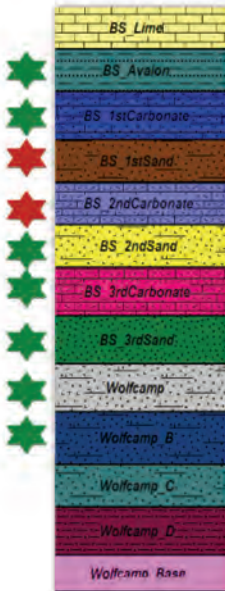


Figure 4. Break-even performance by basin/reservoir.

As we know, most reservoir information as filed by operators with the Texas Railroad Commission usually only contains a formation top and does not break down formations by reservoir, as shown in this snapshot from a completion form:

Formation Record	
Formation	Depth
DELAWARE	
MORROW	
DEVONIAN	
WOLFCAMP	
RED BLUFF	
FUSSELMAN	
STRAWN	
ATOKA	
PENNSYLVANIAN	
ELLENBURGER	
BELL CANYON	4587
CHERRY CANYON	5528
BRUSHY CANYON	7049
BONE SPRINGS	9613

Given that the kickoff point was below the top of the Bone Springs it’s impossible to know which bench/member of the Bone Springs the well was landed in.

So to assume that the IP on this well (2488 BOPD, 4034 MCFD, 2545 BWPD) is a good proxy for ANY Bone Springs reservoir would be a very dangerous assumption.

The stacked pays in the Delaware are the gifts that can keep on giving—but make sure you correctly tie the production to the correct reservoir within the formation. ■



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HGS Scholarship Night

By Linda Sternbach

HGS President John Jordan hosted the Scholarship Night event February 13 at the Westchase Hilton Hotel. Over one hundred people attended the dinner featuring podium awards from HGS President-Elect John Adamick (also Undergraduate Scholarship chair) and Calvert Graduate Fund Chair Jeff Lund.

AAPG President Paul Britt and AAPG President-Elect Charles Sternbach attended with AAPG Executive Director David Curtiss. Paul Britt delivered a talk on AAPG Student programs. Amy Atwater and Eileah Simms gave short talks on their HGS-supported internships at Big Bend National Park in southwest Texas. Thanks to corporate sponsor Chevron, ExxonMobil, Apache, EOG, Noble, SM Energy, Statoil, TGS, OXY W&T offshore, Marathon, Vitruvian, Thunder Exploration, EP Energy, Cabot Energy, CoreLab, Auburn, Richard Bishop, Dave Miller, and John Tubb Jr. Wayne Xu of Schlumberger took photos of the event. ■

Undergraduate Scholarship Winners

- Melanie Bowen - Texas A&M
- Kimberly Moore - Sam Houston State
- Scarlette Hsia - UT
- Sarah Gerenday - Rice
- Elizabeth Klovenski - UH
- Sarah Zagurski - Stephen F Austin
- Jared Hanson - Baylor

Calvert Fund Graduate Student Awardees

- Mariah Michie - UH
- Eric Peavy - TX A&M
- Jordan Coe - Texas Tech
- John Cornthwaite - Rice
- Andrea Nolting - UT
- Lacey Pyle - Rice
- Josh Field - U Missouri
- Megan Browan - U Colorado
- Shawn Lopez - CO school of Mines



Undergraduate Scholarship winners with Evelyn Medvin and John Adamick



Calvert Graduate Student Scholarship winners with Jeff Lund



Amy Atwater poster



Eileah Simms poster



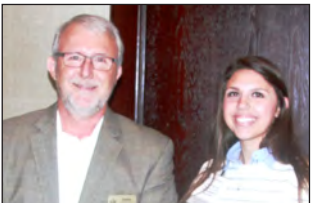
Melanie Bowen



Scarlette Hsia



Sarah Gerenday



Sarah Zagurski



Kimberly Moore



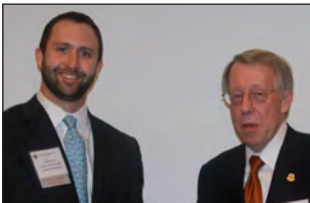
Elizabeth Klovenski



Eric Peavy



Jared Hanson



Jordan Coe



Mariah Michie



John Adamick Undergrad fund



John Jordan HGS President



Paul Britt AAPG President



Sameer Baral, John Adamick and Janet Combes



HGS Welcomes New Members

New Members Effective February 2017

ACTIVE MEMBERS

- Rachael Czechowskyi
- Holly Goggin
- F. Calvin Jones
- Alex Miller
- Simon Payne
- Linda Welzenbach

ASSOCIATE MEMBERS

- Zhenjia (Carly) Gao
- Casey Johnson
- Terrie Pickul

STUDENT MEMBERS

- Gladys Arteaga
- Allison Barbato
- Aimee Goodell
- Yue Hou
- Pankaj Khanna
- Johnathan Torres
- Jessica Waggoner

Welcome New Members

HGS Grand Canyon Field Trip



You are invited to join us as the HGS will once again be offering its Grand Canyon field trip in Summer 2018. This very special “Journey Through Time” will weave the impressive geologic story of the Canyon (with other natural sciences on display), the human history, plus the thrills of running many exciting rapids of the Colorado River.

We will float the River on motorized rafts, providing us the opportunity to see and discuss all the classic geology so beautifully portrayed – from some of the earliest Precambrian sediments found in the US, all the way up to modern processes which continue to shape the canyon. Geological concepts are introduced and magnificently illustrated in the Canyon in such a way that the geology comes alive for everyone. In addition to running rapids, we will take a number of short hikes in some of the many side creeks, eat like royalty, and sleep under the stars. Your river guides and gear are supplied by Hatch River Expeditions (Hatch), one of the most experienced outfitters serving the Grand Canyon. Past participants have stated this was the best geologic trip they ever took and many have brought one or more of their family along to share this incredible experience with them.

While this is not an overly strenuous trip, participants must be in good enough physical condition to climb in and out of the rafts. We will enjoy some hiking each day, the longest being six miles, and several hikes require some scrambling. While any of the hikes will be at your pleasure, I encourage you to take as many as you are comfortable doing to fully experience this extraordinary trip.

The trip begins in Las Vegas on June 3, 2018. We provide transportation from there to Marble Canyon by way of Zion National Park for an opportunity to view the geology. Also included are the first night in Cliff Dwellers Lodge, food and drink for our 8 days/7 nights on the river, a helicopter ride to Bar 10 Ranch the last day, and the flight from there back to Las Vegas. Costs not covered include round-trip airfare to Las Vegas, first night’s dinner and breakfast in Marble Canyon, tips for our river guides, souvenirs purchased at Phantom Ranch or Bar 10 Ranch, and anything you might spend in Vegas should you decide to extend on either end. Optionally, you may join us in Marble Canyon and Hatch will arrange a return flight to there at the end.

Reserve your spot now on the HGS website with a \$500 deposit; the balance due is by December 15, 2017. *Please read the HGS’s refund policy before booking your trip.* ■

Dates: June 3 – 11, 2018

Cost: \$3600 / person

Reserve your spot now

on the HGS website

with a \$500 deposit;

the balance due is by

December 15, 2017.

Government Update

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

If you’d like the most up-to-date Texas rules, regulations, and governmental meeting information we direct you to the HGS website to review The Wise Report. This report, which comes out as needed but not more often than once a week, offers the most up-to-date information that may be of interest to Texas geologists.



The Texas Legislature is now in session. To see which bills are of interest to Texas Geologists, go to the Wise Report: https://www.hgs.org/multimedia_WiseReport

New TCEQ Guidance Document for Risk-based Corrective Action for LPST Sites (RG-523/PST-03)

The TCEQ Remediation Division issued revised guidance for Risk-based Corrective Action for LPST Sites. The guidance document formerly known as RG-36, Risk-based Corrective Action for Leaking Storage Tank Sites has been renamed and is now known as RG-523/PST-03 *Risk-based Corrective Action for LPST Sites*. The revised guidance also incorporates components of the 1995 RG-175 “Guidance for Risk-Based Assessments at LPST Sites in Texas. Emphasizing Initial Investigations and Plan A Evaluation” and the following interoffice memoranda:

- “Chapter 334 Closure Criteria for Domestic Irrigation Wells,” September 6, 2006.
- “Process for Expedited Closure for Evaluation of Priority 4.1 Petroleum Hydrocarbon LPST Sites,” July 17, 2003.
- “Guidance for Leaking Petroleum Storage Tank (LPST) Sites Located on State Designated Major/Minor Aquifers or Local Water Supply,” November 1, 1999.
- “Adjustment to March 6, 1997 Protective Concentrations in Groundwater for Construction Worker Exposure to Account for Time-Averaged Exposure,” August 12, 1997.
- “Clarifications and Amendments for Implementation of RG-36,” March 6, 1997.
- “Guidance for Judging the Adequacy of Contaminant Delineation for Purposes of Determining if Further Corrective Action is Needed,” February 10, 1997.
- “Process for Evaluating Petroleum Hydrocarbon LPST Sites Exceeding Target Concentrations,” February 10, 1997.

The guidance document is available on the TCEQ webpage: <https://www.tceq.texas.gov/publications/rg/rg-523-pst-03>

EPA Proposes New Regulations for Uranium/Thorium In-situ Recovery Activities

On January 3, 2017 former U.S. Environmental Protection Agency Administrator Gina McCarthy signed a proposed revision to 40 CFR Part 192 that would regulate byproduct materials produced by in-situ recovery activities—with a primary focus on groundwater protection and restoration for uranium deposits.

The proposed rule would set post-restoration groundwater standards for 12 constituents and add monitoring requirements.

The EPA first proposed new groundwater protection standards for in-situ recovery facilities in January 2015. After reviewing public comments and new information, EPA decided to re-propose the rule and solicit additional public comment rather than finalize the rule. The proposed rule was published in the Federal Register on January 19, 2017 with a 180-day comment period that will end July 18, 2017. You can view and comment on the proposed rule at: <https://www.federalregister.gov/documents/2017/01/19/2017-00573/health-and-environmental-protection-standards-for-uranium-and-thorium-mill-tailings>

AGI Geoscience Policy Monthly Review (December 2016)

House Natural Resources Subcommittee Holds USGS Oversight Investigation Hearing

The House Natural Resources Subcommittee on Oversight and Investigations held a hearing on December 6, 2016, to investigate instances of data manipulation at the U.S. Geological Survey (USGS). The manipulation in question occurred between 1996 and 2014 within the USGS’s Energy Resources Program (ERP) Geochemistry Laboratory in Lakewood, CO. According to the USGS, an employee that was not properly trained incorrectly adjusted data for calibration from a mass spectrometer, an instrument which measures chemical composition.

During the hearing, Subcommittee Chairman, Rep. Louie Gohmert (R-TX), questioned USGS Deputy Director William Werkheiser about the incident. The hearing also addressed allegations made in a report by the Department of the Interior Office of the Inspector General of a hostile work environment at the USGS ERP Geochemistry Lab. The USGS is currently investigating the extent of the effects created by the data in question, and has notified end users of its manipulation. The estimated cost of all projects that utilized the false data is \$108 million.

To resolve these issues and prevent similar incidents in the future, the USGS has asked the National Academy of Sciences to review all USGS laboratory quality control procedures and will establish

Government Update continued on page 43

Drones and UAVs: Solving Problems, Finding Resources

23-24 May 2017 | Houston, TX



Learn how to identify and describe the ways drones and UAVs use new sensors and analytics that may help optimize the exploration and production of oil and gas, and to reduce costs and find innovative cost-saving solutions for problems. The workshop will consist of 45-minute presentations by experts on case studies, technical solutions, and emerging new practices.

Presentations focus on using UAVs and drones in the following ways:

- Using new sensors & sensor combinations for a number of purposes
- Detecting fugitive methane
- Using hyperspectral for inspecting tank farms and facilities
- Identifying volumes / monitoring surface water
- 3D images, simulation, planning using drone-derived hyperspectral and multispectral data
- Data analytics / interpretation for data visualization
- Planning drone / UAV missions
- Other possibilities...

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General discussions for this forum will include:

- Roles in the unconventional development of the Anadarko Basin
- How to raise and make money during a long period of stressed commodity prices
- Keys to extending mature resource plays and exploring new unconventional opportunities
- How to make efficient use of all that data.

Specific topics are as follows:

- STACK Development
- Southwest Stack Deep Gas
- Northwest Stack Play
- SCOOP Development
- Merge Exploration
- Springer Shale Exploration
- The Penn Sand Resource Play
- How to make efficient use of data

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Global Deepwater Siliciclastic Reservoirs
 29 April 2017 | Houston, Texas
 In Conjunction with OTC 2017

Seismic Interpretation in Deep Water Basins
 29 April 2017 | Houston, Texas
 In Conjunction with OTC 2017

Online Opportunities with CEUs:

Introduction to Shale Gas

Geothermal Energy Basics: A Renewable Energy Certificate Course

Leadership and Strategic Thinking in the Oil & Gas Industry

A-1 and A-2 Carbonates

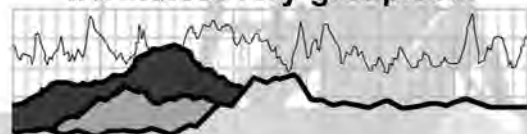
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Risk Analysis, Prospect Evaluation and Exploration Economics

April 24 – 28, 2017

September 25 – 29, 2017

Evaluating Tight Oil and Gas Reservoirs

May 9 – 11, 2017

October 3 – 5, 2017

Bias, Blindness and Illusion in E&P Decision Making

May 22 – 23, 2017

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Government Update continued from page 41

a USGS committee to assess USGS lab conditions. USGS is also initiating an energy program quality management system, and hiring a permanent Quality Management System Manager and two Quality Management System Specialists to maintain lab upkeep procedures.

Congressional Briefing Held on Outcomes of Marrakech Climate Summit

The Environmental and Energy Study Institute (EESI) held a briefing on outcomes from the 22nd Session of the Conference of the Parties to the UN Framework Convention on Climate Change (COP 22) in Marrakech, Morocco, which took place November 7-18, 2016. Christo Artusio, Director of the Office of Global Change at the U.S. Department of State, was the sole speaker at the briefing.

Artusio opened the briefing with an overview of the agreement reached at the COP 21 meeting in Paris in 2015. Artusio noted that the Paris climate agreement reached the minimum requirement to enter into force in October 2016, two years earlier than expected,

following ratification by at least 55 countries representing a minimum of 55 percent of global greenhouse gas emissions. He explained that COP 22 also represented the first meeting of the governing body that will implement the Paris climate agreement, the "CMA 1", which is made up of countries who have ratified the agreement. CMA 1 will work over the next two years to suggest guidelines for carrying out the Paris climate agreement. The United States will be co-chairing the transparency development process. Artusio emphasized that transparency will be a major driver for action in the future, allowing governments to monitor their own and other countries' progress, see where action is needed, and apply peer pressure where necessary.

Artusio reported that many countries have put in place or are working on policies to fulfill commitments from the Paris climate agreement much more quickly than the original target year of 2030. In particular, Artusio highlighted the efforts of several countries to attract financing for low-cost, reliable renewable energy supplies, including Brazil, India, Mexico, South Africa, and United Arab Emirates, among others.

Many future challenges remain to fulfill the goals set by the Paris climate agreement, including reducing the rate of greenhouse gas emissions in order to meet the +2°C goal, uncertainty about future climate policy in the United States and elsewhere, and remaining hesitation by some countries to take necessary actions to reduce their emissions.

More information about the decisions adopted by COP 22 and CMA 1 can be found on the United Nations Framework Convention on Climate Change website (http://unfccc.int/meetings/marrakech_nov_2016/session/9967.php). An audio recording of the briefing and more details can be found on EESI's website (<http://www.eesi.org/briefings/view/121216cop22>). ■

Daniel C. Huston
 Holly Hunter Huston

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Remembrance

Jo R. Cassidy
1934-2017



JO REESER CASSIDY passed peacefully in her sleep Friday, February 10, 2017 at her home in Cypress, Texas, in the loving company of her husband Martin. She endured 4 months of hospital stay recovering from a heart attack, and almost succeeded when she suddenly passed away.

Jo was born to Carrie and Dr. Norman Reeser, living her youth in Lancaster and Camp Hill, Pennsylvania. A gifted student and writer, she attended Wellesley College and graduated in 1955 with a degree in English. Upon graduation, that same week, she married Martin Cassidy, and she set out for a life with him of domestic and international exploration in the oil business, mainly with Amoco. They were married 61 years.

In addition to her loving husband Martin, Jo is survived by three children: Cathy Jo and husband, Don, of Ventura, CA and their son, Cory; Dr. Brandt G. Cassidy and his son, James, and daughter, Meghan, of Norman, OK; and Caroline and her husband, Chris Cooper, of Boston MA, and their sons Dustin and Brandon.

She is preceded in death by her parents and brother, Jim Reeser.

Jo was a homemaker, wife, and mother in a number of locations, including 4 years in Libya, 4 years in London and in various locations in the USA, most notably in Chicago and Texas. She was always active outside the home as a writer, working at times for the *Harrisburg Patriot News*, the *Norman Transcript*, Curriculum Innovations, and as a freelance writer for World Topics.

She was certified as a brailist by the Library of Congress in 1963, and brailled for blind students and adults all her adult life until her final illness. She loved that service and worked as a paid brailist for Houston school districts and also as a volunteer for the UK Royal school for the blind. In England, her work became well-known and she was recruited to work for the BBC Radio World Service in London. She particularly enjoyed her opportunities to broadcast the program “In Touch”. She valued her 50 plus years as brailist for blind students and was pleased with their success in the sighted world. In the final months of her life, she was working for the College Station School district with a blind student and very much regretted being unable to continue her work.

Jo was also very involved in Saint Mary’s Episcopal Church serving on the Altar Guild of over 20 years and interacting with her many loving friends there. She was a gifted letter writer.

A Celebration of Life for Jo was 2:00 p.m. Wednesday, February 15, 2017 at Saint Mary’s Episcopal Church, 15415 N. Eldridge Parkway, (at Louetta and Eldridge), Cypress, TX 77429 Telephone 281- 370- 2000.

More details of her life and the service are on the website www.cyfairfunerals.com

Published in *Houston Chronicle* on Feb. 13, 2017

Revised from: <http://www.legacy.com/obituaries/houstonchronicle/obituary.aspx?n=jo-cassidy&pid=184114477#sthash.N193DGqb.dpuf>



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 CD in Word format with a hard copy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator or Adobe Photoshop. Files should be saved and submitted in .ai, .eps, .tif or .jpg format. Send them as separate attachments via email or CD if they are larger than 5 MEGs 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 .tif, .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 5 MB) or on CD or DVD.

HGS Bulletin Advertising

The *Bulletin* is printed digitally using InDesign. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email ads@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

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8	\$750	\$1,250	\$2,250	\$4,300						
7	\$600	\$1,100	\$2,200	\$3,850						
6	\$550	\$950	\$1,800	\$3,500						\$2,000
5	\$500	\$800	\$1,600	\$3,000	\$4,700	\$4,500	\$4,350	\$4,000		
4	\$450	\$650	\$1,300	\$2,500						
3	\$300	\$550	\$950	\$2,000						\$1,000
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	\$2000 – 6 Months	
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HGS Website Home Page Column Ad	\$700 – Monthly	200 x 400 pixels; home page right column ad
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	\$1200 – 3 Months	
	\$1600 – 6 Months	
	\$2600 – 12 Months	
Geo-Jobs	\$50 – 14 days	Posting of job opportunities on HGS website. Click the Geo-Jobs tab to get started. Must be filled out completed and the dates set appropriately.
	\$100 – 30 days	
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	\$650 – 6 Months	
Vendor Corner	\$1300 – 12 Months	Company logo, company website, and company description will be highlighted on HGS Calendar website event. This is an opportunity to display company wares, gain personnel exposure and hand out product information at HGS dinner meetings.
	\$250	
Bundle & Save!	*4 Pack option available. Send request to vendorcorner@hgs.org .	
	• 30% off website ads when combined with print ads in all 10 HGS <i>Bulletin</i> issues.	
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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.

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- 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.

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Telephone: 713-463-9476 Fax: 281-679-5504

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

Name: _____

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Circle Preferred Mailing Address: Home Office

Professional Affiliations: _____

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Professional Interest:

☐ Environmental Geology

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School _____

Degree _____ Major _____ Year _____

Earth Science Work Experience _____

Applicant's Signature _____ Date _____

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

Name: _____

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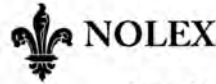
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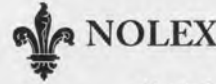
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1500 - 2000 **Collection of Badges**
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1400 - 1600 Exploration Geomechanics Workshop
1600 - 1800 Petroleum Geology SE Asia Introduction for Managers (Ian Longley)
Evening
1800 - 2100 **Ice Breaker** Sponsored by DownUnder, Seabird, TGS

WEDNESDAY 26TH APRIL

SESSION 1
0815 - 0845 Opening
0845 - 0915 Keynote: Can exploration fix its economics? **Andrew Latham (Wood Mackenzie)**
0915 - 0945 Keynote: Learnings in the current Southeast Asian deal space - **Barry O'Donnell (Mandala)**
0945 - 1010 Keynote: Petroleum exploration offshore Myanmar: history and future potential - **Andy Racey (Racey Geoscience)**
Coffee
SESSION 2
1045 - 1110 Myanmar: Turbidite system of the East Andaman Basin, Myanmar: impacts on exploration - **Issam Tarras (Total)**
1110 - 1135 Myanmar: Insights in the Development of the central tertiary basins Onshore & Offshore Myanmar - **Tom Kelly (Berlanga)**
1135 - 1200 Myanmar: Technical overview of the geology and chronostratigraphy of the Rakhine Basin - **Terry Walker (Woodside)**
1200 - 1225 Myanmar: New insights on the Mesozoic to Cenozoic evolution of Myanmar - **Karen Connors (Frogtech)**
Lunch Sponsored by Wood Mackenzie
SESSION 3
1400 - 1425 Australia: Reassessment of the petroleum prospectivity of the Browse Basin, offshore northwest Australia - **Dr Nadege Rollet (Geoscience Australia)**
1425 - 1450 Australia: Exploration of a sub-salt play in the southern Amadeus Basin, central Australia - searching for big gas in Proterozoic reservoirs - **Rhodri Johns (Santos)**
1450 - 1515 Australia: A review of the Lower Middle Triassic, inboard Northern Carnarvon Basin - **Roisin McGee (Carnarvon)**
1515 - 1540 Philippines: Miocene clastic play in southwest Palawan: a new playground for hydrocarbon exploration - **Jaime A. Bacud (PNOC)**
Coffee
SESSION 4
1610 - 1635 East Timor: A preliminary assessment of prospectivity in onshore Timor-Leste - **Tim Charlton (Timor Gap)**
1635 - 1700 East Timor: Re-evaluating Triassic outcrop stratigraphy in Timor-Leste: initial insights into source, reservoir and seal - **Eujay McCartain (UWA)**
1700 - 1725 New Zealand: Well failure; the fairway to success. How understanding failures can be the key to discoveries - **Suzannah Toulmin (NZ Pet & Min)**
1725 - 1750 New Zealand: New Zealand's diverse sedimentary basins - **Chris Uruski (OMV)**
Evening
1800 - 2000 **Quiz Night** Sponsored by MCG, ION, Polarcus

THURSDAY 27TH APRIL

SESSION 5
0845 - 0915 Keynote: Matching exploration strategies and opportunities in Asia Pacific - **Dylan Mair (IHS Markit)**
0915 - 0945 Keynote: Exploration opportunities in the APC Region - **Jean-Marc Rodriguez (Total)**
0945 - 1010 China: Bohai Bay PL19-3 field growth - a mega project with a phased development strategy and successful appraisal program - **Mark Wheeler (ConocoPhillips)**

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SESSION 6

1035 - 1055 PNG: Why has PNG been successful in producing oil and gas? - **Mick McWalter (Port Moresby)**
1055 - 1120 PNG: Potential for future petroleum resource growth in PNG - **John Warburton (Oil Search)**
1120 - 1145 PNG: PNG's first offshore development - opportunities and challenges - **Huw Evans (Twinza)**
1145 - 1210 PNG: Recent appraisal, exploration highlights and technological implication in foothills exploration - **William Gordon Canning (Total)**
1210 - 1235 PNG: PNG LNG development drilling: an integrated approach to managing uncertainty and delivering challenging wells in a complex foldbelt setting - **TBD (ExxonMobil)**
Lunch

SESSION 7

1350 - 1415 Thailand: A seismic inversion method for fluvial reservoirs in Southeast Asia - **Mark Sams (KrisEnergy/Ikon)**
1415 - 1440 Thailand: Observations of hydrocarbon migration within the Jasmine field and the impact on risk assignment for exploration prospectivity in eastern Block B5/27, Gulf of Thailand - **Stuart Clark (Mubadala)**
1440 - 1505 Malaysia: Central Luconia Carbonate Exploration - An Update: After three more SK408 wildcats, has the story changed? - **James Clark (SapuraKencana)**
1505 - 1530 Malaysia: A unique post-MMU hydrocarbon charge system in the Bunguran Trough: a case study from deepwater Sarawak and implications for petroleum exploration - **Kazuhiro Ogawa (JX Nippon)**
Coffee
1600 - 1800 Farmout Forum - Selection of Short Farmout Presentations

FRIDAY 28TH APRIL

SESSION 8

0850 - 0915 Malaysia: Neogene tectonics of northern Borneo: a simple model to explain complex structures within Miocene-Recent deltaic-deepwater sediments both onshore and offshore - **James Clark (SapuraKencana)**
0915 - 0940 Mongolia: Mongolia: emerging and frontier exploration potential - **Philip Holloway (Petro Matad)**
0940 - 1005 Asia Pacific Unconventionals: Where to next? - **Kim Morrison (Lion)**
Coffee

SESSION 9

1030 - 1055 Indonesia: Hidden basins and undrilled anticlines: the legacy of early oil Exploration in Indonesia - **Chris Atkinson (WPS)**
1055 - 1125 Indonesia: Why East Java should still be in your exploration portfolio - **Ian Longley (Gispax)**
1125 - 1150 Vietnam: Low cost exploration in a frontier area: breaking our model with data, Phu Khanh Basin - **AJ Kullman (Murphy/PVEP)**
1150 - 1215 Vietnam: Ham Rong Dong and Ky Lan discoveries: Opening a vast opportunity in the Song Hong Basin (PVEP)
Lunch

SESSION 10

1315 - 1340 Vietnam: Ca Voi Xanh field, Block 118, offshore Da Nang, Vietnam: Exploration highlights and development challenges - **Lori Meyer (ExxonMobil)**
1340 - 1405 Vietnam: Detecting basement reservoir fractures on Vietnam's first ocean bottom seismic survey in the Cuu Long Basin - **Jim Keggin (SBGS)**
1405-1430 TBA
1430 - 1455 Vietnam: The syn-rift petroleum system in the eastern edge of the Cuu Long Basin - **Huy Tran Nhu (PVEP)**
1455 - 1515 Closing
1630 - 1800 **APSC Scout Check (Members only)**
Evening

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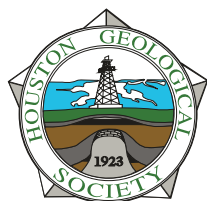
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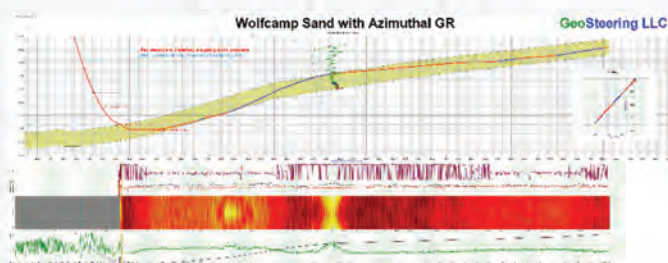
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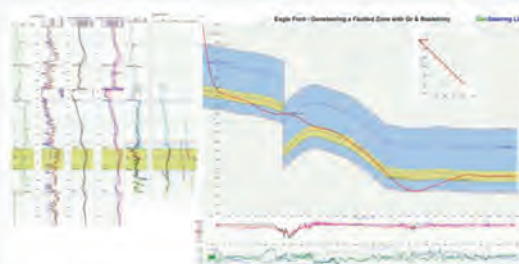
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