



YPFT June 2015, Sam Samford

PBS-SEPM NEWSLETTER

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KEY DATES For October and November 2020

OCTOBER 2020

- **13: WTGS Luncheon,** Midland Country Club, 11:30am-1pm, John Brotherton, Synergies Between Seismic Modeling and Real Time Wellbore Navigation using Modern LWD Data, Uncertainty Principles, and Geosteering Techniques, Bush Convention Center & Zoom, 11:30am-1pm, Dr. Shuvajit Bhattacharya, BEG
- **15: SPE-PB Luncheon,** [Virtual](#), 11:30 am-1pm, Brent Hale & Amanda Warren, Initial Flow Rate Relationships to Decline Trends and Reserves
- **23: SPE-PB Plays & Clays,** Jake's Clays
- **27: SPWLA-PB Virtual Luncheon,** 11:50am-1pm, TBD

NOVEMBER 2020

- **3: WTGS Luncheon,** Midland Country Club, 11:30am-1pm, TBD
- **13-15 PBS-SEPM ROZ Core Workshop and Field Trip:** Robert Lindsay, Robert Trentham, Steve Melzer
- **26 Thanksgiving**

President's Column

Welcome to Fall, officially! September was a very busy month, especially towards the end, where two virtual meetings that many of us normally would have attended in person: the West Texas Geological Society's Fall Symposium, and the American Association of Petroleum Geologist's Annual Conference and Exhibition.

Well, the "big boys" are not the only ones doing things virtually this year. A few days ago and with many thanks to the efforts of Norman Wells, Jr., we also fell into that same virtual line, and hosted our own semi-remote, webcast technical luncheon. Dr. Mark Engle from UT El Paso was our gunnie pig on this experiment and the event went smoothly for the most part. There is always room to improve! We are excited to try this new approach to see if we can reach those who would not otherwise be able to attend, though we certainly do not wish to give up the comradery of time spent together with colleagues dining (and networking) together. Whichever way you wish to attend, we are happy to have you join us.

Our "next big thing" coming up is the Residual Oil Zone Core Workshop and Field Trip (see details in this newsletter) on 11/13/2020. For this dual-event, we need your help. Due to the potential risk of a second round of Covid-19 closures, we are not sure how many of you will want to attend, or if our venues will be open. That brings us to a quandary. If we cancel on the venues, we need to give 30 days notice. So, if you want to attend, we need to hear from you before October 12th, so we can make our decision (and notify the venues, if needed). Of course, they may close on us at any time, but we can only worry about what we can control. If we do get canceled upon, or have to cancel ourselves, those who have signed up and paid already will be refunded right away, so the risk to you is low.

Also, keep in mind that the field trip portion is limited to the first 35 attendees, so the early birds get the worm. Assuming we don't have to postpone until Spring, 2021, this "Meeting with the Bobs" ... and Steve (to borrow a movie phrase) is sure to be very insightful for anyone interested in CO2 Use (Enhanced Oil Recovery), CO2 Storage (CCS), Residual Oil Zone characteristics, tilted Oil-Water Contacts, the San Andres in general, meteoric recharge and migration, karst features (in outcrop and core) or the Horizontal San Andres Play, in particular. Thanks to efforts by past President, Sandra Elliot, we will also get a chance to see an extremely interesting core from the Shafter Silver District in the Marfa Basin. This core shows a fault cut, along with a variety of interesting effects from hydrothermal waters, including maturation effects on organics that results in oil and silver in the same core. So, be sure to sign up early through your favorite method: online, hardcopy via snail-mail, or through email.

Enjoy the beautiful autumn weather. The sudden cold snap earlier in September (mid-40s for the high, in case you missed it) reminded me why I live in Midland, where we can always drive north to see some snow!

Mike Raines
PBS-SEPM President 2020-2021



PBS-SEPM Luncheon Talk – October 20, 2020

Dr. Shuvajit Bhattacharya

*“A Tale of Two Conventional Reservoirs on the North Slope, Alaska:
Nanushuk & Torok”*

Bureau of Economic Geology, UT Austin

Tuesday, October 20, 2020 - [Bush Convention Center](#), 11:30 a.m.

~Will be available virtually through Zoom, link will be available after RSVP for that option~

Abstract

Exploration of the Cretaceous Nanushuk and Torok formations on the North Slope of Alaska is a hot topic these days. These formations are progradational clastic deposits in the Colville basin of Alaska. The Nanushuk Formation is a clastic fluvial-deltaic-shelf succession, whereas the Torok Formation is its basinward equivalent. These formations offer new opportunities to the oil and gas community because of their shallow depth, vast spatial extent, publicly available data, and scope of development. In this study, we integrate the results from eight large 3-D seismic surveys, well logs, and core (poro-perm and special core scan) data. The study area covers ~2,389.21 square miles.

Seismic sections show the presence of low-angle clinothems all over the study area, where the Nanushuk Formation is expressed as topset, and the Torok Formation is expressed as foreset and bottomset. Seismic-attribute-assisted mapping reveals the presence of prograding shelf edges, channels, and basin-floor fans, all with significant amplitude anomalies, which could be potential reservoirs. Apart from these deposits, abundant mass-transport deposits and sediment wave deposits are observed. Co-rendering of seismic attributes, such as coherent energy, Sobel-filter similarity (coherence), and spectral decomposition reveals these geomorphological features in more detail.

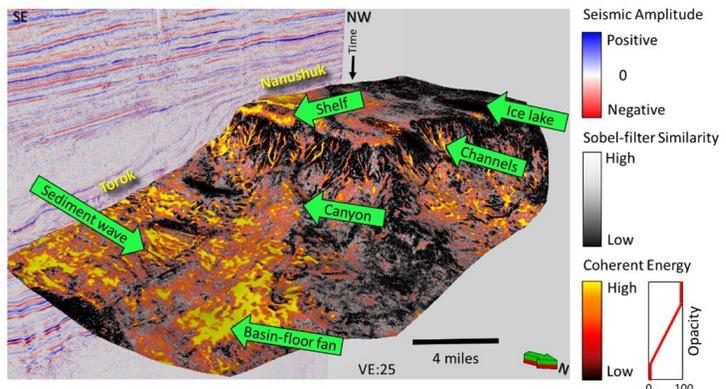
Both Nanushuk and Torok formations are internally heterogeneous, as revealed by petrophysical data. These formations are composed of laminated sand-shale sequences and contain thin-bedded, low-resistivity pay intervals. Only a few zones in the parasequences are oil saturated. Based on the core data, the porosity and permeability in these formations range from 5% to 35% and approximately 0.001 to 1,000 millidarcies, respectively. The ratio of P-wave and S-wave velocity (V_P/V_S) is a good indicator of hydrocarbon-bearing sandstones in these formations, which can be used in seismic inversion to identify and predict the sweetspots for further exploration.

Biography

Dr. Bhattacharya is a researcher at the Bureau of Economic Geology, UT Austin. He is an applied geophysicist/petrophysicist by background. Dr. Bhattacharya is primarily interested in extracting and integrating fundamental rock and fluid properties across multiple scales of resolution (core, well log, and seismic). Prior to joining BEG, he worked with the University of Alaska Anchorage, Battelle, and other organizations in different roles, such as an assistant professor and petroleum geoscientist. He completed multiple projects for energy resources exploration and carbon sequestration in the US, Australia, South Africa, and India. He has published over 50 technical articles in different journals and conferences.



Interpreted seismic data (after Shuvajit Bhattacharya and Sumit Verma, 2020)





Permian Basin Section-SEPM ROZ Core Workshop & Field Trip



Friday Nov. 13 (8 AM-2 PM), Bush Convention Center, Midland, Texas
Saturday-Sunday November 14th-15th, 2020 – Field Trip, New Mexico

Registration Form

PBS-SEPM is Hosting a Two-Part Residual Oil Zone (ROZ) Core Workshop and Field Trip

The ROZ Core Workshop will begin at 8 AM in the Ballroom at the Bush Convention Center. Light pastry options will be available for breakfast. We will have a total of 5 cores available:

- Goldsmith San Andres Unit #1-335A (Main Pay), XTO, Ector - Goldsmith San Andres Unit # 1-9-WC (ROZ), XTO, Ector
- Goldsmith-Landreth San Andres Unit 190, Kinder Morgan, Ector - Hanford San Andres Unit #501, Faskin, Gaines
- Shafter Silver District, Ross Mine Formation, Marfa Basin (*Faults, Hydrothermal Silver, and Oil*), Pecos (2 Cores)
- Cleveland #A-601, Riley Permian, Yoakum - Miss Kitty # 669-704, Riley Permian, Yoakum

Lunch at the Bush Convention Center will be included. The workshop will end at 2 PM. Field trip attendees will board SUVs to head to the Stevens Hotel in Carlsbad, New Mexico. Friday evening will include a group dinner along with an overview of the outcrop stops. Saturday begins at 6 AM (MT) with breakfast at the hotel and a 7 AM departure to Laurel Canyon west of Carlsbad. Box Lunch is provided (both days). Saturday stops end at Stone Canyon. Everyone is free to decide their individual plans for dinner. Sunday morning's schedule is identical to Saturday, with stops starting at Cloudcroft, then moving to Northern Ruidoso before heading east. Sunday's stops will include the present day lower San Andres recharge area west of Roswell, which has well developed karst. The trip will end with a return to Midland, arriving around 6 PM at the Bush Center.

If you are interested in sponsoring this event, either for the food, supplies, transportation, or student sponsorship, please send an email to info@pbs-sepm.org with your name, company, contact information, and amount you would like to contribute.

If you are interested in driving one of the 5 SUVs on this trip, please send an email to info@pbs-sepm.org with a copy of your Driver's License, Insurance Information, and a few notes of previous experience driving off road in SUVs.

Field trip attendance is limited to 35 registrants, on a first-come, first-served basis.

The Core Workshop and Field Trip give you a chance to see:

- The ROZ interval (and its oil saturation variations with depth)
- Lower San Andres Limestones below the ROZ
- Pay Zones in the Horizontal San Andres Play*
- San Andres meteoric water recharge area
- Impact of Meteoric water-sweep (on fluids and rock)
- Maturity enhancements in clastics exposed to volcanics
- Diagenesis related to volcanic hydrothermal waters
- Stratigraphic and depositional styles of the San Andres
- Karst / collapse breccia in San Andres in outcrops
- Two newly slabbed silver mine cores, never before described

* Yoakum is the most active area, with 250 wells since 2014, producing 300,000 BOPD. Riley's cores are in the heart of the play.

Registration Fees

Core and Field Trip: PBS-SEPM Members \$425 () Non-Members \$460 () ** Students \$325 ()
Workshop Only: PBS-SEPM Members \$250 () Non-Members \$285 () ** Students \$125 ()

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To purchase online, go to <https://www.pbs-sepm.org/events-1/roz-core-workshop-and-fieldtrip> and pay by card

** - Student rate is limited to full time students who are not employed full time

PBS-SEPM Luncheon Talk – November 17, 2020

Stephen R. Robichaud, PG, CPG, Geologist

“Marketable Minerals in Permian Basin Waste Water”

Echelon Exploration & Production Company, Inc.

Tuesday, November 17, 2020 - [Bush Convention Center](#), 11:30 a.m.

~Will be available virtually through Zoom, link will be available after RSVP for that option~

Abstract

Every day, oil and gas operators in the Permian Basin recover, as an unwanted co-produced fluid, tens of millions of barrels of saline waste water. During the early years of production, this waste water was recognized as a nuisance and, eventually, a hazard. Until the present day, the recovery of minerals from this waste water for commercial production has been largely untested. This presentation will outline the technical basis for the exploration for these minerals, and illuminate recent technological developments for economically recovering these minerals.

Previous generations of geologists have recognized that in the Permian Basin the connate water in the oil-bearing rocks is in motion. Carol Hill in 1996 published a comprehensive study on the interdependence between the motion of these fluids with the chemistry of the rocks, the chemistry of the fluids and the dissolution and deposition of minerals. Later work by Art Saller and co-workers illuminated the origin of the fluids through the examination of the water chemistry.

Permian Basin operations have, for many years, unintentionally recovered some of the minerals from this hyper-saline water. Scale in the form of calcium and magnesium sulfates and calcium and magnesium carbonates have been a nuisance in the oil field from the beginning. Additionally, barium in solution is incorporated into this scale as the mineral barite, and is a Naturally Occurring Radioactive Material. Also known to exist at measurable concentrations in Permian Basin water are boron, cadmium, cobalt, lithium, potassium, rubidium and strontium. Other potentially recoverable metals whose presence in Permian Basin waters is unknown are beryllium, copper, molybdenum, nickel, silver, thorium and uranium.

Lithium mining in the past has been mostly by way of the hard-rock mining of spodumene (which contains lithium) and the evaporative precipitation of LiCl and Li_2CO_3 from brines. Recent advances in membrane technology have successfully recovered lithium from brines without the need for the broad footprint of an evaporative pan. In this way the recovery of lithium from Permian Basin water is possible, and under certain conditions could become a significant secondary revenue stream.

In 1976 the USGS convened a symposium on “Lithium Resources and Requirements by the Year 2000”, within which oil field waste water was identified as a probable source of recoverable lithium. The exploration for lithium and other metals will require the sampling of waters over a broad geography in the Permian Basin, and across a broad spectrum of strata, with analysis by way of atomic emission spectrometry.

Biography



Steve Robichaud is Founder, President and Geologist at Echelon Exploration & Production Company, Inc. in Midland, Texas. Mr. Robichaud holds a BS in Geology from Rensselaer Polytechnic Institute in Troy, New York, and an MS in Geology from Louisiana State University in Baton Rouge, Louisiana. Mr. Robichaud began his oil industry experience in 1979 at Getty Oil Company in Midland, and then he worked for Coastal oil and Gas/Border Exploration Company. Since 1984 he has been a Consulting Geologist and Independent oil businessman, specializing in Permian Basin stratigraphy as applied to reservoir characterization, acquisition of producing properties, waste water disposal, and the relationship between regional geologic phenomena and the habitat of hydrocarbons in the Permian Basin. His current work focusses on the economic resource value of minerals which could be recovered from the hypersaline brines associated with the oil and gas production in the Permian Basin.



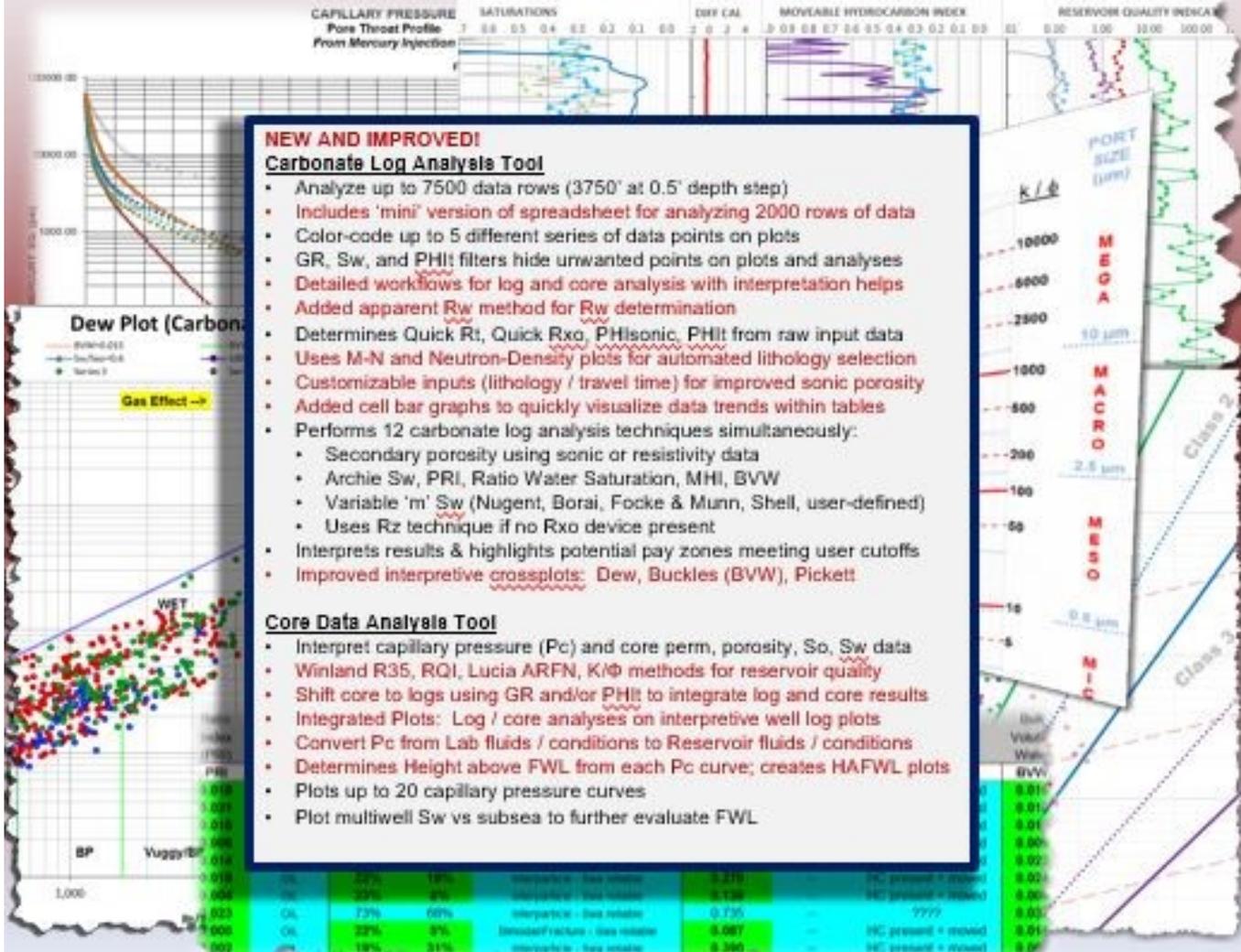
Carbonate Log & Core Analysis Spreadsheet v. 5.0

By Cory L. Hoffman, Ph.D.



Major Upgrade (January 2020)! [Designed for Microsoft Excel 2013]

Carbonate Log analysis draws heavily upon teachings of George Asquith
 Core Data analysis draws heavily upon teachings of Dan Hartmann



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SPE/AAPG: Permian Basin Members in Training Webinar—October 19, 2020

Cye Wagner

“Building a Family Oil & Gas Business”

Chairman of the Board Texas Alliance of Energy Producers

Monday, October 19th, 2020 - [GoToWebinar](#), 11:30 a.m.

~Unemployed members and students who want a discount
can reach out to fakintunji@unitexoil.com~

Abstract

Please check the [website](#) for both the abstract and the link to the webinar.

Biography

Cye Wagner is an executive with Cooper Oil & Gas, an exploration and production business and has enjoyed over 10 years. At COGI, Cye serves in an executive management role over the exploration, accounting, human resource, and regulatory departments. She brings an important perspective and deep expertise to the Alliance as a second generation operator and steward of the 40-year-old family business. As Board Chair, she will support the Alliance's mission to effectively represent the Texas oil and gas industry and in particular the interests of smaller independent oil and gas companies

She graduated from Texas A&M University with a Bachelor of Science degree in Petroleum Engineering and a minor in Business. After completing internships with Burlington Resources, Chevron and EOG Resources, she chose to work for EOG in the Fort Worth Division upon graduation. Cye enjoyed her tenure there in completions and production engineering until making the move to the family business.



Cye is a member of several other industry organizations including the Society of Petroleum Engineers and the Independent Petroleum Association of America. Cye is very active in her community of Fort Worth, serving in leadership roles in the Junior League for many years .

“Success is not final; failure is not fatal: it is the courage to continue that counts.”

– Sheryl Sandberg
COO of Facebook (2008-present)

PBS-SEPM Publications



PBS-SEPM PUBLICATION HIGHLIGHT

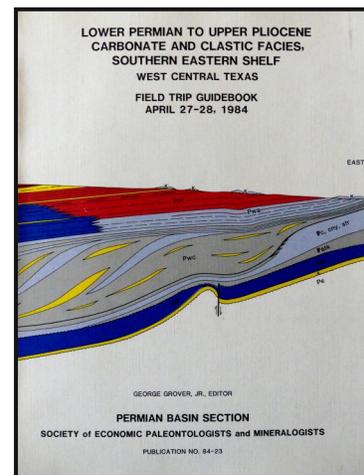
“Lower Permian to Upper Pliocene Carbonate & Clastic Facies, Southern Eastern Shelf - West Central Texas, Field Trip Guidebook”



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SPECIAL STUDIES

- Carbonate Facies in the Pueblo Formation
- Depositional Systems in the Putnam Formation
- Depositional History and Petroleum Potential of the Permian Tannehill Sandstone
- Stratigraphy of Upper Permian Rocks
- Origin of Siliceous Dockum Conglomerates
- Pictographs at Paint Rock
- Origin of the “Cup and Saucer”
- Analysis of a Remotely Sensed Satellite Image



Entire PBS-SEPM publication library (1955 – 2007)

There is a fully searchable Table of Contents—find a topic or author just by typing in the word(s). All publications are in Adobe PDF with all major articles being bookmarked, and all the figures are linked in the text for quick reference. Those areas that are off limits to geologists like the Glass Mountains or Sierra Diablos have been written up in these publications. Numerous out-of-print publications and figures and/or plates not published in the original guidebooks are now available in this library.

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Do you have an idea for an interesting luncheon talk? Have a core workshop you'd like to present? Have some suggestions on how PBS-SEPM can better serve the geologic community? Send us an e-mail to share your idea, your PBS-SEPM Executive Board wants to hear from you!



Grayburg Stone Canyon, Bob Lindsay Field Trip, 2018

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“That's what I consider true generosity: You give your all, and yet you always feel as if it costs you nothing.”

-Simone de Beauvoir (1908-1986)

French Writer, intellectual, existentialist philosopher, political activist, feminist, and social theorist



PBS-SEPM
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“I am a big believer that eventually everything comes back to you. You get back what you give out.”

**-Nancy Reagan
(1921-2016)
Actress, First Lady of the
United States**

PBS-SEPM is the Permian Basin Section of SEPM—the Society for Sedimentary Geology. However, you do not need to be a SEPM member or a geologist to join PBS-SEPM.

PBS-SEPM prides itself on its success in providing high caliber speakers as well as exceptional core workshops and field trips. PBS-SEPM also provides scholarships to graduating high school students in western Texas and New Mexico. These scholarships are on occasion, offered to college students that have declared their desire to pursue a degree in the geosciences. Through continued support from the industry, PBS-SEPM can continue to provide excellent educational opportunities for the oil and gas industry.

If you would like to join PBS-SEPM, you may visit our website to learn more about us, download a membership form, and learn how to get involved.

Scholarship and Distinguished Speaker Events (2020-2021)

Wendell J. Stewart Fund: so named for the famous sequence stratigrapher, was initially funded by the family, and then later through PBS-SEPM members who have contributed over the years. In the past, the scholarship was established to award high school students intending to pursue a college education in the geoscience field (declared major), and had evolved to include college students actively pursuing a geology degree when there were no other qualified candidates. Funding for this scholarship has waxed and waned over the years with the changes of the petroleum industry and because this scholarship is set up in such a manner that only the interest can be used to distribute funds, most scholarships in the last 30 years have been awarded through the PBS-SEPM main budget and not the scholarship fund.

We are proud to announce that we had two receivers for the Wendell J. Stewart Scholarship Fund in May 2020: Vanessa Armendariz, an undergraduate petroleum geologist at UTPB, and Heather Dudley, a paleontology graduate student at Sul Ross.

Robert Read Distinguished Lecturer Fund: was founded to honor a bright, young geologist who had been an active member of both PBS-SEPM and WTGS and was tragically killed by a drunk driver. Donations from various members of both societies contributed to a membership donation fund that both encourages our continuing education efforts by helping offset the cost of bringing in a distinguished lecturer, usually in geosciences, but not required.