PBS-SEPM NEWSLETTER

AUGUST 2013

Points of Interest

- WTGS/PBGS 20th Annual Clay Shoot
- PBS-SEPM Luncheon Talk for September
- WTGS Fall Symposium
- WTGS Golf Tournament

Inside this issue:

President's Column

Welcome to the new year for the PBS-SEPM. I would like to first thank the 2012-2013 officers and committee members. Past President Robert Nail and the previous board left us in excellent condition for the upcoming year.

We also have already put in place our fall fieldtrip to the Solitario Laccolith in west Texas. And we also had a successful Young Professionals Field Trip and a successful Bahamas field trip. Jesse White has an excellent article in the WTGS bulletin about the Bahamas field trip.

As I write this letter, it is raining here in the Permian Basin and we broke a record for the "low-high". This rain is most welcome and the break from the heat is a real treat. The oil business is booming and Midland along with the surrounding cities are changing daily due to building of businesses, homes and apartments. The infrastructure for our whole area is being pushed to the max. Everyone is in a hurry, so keep a watchful eye out for those who may not be paying attention to what they are doing like they should.

Our new board is in place and I am so proud that we have brought in some of our younger members. John Speight is our Treasurer, Ben Davis is Secretary, Brady Kolb is Second Vice President, John Leone is First Vice President, and Curtis Helms, Jr. is President-Elect. When you see these gentlemen, please thank them for their service to the PBS-SEPM.

And most importantly don't forget about Paula Sanchez our Executive Director who keeps us all going in the right direction and does more behind the scenes work than we will ever know.

I would ask that you consider volunteering for one of the Committees. If you are interested in serving on any of the committees, please let one of the board members or the committee chair know. Any one of us will be more than happy to get you started.

I hope to see each of you at our luncheon meeting on Tuesday September 17th!

Cindy E. Bowden
President PBS-SEPM 2013-2014
http://www.pbs-sepm.org

Mark Your Calendars!

AUGUST

- **17: WTGS/PBGS 20th Annual Invitational Clay Shoot,** (Jake's Clays, 9:00 am)

SEPTEMBER

- **17: PBS-SEPM** Luncheon: G. Michael Grammer, Ph.D., "An Integrated Approach to Carbonate Reservoir Characterization" (Midland Center; 11:30 a.m.—1:00 p.m.)
- **25-27: WTGS Fall Symposium**, "Re-Invigorating the Permian Basin (Midland Center; 8-5 PM)
- **27: WTGS** 45th Annual Golf Tournament Rock, (Hogan Park; noon - 8 pm)

OCTOBER

- **15: PBS-SEPM** Luncheon: Helge Alsleben, Ph.D., "Using XRF Analyses to Understand the Effects of Compositional Variations on Rock Strength Determined From Micro-Mechanical Devices" (Midland Center; 11:30-1:00 PM)

November

- **19: PBS-SEPM** Luncheon: David Hume, (Canadian Discovery, LTD.); Structural Fabrics in Unconventional 'Mudrock' Reservoirs (Midland Center; 11:30-1:00 PM)

PBS-SEPM Executive Board (2013-2014)

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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? Just click on the e-mail above & drop us a note, your PBS-SEPM Executive Board would love to hear from you!

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Your support lifts your corporate

name within the Permian Basin.

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"The intuitive mind is a sacred gift and the rational mind is a faithful servant; we have created a society that honours the servant and has forgotten the gift."
Albert Einstein

"Everyone here? Good. Meeting topic: Setting world record for shortest meeting. All in favor say aye. Ayes have it. Meeting over."

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"Science is facts; just as houses are made of stone, so is science made of facts; but a pile of stones is not a house, and a collection of facts is not neces-sarily science."

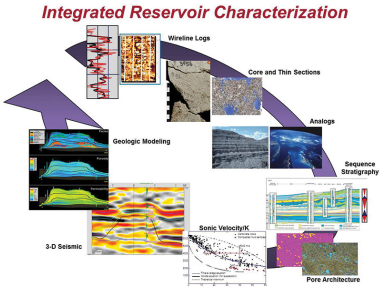
-Jules Henri Poincaré (1854-1912) French mathematician

PBS-SEPM Luncheon Talk

G. Michael Grammer, Ph.D.

"An Integrated Approach to Carbonate Reservoir Characterization"

Tuesday, September 17, 2013
Midland Center, 11:30 a.m.

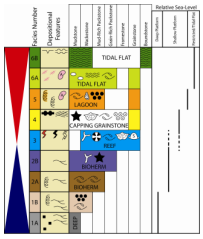


Abstract

Carbonate reservoirs are characterized by significant heterogeneity at a number of scales, ranging from exploration to production and enhanced production scale. An understanding of how primary depositional facies, diagenesis, and the sequence stratigraphic framework control the development of pores in carbonate rocks, and how the variation in pore architecture influences reservoir permeability is a fundamental process in the accurate characterization of carbonate reservoirs.

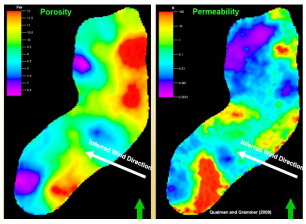
In addition, with the ubiquitous use of geostatistical models to define and predict 3-D reservoir architecture in the subsurface, it has become increasingly important to accurately define the probable geometric distribution of potential reservoirs and seals at multiple scales to provide geologically-based, three dimensional reservoir models that can be used to develop dynamic reservoir simulation and flow models. To effectively do this, the challenge is to integrate data on the primary depositional environment (facies, probable geometry, and susceptibility to diagenetic modification), the sequence stratigraphic framework, and the petrophysical characteristics of carbonates at multiple scales utilizing a combination of core, wireline logs, 3D seismic and the incorporation of both modern and ancient analogs.

Examples from the Michigan Basin and other productive basins provide a means to review the controls on carbonate reservoir heterogeneity, ranging from the pore architecture scale to geometrical attributes of flow units at the reservoir-scale, and to discuss how these parameters can be incorporated and integrated into the development of viable, petrophysically-based reservoir models of carbonate reservoirs.



"The use of *oversimplified geological* models based on data from a limited number of widely spaced wells is probably one of the most important reasons for the failures in predicting field performance."

Damsleth et al.
JPT (April 1992)



Biography

Dr. G. Michael Grammer is a Professor and Chesapeake Energy Chair of Petroleum Geology Boone Pickens School of Geology at Oklahoma State University. Mike received his PhD in 1991 at the University of Miami's Rosenstiel School of Marine and Atmospheric Science and has 25+ years of industry-related experience in carbonate reservoirs, sequence stratigraphy and carbonate reservoir characterization. His current research interests involve the various aspects of high resolution sequence stratigraphy and its application to carbonate reservoir characterization, 3-D modeling and petrophysical characterization. He has been an AAPG Distinguished Lecturer (2002-2003) and has led several AAPG field courses, including AAPG's modern carbonate course in the Bahamas which he co-led for 14 years. He has published extensively on carbonate reservoir characterization issues, including as lead editor of AAPG Memoir 80 "Integration of Outcrop and Modern Analogs in Reservoir Modeling" which won AAPG's Robert H. Dott Sr. Memorial Award for best special publication in 2006. Mike's industry-related experience includes senior research positions with Texaco and ChevronTexaco where he functioned as an internal consultant and instructor on carbonate reservoir characterization issues in various parts of the world, most notably with super-giant fields in Kazakhstan. He has consulted, presented short courses and led field trips for AAPG, Nautilus, and Petroskills, as well as numerous domestic and international petroleum companies.

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PBS-SEPM Luncheon Talk

Helge Alsleben, Ph.D.

"Using XRF Analyses to Understand the Effects of Compositional Variations on Rock Strength Determined From Micro-Mechanical Devices"

Tuesday, October 15, 2013 - Midland Center, 11:30 a.m.

Abstract

The exploration of unconventional resources and search for "sweet spots" requires understanding the geology and geologic variation of the formation of interest. Variations include stratigraphic and structural (including strength) variations, which affect the deformation behavior and may be important when it comes to the rock's response to hydraulic fracture stimulation. The fine-grained nature of many unconventional plays complicates traditional stratigraphic and structural analyses. Also, the high cost and time-consuming nature of many chemical analyses and rock deformation experiments using triaxial load cells may present an obstacle to adequately evaluate significant variations.

Data from three hand-held devices is used to analyze a Barnett Shale core from the Fort Worth basin. Using energy-dispersive XRF allows assessment of the chemical and mineralogical variation and a micro-indentation tool and micro-rebound hammer are used to evaluate strength variations. These tools are easy to use, quick, relatively inexpensive, portable and non-destructive and reveal mineralogical and rock strength changes throughout the core. Furthermore, results can be used to assess how chemical variations affect rock strength.

The ~60 m cored interval was sampled every 30 cm, where XRF analyses and rock strength tests were completed. Based on XRF analyses of both major and trace elements, the Barnett in this core is mostly a siliceous mudrock, although more quartz- and carbonate-dominated facies are locally present and overall the core can be broken into eleven chemostratigraphic facies. The unconfined compressive strength (UCS) based on the micro-indentation tool varies from ~38 to ~138 MPa with an average UCS of ~72 MPa. These values are similar to UCS values from the micro-rebound hammer. However, UCS results using the micro-rebound hammer and micro-indentation tools appear to vary systemically as mineralogy changes. While UCS values show a closer agreement in more siliceous facies, more calcareous facies appear to show greater divergence in UCS values, which suggests that the micro-rebound hammer is sensitive to the presence of carbonate material in the rock. Overall, our approach provides a quick, reliable assessment of the mineralogy and strength variations of the core and shows how the former can influence the latter.

Biography

Dr. Helge Alsleben is a structural geologist and Associate Professor in the School of Geology, Energy, and the Environment at TCU. Helge is a native of Germany and holds a B.S. equivalent from the University of Hamburg, Germany, a M.S. in geology from San Jose State University in San Jose, California, and a Ph.D. in geology from the University of Southern California in Los Angeles, California. He teaches undergraduate and graduate courses in "Structural Geology", "Global Tectonics and Basin Analysis" and "Geomechanics". He is primarily a field-oriented geologist with a background in strain analyses as well as structural and microstructural analyses of rocks. His academic expertise about stress and strain provides the theoretical background for applied geomechanical problems that are part of his current research interests. He has authored or co-authored numerous publications and regularly presents his research results at regional, national, and international conferences. He is a member of AAPG, AGU, and GSA.

*"Science can only ascertain what **is**, but not what **should be**, and outside of its domain value judgments of all kinds remain necessary"*

Albert Einstein
(1879-1955)

U.S. Physicist,
born in Germany

"Truth in science can be defined as the working hypothesis best suited to open the way to the next better one"

Konrad (Zacharias) Lorenz
(1903-1989)

Austrian Ethnologist
Nobel Prize for Medicine in 1973

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" Innocence about Science is the worst crime today"

Sir Charles Percy Snow
(1905-1980)
English novelist

" The strongest arguments prove nothing so long as the conclusions are not verified by experience. Experimental science is the queen of sciences and the goal of all speculation "

Roger Bacon
(1214:?- 1294)
English Scientist,

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.

Our non-profit society relies upon the efforts of dedicated volunteers to serve the geological community—primarily through educational events. These events include monthly luncheon talks, core workshops, annual field trips, and special geological publications. Additionally, we are involved on the college campuses—reaching out to future earth scientists through scholarships, discounted memberships, and offering full-time geology students the ability to participate in professional-grade field trips at little to no cost.

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"In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual."

– Galileo Galilei