



Evaluating Siliciclastic Reservoir Quality in a Changing World

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*Note: AGS meetings will be at the BP Energy Center for 2010-2011.
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This abstract promotes the November luncheon talk of the Alaska Geological Society,
to be held Thursday, November 18th, at the BP Energy Center.*

Predicting reservoir quality prior to drilling is a major goal in both exploration and for optimized field development. However, today many of the prime opportunities only exist in deeper, hotter basins, where seismic imaging is challenged. To meet that challenge, detailed reservoir characterization integrated with basin modeling has been successfully used to predict reservoir quality in deep "conventional" reservoirs (typically quartz-rich) which are dominated by a preserved, primary intergranular porosity network. The accuracy of our predictions is based on a fundamental understanding of the primary controls on porosity evolution (for given depositional settings), and our ability to forward model compaction and high temperature (>70-80oC) quartz cement growth.

However, in the last decade, we have also seen an explosion of activity in fine-grained, microporous, clay/organic-rich reservoirs (with nano-sized pores). These "unconventional" reservoirs (e.g. tight gas/shale gas) which were previously considered to be uneconomic, are extremely heterogeneous and often contain unstable, ductile mineral phases that react differently (from conventional reservoirs) during burial diagenesis. To meet the "nano" challenge, new tools and methods in reservoir characterization are being developed to maximize recovery.

In this talk, we will review some of the key characterization tools currently being used for "sweet spot" identification in both "conventional" and

AGS Luncheon

Date & Time: November 18th, 11:30 am – 1:00 pm

Program: Siliclastic Reservoir Quality

Speaker: Joann E. Welton, ExxonMobil

Place: BP Energy Center

Reservations: Please make your reservation before noon Tuesday Nov. 16th, 2010.

Cost: Seminar only, no meal: Free

Reserve a box lunch: \$15

Reserve a hot lunch: \$20

Lunch with no reservation:
On an "as-available" basis only

E-mail reservations: vp@alaskageology.org
Or phone (907) 269-8673
(Ken Helmold, AGS VP)

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"unconventional" reservoirs. We will also examine how modern grain coat studies and laboratory experiments are providing new insights into the impact of early

diagenesis on reservoir quality. Lastly, we will examine the question of where is the porosity in tight gas/shale gas reservoirs, which takes us into the new world of nanoscale pore imaging.

About the Speaker:

Joann Welton is a Senior Research Associate at ExxonMobil's Upstream Research Lab in Houston. She has a Bachelor's Degree from Portland State University, Portland, Oregon and a Master's Degree from University of Southern California.

Joann began her career 37 years ago at Standard of California (now Chevron) where she worked on a variety of assignments ranging from operations geology, SEM characterization of rocks, organic geochemistry, and petrophysics. In 1988, she moved to Mobil's Dallas Research Lab to focus on integrated reservoir quality prediction and now resides at the ExxonMobil Upstream Research Lab in Houston where she works on reservoir quality research, global RQ risk assessments, and mentoring new RQ specialists. Her current research focus is on understanding the impact of early diagenesis on reservoir quality.

A pioneer in the use of the scanning electron microscope to evaluate reservoir quality, she was the author of the 1984 AAPG "Methods in Exploration Series" book - "SEM Petrology Atlas". Joann received an SEPM "Excellence of Presentation" Award in 1981, was co-author of a "Top 10" 2008 AAPG poster "Advances in Reservoir Quality Assessment of Tight-Gas Sands – Links to Producibility", and a co-chair of the 2004 Hedberg Research Conference on "Structural Diagenesis: Fundamental Advances and New Applications from a Holistic View of Mechanical and Chemical Processes". She has been an active member of both the AAPG and SEPM for 30+ years and is currently on the AAPG Research Committee and an active participant in the SEPM Clastic Diagenesis Research Group.