



## Practical Seismic Petrophysics: The Effective Use of Log Data For Seismic Analysis

**Tad Smith**  
SEG Honorary Lecturer  
Apache Corporation

The conditioning and analysis of log data for quantitative seismic interpretation is often simply categorized as “rock physics.” Unfortunately, rock physics workflows often overlook or oversimplify the proper editing and interpretation of log data the results of which can be unrealistic expectations and interpretations of seismic amplitude responses. The more encompassing phrase “seismic petrophysics” better describes the necessary linkage between petrophysics and rock physics. Seismic petrophysics not only includes rock physics, but also includes the proper conditioning and interpretation of log data that should occur prior to the application of rock physics and seismic models. This is especially true in conditioning log data for shearwave velocity estimation, fluid substitution calculations, and AVO modeling.

This talk will focus on the important role of “seismic petrophysics” in the quest to extract additional information from subtle seismic responses. Topics covered will include various aspects of log editing, petrophysical interpretation (including integration of other sources – core, fluids, pressures, etc.), and some common pitfalls associated with the “workhorses” of rock physics (invasion corrections, shear velocity estimation, and elements of fluid substitution). It is important

### **AGS Luncheon**

**Date & Time:** Dec. 8<sup>th</sup>, 11:30 am – 1:00 pm

**Program:** Practical Seismic Petrophysics

**Speaker(s):** Tad Smith

**Place:** BP Energy Center

**Reservations:** Please make your reservation before noon Tuesday, Dec. 6<sup>th</sup>, 2011.

**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](mailto:vp@alaskageology.org)  
Or phone (907) 644-4429

**For more information:** visit the AGS website:

[www.alaskageology.org](http://www.alaskageology.org)

to recognize that log data should not simply be recomputed to fit prior expectation as defined by a rock physics model. Instead, rock physics models should be used as templates, which allow

the interpreter to better understand the underlying physics of observed log responses and how they are governed by local petrophysical properties. Case studies will be used to reinforce critical concepts.

For more information contact  
**SEG Professional Development at**  
[hl@seg.org](mailto:hl@seg.org) or visit the Web site at:  
<http://seg.org/hl>

**About the Speaker:**



Tad Smith is senior technical advisor for petrophysics and seismic rock properties at Apache Corporation. Prior to joining Apache, Tad held a variety of positions as a geologist and petrophysicist at various companies, including Amoco, PB, Newfield Exploration, VeritasDGC, CGGVeritas, and ConocoPhillips. In 1995 – 1996, he participated in the Amoco Petrophysics Training program, where he developed a keen interest in petrophysics and seismic rock properties (“seismic petrophysics”). He has been actively engaged in the process of integrating petrophysical data into geophysical work-flows ever since. Tad has a PhD in geology from Texas A&M University, and is a member of SEG, AAPG, SPWLA, SPE, GSH, and the HGS. When he’s not working on interesting petrophysical problems, he enjoys time with his wife and son, riding bikes, spending time with good friends, and listening to good music.

**From the President’s Desk ...**

I would like to wish all the members a prosperous and happy holiday season - have a Merry Christmas, Happy Hanukkah, Kickin’ Kwanzaa, Rockin’ Ramadan, Peaceful Parinirvana, Delightful Diwali, Soulful Solstice and, for our atheist brethren, a Cheerful Cuarto-Uno. I would also like to remind everyone this month’s luncheon is scheduled for the second Thursday of the month (December 8) and is a joint meeting of the Alaska Geological Society and the Geophysical Society of Alaska.

Al Hunter, AGS Treasurer, has arranged for AGS to accept payments via credit and debit cards; Visa, Mastercard, American Express and Discover cards are accepted. You can use this option to pay for luncheons, publications, field trips, or annual dues. Speaking of which, November 1 is the annual renewal date for AGS membership, so please pay your dues as soon as convenient (annual membership is \$20, student membership is \$5). If you are the curious type, try using the new credit/debit card system to pay your dues. I would also encourage members to be on the lookout for potential new members.

**The Alaska Geological Society**

**LUNCHEON SCHEDULE 2011 - 2012**

**Updates on the web at:**  
<http://www.alaskageology.org>

September 2011	Thursday, Sept. 15 <sup>th</sup> , Paul Decker, DNR Source-Reservoired Oil Resources, North Slope Alaska
October 2011	Thursday, Oct. 20 <sup>th</sup> , Kristine Crossen and David Yesner, UAA, Youngest Mammoths in America: 5700 Year Old Mammoth Remains from Qagnax Cave, Pribilof Islands, Alaska
November 2011	Thursday, Nov. 17 <sup>th</sup> , Tom Homza, Shell Exploration & Production, Toward an Integrated Model for the Canada Basin: Implications for North Alaska
December 2011	Thursday, Dec. 8 <sup>th</sup> – Tad Smith (SEG 2011 Honorary Lecturer), Apache Corporation, Practical Seismic Petrophysics: The Effective Use of Log Data for Seismic Analysis (Joint meeting AGS / GSA)
January 2012	Tentative
February 2012	Tentative
March 2012	Tentative (AAPG Distinguished Lecturer)
April 2012	Tentative
May 2012	Tentative

**If you would like to volunteer a talk or would like to suggest a speaker, please contact Dick Garrard at 644-4429.**

AGS is looking for volunteers to write articles for publication in the newsletter. The articles can be on any aspect of geoscience, but those dealing with local Alaskan geology would probably be of most interest to a general audience. Please submit your contributions to Greg Wilson who is responsible for assembling and distributing the newsletter. He can be contacted at:

[Gregory.c.wilson@conocophillips.com](mailto:Gregory.c.wilson@conocophillips.com).

This month's luncheon presentation by Tad Smith of Apache Corporation will be on "Practical Seismic Petrophysics: The Effective use of Log Data for Seismic Analysis". Dick Garrard has assured me the talk contains minimal equations and will pique the interests of all exploration geoscientists. Come early to get a good seat.


- Ken



Recognize this landscape? Hint – the lake in the upper left of the photo has been dammed intermittently by the glacier at the top of the photo.

Photo by G. Wilson, 2011

Last month's photo was correctly identified by **JERRY SIOK** and **TOM MOORE** as Kanayut Conglomerate from the Atigun Pass area in the Brooks Range.



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## Meeting Information

The **American Geological Institute** provides a comprehensive list of national and international geoscience meetings at: <http://calendar.agiweb.org>

### Local Meetings:

#### American Water Resources Association—Alaska Section

<http://www.awra.org/state/alaska/index.html>

#### Alaska Geological Society

<http://www.alaskageology.org>

Lunch meetings are held monthly September through May in Anchorage. For more information, contact Jim Clough, 451-5030.

#### Alaska Miners Association

<http://www.alaskaminers.org/>

The Anchorage branch of the AMA holds weekly meetings at 7 AM every Friday at the Denny's on Northern Lights and Denali. They hold regular luncheon meetings in association with SME. For more information, contact the AMA office at 563-9229.

#### American Institute of Professional Geologists

<http://www.aipg.org>

AIPG holds regular quarterly evening Section meetings in Anchorage and Fairbanks. For more information contact Mark Lockwood, President, at Shannon & Wilson, Inc., in Fairbanks, 907-458-3142.

#### Chugach Gem & Mineral Society

<http://www.chugachgms.org>

CG&MS holds all meetings at the First United Methodist Church on 9<sup>th</sup> Avenue. Contact their hotline at 566-3403 for information on regular monthly business meetings, monthly potlucks, and guidebook sales, including the new Alaska Rockhound Guidebook.

#### Geophysical Society of Alaska

<http://gsa.seg.org/>

Luncheon meetings are held monthly September through May at the ConocoPhillips Tower. For more information, contact Phil Rorison, 265-6321

#### Society of Petroleum Engineers

<http://alaska.spe.org/>

#### UAS Environmental Science Program

<http://www.uas.alaska.edu/envs>

#### National Association of Geology Teachers (NAGT)

<http://www.nagt>

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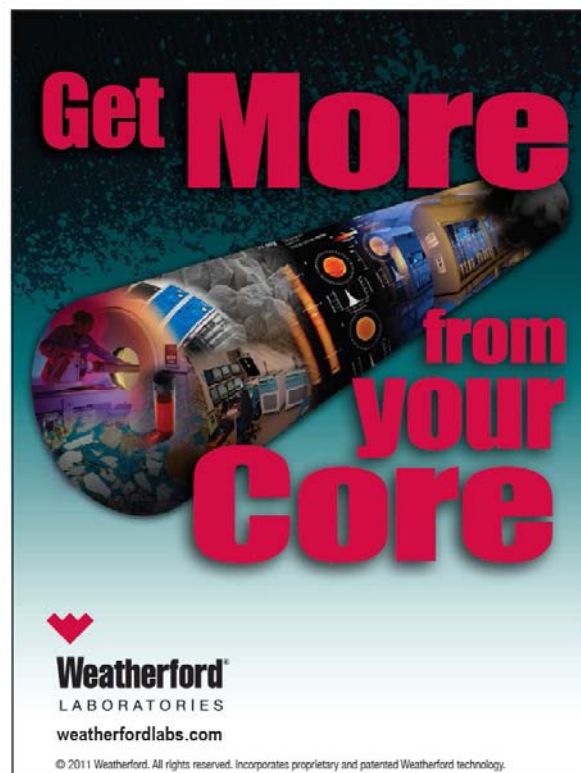
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The Alaska Geological Society, Inc.  
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On the web at: <http://www.alaskageology.org>

The Alaska Geological Society is an organization which seeks to promote interest in and understanding of Geology and the related Earth Sciences, and to provide a common organization for those individuals interested in geology and the related Earth Sciences.

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### MEMBERSHIP INFORMATION

AGS annual memberships expire November 1. The annual membership fee is \$20/year. You may download a membership application from the AGS website and return it at a luncheon meeting, or mail it to the address above.

Contact membership coordinator Greg Wilson with changes or updates (e-mail: [gregory.c.wilson@conocophillips.com](mailto:gregory.c.wilson@conocophillips.com); phone: 907-263-4690)

All AGS publications are now available for on-line purchase on our website. Check to see the complete catalogue.

<http://www.alaskageology.org/publications>

### ADVERTISING RATES

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### Membership Notes

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Membership renewal is Nov. 1<sup>st</sup>



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