



Geophysical Society of Pittsburgh



Proudly Presents Thursday, May 16th, 2013

At

Penn Brewery, Pittsburgh, Pennsylvania

Optimizing Subsurface Imaging using 5D Interpolation in the Marcellus Shale: Brookside 3D Study, Lycoming County, Pennsylvania

By

Mr. Kirk Vensel and Mr. Art McCarthy

Abstract:

In rugged terrain, acquiring seismic data in a regular 3D acquisition grid can be challenging, and one such locale is the region of Northeastern Pennsylvania. The Brookside 3D survey covers 450 square miles and was acquired in 2011-2012. Field operations consisted of a mixture of vibroseis and dynamite sources. The 3D patch consists of a slanted spread with 1320 foot (ft) shot and 880 ft receiver line intervals, and has an average CDP fold of 80. However, with the difficult surface terrain, sparse or irregularly sampled acquisition can produce non-optimized subsurface images, leaving interpreters with a good deal of uncertainty.

In this presentation, we use 5D interpolation to mitigate the spatial sampling problem and enable interpreters to leverage all the information inherent in their seismic surveys. 5D Fourier interpolation performs simultaneous prestack interpolation in five dimensions (inline, crossline, offset, azimuth, and frequency) to predict new sources and receivers at desired locations. Using 5D Interpolation, the source line interval is reduced from 1320 ft to 660 ft, and the receiver line interval from 880 ft to 440 ft. We analyze azimuthal pre-stack time imaging in the Offset Vector Tile (OVT) domain after 5D interpolation and demonstrate that 5D interpolation can provide better image gathers for Amplitude Versus Offset (AVO) and Amplitude Versus Azimuth (AVAz) analysis.

Biographies:



Mr. Kirk Vensel is currently a Senior Geophysicist at CGG with 25 years industry experience, focused on business development. Based in Calgary, Kirk supports land processing and imaging for CGG North America. Kirk holds a B.Sc. in Geophysics from the University of Calgary (1988). Kirk's core experience is in land imaging 3D, 3C, 4D and OBC data. Kirk has extensive experience in Oklahoma, Pennsylvania, Texas, Louisiana, North Slope Alaska, Heavy Oil (SAGD, 4D), BC Shale gas, Yemen, India, Nigeria, South America and Latin America.



Mr. Art McCarthy is currently a Project Manager at CGG with fifteen years of industry experience. Art received a Bachelor of Engineering in Geophysics from Queen's University (1997). Art is experienced in complex structural settings including TTI RTM depth migrations. His project experience includes six years overseas in Oman working on high density land 3D surveys. Art is experienced in Pennsylvania, North Slope Alaska, Oklahoma, Texas, Foothills/plains projects in Canada, structural projects in Colombia, Peru, Bolivia and Argentina, transition zone surveys in Indonesia, and marine/land surveys in Venezuela.

*Please RSVP using the PayPal link on the Geophysical Society of Pittsburgh website at: www.thegsp.org
Cost \$35 (\$20 for Students). Meeting Location: Penn Brewery, 800 Vinial St., Pittsburgh, PA 412.237.9400*

Thursday, May 16th Meeting Menu

5:00 pm Social Hour



This month's social hour is proudly sponsored by
[Discovery Acquisition Services!](#)

Beer on Tap:

Penn Marzen, Marzen Style Amber Lager - very tasty!
Penn Dark Lager Beer, European-Style Dark
Penn Gold Lager, Munichener Helles Style
Penn Pilsner, Vienna Style Pilsner
Also Available: Red & White wine

Hors D'oeuvres:

Side of Smoked Salmon with Pumpernickel, Cream Cheese, Chopped Eggs and Red Onions, and Capers

6:00 pm Dinner

Dinner Buffet

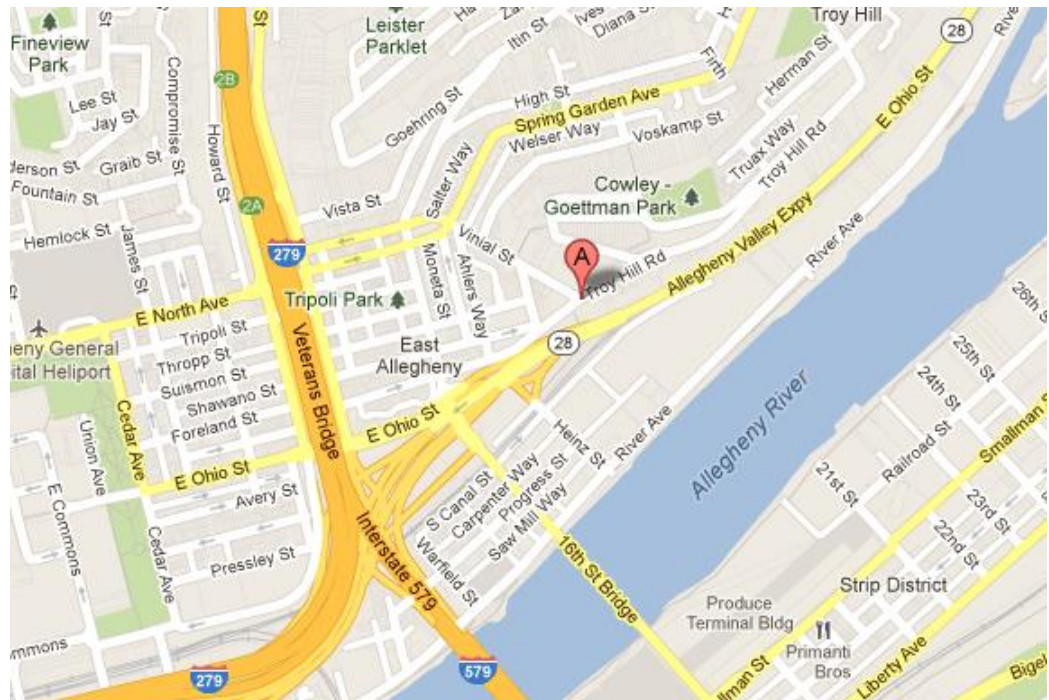
Schweinebraten
Smoked Bratwurst Sausages and Sauerkraut
Balsamic Chicken with grilled vegetables,
Beef Tenderloin Medallions with wild mushroom demi glaze,
Rice Pilaf, Fresh Green Beans with Red Peppers
Tossed Green Salad with Ranch, Italian and Balsamic Dressing.
Dessert: Apple and Cherry Pie
Coffee & Cream

7:00 pm Lecture

We are pleased to announce that this month's lecture will be held at :

[Penn Brewery](#)

800 Vinial Street
Pittsburgh, PA 15212 USA
412.237.9400



Geophysical Society of Pittsburgh Upcoming Lecture Series & Events:

May 16th: Optimizing Subsurface Imaging using 5D Interpolation in the Marcellus Shale: Brookside 3D Study, Lycoming County, Pennsylvania, Mr. Kirk Vensel and Mr. Art McCarthy

👉👉 Geophysical Society of Pittsburgh Officer Elections 👈👈

All GSP members must return their completed ballot they received via email by May 15th!

(If you did not receive an email ballot then you need to renew your GSP membership)

August 27th: Annual GSP Golf Outing!



Photo: Bill Harbert

News and Events from Geoscience Organizations

WORKSHOP *SEG/SPE Workshop*
**Seismic While Drilling:
Managing Risk and Optimizing Well Placement**
*Moody Gardens Hotel & Convention Center
Galveston Island, TX • 1–3 May 2013*



AAPG ANNUAL 2013

CONVENTION & EXHIBITION

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS
WITH SEPM (SOCIETY FOR SEDIMENTARY GEOLOGY)

19-22 MAY 2013 • DAVID L. LAWRENCE CONVENTION CENTER • PITTSBURGH

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at AAPG 2013 ACE in Pittsburgh!

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[3D Seismic Attributes for Prospect Identification and Reservoir Characterization](#)

Instructor: Kurt Marfurt

23 May 2013 at 8:00 AM to 24 May 2013 at 5:00 PM

[Westin Convention Center](#)

1000 Penn Avenue, Pittsburgh, PA 15222

Participants gain an intuitive understanding of the kinds of seismic features that can be identified by 3D seismic attributes, the sensitivity of seismic attributes to seismic acquisition and processing, and of how 'independent' seismic attributes can be coupled through geology. We will also discuss alternative workflows using seismic attributes for reservoir characterization as implemented by modern commercial software and practiced by interpretation service companies. For more information please contact Jill Abbott: jabbott@seg.org

News and Events from Geoscience Organizations



WORKSHOP
SEG WORKSHOP
***Unconventional Resources:
The Role of Geophysics***
Omni William Penn Hotel
Pittsburgh, Pennsylvania • 2-6 June 2013

SEG
Society of Exploration Geophysicists
The international society of applied geophysics

The objectives of this [SEG Workshop](#) are:

- Share the state of the art geophysical technologies in play evaluation, reservoir characterization, sweetspotting, drilling and completion, understanding and providing information for integrity of wellbore, reservoirs and seals, as well as practice in HSE.
- Discuss a way forward to understand today and tomorrow's technologies as well as their full value and potential in maximizing subsurface information of multi-disciplines with multi-scales.
- Probe common issues and solutions. An optional field trip on the Marcellus shale will be co-organized with the Penn State University to apprehend this workshop.

For more information see: <http://www.seg.org/events/upcoming-seg-meetings/pittsburgh2013>

Pittsburgh Geological Society

The PGS Generally Meets on the 3rd Wednesday of the Month From September through May. More information is available at <http://www.pittsburghgeologicalsociety.org/>



P·A·P·G

Pittsburgh Association of
Petroleum Geologists

An AAPG Affiliated Society

www.papgrocks.org

The PAPG Generally Meets on the 2nd Monday of the Month From September through May. More information is available at <http://www.papgrocks.org/>

We would like to thank our 2012-2013 Corporate Gold Sponsors:

GOLD



We would like to thank our 2012-2013 Corporate Silver and Bronze Sponsors:

SILVER



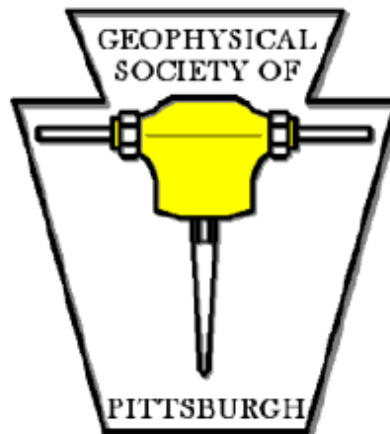
BRONZE



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- *SEG Distinguished Lecturers*
- *Annual Scholarship Awards*
- *Annual Golf Outing*
- *Short Courses*

Please contact Eddie Gonzales (egonzales@dawson3d.com) for Sponsorship Opportunities.

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