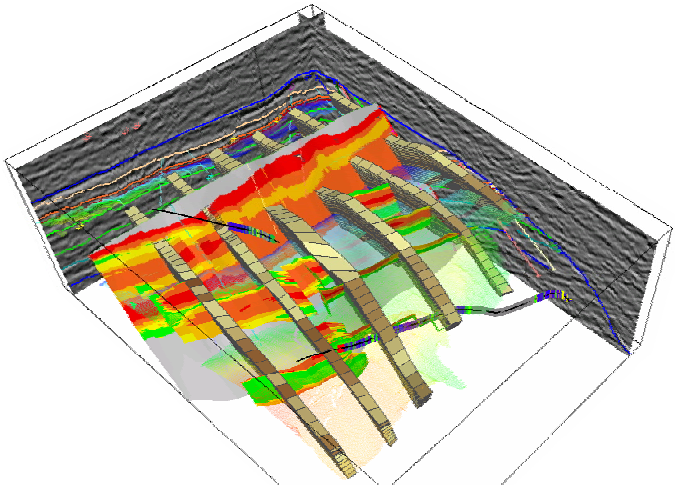
AAPG Annual Convention

Calgary, June 2005



Integrated model in Badley's TrapTester[1]

TW0516_1 Introduction

We arrived at the tail end of one of the wettest periods in Southern Alberta's history – the province looked like a swamp as we landed. But the next day, and for the duration of the AAPG, the sun shone and the AAPG conference broke its post-1980s boom attendance record with a final count of 7,748 (the all-time record is around 13,000).

We were impressed by Exxon-Mobil's **Reservoir Evaluation Time Reduction** (RETR), the interpretational equivalent of 'extreme programming' as presented by Lester Landis. Landis argues, *inter alia*, that super computer power should be used, not to build bigger models, but to build more models to test and evaluate multiple hypotheses.

Chevron has also been addressing the problems of multiple models, in particular, the potentially enormous combination of geological and flow models that need to be evaluated. Here, Chevron is an enthusiastic user and proselytizer for '**Design of Experiment**' statistical techniques derived from statistical work done early in the 20th century by statistician Ron Fisher.

Another significant driver in modeling and interpretation comes from BP's geological toolkit run-off and '**co-visualization**' research effort. BP is trying to get software vendors to offer simultaneous views of multiple domain models – geomodel plus attributes or reservoir flow simulation etc.

The seismic processing industry, according to a Schlumberger presentation, no longer considers itself '**CPU-bound**' – only 20% of the workflow involves a CPU wait. The rest of the time is spent interpreting and managing the data workflow – which has of course grown to more than fill the time gained by faster computers!

GIS usage is widespread. Anadarko presented a sophisticated use of geoprocessing to filter attributes according to proximity to geobodies. This appears to involve a considerable amount of data juggling between interpretation systems, ESRI and other image processing tools. Most vendors appear to have limited use and or requirements for geoprocessing and are more concerned with geodata management (even if this just involves Shapefile import) and web access to geo data. Others have equivalent functionality built into their applications (non GIS-solutions).

More generally it appears that **geological modeling** is expanding in scope to embrace tectonic plates, basins, source rocks, structures, fractures and more. Hitherto esoteric modeling is moving into mainstream prospect evaluation – posing a new set of problems of software and data integration.

[1] Images in this report have been contributed by the software vendors and authors concerned who hold copyright.

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Schlumberger's new display was a model of roominess and frequentation. Roxar was conspicuous by its absence. Landmark was busy 're-igniting' Geographix, which now has a direct link to OpenWorks. Seismic Micro Technology president Tom Smith pointed us in the direction of a seminal presentation made by Leonhard Ganzer at the 2005 EAGE in Madrid. SMT was not showing this at the AAPG, but SMT's use of **graphics processing units** (GPU) in fluid flow simulation looks like potential breakthrough.

Highlights

Reservoir Evaluation Time Reduction (ExxonMobil)
Seismic Geomorphology (Anadarko)
Proven undeveloped reserves as KPI (Ammonite)
Renewable Energy Session
Future of E&P IT (Schlumberger)
GPU-based reservoir modeling (SMT)
New Interpretation Suite (Transform Software)
Papers of note

Contents

TW0516_1 Introduction 1
TW0516_2 Awards Ceremony 4
TW0516_2.1 Sidney Powers Award – Ken Glennie, Shell. *4*
TW0516_3 Geology/Modeling and Interpretation Sessions 4
TW0516_3.1 Seismic Geomorphology – Henry Posamentier et al., Anadarko *4*
TW0516_3.2 Reservoir Evaluation Time Reduction – Lester Landis, ExxonMobil *4*
TW0516_4 Reserves Session 5
TW0516_4.1 Proven undeveloped reserves as KPI for Major – Mary Van Der Loop, Ammonite Resources *5*
TW0516_4.2 Time to certify reserves certifiers? – Dan Tearpock, SCA *5*
TW0516_5 Renewable Energy Seminar 5
TW0516_5.1 Kyoto 101 – Steve Ball, Conestoga-Rover *5*
TW0516_5.2 Cutting edge environmental Technology – Dave Cesar, Williams Energy *6*
TW0516_5.3 CBM water management – Matt Joy, Jorden Bischoff *6*
TW0516_6 Interviews 6
TW0516_6.1 Art Paradis (CEO, Dynamic Graphics) *6*
TW0516_6.2 Bjorn Wygrala (CEO, IES) *6*
TW0516_6.3 Jeff Pferd (CTO, Petris) *7*
TW0516_6.4 Martin Lange (VP Sales, Geographix) *7*
TW0516_6.5 Phil Neri (CTO, Paradigm) *8*
TW0516_6.6 Tom Smith (President SMT) *8*
TW0516_7 Exhibitors 9
TW0516_7.1 ARCIS texture attribute analysis service *9*
TW0516_7.2 Badleys TrapTester and FaultED fracture analysis *9*
TW0516_7.3 Beicip-Franlab fracture modeling and complex gridding tool *10*
TW0516_7.4 Core Laboratories – Digital Core Data Management *11*
TW0516_7.5 Deloitte – new PetroView databases *11*
TW0516_7.6 Digital Data Services – Worldwide Digital Elevation Data *12*
TW0516_7.7 Divestco Inc. PetroData Source Well Reports, 3D Viewer, GeoCarta tools *12*
TW0516_7.8 Dynamic Graphics EarthVision 7.5 co-visualization prototype *12*
TW0516_7.9 EarthMoves Central Atlantic Digital maps and hydrocarbon prospectivity *13*
TW0516_7.10 Fugro-Jason RockMod Services for frac tuning *13*
TW0516_7.11 Geographix – Direct link to OpenWorks data *14*
TW0516_7.12 GeoLOGIC new 'gDC' Calgary Data Center *15*
TW0516_7.13 Geologic Data Systems – international digital geology *15*
TW0516_7.14 GeoMark – Gandolph PalaeoMap project *15*
TW0516_7.15 GeoPlus Corp – Petra 3DViz module *15*
TW0516_7.16 Golder Associates *15*
TW0516_7.17 IES Petromod 2D TechLink *16*

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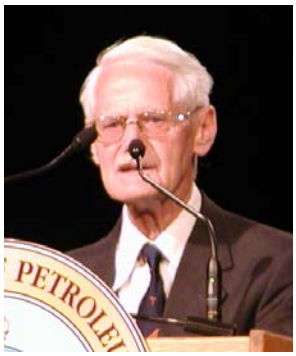
TW0516_7.18 IHS Energy US Seismic Database *16*
TW0516_7.19 Infoterra LIDAR Global Seeps database *16*
TW0516_7.20 Mercury Computer Systems XB series HPC/HPV platform *16*
TW0516_7.21 MetaCarta GeoDrive GIS and EDMS integration *17*
TW0516_7.22 Midland Valley (with EDS) - FracMV *17*
TW0516_7.23 National Science Foundation - Earth Scope monitoring of the San Andreas fault *18*
TW0516_7.24 Neuralog – Neura DB *18*
TW0516_7.25 Paradigm Geolog 6.6 ..... *19*
TW0516_7.26 Paulsson Geophysical Services – Long borehole array for fault zone monitoring *19*
TW0516_7.27 Petrosys multi-source 3D viewer and PPDM 3.7 implementation *19*
TW0516_7.28 Schlumberger – Petrel model of Forties Alan Clare, Apache *20*
TW0516_7.29 Schlumberger – the future of E&P IT *20*
TW0516_7.30 SDI Computer Graphics Metaware (CGM) DT Tools – graphics and print utilities *21*
TW0516_7.31 SMT – GPU-based flow modeling *21*
TW0516_7.32 Spotfire Decision Site V1.1 ..... *22*
TW0516_7.33 Terrasciences TerraStation II V7. ..... *22*
TW0516_7.34 Transform Software – New interpretation suite *23*
TW0516_7.35 WellDog tool for direct analysis of CBM gas potential *24*
TW0516_8 Design of Experiment papers 24
TW0516_8.1 Volumetric and Connectivity Uncertainty – Scott Meddaugh et al., Chevron. *24*
TW0516_8.2 Uncertainty in geological and flow modeling – Harding et al., Chevron *24*
TW0516_9 Environment/Kyoto papers 25
TW0516_9.1 Visual Impact Assessment - Robert Van Wyngaarden et al., Golder Associates. *25*
TW0516_9.2 A New meme for the Hydrocarbon Industry – Douglas Swift et al., Whelan and Swift. *25*
TW0516_9.3 Renewable Energy, Climate Change, and Business Opportunities – Ed McBean, Conestoga-Rovers 25
TW0516_9.4 Operational Concerns Database – Jena Wyllie et al., Boyd PetroSearch *25*
TW0516_9.5 Decision Support System for Carbon Sequestration – Erik Venteris et al., Ohio Geological Survey 25
TW0516_9.6 Midwest Regional Carbon Sequestration Partnership – Lawrence Wickstrom et al., Ohio Geological Survey. 25
TW0516_10 General geology and interpretation papers 25
TW0516_10.1 The Case for Integrated Studies – Sunit Addy et al. Compania Mexicana de Geofisica. *25*
TW0516_10.2 New diagenetic simulator - Anthony Park, Sienna Geodynamics *25*
TW0516_10.3 Opening History of the South Atlantic – Ian Davison, EarthMoves. *26*
TW0516_11 General IT-related papers 26
TW0516_11.1 Reservoir Visualization – William Keach et al., Landmark Graphics *26*
TW0516_11.2 E&P Data Mining – Paul Genovese (Grizzly Energy Resources) and Tawsak Urwongse (Chevron). 26
TW0516_11.3 Stochastic and Deterministic Methods in Geological Modeling – Taizhong Duan et al,. Marathon 26
TW0516_12 GIS/Remote sensing papers 26
TW0516_12.1 Outcrop Studies using GIS – Rufus Brunt et al., Leeds University *26*
TW0516_12.2 3D Reservoir Models from Digital Outcrop Data – David Hodgetts et al., Manchester University 26
TW0516_12.3 Earth Systems Modeling – Plate Tectonic Models for the Circum-Arctic. John Jacques et al., Getech 27
TW0516_12.4 Arc GIS Oil and Gas Field Outlines for Onshore US. Samuel Limerick et al. Energy Information Administratio. *27*
TW0516_12.5 3-D GPR Outcrop studies – Mark Grasmueck et al., University of Miami *27*
TW0516_13 Reserves papers 27
TW0516_13.1 Proven developed vs. proven undeveloped reserves – Mary Van Der Loop, Ammonite Resources 27
TW0516_13.2 Canadian Oil and Gas Disclosure Legislation. A Model for Other Countries? – David Elliott, Alberta Securities Commission *27*
TW0516_14 Sedimentology papers 27
TW0516_14.1 Reconstructing the Fluvial Record, a Reality Check – Andrew Miall, University of Toronto *27*
TW0516_14.2 Improving Depositional Analogues Through Simulation – Anthony Wain, Talisman *27*
TW0516_14.3 Multiscale Investigation of Deep Sea Zaire Fan – Philippe De Clarens et al., Total *27*
TW0516_15 Seismic interpretation papers 27

TW0516_15.1 Automated Seismic Fault Interpretation – Randolph Pepper, Schlumberger 27
TW0516_15.2 Curvature for Visualization of Surface Morphology – Bruce Hart et al., McGill University 28
TW0516_15.3 AVO Modeling – Richard Cooper et al. Rock Solid Images 28
TW0516_15.4 Calibration of Velocity-Based Pressure Prediction Models – Mario Gutierrez et al. Shell. 28
TW0516_15.5 Seismic Geomorphology & 3-D Visualization – Henry Posamentier et al., Anadarko 28
TW0516_15.6 Iterative, Common-Scale reservoir Modeling – Lester Landis et al., ExxonMobil 28
TW0516_16 Structural geology, fracturing and restoration papers 28
TW0516_16.1 Volume Interpretation for Fracture Detection – Ben Stephenson et al., Shell 28
TW0516_16.2 Fault seal, migration and accumulation – Stephen Dee et al., Badley Geoscience..... 28
TW0516_16.3 Geomechanical Modeling of Discrete Fracture Networks – Rolf Ackermann et al., Beicip..... 28

TW0516_2 Awards Ceremony

There were no keynote speeches as such, although AAPG president Pat Graffon offered a brief recap of the AAPG's activity during the last year. The AAPG now has 32,000 members, one third international. Membership is down from the boom years of the 1980s, but the number of committees is up! Challenges facing the industry today include a workforce shortage and increasing production from unconventional resources. To help in this, the AAPG has a 'strategic plan' – to 'advance the science and profession of earth science worldwide'.

TW0516_2.1 Sidney Powers Award – Ken Glennie, Shell.



Glennie

Sidney Powers awardee, Ken Glennie (ex-Shell), author of the definitive Petroleum Geology of the North Sea gave an entertaining account of early work with Shell, investigating an apparent association between oil in Oman and nearby outcrops of oceanic basalts – which turned out to be tectonic serendipity. Declining a posting back to the UK in 1972, Glennie was banned from promotion for life, reflecting the 'autocratic times' of the day. Glennie became an educator, within Shell and outside—with publications on the petroleum geology of NW Europe, the desert of SW Arabia and most recently of the southern North Sea's Permian basin.

TW0516_3 Geology/Modeling and Interpretation Sessions

TW0516_3.1 Seismic Geomorphology – Henry Posamentier et al., Anadarko

Posamentier presented a fireworks display of seismic geomorphology leveraging VoxelGeo, StratiMagic and image processing with ER Mapper. Seismic geomorphology has undergone a revolution – moving from the 2D internal reflection mapping of the past to 3D seismic volume interpretation. By changing cube transparency, fluviatile patterns or carbonate patch reefs are revealed. A video of the Alaskan shelf showed stupendous imagery of sedimentary structures like crevasse splays, revealed by changing vertical relief and illumination angle. Such techniques can also identify 'FLT's, funny looking things—a 'technical term'. Quantitative seismic geomorphology leverages geoprocessing with ESRI tools, to study channel sinuosity and center line mapping for automated channel counts.

TW0516_3.2 Reservoir Evaluation Time Reduction – Lester Landis, ExxonMobil

Lester Landis presented the E&P equivalent of 'Extreme Programming,' Reservoir Evaluation Time Reduction (RETR). This has produced a 'step change' in cycle time reduction for reservoir evaluation 'without compromising interpretation quality'. Key enablers are Schlumberger's Petrel and Exxon's EPSIM and Power simulators. The idea is simple—build a simple model quickly and then refine it. EPSIM builds a

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