SKUA-GOCAD UGM - Abstracts and Speaker Biographies

Case Study #1: "Uncertainty Reduction in Fracture Characterization Using Dynamic Data"

Presenter: Carlos Collantes, DWEP Appraisal Modeler - Chevron North America, E&P

Abstract:
Earth models are perfect until they are flow simulated. Fracture characterizations are no different. The Mcelroy AD team uses streamline simulation and recycling to gradually improve matrix and fracture characterization using 400+ wells and 90+ years of production history. The objective is to test drilling patterns in the field and optimize water injection.

Biography:
Carlos Collantes graduated as an Electrical Engineer in 1996, and received his MSc in Geophysics from the IFP School in Paris in 1997. Carlos performed exploration with Repsol in Libya for three years, and discovered Earth Modeling and Geostatistics while working for Earth Decision Sciences. For the last seven years, Carlos has been dealing with earth models at Chevron, both onshore and offshore, domestic and internationally. Carlos does not know much geology, but he has seen many outcrops.

Case Study #2: “3D Structural Model Building for Refined Geothermal Field Development and Induced Seismicity Mitigation, the Geysers, Northern California”

Presenter: Craig Hartline, Senior Geophysicist – Calpine Corporation

Abstract:
The Geysers is the largest complex of geothermal power plants in the world, providing 18% of California’s renewable electricity generation. Calpine Corporation, the largest geothermal power producer in the United States, owns and operates 15 of 18 power plants at The Geysers, with a net generating capacity of about 725 megawatts of electricity - enough to power 725,000 homes, or a city the size of San Francisco.

Sustainable power generation at The Geysers is possible due to two large-scale wastewater injection projects providing approximately 20 million gallons of reclaimed water per day for “free-fall” water injection into The Geysers’ vapor-dominated (steam) reservoir. However, the water injection required to sustain The Geysers’ reservoir is also responsible for induced seismicity at The Geysers. Primarily, cool water contacts hot rock and reactivates fractures (thermal contraction). Secondarily, modest pressure increases also reactivate fractures. This presentation will (1) provide a brief overview of Calpine Corporation’s geothermal operations at The Geysers, (2) discuss induced seismicity analysis utilizing Paradigm SKUA-GOCAD™ software, and (3) discuss the 3D structural model building efforts at The Geysers, also utilizing SKUA-GOCAD software.

Biography:
Craig Hartline is a geophysicist who joined Calpine Corporation in October 2010 after nearly 20 years with Phillips Petroleum/ConocoPhillips Corporation. His main duties at Phillips/ConocoPhillips included 3D seismic acquisition design, 3D seismic imaging/interpretation and multi-component
(3D4C) seismic research, in offices in Bartlesville, Oklahoma, Houston, Texas and Stavanger, Norway. Since joining Calpine Corporation at The Geysers, Craig has been transitioning into a role that includes reservoir analysis, seismicity (analysis and outreach) and 3D model building and visualization. Craig has Bachelor and Master of Science degrees in Geophysics from The University of Akron (Ohio).

Case Study #3: “Using SKUA in Shell – GeoSigns”

**Presenter:** Elaine Babb, Senior Technical Software Development Lead, Shell Global Solutions

**Abstract:**
This presentation will examine how Shell Global Solutions currently uses SKUA in GeoSigns. Elaine will describe the structural modeling workflow and how SKUA fits in.

**Biography:**
Elaine Babb graduated with a Computer Science BS degree from the University of Missouri Rolla. She started working for Shell Oil Company right after college and has worked for different departments within Shell for the past 25 years. Elaine has been in her current assignment as one of the senior technical development leads for GeoSigns/nDI, Shell’s internal interpretation system, for 12 years.

Case Study #4: “Combining Interpretation with Modeling to Improve Subsurface Uncertainty Estimation”

**Presenter:** Damien Thenin, EMZED Exploration

**Abstract:**
Earth models are routinely used in the oil & gas industry to integrate multidisciplinary data for subsurface property predictions. While most earth models predict reasonably well at the field scale, they often fail to accurately predict the subsurface conditions at a specific location, especially in geologically complex reservoirs. Earth models can become more predictive by integrating information routinely extracted from 3D seismic, such as faults, stratigraphy, facies and rock properties. But their integration into earth models is often done without accounting for their uncertainties, potentially leading to mis-prediction of the subsurface properties.

The aim of this presentation is to review several seismic interpretation techniques that provide useful input to better constrain earth models, and to suggest ways to account for the interpretation uncertainty in these models. Examples are used to discuss pitfalls and practical solutions for a successful quantitative seismic interpretation that can lead to more predictive earth models.

**Biography:**
Damien Thenin holds an MSc in Engineering and Earth Sciences from the Nancy School of Geology, France, where he specialized in Petroleum Geology and worked with the GOCAD Research Group. He has 12 years of international and domestic experience working as a geoscientist in the oil & gas and mining industries. He is a recognized expert in 3D geological modelling and has numerous publications in the field.

Damien commenced his career as geomodeling consultant with Earth Decision in 2003 in Dubai, and in 2005 was nominated for Best Consultant by Saudi Aramco. He came to Canada in 2005 and grew Earth Decision Canada operations from zero base to profit in 12 months. He has consulted with RPS Energy for several major, national and independent oil companies from his home base in Canada, working on a variety of conventional and unconventional resource plays in North America, South America, Middle East, Asia and Africa. In recent years, he developed an intimate knowledge of Alberta’s oil sands and is now a recognized expert in this area. He specializes in the estimation and characterization of oil & gas
resources and their associated uncertainties, and helps E&P companies increase their exploration and development success rates by identifying new or bypassed hydrocarbon prospects.

In June 2014 he founded EMZED Exploration with Tony Wain. EMZED uses probabilistic methods for oil & gas exploration and is currently involved in projects in Central America, Indonesia and the U.S.

**Case Study #5: "Modeling a Complex Structure for Static Volume Assessment"**

**Presenter:** Anne Dutranois Coumont, ETC Earth Modeling R&D

**Abstract:**
This is a workflow presentation of a service job performed by ETC, featuring a complex structural environment. The SKUA technology was used to obtain a proper representation of the many Y faults that were interpreted and include them in the structural model, grid the model, and compute static properties. This presentation concludes with feedback about the SKUA tools.

**Biography:**
Anne received her master’s degree in the Nancy School of Geology. She has 10 years of experience in the industry. She started working for Earth Decision (GOCAD support and testing), then moved on to product management for SKUA at Paradigm. Three years ago, Anne joined Chevron – ETC (the service company), where she is part of the Earth Modeling R&D team coordinating the work around SKUA. Anne was also the SKUA-GOCAD strategist in charge of coordinating the team effort to deploy the solutions to Chevron users.


**Presenter:** Gervais Perron, Director, Software Solutions - Mira Geoscience Ltd.

**Abstract:**
Alternative geophysical methods to complement seismic programs are sometimes required to assist with exploration and even reservoir monitoring work. This is especially true with Controlled Source Electromagnetics surveys (CSEM). Designed to identify zones of “resistive” rocks often associated with oil and gas traps, CSEM surveys can be a valuable asset in reducing ambiguity associated with possible drill targets identified through seismic imaging alone. Prior to CSEM acquisition, service companies and/or producers will propose to conduct detectability studies and survey designs. Unfortunately, software tools to conduct those studies are often proprietary to service companies or not well integrated with existing E&P platforms.

Over the past 7 years, Mira Geoscience has worked with both oil & gas producers and service companies to develop comprehensive and intuitive software for non-seismic (with focus on electromagnetic) geophysical methods geared at detectability and survey design studies as a plug-in to the SKUA-GOCAD framework. The approach allows the rapid construction of models composed of existing faults and horizons and/or a suite of parametric bodies. The plug-in also allows users to derive geometrical and/or rock property offspring from the “base model”, create or edit grids, and export to a dedicated file format for geophysical forward modelling. Built as a SKUA-GOCAD workflow, the Geophysical Model Builder plug-in is delivered with the proper tools for QCQA, knowledge transfer and “as you go” report building.

**Biography:**
Gervais Perron is Director of Software Solutions at Mira Geoscience. He graduated from École Polytechnique de Montréal with a B.Eng in geological engineering in 1993, and with an M.Sc.A. from the same school in 1996, working on reflection seismology applied to mineral exploration. After his
studies, he spent 5 years as a research associate at the Geological Survey of Canada in Ottawa working on different hard rock seismic projects. For the past 15 years, Gervais has been with Mira Geoscience, where he has held different jobs leading to his current position. His interests are 3D model-based multi-disciplinary data integration projects and related software design and implementation.