

## GeoConvention 2022

Monday, Jun 20: Exhibit Hall E

03:30 PM - 04:30 PM

### Opening Remarks and Keynote

Exhibit Hall E

**Michael Rose**

President, CEO and Chairman, Tourmaline

Tuesday, Jun 21: Glen 201-204

08:25 AM - 12:40 PM

### A symposium in honour of Gerard V. Middleton

Session Chairs: Andrew Miall and Robert Dalrymple and Janok Bhattacharya with an introduction by John Southard

Glen 201-204

**Andrew Miall**

Professor Emeritus, University of Toronto

**Bill Arnott**

Professor, University of Ottawa

**Dale Leckie**

Brokenpoplars

**Daniel Bell**

Dr, University of Calgary

**Guy Plint**

Dr., University of Western Ontario

**Janok Bhattacharya**

Susan Cunningham Research Chair in Geology, McMaster University

**Rebecca Englert**

University of Calgary

**Robert Dalrymple**

Emeritus Professor, Queen's University

Session Chairs: Andrew Miall and Robert Dalrymple and Janok Bhattacharya

Tuesday, Jun 21: Glen 201-204

08:25 AM - 08:35 AM

## Gerard V. Middleton Introduction and Opening Remarks

Hosted by John Southard

Glen 201-204

Tuesday, Jun 21: Telus 104-105

08:35 AM - 09:00 AM

## Multi-Lateral Horizontal Well with Dual-Tubing System for Improving CO2 Storage Security and Reducing CCS Cost

Telus 104-105

**Min Kim**

Dr., Ewha Womans University

This study proposes a multi-lateral horizontal well with a dual-tubing (MLHW-DT) system to improve CO2 storage security and reduce the cost of carbon capture and storage (CCS). In this work, the proposed MLHW-DT system is designed to implement the concept of the re-injection of produced brine for improving CO2 storage security while supplementing the shortcomings of the conventional brine production system by reducing the CCS cost. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 201-204

08:35 AM - 09:00 AM

## Gerard Middleton, fractals, and the "frozen accidents" model of stratigraphy

Glen 201-204

**Andrew Miall**

Professor Emeritus, University of Toronto

How Gerard's Middleton's interest in geological processes stimulated the development of modern stratigraphy and sedimentology. This paper focuses on the fractal-like nature of the state of preservation of the sedimentary record. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

08:35 AM - 09:00 AM

## Experimental processing of physical modeling data from circular arrays

Telus 106

**David Henley**

Research Geophysicist, CREWES, Univ of Calgary

This physical modeling research aims to adapt seismic acquisition and processing techniques to the medical ultrasound environment by exploring the use of transmitted signals to create an estimate of the shape and location of an object immersed in water and probed using a circular array of sources and receivers. We use the concept of projected shadows, which are summed to yield a rudimentary image of the object as a starting point for FWI using backscattered signals from the same circular acquisition setup. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

08:35 AM - 09:00 AM

## Linking the micro-indentation test results of Montney siltstone to its mineralogical composition

Telus 101-102

**Wenbo Zheng**

Assistant Professor, University of Northern British Columbia

Rock mechanical properties are important input parameters for designing drilling and hydraulic fracturing horizontal wells to recover unconventional hydrocarbons from tight formations. Tight reservoir rocks are heterogeneous in nature, and their mineralogical composition can change significantly along depths and laterally for a tight formation, which affects their rock mechanical properties. While traditional expensive compressional tests on standard-sized rock samples can provide bulk rock mechanical parameters, but little insights on its relationship to mineralogical composition at a micro-scale. Using siltstone samples from the Montney gas play as an example, this presentation aims to quantify the influence of rock mineralogical composition on ...

Tuesday, Jun 21: Glen 208-209

08:35 AM - 09:00 AM

## The Pandemic Shut-In: Reactivating Wells Shut-In in Spring 2020 - The Impact on 10-Year Forecast and EUR Outlook: A Duvernay Oil Case Study

Glen 208-209

**Alex Renaud**

Senior Engineering Advisor, geoLOGIC systems Ltd.

The COVID-19 pandemic forced Canadian oil and gas operators to cut crude oil production by almost 1 MMb/d in the first half of 2020 due to low oil prices driven by reduced demand. When these wells were reactivated, was their 10-year forecast and EUR outlook impacted? If so, did the way the wells were operated upon reactivation, completed, or even drilled, play a part? This paper will investigate these questions and more in a regional case study of unconventional Duvernay oil production in western Canada using public data and a fully automated, physio-statistical, predictive analytical production forecasting tool. Click Here for ...

Tuesday, Jun 21: Glen 205

08:35 AM - 09:00 AM

## Mesoproterozoic Source Rock Reservoirs - Insights from the Kyalla Formation in the Northern Territory, Australia

Glen 205

**Nisael Solano**

University of Calgary

The Northern Territory in north-central Australia is host to several Mesoproterozoic fine-grained siliciclastic sequences with the potential to be source rock hydrocarbon reservoirs. Among these, the Velkerri (1320-1349 Ma) and Kyalla (1313±47 Ma) formations from the Roper Group in the Beetaloo Sub-Basin are currently under appraisal by local operators. The most recent activity includes successful testing of organic-rich mudstone sections using multi-fractured horizontal wells; these tests yielded average gas rates of 1.15 and 1.5 mmscf/day from the Velkerri and Kyalla formations, respectively. As part of an exploration program in the area, a 45m length drill core was recovered from the ...

Tuesday, Jun 21: Glen 208-209

08:35 AM - 11:50 AM

## Duvernay

Session Chairs: Mahbub Alam and Zied Ouled Ameer

Glen 208-209

**Alex Renaud**

Senior Engineering Advisor, geoLOGIC systems ltd.

**Guido Garcia Rodriguez**

Characterization of natural fractures of the Upper Devonian Duvernay Formation in the Kaybob Area, AB, University of Alberta

**Hui Li**

University of Alberta

**Jennifer Yermiy**

Liability Management Specialist, CNRL

**Ryan Wilson**

Chevron

**Tim Leshchyshyn**

FracKnowledge

Session Chairs: Mahbub Alam and Zied Ouled Ameer

Tuesday, Jun 21: Telus 106

08:35 AM - 11:50 AM

## Seismic Processing part 1

Session Chairs: Amsalu Anagaw and Bill Goodway

Telus 106

**Alejandro Quiaro Sandoval**

SAIG, University of Alberta

**David Henley**

Research Geophysicist, CREWES, Univ of Calgary

**Juefu Wang**

Primary GeoServices Ltd.

**Kevin Hall**

CREWES/University of Calgary

**Luping Qu**

ucalgary (CREWES)

**Stewart Trickett**

President, Juniper Bay Software

Session Chairs: Amsalu Anagaw and Bill Goodway

Tuesday, Jun 21: Glen 206

08:35 AM - 11:50 AM

## Back to the Basics: Geophysics

Session Chairs: Dennis Ellison and Nathan Fester

Glen 206

**Bill Goodway**

Scientific Advisor Quantitative Interpretation and AVO Technology, Qeye Labs

**Dennis Ellison**

Principal Consultant - QSI, Emerson E&P

**Gregory Partyka**

OpenGeoSolutions Inc.

**Lee Hunt**

Subsurface Advisor, Carbon Alpha

**Michael Hons**

5D Integrated Inc

**Mike Law**

Junior Geophysicist, DMT Geosciences Ltd

Session Chairs: Dennis Ellison and Nathan Fester

Tuesday, Jun 21: Telus 101-102

08:35 AM - 09:50 AM

## Applications of Geomechanics in Western Canada

Session Chairs: Amy Fox and Jason Tucker

Telus 101-102

**Doug Bearinger**

Completion Geoscience

**Wenbo Zheng**

Assistant Professor, University of Northern British Columbia

**Wenjing Wang**

PhD Candidate, Purdue University

Session Chairs: Amy Fox and Jason Tucker

Tuesday, Jun 21: Telus 101-102

08:35 AM - 09:50 AM

## Petrophysics

Session Chairs: Nasir Rahim

Telus 101-102

**Leon Fedenczuk**

Analytical Consultant, Gambit Consulting Ltd.

**Qi Hu**

**Stephanie Perry**

Petrophysicist, Intertek (Westport Laboratory)

Session Chairs: Nasir Rahim

Tuesday, Jun 21: Telus 104-105

08:35 AM - 11:50 AM

## Carbon Capture, Utilization and Storage

Session Chairs: Marie Macquet and Brendan Kolkman-Quinn

Telus 104-105

**Brendan Kolkman-Quinn**

Geophysicist, CREWES, University of Calgary

**Elena Konstantinovskaya**

Associate Director, Integrated Petroleum Geosciences, University of Alberta

**Faisal Khan**

Senior Reservoir Engineer, Alberta Energy Regulator

**Joanna Cooper**

University of Calgary

**Min Kim**

Dr., Ewha Womans University

**Ninoska Amundaray**

M.Sc. Student, University of Calgary-CREWES

Session Chairs: Marie Macquet and Brendan Kolkman-Quinn

Tuesday, Jun 21: Glen 205

08:35 AM - 11:50 AM

## International Case Studies and Exploration

Session Chairs: Nanna Eliuk and Patricia Gavotti

Glen 205

**Graham Bain**

Enverus

**Luz Rodriguez**

Senior Staff Geologist, Canacol Energy LTD

**Nisael Solano**

University of Calgary

**Patricia Gavotti**

Sr. Geophysicist, Canacol Energy

**Tako Koning**

Senior Geologist, Independent Geological Consultant

**Tim Leshchyshyn**

FracKnowledge

Session Chairs: Nanna Eliuk and Patricia Gavotti

Tuesday, Jun 21: Telus 111 - Colab

08:35 AM - 11:00 AM

## Managing Transition in a Changing Industry

Session Chairs: Karena Brawley and Carrie Youzwishen

Telus 111 - Colab

**Carrie Youzwishen**

Resilience in the face of Career Curveballs, CY Coaching

**Erin Thorp**

Founder / Leadership Development Coach, ELF Solutions Inc.

**Karena Brawley**

Mindset and High Performance Coach & Geophysicist, Amulet Coaching & Amulet Exploration Ltd.

**Zachary Novak**

Session Chairs: Karena Brawley and Carrie Youzwishen

Tuesday, Jun 21: Telus 111 - Colab

08:35 AM - 09:00 AM

## Managing Corporate Stress and Uncertainty for Leaders and Individuals

Telus 111 - Colab

**Carrie Youzwishen**

Resilience in the face of Career Curveballs, CY Coaching

Career curveballs are shocking surprises in your career where you lose confidence, momentum and direction. Bouncing back from these require resilience and courage. Come hear what myself and my clients have learned in the journey! [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

08:35 AM - 09:00 AM

## Fresnel zones: What is in a seismic trace?

Glen 206

**Michael Hons**

5D Integrated Inc

Seismic source-receiver pairs produce a single trace that contains a wealth of subsurface information, but also significant ambiguity in subsurface features within reflection and transmission Fresnel zones that can create an identical trace. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

09:00 AM - 09:25 AM

## The Complete Bakken History of Refracs and Re-completes in the North Dakota: Determining Detailed Type of Refrac and Incremental Production

Glen 205

**Tim Leshchyshyn**

FracKnowledge

Refracturing is a practice to re-use and re-vitalize production without drilling a new well or abandoning a horizontal well before it is needed because the refracturing is tougher. The uncertainty is higher on refracturing and the industry experience is light. This study highlights the experience from a major play in the USA, the Bakken in North Dakota. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 104-105

09:00 AM - 09:25 AM

## 3D geomechanical modeling and reservoir simulation for safe CO2 storage in the Becancour area (Gentilly Block), Quebec

Telus 104-105

**Elena Konstantinovskaya**

Associate Director, Integrated Petroleum Geosciences, University of Alberta

The application of numerical models of CO2 injection and storage in sandstone reservoirs is particularly important in relatively tight and naturally fractured sandstones, as it is the case of the Potsdam sandstones of the St. Lawrence Platform, Quebec. A 3D coupled reservoir-geomechanical modeling and CO2 injection reservoir simulations are conducted targeting deep (2.3-2.5 km bsl) saline aquifer of Cambrian-Lower Ordovician Potsdam sandstone in the Becancour area (Gentilly Block) to predict CO2 injectivity, evaluate ranges of safe injection pressure, and minimize the risk of top and bottom seal failure and fault shear slip reactivation. It is shown that safe CO2 injection ...



Tuesday, Jun 21: Glen 201-204

09:00 AM - 09:25 AM

## Stratigraphic Emmental - Finding the Holes

Glen 201-204

**Guy Plint**

Dr., University of Western Ontario

Detailed subsurface and outcrop correlation of mid-Cretaceous, mudstone-dominated successions in the Western Canada Foreland Basin has revealed an abundance of stratigraphic hiatuses. Stratigraphic gaps can span from as little as 10 kyr to > 1 myr. Beveling erosion surfaces reflect flexural subsidence and uplift on length scales of 500-1000 km over 0.5 to 1 myr. Some biostratigraphically- and isotopically-constrained hiatuses can be correlated across the Atlantic and imply eustatic control, probably involving ~ 10-20 m of sea-level change. Extra-basinal clasts on hiatal surfaces imply lowstand emergence and fluvial supply of conglomerate. In rare cases, the gravelly feeder channel can be ...

Tuesday, Jun 21: Telus 101-102

09:00 AM - 09:25 AM

## Complete Hydraulic Fracture Modeling of the Full Montney

Telus 101-102

**Doug Bearinger**

Completion Geoscience

The Montney of northeast British Columbia, Canada (NEBC) presents some challenges to hydraulic fracture modeling. Planar Hydraulic (induced) Fracture models do not account for most of the fluid pumped. This casts doubt on their ability to assess optimal well spacing, stratigraphic positioning, induced seismicity and wellbore deformation. Fracturing surveillance measurements show that fluid enters fault and fold structures, through fractures and bedding planes. A Discrete Fracture Network (DFN) tool (FracMan®) was used to trace where the fracturing fluid goes, using a comprehensive model of discontinuities in a well described geomechanical model within a well constrained stress field. Both vertical and ...

Tuesday, Jun 21: Glen 208-209

09:00 AM - 09:25 AM

## Characterization of natural fractures of the Upper Devonian Duvernay Formation in the Kaybob Area, Alberta

Glen 208-209

**Guido Garcia Rodriguez**

Characterization of natural fractures of the Upper Devonian Duvernay Formation in the Kaybob Area, AB, University of Alberta

Natural fractures (NFs) in a shale reservoir tend to interact with hydraulic fractures (HFs) resulting in the development of complex fracture network that allows enhanced fluid conductivity and controls the efficiency of well treatment. The analysis of NFs may help to predict vertical and lateral propagation of HFs and optimize HF. The main objective of this research project is to study natural fractures in the Upper Devonian Duvernay Formation and integrate these data with lithofacies and mechanical properties of the mudrocks. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

09:00 AM - 09:25 AM

## Near Surface Resistivity Imaging: The Basics, Advantages, Pitfalls, Limitations, and Advances

Glen 206

**Mike Law**

Junior Geophysicist, DMT Geosciences Ltd

Resistivity imaging is a commonly used method for near surface geophysics, particularly in applications to engineering and environmental work. In this presentation, we will go over the basic principles of such methods, compare different resistivity methods to each other, and summarize all the advantages, pitfalls, limitations, and current advances that are associated with these methods. As well, resistivity methods will be compared with other standard geophysical methods to show where they can be complementary, and where they can be advantageous. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

09:00 AM - 09:25 AM

## Estimation of helical fibre pitch angle and trace spacing from DAS data

Telus 106

**Kevin Hall**

CREWES/University of Calgary

This work shows results from recent research in estimating the trace spacing of a fibre-optic seismic dataset, given the existence of co-located seismic data with known a trace spacing (fibre-optic, geophone, or accelerometer) to facilitate dataset registration. We are also able to estimate the pitch angle for data acquired using helically wound optical fibre cables for comparison with the nominal pitch angle provided by the cable manufacturer. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 111 - Colab

09:00 AM - 09:25 AM

## Beyond "Self-Help": Psycho-Cybernetic Science for the Skeptic in Times of Change

Telus 111 - Colab

**Karena Brawley**

Mindset and High Performance Coach & Geophysicist, Amulet Coaching & Amulet Exploration Ltd.

With the personal development industry continuing to grow there is no shortage of "self-help" and coaching to guide those going through transition and change, or simply looking for more in life. The challenge is finding methods and approaches that work for the long term. This presentation will teach you the principals of psycho-cybernetics and how to apply them such that you can meet transition and uncertainty with resilience, adapt to change successfully. The methodologies taught will provide reliable neuro-science based tools that make positive change stick for the long term. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

09:25 AM - 09:50 AM

## Weakness plane controlled breakouts: examples and analyses from a deep borehole in a tilted anisotropic formation

Telus 101-102

**Wenjing Wang**

PhD Candidate, Purdue University

We provide ultrasonic image log examples of foliation-controlled breakouts from a portion of a vertical wellbore drilled deep into the cratonic basement in NE Alberta. The average breakout azimuth is N100°E: about 40° rotated from the general expected NE-SW compression. The breakout failure patterns appear as opposing crescent moon shapes. The azimuths of the peaks and troughs of these breakouts correlate with the orientation of the metamorphic foliations. We used a recently developed program EASAFail to model the breakout failure pattern around the wellbore by taking the slippage failure into account. The model demonstrates that the observed breakout orientations at ...

Tuesday, Jun 21: Glen 205

09:25 AM - 09:50 AM

## Aguas Vivas Field - A significant new gas discovery "hidden" for over 70 years of exploration history in the Lower Magdalena Valley Basin, Colombia.

Glen 205

**Patricia Gavotti**

Sr. Geophysicist, Canacol Energy

Detailed seismic interpretation coupled with the use of AVO attributes led to the discovery of the Aguas Vivas gas field in the Lower Magdalena Valley Basin, Colombia. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

09:25 AM - 09:50 AM

## Noise attenuation by 4D greedy Radon transform

Telus 106

**Juefu Wang**

Primary GeoServices Ltd.

I present a noise attenuation method using a frequency domain 4D greedy Radon transform that simulates local seismic data with limited number of dips in three directions. The three directions correspond to CDP-x, CDP-y and offset for 3D data. The optimal solution is computed by a greedy approach. Particularly events with larger amplitude are solved earlier than those with smaller amplitude. A real data example shows that the algorithm can effectively suppress random noise and preserve signal. It can also reduce high-dip linear noise because only a limited number of moveout parameters are used in the inversion. Due to the ...

Tuesday, Jun 21: Glen 201-204

09:25 AM - 09:50 AM

## Searching for reservoir analogs: integrating field work and theory in paleohydrology and scaling estimates

Glen 201-204

**Janok Bhattacharya**

Susan Cunningham Research Chair in Geology, McMaster University

Finding appropriate modern or outcrop analogs to ancient subsurface reservoirs requires both qualitative interpretations of the overall environments as well as a quantitative understanding of scales and magnitudes of formative processes, architecture and facies, as well climatic and tectonic settings. This presentation discusses the search for outcrop analogs of the coarse-grained fluvio-deltaic, Permo-Triassic Prudhoe Bay Field in Alaska and the evaluation of the fluvio-deltaic Cretaceous Ferron Sandstone and the Jurassic Morrison distributive fluvial system, both in Utah. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 104-105

09:25 AM - 09:50 AM

## Reanalysis of CO2 storage resources in Alberta

Telus 104-105

**Joanna Cooper**

University of Calgary

We are undertaking a regional reanalysis of CO2 storage resources in the Western Canada Sedimentary Basin, with an initial focus on Alberta. This reanalysis includes storage options such as CO2 enhanced oil recovery, depleted oil and gas reservoirs, and saline aquifers, with the goal of identifying the most prospective regions and options for storage. The ability to compare different storage options requires consistency in the methodology used to assess the storage potential, including factors related to capacity, containment, and injectivity. Once consistent resource assessments are made, different layers representing regulatory, economic, risk, and other factors can be combined to identify ...

Tuesday, Jun 21: Glen 206

09:25 AM - 09:50 AM

## The Learning Before Machine Learning

Glen 206

**Lee Hunt**

Subsurface Advisor, Carbon Alpha

This talk will cover elements of fundamental data analysis techniques such as correlation, statistical measures of significance and basic statistics. We will do this with some very simple datasets and involve the audience interactively (but in non-terrifying ways). One of the barriers to competence has always been fear of taking that first step, of learning the fundamentals. This talk will help us take that step and initiate the learning process. This is the learning before the machine learning, and it is best done a step at a time. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 208-209

09:25 AM - 09:50 AM

## **Depositional Environment and Sedimentary Facies of the Duvernay-Ireton Unconventional system: Developing a predictable mechanical facies framework**

Glen 208-209

**Ryan Wilson**  
Chevron

Workflow developed to upscale geomechanical properties through linkage of facies associations within a predictable depositional and sequence stratigraphic framework. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 111 - Colab

09:25 AM - 09:50 AM

## **Tactical Empathy: The Competitive Edge in High Performing Teams**

Telus 111 - Colab

**Erin Thorp**  
Founder / Leadership Development Coach, ELF Solutions Inc.

Empathy is the ability to connect with your workforce without trying to fix, blame or minimize the experience and is the competitive edge most leaders are missing. Individuals, teams and workplace cultures value empathy; yet leaders demonstrated skills are not measuring up. Leadership demands empathy in various situations and must often be put into practice when emotions are high, pressure is mounting, and stress is palpable. It is in these very moments that our empathy abilities determine our impact as a leader. In this session, Erin Thorp, speaker and author of Inside Out Empathy, will explore the superpower of empathy when building, ...

Tuesday, Jun 21

10:00 AM - 10:10 AM

## **Weakness plane controlled breakouts: examples and analyses from a deep borehole in a tilted anisotropic formation**

Poster Board 1

**Wenjing Wang**  
PhD Candidate, Purdue University

Poster Board 1 The average breakout azimuth is N100°E: about 40° rotated from the general expected NE-SW compression. The breakout failure patterns appear as opposing crescent moon shapes. The azimuths of the peaks and troughs of these breakouts correlate with the orientation of the metamorphic foliations. We used a recently developed program EASAFail to model the breakout failure pattern around the wellbore by taking the slippage failure into account. The model demonstrates that the observed breakout orientations at N100°E are consistent with the expected NE-SW compression when the textured anisotropic strength of foliation planes are included. This work highlights that ...

Tuesday, Jun 21

10:00 AM - 10:10 AM

## **Multi-Lateral Horizontal Well with Dual-Tubing System for Improving CO2 Storage Security and Reducing CCS Cost**

Poster Board 13

**Min Kim**

Dr., Ewha Womans University

Poster Board 13 This study proposes a multi-lateral horizontal well with a dual-tubing (MLHW-DT) system to improve CO2 storage security and reduce the cost of carbon capture and storage (CCS). In this work, the proposed MLHW-DT system is designed to implement the concept of the re-injection of produced brine for improving CO2 storage security while supplementing the shortcomings of the conventional brine production system by reducing the CCS cost. Click Here for the Full Abstract

Tuesday, Jun 21

10:00 AM - 10:10 AM

## **Cretaceous cyclostratigraphy and prominent unconformities of the Jeza-Qamar Basin, southern Oman**

Poster Board 43

**Osman Salad Hersi**

University of Regina

Poster Board 43 The stratigraphic succession of the Jeza-Qamar Basin in southern Oman (Dhofar Region) is filled by Cretaceous rocks that include, in an ascending order, Qishn, Kharfot, Dhalqut, Samhan and Sharwayn formations. The stratigraphic column is punctuated by extensive unconformities that correlate with coeval hiatuses in other parts of the Arabian Peninsula. Five of such unconformities are recognized and include (1) pre-Qishn, (2) Qishn-Kharfot, (3) Dhalqut-Samhan, (4) Samhan-Sharwayn and (5) Sharwayn-Umm er Radhuma (Tertiary) unconformities. The erosional vacuities generated by these unconformities reach different depths although the cuts of different unconformities may get combined and thus remove significant portions ...

Tuesday, Jun 21

10:00 AM - 10:10 AM

## **Sedimentologic properties of a siliciclastic depositional system: The Black Island Member of the Late Ordovician Winnipeg Formation, Southeastern Saskatchewan**

Poster Board 52

**Naveed Iqbal**

University of Regina

Poster Board 52 The Winnipeg Formation is a Late Ordovician siliciclastic unit that occurs in the SE subsurface of Saskatchewan. Deposition of the formation took place in the northeastern shelf of the sub-circular intracratonic Williston Basin. The formation consists of two members in the study area: a lower sandstone-dominated Black Island and an upper shale-dominated Icebox member. The lower member constitutes a good hydrocarbon reservoir in Saskatchewan and the neighboring state of South Dakota. Sedimentologic data from cores drilled in SE Saskatchewan and their wireline curves, petrographic data have been collected and analyzed. This study investigates lithologic attributes, lithostratigraphic architecture, petrographic properties, and depositional environment of the Black Island ...

Tuesday, Jun 21

10:00 AM - 10:10 AM

## **A pseudo-3D MT inversion with deep learning and its application to the Mount Meager geothermal area, British Columbia**

Poster Board 55

**Xiaojun Liu**

Physical Scientist, Geological Survey of Canada

Poster Board 55 Inversion of magnetotelluric (MT) data is the process of retrieving the subsurface resistivity structure from surface measured electric and magnetic fields. The computation time of 3D MT inversion is long, even with HPC. In recent years, an alternative technique utilizing artificial neural networks has emerged to predict subsurface physical properties. We propose a pseudo 3D inversion algorithm within a convolutional neural network (CNN) framework to realize the connection between resistivity model and MT response. The sensitivity of the MT response to a conductor at different locations was compared. During model training, 50,000 resistivity models were generated, and ...

Tuesday, Jun 21

10:10 AM - 10:20 AM

## **Overpressure detection in the Beaufort-Mackenzie Basin, northern Canada, using an integrated approach**

Poster Board 2

**Kezhen Hu**

Petrophysicist, Geological Survey of Canada

Poster Board 2 This study focuses on overpressure detection in the Beaufort-Mackenzie Basin by employing an integrated approach that combines geophysical, drilling, and well testing data from petroleum exploration wells. It not only presents detailed documentation of the large comprehensive datasets and refined interpretations for the top of the overpressure zone in exploration wells, but it also presents stratigraphic frameworks to illustrate the distributions of the detected overpressure along schematic stratigraphic cross sections throughout the basin. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

10:10 AM - 10:20 AM

## **Accuracy and temporal resolution of attenuation estimation from DAS VSP at CaMI Field Research Station, Alberta**

Poster Board 14

**Yichuan Wang**

University of Calgary

Poster Board 14 For seismic monitoring injected CO<sub>2</sub> during geologic CO<sub>2</sub> sequestration, it is useful to measure seismic attenuation. However, due to finite extents and limited sampling in the time-frequency plane, there are always strong limitations on the attainable measurement accuracy. We have used an approach for measuring attenuation by iteratively identifying a sparse set of the strongest reflections in the seismic trace and stacking their waveforms. It is data-driven and applied to the DAS VSP dataset from the CaMI Field Research Station (FRS) in Newell County, Alberta, Canada. We evaluated the errors of estimated attenuation coefficients and shown their ...

Tuesday, Jun 21

10:10 AM - 10:20 AM

## **Amplitude-encoding acoustic FWI using different bases**

Poster Board 30

**He Liu**

University of Calgary

Poster Board 30 Full waveform inversion (FWI) is a promising tool to estimate high-resolution velocity models, but it suffers from expensive data acquisition and processing costs. To overcome these challenges, FWI using super-shot or blended data with source-encoding strategies have been proposed to accelerate FWI process. In previous work, we have presented the synthetic examples using amplitude-encoding strategy with Hartley and cosine bases. In both static- and dynamic-encoding experiments, amplitude-encoding strategy shows great performance and the latter one requires less number of super-shots. In this follow-up work, we further adopt sine and random polarity bases as the encoding functions. With ...

Tuesday, Jun 21

10:10 AM - 10:20 AM

## **Dry Holes Analysis Leads To Exploration: Assessment Steps to Determine the Major Reason of Failure in Prospects**

Poster Board 44

**Muhammad Akram**

Manager Exploration, Oil and Gas Development Company Limited, Islamabad, Pakistan

Poster Board 44 The search for hydrocarbons in wildcat and developed zones needs a comprehensive evaluation of petroleum system elements to reduce the risk in this big investment. The dry wells (wells could not produce hydrocarbons) either exploratory or development is a common phenomenon across the worldwide sedimentary basins for hydrocarbon exploration. The investigation techniques that change failure to success for well and block is another step of research in the heading of "DRY HOLE ANALYSIS (DHA)". This analysis can lead to success in the dry well or dry blocks if thoroughly examine the petroleum system on the basis of ...

Tuesday, Jun 21

10:10 AM - 10:20 AM

## **Building On a Strong Foundation: Progress on the 2027 Geological Atlas of the Western Canada Sedimentary Basin**

Poster Board 53

**Simon Haynes**

Atlas Steering Committee

Poster Board 53 This talk will provide an overview and update the project status for the Geological Atlas of the Western Canada Sedimentary Basin, which will be formally published in 2027 ("Atlas 2027"). New work will expand on the stratigraphy described in the 1994 edition, and provide additional information on topics such as; pore space resources, including hydrogen, helium, lithium, carbon capture storage, and groundwater. This edition will also aim to leverage modern online and interactive digital platforms to improve the access to the chapters and associated 2D and 3D data products. [Click Here for the Full Abstract](#)



**Tuesday, Jun 21**

**10:10 AM - 10:20 AM**

## **Learning the elastic wave equation with Fourier Neural Operators**

Poster Board 56

**Tianze Zhang**

Poster Board 56 Neural operators are extensions of neural networks which in supervised training learn how to map complex relationships, such as classes of PDE. Recent literature reports efforts to develop one type of these, the Fourier Neural Operator (FNO) such that it learns to create relatively general solutions to PDEs such as the Navier-Stokes equation. In this study, we seek what we believe is the first numerical instance of a Fourier Neural Operator (FNO) be trained to learn the elastic wave equation from a synthetic training data set. FNO attempts to find a manifold for elastic wave propagation. The ...

**Tuesday, Jun 21**

**10:20 AM - 10:30 AM**

## **Tectonic Strain Mapping Study in the Montney Formation**

Poster Board 3

**Tim Leshchyshyn**  
FracKnowledge

Poster Board 3 Tectonic strain has a large impact on fracture modeling and production optimization, and this is often overlooked. As always the petrophysicist is the key to the team to translate all geoscience to the engineering team, that allows the strain to be relayed back to the geoscience team. This study using 832 wells highlights the importance of the production expectation accuracy and its impact to field development at any commodity price. [Click Here for the Full Abstract](#)

**Tuesday, Jun 21**

**10:20 AM - 10:30 AM**

## **CO2 Fracturing Fluids Substituting N2 to Meet Net Zero Carbon Emissions**

Poster Board 15

**Tim Leshchyshyn**  
FracKnowledge

Poster Board 15 CO2 fracturing, whether 100% or high quality, will play a major role in meeting net zero carbon targets, while maximizing the production of our reservoirs and water disposal wells. Substituting N2 with CO2 in fracturing has geological, production and economic advantages. [Click Here for the Full Abstract](#)

**Tuesday, Jun 21**

**10:20 AM - 10:30 AM**

## **Application of amplitude-encoding strategy to elastic full waveform inversion**

Poster Board 29

**He Liu**  
University of Calgary

Poster Board 29 Elastic full waveform inversion (EFWI) is a powerful tool to characterize the underground P- and S-wave velocity profiles by matching the synthetic and observed waveform data, which requires super expensive data acquisition and processing costs. We have presented the synthetic examples of acoustic FWI using amplitude-encoding strategy, which requires much less calculation effort and provides inversion results with ignorable crosstalk noises. In this work, we further apply this strategy to EFWI using cosine basis, which provides comparable inversion results with conventional method with half reduced calculation time. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

10:20 AM - 10:30 AM

## Virtual Petrophysical Laboratory - Part 3 Erosion Simulation in Porous Media

Poster Board 45

**Leon Fedenczuk**

Analytical Consultant, Gambit Consulting Ltd.

Poster Board 45 This paper presents an erosion simulation in a computer based petrophysical laboratory of porous media done directly in 3D space. It is the first step in modeling simultaneous erosion and deposition in synthetic rock samples. The foundation of the system was presented in the first two papers<sup>1,2</sup> during Geoconvention 2020 and 2021. These two previous papers presented modeling and visualization of rock samples followed by estimating the total porosity, effective porosity, tortuosity, and resistivity. Erosion is simulated in our virtual laboratory by dynamic modification of the solid parts of the model along established flow paths that connect ...

Tuesday, Jun 21

10:20 AM - 10:30 AM

## Digitization of Raster Logs: A Deep Learning Application

Poster Board 57

**Tannistha Maiti**

DeepKapha

Poster Board 57 Many raster logs with well log data have been generated over the years. To revisit and study the well data experts need to read these old raster logs. This process is both erroneous and tedious. To digitize these raster logs and efficiently use it in conventional as well as unconventional analysis one needs to buy a costly digitizer which is manual and time-consuming task. To address this issue, we automate this process using deep learning. We use attention layer in an encoder-decoder architecture. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

10:35 AM - 11:00 AM

## Rock physics analysis of CaMI.FRS well-log data

Telus 101-102

**Qi Hu**

We present a rock physics workflow based on the soft-sand model to convert reservoir properties (e.g., porosity, lithology, fluid saturation, and pressure) to seismic elastic attributes (e.g., velocity, density, and modulus) at the CaMI Field Research Station, Alberta, Canada. The soft-sand model is selected based on the geological setting of the study region and its visible fit to the well-log data. We use this model to predict the missing sections of velocity and density logs. The results show a good agreement with the local geology. We further carry out sensitivity studies using a directed Monte-Carlo method for the estimation of ...

Tuesday, Jun 21: Glen 201-204

10:35 AM - 11:00 AM

## On the murky, viscous world of planar-stratified sediment - the what, and possible how

Glen 201-204

**Bill Arnott**

Professor, University of Ottawa

Planar-stratified sediment consisting of rhythmically alternating sub-millimeter to centimetre thick layers of well-sorted, clay-poor and poorly sorted, clay-rich sediment is arguably the most common physical sedimentary structure in the combined modern and ancient sedimentary records. This presentation will describe in detail the textural make-up of these sediment, and provide a possible physical mechanism to explain its origin. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

10:35 AM - 11:00 AM

## The Use and Abuse of AVO: Value, Analysis, Errors and Pitfalls

Glen 206

**Bill Goodway**

Scientific Advisor Quantitative Interpretation and AVO Technology, Qeye Labs

AVO might be considered the "holy grail" in the use of seismic data to remotely describe the subsurface in all its geological complexity of lithology, porosity, rock fabric, fluids, pore pressure and stress. As with any scientific method that claims to be a "theory of everything" there are practical approximations and assumptions that must be satisfied, along with pitfalls to be avoided, in order to achieve the promise of AVO's superior reservoir characterization ability. This paper provides some practical considerations in the use and abuse of methods that underlie the application of AVO. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

10:35 AM - 11:00 AM

## Assessing the Viability and Footprint of Six Underappreciated Secondary Intervals in the Permian Basin

Glen 205

**Graham Bain**

Enverus

What secondary intervals in the Permian show promising economics and development? How do these intervals compare to the most-targeted intervals in the basin, and where are the lowest risk opportunities? [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

10:35 AM - 11:00 AM

## Reducing the influence of remnant noises on FWI by modifying the misfit function

Telus 106

**Luping Qu**  
ucalgary (CREWES)

In this study, we try to minimize the influence of remnant noises in the observing data by modifying the misfit function. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 208-209

10:35 AM - 11:00 AM

## Clay composition and diagenesis in the organic-rich Upper Devonian Duvernay Shale, Western Canadian Sedimentary Basin

Glen 208-209

**Hui Li**  
University of Alberta

In mudstones, mixed-layer clays, in which illite and smectite are interstratified at a crystallographic scale, are common components. The conversion from smectite to illite influences reservoir and geomechanical properties of the mudstone and nearby formation. The classic model for smectite to illite conversion suggests that the proportion of illite in mixed layer I/S increases from less than 20% (1850m and shallower) to about 80% (3700m and deeper). However, clay compositions in the Duvernay Formation shows different characteristics. From 1100 to 4000 m in Duvernay Formation, even in the shallowest samples, highly illite-rich I-S mixed layer clays are dominant. It is still ...

Tuesday, Jun 21: Telus 104-105

10:35 AM - 11:00 AM

## Alberta Energy Regulator Directive 065 Changes for CO2 Sequestration and CO2 EOR-Storage Applications

Telus 104-105

**Faisal Khan**  
Senior Reservoir Engineer, Alberta Energy Regulator

The Alberta Energy Regulator (AER) has updated the conservation and disposal units of Directive 065 Resources Applications for Oil and Gas Reservoirs are designed to ensure CO2 is safely contained within the applied for storage formation. The AER has new applications types for Carbon Capture Utilization and Storage Directive 065 scheme approvals. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 111 - Colab

10:35 AM - 11:00 AM

## Evolving Your Career Into A Digital Future

Telus 111 - Colab

**Zachary Novak**

I don't have a paper. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 208-209

11:00 AM - 11:25 AM

## Duvernay Best Practices Fracturing Study Including Chemical - Rock Interactions

Glen 208-209

**Tim Leshchyshyn**

FracKnowledge

As slickwater and hybrid slickwater fracturing has enabled unconventional fracturing in the Duvernay in combination with multistage fracturing technology has been tremendously successful, most wells are not optimized. The details of the fracturing chemistry design and its impact on the reservoir rock is often ignored and will be addressed in this study. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 201-204

11:00 AM - 11:25 AM

## Are Tidal Bores Analogous to High-density Sandy Gravity Flows?

Glen 201-204

**Robert Dalrymple**

Emeritus Professor, Queen's University

The deposits formed by tidal bores in the Salmon River estuary, Bay of Fundy, are described, and are shown to be analogous to the deposits of high-density, sandy turbidity currents. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

11:00 AM - 11:25 AM

## The Miocene Porquero Formation in the Lower Magdalena Valley basin of NW Colombia: from bypassed pay to four producing gas fields in 5 years.

Glen 205

**Luz Rodriguez**

Senior Staff Geologist, Canacol Energy LTD

The Miocene Porquero Formation in the Lower Magdalena Valley basin of NW Colombia: from bypassed pay to four producing gas fields in 5 years. The Miocene Porquero Formation in the Lower Magdalena Valley basin of NW Colombia is a thick marine shale that has historically been viewed as a regional top seal and potential source rock. There have been some gas shows and limited production in the adjacent Plato sub-basin, but sandstones within the thick shale in the San Jorge sub-basin found bypassed gas pay in sandstone in legacy and exploratory wells. This concept was proved in an existing well ...

Tuesday, Jun 21: Telus 104-105

11:00 AM - 11:25 AM

## Time-lapse VSP detection of a simulated shallow CO<sub>2</sub> leak at the CaMI Field Research Station

Telus 104-105

**Brendan Kolkman-Quinn**

Geophysicist, CREWES, University of Calgary

The Containment and Monitoring Institute operates a shallow CO<sub>2</sub> sequestration field experiment with a 300m deep reservoir of up to 10% porosity. A detection threshold of 33 t of CO<sub>2</sub> has been established with time-lapse VSP data. This required a time-lapse compliant workflow to be developed which produced directly comparable baseline and monitor amplitudes, avoiding the need for shaping filter cross-equalization. The workflow and detection threshold informs Measurement, Monitoring, and Verification capabilities of larger scale CO<sub>2</sub> sequestration operations, for both shallow leak detection and shallow CO<sub>2</sub> injection scenarios. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

11:00 AM - 11:25 AM

## Automatic SNR based rank estimator and its application for denoising.

Telus 106

**Alejandro Quiaro Sandoval**

SAIG, University of Alberta

This paper presents an approach for automatic rank determination based on a signal-to-noise ratio estimator. The signal-to-noise ratio estimator takes a matrix and calculates the ratio between the energy of the k-largest eigenvalues (associated with the desired signal) and the remaining eigenvalues (corresponding to the energy at "noise levels"). [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

11:00 AM - 11:25 AM

## Wedge Modelling and Waveform Classification for sub-resolution thickness estimation in the Marcellus

Glen 206

**Dennis Ellison**

Principal Consultant - QSI, Emerson E&P

TBD [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

11:00 AM - 11:25 AM

## A Comparison of Hydrocarbon Mobility Understanding, Approaches and Applied Workflows

Telus 101-102

Remote Presentation

**Stephanie Perry**

Petrophysicist, Intertek (Westport Laboratory)

The innovation and advancement of open hole wireline tools as well as laboratory methodology has led the petrophysical discipline to techniques and approaches that can access the mobile versus immobile fractions of both the water and hydrocarbon filled pore volume. Techniques and approaches to the quantify vary from applied nuclear magnetic resonance cut-off methodology to programmed pyrolysis understanding and hydrocarbon light versus heavy fraction corrections. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

11:25 AM - 12:15 PM

## Virtual Petrophysical Laboratory - Part 3 Erosion Simulation in Porous Media

Telus 101-102

**Leon Fedenczuk**

Analytical Consultant, Gambit Consulting Ltd.

This paper presents an erosion simulation in a computer based petrophysical laboratory of porous media done directly in 3D space. It is the first step in modeling simultaneous erosion and deposition in synthetic rock samples. The foundation of the system was presented in the first two papers<sup>1,2</sup> during Geoconvention 2020 and 2021. These two previous papers presented modeling and visualization of rock samples followed by estimating the total porosity, effective porosity, tortuosity, and resistivity. Erosion is simulated in our virtual laboratory by dynamic modification of the solid parts of the model along established flow paths that connect two opposite model ...

Tuesday, Jun 21: Glen 205

11:25 AM - 11:50 AM

## Exploring in China for Oil and Gas in Fractured and Weathered Basement Reservoirs

Glen 205

**Tako Koning**

Senior Geologist, Independent Geological Consultant

China is a major producer of oil and gas. Very little technical data has been published on China's oil and gas fields. This presentation is based on an intensive study by the author on the limited data available on China's basement oil and gas fields. Due to China's surging demand for oil and gas, these fields are of great economic and strategic importance for China. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 104-105

11:25 AM - 11:50 AM

## Elastic full waveform inversion for time-lapse analysis of a CO2 injection at CaMI.FRS using synthetic VSP

Telus 104-105

**Ninoska Amundaray**

M.Sc. Student, University of Calgary-CREWES

Full waveform inversion (FWI) is investigated as an assessment tool to image elastic variations in a clastic reservoir due to the effects of a carbon dioxide (CO2) injection at the Containment and Monitoring Institute Field Research Station (CaMI.FRS). Three injection stages are modeled and compared using a vertical seismic profiles (VSP) as acquisition design for synthetic data. Two elastic parameterizations to describe the subsurface and two inversion strategies on how to use multi-component data were tested. Inverted models converged towards the true solution with variations associated on how the inversion was framed. Changes at the reservoir level were constrained laterally ...

Tuesday, Jun 21: Glen 201-204

11:25 AM - 11:50 AM

## Linking knickpoint morphodynamic processes to the stratigraphic products of modern and ancient submarine channels

Glen 201-204

**Daniel Bell**

Dr, University of Calgary

The growth of barforms are primary controls on fluvial channel evolution and links sedimentary processes to the rock record. Despite their planform similarity to rivers, outcrop and core observations of submarine channel fills show the rock record is dominated by cut-and-fill packages rather than laterally accreting barforms, thus our understanding of their morphodynamic controls is limited. To address this, we compare outcrops of the Tres Pasos Fm., Chile, to deposits within the Bute Inlet submarine channel, B.C. Channel evolution in Bute Inlet is dominated by upstream migrating knickpoints which produce upstream erosion, and downstream deposition. Repeat bathymetric surveys illustrate that ...

Tuesday, Jun 21: Glen 206

11:25 AM - 11:50 AM

## Objective Seismic Insight

Glen 206

**Gregory Partyka**

OpenGeoSolutions Inc.

Data growth associated with seismic inversion and characterization can easily overwhelm end users. Painless data access, presentation, and visualization are just as important to the act of interpretation, as the content itself. To maximize interpretational insight that seismic can provide, requires: (1) targeted processing (i.e. careful and comprehensive inversion and attribute decomposition), and (2) comprehensive real-time visualization that avoids problems associated with data access and navigation through the solution space. Both aspects are equally important. The targeted processing, reveals the breadth of geological details that are embedded within the seismic signal. The comprehensive real-time visualization makes it easy to explore the ...



Tuesday, Jun 21: Telus 106

11:25 AM - 11:50 AM

## Shaping the Vibroseis first arrival

Telus 106

**Stewart Trickett**

President, Juniper Bay Software

Vibroseis first arrivals are often ringy and noisy, making it difficult to pick a consistent feature for weathering correction. Even when a consistent feature is picked, it's not clear where the true first-arrival time is relative to it. I describe a novel shaping filter that removes the ringiness and focuses the first-arrival energy into a single strong peak, making it less likely to be submerged by noise. Further, this peak is at the true first-arrival time. The result is better picks and more accurate weathering statics. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 208-209

11:25 AM - 11:50 AM

## The Role of Geoscience in Liability Management

Glen 208-209

**Jennifer Yermiy**

Liability Management Specialist, CNRL

With the shift from growth to sustainable development models, there is an opportunity to review best practices in order to meet new demands of investors, Governments, regulatory bodies and stakeholders. We are now asked to maintain production levels, not grow them, while reducing carbon emissions and inactive liability. Rather than focus on "asset development plans" we must consider "Life-Cycle Management". This means from the moment a Geoscientist conceives of a drilling or recompletion opportunity, it is best to consider its carrying costs and surface footprint that will ultimately need to be reclaimed. Most importantly, from a geoscience standpoint, to consider ...

Tuesday, Jun 21: Glen 201-204

11:50 AM - 12:15 PM

## Flow processes and bed-scale characteristics associated with a fault-controlled intraslope fan deposit, Tres Pasos Formation, Chile

Glen 201-204

**Rebecca Englert**

University of Calgary

Sandy intraslope fans form where local changes in gradient and confinement generate accommodation for deposition and represent attractive hydrocarbon reservoir targets in many basins around the world. However, relatively few examples of intraslope fans have been identified in outcrop and, as a result, the flow dynamics and depositional processes that result in these slope accumulations remain poorly constrained. We examine an exceptional outcrop at El Chingue Bluff in Chilean Patagonia, which reveals an oblique depositional-dip perspective of a fault-bound intraslope fan deposit along its entire depositional length. We conduct a bed-scale investigation using classic field methods and UAV-sfm DOM to ...

Tuesday, Jun 21: Glen 201-204

12:15 PM - 12:40 PM

## Sedimentology and Geotourism - A Tribute to Gerry Middleton

Glen 201-204

**Dale Leckie**

Brokenpoplars

Gerry Middleton had a passion for "synthesizing information and passing that knowledge to others" (Dalrymple and Bhattacharya, 2021). It was because of the training that I received from Gerry Middleton and his colleague Roger Walker that I took the career path that I did. After great stints at the Geological Survey of Canada and then in the Canadian energy industry, I now write geotourism books. The goal of these books is to synthesize the geology of landscapes and pass that information to the general public, such that they can understand and appreciate how earth surface processes create spectacular mountain and ...

Tuesday, Jun 21: Glen 208-209

01:25 PM - 01:50 PM

## Local optimization approaches for simultaneous AVO inversion based on re-parameterized Zoeppritz equations

Glen 208-209

**Mariana Lume**

CREWES, University of Calgary

Linearized AVO inversion methods, such as the weighted stacking, are based on approximations of the Zoeppritz equations subject to several assumptions, including the limitation of incidence angles to 35-40°. Thus, in long-offset seismic acquisitions these approaches fail. In this project, we focused on developing a nonlinear inversion appropriate for these circumstances, modifying the Zoeppritz equations in terms of the fractional density and compressional and shear impedances and considering synthetic P-P and P-S datasets with different noise and frequency content. Overall, three different local optimization algorithms, under a good initial model, demonstrated a superior performance respect to the simultaneous weighted stacking, ...

Tuesday, Jun 21: Glen 206

01:25 PM - 01:50 PM

## Snapshots of the Canadian Foothills: Gliding with Style and Detachment into a Wedge

Glen 206

**Daniel Lebel**

Director General, Geological Survey of Canada / NRCan

The author will summarise findings, and lessons learned from his career spanning some 40 years, from early beginnings mapping foreland thrust and fold belts of the Quebec Appalachians, then moving on to the Canadian Rocky Mountains Foothills and Front Ranges thrust belt. The author had also the further privilege over the last 20 years to lead the Geological Survey of Canada and shape scientific and policy objectives, [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

01:25 PM - 01:50 PM

## Tu Deh-Kah Geothermal - Technical Update

Telus 101-102

**Jamie Capot-Blanc**

Project Coordinator, Tu Deh-Kah Geothermal

Two wells were drilled in the summer of 2021 to the Precambrian basement at Clarke Lake Field, Fort Nelson, B.C., Canada to investigate the geothermal reservoir potential. The first well, C-87-I, is designated as an injection well and the second well, C-A87-I a production well for a flow test that will circulate formation water to the surface and back into the formation. A full suite of logs was run for each well to correlate porous and fractured zones within the Precambrian and Devonian carbonates that include the Granite Wash, Chinchaga, Lower Keg River, Upper Keg River, Sulphur Point and Slave ...

Tuesday, Jun 21: Glen 201-204

01:25 PM - 01:50 PM

## The Evolution of Montney Development

Glen 201-204

**Chris Podetz**

Canadian Discovery Ltd.

An outline of changes and challenges to Montney development since its origins as a conventional shoreface sandstone play in the 1960s to its position today as Canada's top unconventional play. Their association with advances in drilling and completion technology, as well as new geological interpretations and concepts will also be discussed. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 111 - Colab

01:25 PM - 01:50 PM

## Waste Fluid Disposal vs. Oil and Gas Production in Western Canada - Compare and Contrast: Drilling, Completions, Regulations and Reservoirs

Telus 111 - Colab

**Kim Kingsmith**

President, K D Kingsmith Resource Consultants

Western Canadian waste fluid disposal and hydrocarbon production go hand in hand. But there are significant differences in the two relating to drilling, completing, evaluating wells, regulations and reservoir parameter requirements. A compare and contrast between production and disposal will be discussed. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 104-105

01:25 PM - 01:50 PM

## Western Canada - How to Become a World Leader in CCUS

Telus 104-105

**Chase Gilbert**

Geologist, McDaniel and Associates Consultants

Western Canada is already a world leader in CCUS due to our technical expertise, geological suitability, and legal, regulatory, and policy frameworks, which have enabled the safe and successful operation of numerous projects to date. Strengthened climate goals, increased investment incentives, and public perceptions have led to a dramatic increase in momentum for CCUS in Canada over the recent past that will further establish our place as a global leader. Technology will play an increasingly important role in Canada's net-zero 2050 ambitions and will deliver emission reduction solutions for a range of hard-to-abate industries. Furthermore, as the carbon sequestration industry ...

Tuesday, Jun 21: Telus 106

01:25 PM - 01:50 PM

## Model-driven Deep Learning Nonstationary Seismic Reflectivity Inversion Method

Telus 106

**Hongling Chen**

University of Alberta & Xi'an Jiaotong University

Nonstationary reflectivity inversion methods become more and more attractive, which can directly invert the reflectivity from the nonstationary field data to improve the resolution. However, the approach needs to pre-estimate the time-varying wavelets, design the regularization terms, and pre-determine the regularization parameters. In addition, the computational cost is generally expensive for the field application. To alleviate these limitations, we proposed a model-driven deep learning method to implement blind nonstationary deconvolution. We start from the alternating iterative algorithm to derive the iterative solutions of the blind deconvolution, and apply the convolutional neural networks to replace the gradient components. Then, a model-driven ...

Tuesday, Jun 21: Glen 205

01:25 PM - 01:50 PM

## Investigation of Potential Brine Plumes by Reinterpreting AEM Data using ERT and Borehole Constrained Inversions

Glen 205

**Landon Woods**

BGC Engineering Inc.

This case study used a 2016 RESOLVE airborne electromagnetic (AEM) data set, inverted using constraints from electrical resistivity tomography (ERT) and a Pierre Shale bedrock surface extracted from boreholes in order to investigate potential brine plumes. Results from this study emphasize the importance of AEM inversions constrained with comparatively high-resolution surface geophysical methods in order to triage potential brine plumes from clays deposited in a marine environment. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 104-105

01:25 PM - 03:45 PM

## Carbon Sequestration - What to expect beyond 2022

Session Chairs: Francis Morin and Marcia Coueslan

Telus 104-105

**Brendan McGowan**

**Chase Gilbert**

Geologist, McDaniel and Associates Consultants

**Diego Vazquez Anzola**

Pcpal. Carbon/GHG Storage consultant, Asia Pacific Energy Solutions

**Jeff Kler**

Technical Manager, Low Carbon Development, Enbridge Inc

**Kyle Reiling**

Executive Director, Greenview Industrial Gateway, MD of Greenview

**Nelson Molina Giraldo**

Fluid Domains Inc

Session Chairs: Francis Morin and Marcia Coueslan

Tuesday, Jun 21: Glen 208-209

01:25 PM - 04:35 PM

## Seismic Inversion for Reservoir Characterization

Session Chairs: Raúl Cova and Azer Mustaqeem

Glen 208-209

**Adriana Gordon**

Qeye

**Carl Reine**

Chief Geophysicist, Sound QI Solutions Ltd.

**Dennis Ellison**

Principal Consultant - QSI, Emerson E&P

**John Pendrel**

Product Strategy Manager, GeoSoftware

**Mariana Lume**

CREWES, University of Calgary

**Raul Cova**

Qeye

Session Chairs: Raúl Cova and Azer Mustaqeem

Tuesday, Jun 21: Glen 201-204

01:25 PM - 05:25 PM

## Montney

Session Chairs: Sochi Iwuoha and Bruce Palmer

Glen 201-204

**Andrew Kingston**

Geological Survey of Canada

**Chris Bird**

Geophysicist, ARC Resources

**Chris Podetz**

Canadian Discovery Ltd.

**Greg Baniak**

**Lindsay Dunn**

Dr, Athabasca Oil Corp

**Mantu Sihota**

Director, Geoscience, Pulse Seismic

**Naimeh Riaz**

University of Calgary

**Zahra Esmaeilzadeh**

PhD student, University of Calgary

Session Chairs: Sochi Iwuoha and Bruce Palmer

Tuesday, Jun 21: Telus 111 - Colab

01:25 PM - 02:40 PM

## Hydrodynamics: From Petroleum to Carbon Storage

Session Chairs: Allison Gibbs and Gavin Phinney

Telus 111 - Colab

**Allison Gibbs**

Senior Hydrodynamicist, Canadian Discovery Ltd.

**Richard Baker**

BRE group

**Xiaojun (Albert) Cui**

AGAT Laboratories

Session Chairs: Allison Gibbs and Gavin Phinney

Tuesday, Jun 21: Telus 106

01:25 PM - 04:10 PM

## Seismic Processing part 2

Session Chairs: Amsalu Anagaw and Bill Goodway

Telus 106

**Dawei Liu**

University of Alberta & Xi'an Jiaotong University

**Hongling Chen**

University of Alberta & Xi'an Jiaotong University

**Michael Lamoureux**

Faculty Professor, University of Calgary

**Shang Huang**

University of Calgary

**Yexin Liu**

SoftMirrors Ltd.

Session Chairs: Amsalu Anagaw and Bill Goodway

Tuesday, Jun 21: Telus 111 - Colab

01:25 PM - 02:40 PM

## Water Disposal

Session Chairs: Krista Beavis and Sarah Schultz

Telus 111 - Colab

**Kienan Marion**

PhD Student, University of Calgary

**Kim Kingsmith**

President, K D Kingsmith Resource Consultants

**Lonn Brown**

Mr., University of Alberta

Session Chairs: Krista Beavis and Sarah Schultz

Tuesday, Jun 21: Glen 205

01:25 PM - 04:35 PM

## Advances in Near-Surface Geophysics: Environmental and Engineering Applications

Session Chairs: Alastair McClymont and Susanne Ouellet

Glen 205

**Carlos Niño**

Universidad Industrial de Santander

**Ivan Sanchez-Galvis**

Universidad Industrial de Santander - University of Calgary (Visiting Student Researcher)

**Landon Woods**

BGC Engineering Inc.

**Mike Law**

Junior Geophysicist, DMT Geosciences Ltd

**Randy Brehm**

Senior Geophysicist, Nutrien Ltd.

**Thomas Coleman**

Silixa LLC

Session Chairs: Alastair McClymont and Susanne Ouellet

Tuesday, Jun 21: Telus 101-102

01:25 PM - 04:35 PM

## Geothermal: The Ultimate Renewable Energy Solution

Session Chairs: Robinson Olugbemiro and Catherine Hickson

Telus 101-102

**Alireza Rangriz Shokri**

Research Associate, University of Alberta

**Catherine Hickson**

Alberta No. 1

**Jamie Capot-Blanc**

Project Coordinator, Tu Deh-Kah Geothermal

**Jordan Brinsky**

Hydrogeologist, Alberta Geological Survey / Alberta Energy Regulator

**Philip Harms**

GEOSEIS Inc.

**Wanju Yuan**

Research Scientist, Geological Survey of Canada, Natural Resources Canada

Session Chairs: Robinson Olugbemiro and Catherine Hickson



Tuesday, Jun 21: Glen 206

01:25 PM - 04:10 PM

## Hydrocarbon Exploration in Fold and Thrust Belts, Where Style Still Matters

Session Chairs: Andrew Newson and Elena Konstantinovskaya and Thomas Kubli

Glen 206

### Andrew Newson

Senior Technical Consultant, Folded Thrust Geology Ltd

### Charles Berg

President, Resdip Systems

### Daniel Lebel

Director General, Geological Survey of Canada / NRCan

### Elena Konstantinovskaya

Associate Director, Integrated Petroleum Geosciences, University of Alberta

### Naimeh Riaz

University of Calgary

### Rob Vestrum

Structural Imager, Thrust Belt Imaging

Session Chairs: Andrew Newson and Elena Konstantinovskaya and Thomas Kubli

Tuesday, Jun 21: Telus 111 - Colab

01:50 PM - 02:15 PM

## Time-lapse monitoring of saltwater disposal in Kansas and Oklahoma using ambient noise

Telus 111 - Colab

### Lonn Brown

Mr., University of Alberta

The substantial rise of seismic activity observed in both Oklahoma and Kansas from 2012-2016 has been widely linked to the similar increase in downhole injection of wastewater which occurred during that time. Injection of fluids into the subsurface is typically related to the extraction of hydrocarbons, and this study investigates the feasibility of using interferometric methods to monitor these activities, with encouraging results so far. Injection increases pore pressure in the reservoir, which expands and affects surrounding elastic stresses. Models which seek to quantify this change are often poorly constrained, and so spatial measurements of the subsurface response would be ...

Tuesday, Jun 21: Glen 206

01:50 PM - 02:15 PM

## Multiduplex emplacement in the Cate Creek window, southern Canadian Rocky Mountains: interaction of erosion and tectonic underplating in thrust wedges with décollements based on 2D forward modeling

Glen 206

**Elena Konstantinovskaya**

Associate Director, Integrated Petroleum Geosciences, University of Alberta

Interaction between tectonic underplating and surface erosion in thrust wedges with multiple décollements may result in strain partitioning with the development of multiduplex antiformal stacking, strong uplift, and synchronous normal faulting within discrete areas. These processes are studied through 2D numerical simulations along a 115-km long 2D cross-section in the area of the Cate Creek window, southern Canadian Rocky Mountains. Shortening in a sedimentary succession with contrasting mechanical strength of the rocks results in strain partitioning in thrust wedges. Accretion mechanisms in thrust wedges with decollement layers: duplexing and underplating below a weak layer at the back of the wedge ...

Tuesday, Jun 21: Telus 106

01:50 PM - 02:15 PM

## Convolutional neural network-based reverse time migration with multiple energy

Telus 106

**Shang Huang**

University of Calgary

We proposed a method based on a convolutional neural network (CNN) in the reverse time migration with multiples (RTMM) that behaves like a filter applying the inverse of the Hessian in the least-squares reverse time migration (LSRTM) but with less computational cost. This approach can learn patterns that represent the relation between the reflectivity obtained through RTMM and the true reflectivity obtained from velocity models through a modified residual U-Net. Once trained this neural network (RTMM-CNN) can be used to improve the quality of migrated images. Click [Here](#) for the Full Abstract

Tuesday, Jun 21: Telus 101-102

01:50 PM - 02:15 PM

## Hybrid Energy Co-production of the Hydrocarbon and Geothermal Energy by Repurposing Horizontal Wells to Open-loop System in Horn River Basin, Canada

Telus 101-102

**Wanju Yuan**

Research Scientist, Geological Survey of Canada, Natural Resources Canada

Canada has pledged to reach Net-Zero emissions by 2050 since the last year. The clean energy transition from hydrocarbon energy to geothermal energy is a practical pathway for the oil and gas sector. This study treats different energy resources as a whole to test the hybrid energy co-production by repurposing horizontal wells to the open-loop geothermal system in Horn River Basin, Canada. Numerical simulations are conducted to analyze the feasibility of hybrid energy production. Click [Here](#) for the Full Abstract

Tuesday, Jun 21: Glen 208-209

01:50 PM - 02:15 PM

## Merge of two seismic AVO inversions: Montney example

Glen 208-209

**Adriana Gordon**

Qeye

A 3D simultaneous AVO inversion was carried out to help characterize the reservoir properties of the Montney Formation. This case study showcases seismic data challenges caused by surface conditions that significantly affected the quality of the seismic data. Given the large spatial variations in frequency and amplitudes observed in the seismic data, a different methodology was applied to overcome these challenges. It consisted of treating the quantitative interpretation study as two separate inversions. Each subarea was analyzed individually rather than hampering the quality of one side of the study to match the other one with substantial lower amplitudes and frequencies. ...

Tuesday, Jun 21: Glen 201-204

01:50 PM - 02:15 PM

## SEQUENCE STRATIGRAPHIC ARCHITECTURE AND RESERVOIR CHARACTERIZATION OF THE LOWER TRIASSIC MONTNEY FORMATION, NE BRITISH COLUMBIA

Glen 201-204

**Greg Baniak**

Using petrophysical logs, subsurface core, and biostratigraphic data as an underpinning, we subdivide the traditional Upper, Middle, and Lower Montney into higher resolution parasequence sets within a dataset in NE British Columbia. From this, we show the impact of using these parasequence sets on assessing reservoir quality. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

01:50 PM - 02:15 PM

## Mirror Mirror on the Floor: A Tale of Mirrored GPR Reflections in a Saskatchewan Potash Mine

Glen 205

**Randy Brehm**

Senior Geophysicist, Nutrien Ltd.

Low Frequency Ground Penetrating Radar (GPR) is routinely acquired at the Nutrien's Rocanville potash mine to guide the mining machines vertically when the ore zone is lost due to operational and/or anomalous geological conditions. GPR scans are acquired on the floor and on the ceiling of the mine rooms. The target beyond the ceiling is a clay seam at the base of the White Bear Member while the target in the floor is a thin Anhydrite seam labelled as the GPR Marker, roughly 23 meters apart. In a regional GPR study using a 100 MHz antenna, the horizon in the ...

Tuesday, Jun 21: Telus 104-105

01:50 PM - 02:15 PM

## Canadian CCUS Perspective

Telus 104-105

**Brendan McGowan**

Tuesday, Jun 21: Telus 104-105

02:15 PM - 02:40 PM

## Wabamun Carbon Hub - A Developers View

Telus 104-105

**Jeff Kler**

Technical Manager, Low Carbon Development, Enbridge Inc

Ever wonder what discussions happen on the other side of the door before a developer ever approaches the types of professionals present at this conventions - get a peek behind the thought and development process of The Open Access Wabamun Carbon Hub. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

02:15 PM - 02:40 PM

## Challenges in Seismic Imaging in Fold and Thrust Belts

Glen 206

**Rob Vestrum**

Structural Imager, Thrust Belt Imaging

This presentation develops the themes presented in Chapter 2 of the AAPG publication, Andean Structural Styles: A Seismic Atlas, and presented at the AAPG ICE 2022, using data examples from the foothills of the Canadian Rockies. Seismic data in foothills areas have unique challenges that break traditional seismic-imaging methods. Reducing exploration risk in these basins requires a workflow tailored to the geologic setting. The under-constrained nature of the seismic data requires tight integration with the structural geologist. Seismic imaging is a vital tool for mapping complex geologic structures. The method of imaging the Earth's subsurface with seismic waves is powerful, and ...

Tuesday, Jun 21: Telus 111 - Colab

02:15 PM - 02:40 PM

## A "Bad Moon Rising" in Rocky Mountain House - is brine disposal responsible for induced seismicity?

Telus 111 - Colab

**Kienan Marion**

PhD Student, University of Calgary

New evidence suggests recent seismicity (2013-present) in the Rocky Mountain House Seismogenic Zone is attributable to wastewater disposal, particularly after the disposal zone was changed from the Leduc Formation to the Wabamun Formation by the operator in 2013. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 201-204

02:15 PM - 02:40 PM

## **Not the monotony: An integrated sedimentological, sequence biostratigraphic approach to full field development planning. A case study from the Montney Formation, Placid Alberta Canada.**

Glen 201-204

**Lindsay Dunn**

Dr, Athabasca Oil Corp

A case study on how the application of sedimentologic and stratigraphic principles can drive field development planning and de-risking in the Alberta Montney liquids rich gas trend. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

02:15 PM - 02:40 PM

## **Using Shallow Geophysics for Enhanced Remediation Practices and Increased Collaboration Efforts**

Glen 205

**Mike Law**

Junior Geophysicist, DMT Geosciences Ltd

Geophysical investigations can be a powerful tool to explore the physical properties of the subsurface. In the planning stage of remediation and reclamation, geophysics provides valuable screening tools for borehole placement and site characterization. Electromagnetic surveys are commonly used screening methods to explore the terrain conductivity at a site of interest, but other methods, such as pseudo-3D resistivity imaging can provide high-value horizontal and vertical delineation at much greater depths. This presentation will highlight where collaborative efforts combined with advanced geophysical techniques have been used to enhance the remediation strategies at two decommissioned oil and gas sites in Southern Alberta. [Click ...](#)

Tuesday, Jun 21: Glen 208-209

02:15 PM - 02:40 PM

## **Fluid characterization using 4D Simultaneous AVO and rock physics inversion in SAGD operations**

Glen 208-209

**Raul Cova**

Qeye

Time lapse (4D) seismic is a well-established technology used to monitor production in oil and gas fields. Specifically, in SAGD operations where the consequences of injecting steam in conjunction with bitumen production cause some fluid replacements, temperature, pressure changes, and geomechanical effects into the reservoir. All these changes create strong time-lapse responses easily detectable on 4D seismic. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

02:15 PM - 02:40 PM

## Temperature Mapping of Select Devonian Formations in Alberta

Telus 101-102

**Jordan Brinsky**

Hydrogeologist, Alberta Geological Survey / Alberta Energy Regulator

This presentation provides the results and findings of a subsurface temperature mapping project conducted by the Alberta Geological Survey [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

02:15 PM - 02:40 PM

## Machine Learning-based Seismic Velocity Automatic Picking

Telus 106

**Yexin Liu**

SoftMirrors Ltd.

In this paper, we proposed the Machine Learning-based seismic velocity automatic picking workflows. The workflows involved the multi-cross correlations based on super-gathers instead of traditional semblance analysis, followed by fine-tuning the velocity using Machine Learning methods. After fine-tuning the velocity, the quadratic splines are used to detect and remove the bad picks without distorting its trend. The Machine Learning-based auto-pickings can mimic geophysicists to carry out every several CDP spacings or a 3D picking grid on the seismic dataset, and at each auto-picking point, the auto-pickings can pick the time-velocity pairs with every 100ms or other time samples. Several real data ...

Tuesday, Jun 21

02:45 PM - 02:55 PM

## Occurrence of structural features induced by compressional tectonics in the so-called "stable" region of western and southern Iraq: Implications for hydrocarbon potential of the under-explored Paleozoic succession of the region

Poster Board 4

**Osman Salad Hersi**

University of Regina

Poster Board 4 This study demonstrates that the under-explored western and southern regions [south of NW-SE-trending Abu Jir-Euphrates Active Fault Zone (AJ-EAFZ)] of Iraq have high hydrocarbon potential. This view is supported by existence of tectonically-induced anticlines and thick Paleozoic sedimentary succession. The latter includes Ordovician to Permian sandstones (Khabour, Suffi, Pirispiki, Kaista and Ga'ara), Devonian and Permian carbonates (Harur and Permian Chia Zairi, respectively) and shales (Ordovician Khabour, Silurian Akkas and Devonian Ora). The TOC of the shales ranges between 0.9% and 16.6%. These organic-rich shales are mature with high hydrocarbon generation potential. Juxtaposition of the mature shales, clastic ...

Tuesday, Jun 21

02:45 PM - 02:55 PM

## Reducing source wavelet non-repeatability for time-lapse shot gathers

Poster Board 16

**Xin Fu**

PhD student, University of Calgary

Poster Board 16 In time-lapse seismic applications, the signal produced by changes in the properties of subsurface rocks is generally obscured by noise associated with imperfect repeatability between surveys. A particularly important obstacle in the formation of time-lapse difference images is variation in the effective source wavelet between baseline and monitoring datasets. However, the partially separable influence of the wavelet within the Green's function model of seismic data permits two frequency-domain matching filters to be designed, which act to reduce source wavelet non-repeatability. One is based on the spectral ratio of the baseline and monitoring wavelets, and can be applied ...

Tuesday, Jun 21

02:45 PM - 02:55 PM

## Paleotopographic highs and incised valleys at the top of the Middle Ordovician Hawaz Formation, Murzuq Basin, SW Libya: New insights from high-resolution seismic attributes

Poster Board 39

**Aiman Ezzaroug**

Geoscientist, Akakus Oil, Libya

Poster Board 39 The study is focused on detecting the morphology of the irregular unconformable surface of the Middle Ordovician Hawaz Formation in the H Field of the Murzuq Basin, SW Libya. The surface is defined by paleohighs and intervening incised valleys filled by mudrocks of the Melaz Shuqran Formation. These mudrocks constitute stratigraphic barrier that separate the sandstone reservoirs of the Hawaz Fm. Seismic attribute analysis has been used to decipher the geomorphological features of the paleotopographic surface and the nature of the depression-filling facies. The seismic data illustrates that the top-Hawaz surface was carved by the Late Ordovician ...

Tuesday, Jun 21

02:45 PM - 02:55 PM

## Duvernay Best Practices Fracturing Study Including Chemical - Rock Interactions

Poster Board 46

**Tim Leshchyshyn**

FracKnowledge

Poster Board 46 As slickwater and hybrid slickwater fracturing has enabled unconventional fracturing in the Duvernay in combination with multistage fracturing technology has been tremendously successful, most wells are not optimized. The details of the fracturing chemistry design and its impact on the reservoir rock is often ignored and will be addressed in this study. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

02:45 PM - 02:55 PM

## **Partial stack seismic data used for AVO analysis and deep learning, a case study**

Poster Board 54

**Rongfeng Zhang**

Senior Geoscientist, Geomodeling Technology Corp.

Poster Board 54 The author studies the usage of partial stack data in traditional AVO analysis and deep learning. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

02:45 PM - 02:55 PM

## **Wabamun Carbon Hub - A Developers View**

Poster Board 67

**Jeff Kler**

Technical Manager, Low Carbon Development, Enbridge Inc

Poster Board 67 Ever wonder what discussions happen on the other side of the door before a developer ever approaches the types of professionals present at this conventions - get a peek behind the thought and development process of The Open Access Wabamun Carbon Hub. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

02:55 PM - 03:05 PM

## **Geostatistical Reservoir Modeling of Fimkassar Area, Upper Indus Basin, (A Case Study From The Potwar Plateau, Indian Plateau's Northwest Corner)**

Poster Board 5

**Ameer Zia**

Bahria University Islamabad

Poster Board 5 When it comes to entrapment and advancement of hydrocarbons, regions typified by collisional/compressional tectonics play a significant role. Collisional tectonic settings have resulted in the formation of faults, which are contributing to the trapping of hydrocarbons or the creation of channels for hydrocarbon migration. P. Mann Lisa Gahagan, 2003 investigated the tectonic settings of the world's 877 huge hydrocarbon fields and classified the tectonic settings of these giant fields into six categories: continental passive margins (304 fields), continental rifts (271 fields), collisional margins produced by terminal collision between two continents (173 fields), collisional margins produced by collision ...

Tuesday, Jun 21

02:55 PM - 03:05 PM

## **Precise Reservoir Characterization, Formation Evaluation and completion design using LWD High-Resolution Ultrasonic Imaging in North Kuwait Cretaceous Carbonate: Case Study**

Poster Board 40

**David Jesudian**

Senior Geologist, Kuwait Oil company

Poster Board 40 This paper provides insight into the successful application of innovative field development strategies to optimize production from Carbonate reservoir. It also highlights the advantage of acquiring high-resolution image in different mud system for identifying the zones of demonstrating production and reservoir characterization and Formation Evaluation. [Click Here for the Full Abstract](#)



Tuesday, Jun 21

02:55 PM - 03:05 PM

## **A Technical - Economic Comparison of Deep Saline Aquifers vs. Depleted Gas Reservoirs Factoring in Risk for CCUS Projects**

Poster Board 47

**Richard Baker**  
BRE group

Poster Board 47 The paper examines the critical subsurface risks for both Saline Aquifers (SA) and Depleted Gas Reservoir (DGR). Basin wide studies often quote that SA's have huge storage capacity vs. DGR's. That is correct, but ignores critical factors of reservoir continuity and large-scale permeability. The advantage of DGRs are that the capacity or volumetrics are well understood because of dynamic data but the risk of wellbore leakage is higher. The advantage of SA is that they have less well penetrations and thus lower leakage risk and possibly larger capacity. The optimum economic decision thus is a trade off ...

Tuesday, Jun 21

02:55 PM - 03:05 PM

## **Sudbury, a new theory of formation**

Poster Board 68

**Christopher Irvine**  
retired

Poster Board 68 A new theory has been developed to explain how planets and moons formed. This theory explains the gravitational stratification of the non-metals throughout geologic time. It leads to a new theory for the formation of the Sudbury Igneous Complex. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

02:55 PM - 03:05 PM

## **Acquisition duration of vibrator surveys using movement simulation**

Poster Board 74

**Stuart Bergen**  
Schlumberger

Poster Board 74 A method for estimating the acquisition duration of a vibrator survey is proposed. The method employs a movement simulation algorithm that can be used to model source production times and receiver deployment durations for an arbitrary shooting script. Source production times are estimated as the elapsed time it takes to traverse a shooting script using prescribed vibrator movement and cycle specifications. Receiver deployment durations necessary to realize the source production are calculated for each receiver which include their first, last, and elapsed usage times. Numerical examples focus on a multiblock survey that demonstrate trade-offs between source production ...

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **Exploiting of software application to overcome complex geological conditions while geosteering in Mungi Gas Field, Eastern Australia**

Poster Board 6

**VINICIUS BEAL**  
Business Development Manager, Adaga Solutions Ltd

Poster Board 6 In order to achieve a geosteering efficiency while drilling in thrust zone with low angle's reverse faults and deformed, the innovativesoftware applications which have the capability to simultaneously handle different geosteering scenarios with greater degree of certainty even with single GR measurements while remaining robust and easy to handle must be exploited by operational geologist. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **Prioritizing watershed basins for flood management based on morphometric features, case study: North Alborz, basins of Golandrood watershed**

Poster Board 37

**Saeid Zarghami**

Poster Board 37 Flooding process is one of the most complex and destructive natural disasters, which endanger the social and economic conditions of societies, more than any other natural disasters. Morphometric variables of basin, would be considered as some of factors which have an influence on flood initiating. This research is done with the aim of investigating flooding potential in sub-basins of Golandrood watershed, in the southern part of Rooyan district in Noor city in Mazandaran province, with a total area of 343.86 km<sup>2</sup>. This research also tries to prioritize watershed basins with the help of decision-making models. In order ...

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **The effect of morphogenic and geomorphic features on the identification of groundwater quality zones in Rey city, Tehran province**

Poster Board 38

**Seyed Sepehr Aarabi**

Poster Board 38 The city of Rey, located in Tehran province, is one of the most populous parts of the country and features a dry climate. In this study, the number of various groundwater contaminants for about 27 drinking and non-drinking water wells and the quality characteristics of the soil around the wells were investigated. Qualitative values were proportional and at the end, all data with morphogenic characteristics of landforms such as alluvial barracks, floodplain, debris area, headward erosion, etc. by multivariate and univariate tests were statistically evaluated. The results showed that the water parameters of wells in the central ...

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **An implicit neural representation for full waveform inversion**

Poster Board 28

**Tianze Zhang**

Poster Board 28 We introduce and analyze implicit full waveform inversion (IFWI), which uses a neural network to generate velocity models and perform full waveform inversion. IFWI has two main parts: a neural network that generates velocity models, and a recurrent neural network FWI to perform the inversion. IFWI is distinct from conventional waveform inversion in two key ways. First, it does not require an initial model as does conventional FWI. Instead, it requires general information about the target area, for instance means and standard deviations of medium properties in the target area, or alternatively well-log information in the target ...

**Tuesday, Jun 21**

**03:05 PM - 03:15 PM**

## **Time-lapse velocity changes during an open-pit mine slope failure**

Poster Board 34

**Tjaart de Wit**

Colorado School of Mines and Institute of Mine Seismology

Poster Board 34 Landslides are widespread geological events that directly impact thousands of people every year. Landslides are often triggered by extreme weather events or earthquakes. Increased extreme weather events are expected due to climate change, which will likely lead to greater occurrence of landslides. While many slope monitoring approaches focus on surface deformation (e.g. using radar), often by the time changes manifest at surface, it can be too late to provide adequate early warning. Seismic ambient noise correlation has been successfully applied in landslide monitoring to measure time-lapse velocity changes in the subsurface of a slope. Several cases of precursory

...

**Tuesday, Jun 21**

**03:05 PM - 03:15 PM**

## **Structural and Sequence Stratigraphic Analyses of Fuzzal Field, Niger Delta**

Poster Board 35

**TAofeek Ogunfolabo**

Poster Board 35 Stratigraphic and structural analyses of Orlawah field, Niger Delta were carried out with the aim of evaluating the hydrocarbon potential of the field. A suite of wireline logs and 3D seismic data were quality controlled and processed. Computation of petrophysical properties of reservoir units identified from log data (i.e porosity, permeability and volume of shale) from well-established equations was executed. Lithologic interpretation and hydrocarbon reservoir identification were carried out using gamma ray and resistivity log responses. Log sequence evaluation was done by the analysis of log amplitude and stacking patterns of facies succession. Identification and mapping of ...

**Tuesday, Jun 21**

**03:05 PM - 03:15 PM**

## **Exploring in China for Oil and Gas in Fractured and Weathered Basement Reservoirs**

Poster Board 36

**Tako Koning**

Senior Geologist, Independent Geological Consultant

Poster Board 36 China is a major producer of oil and gas. Very little technical data has been published on China's oil and gas fields. This presentation is based on an intensive study by the author on the limited data available on China's basement oil and gas fields. Due to China's surging demand for oil and gas, these fields are of great economic and strategic importance for China. [Click Here for the Full Abstract](#)

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **Ultraheavy oil deposition in Burgan reservoir: Comprehensive study on petroleum system process of origin mechanisms and possible development solution of Tarmat reservoirs in North Kuwait**

Poster Board 41

**David Jesudian**

Senior Geologist, Kuwait Oil company

Poster Board 41 This paper analysis the various precipitation mechanisms of heavy oil including low maturity, biodegradation, water / gas washing, gravitational segregation and reservoir pressure reduction. The study suggest assumption on its origin to help in predicting its occurrence in the field and viscosity profiles, coupling with baffle and compartmentalization occurrence that can justify sweet spot pick up and field development decisions. Appropriate environment friendly technology to be developed for exploitation of tar reservoirs as huge reserve of hydrocarbon is hidden with the tar beds [Click Here for the Full Abstract](#)

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **Unsupervised AI workflow to evaluate the transition of a 50-year giant gas field quickly and thoroughly to potential multiple CO2 storage and geothermal viable projects.**

Poster Board 48

**Bernard Laugier**

Senior Geophysical Advisor, Scolty Energy Consulting LLC-Seisnetics

Poster Board 48 Seismic data remain a pillar of subsurface modeling and the understanding of the potential for transitioning from oil and gas production to applications such as CO2 storage and geothermal projects. However, interpretation is a biased and time-consuming process forcing geoscientists to spend more energy picking horizons and building models than focusing their attention on evaluating the results. A new unsupervised Artificial Intelligence based on genetic algorithm to automatically process the seismic data in an unbiased way and record time was applied to the Groningen giant gas field depleted area, using data available online from the multiple seismic ...

Tuesday, Jun 21

03:05 PM - 03:15 PM

## **The Pan-Canadian Geoscience Strategy: Integration and Cooperation for Critical Minerals Exploration and Energy Transformation**

Poster Board 69

**Daniel Lebel**

Director General, Geological Survey of Canada / NRCan

Poster Board 69 The Pan-Canadian Geoscience Strategy (PGS) builds on existing collaborations and represents a renewed commitment to strong relationships for delivering new accessible geoscience data and knowledge for all Canadians. The need for this Strategy was identified in the Canadian Minerals and Metals Plan (2019), and agreed upon by Canada's Mines Ministers under the related Action Plan 2020. This presentation will outline the main priorities and their contribution to Energy Transformation and the supply of Critical Minerals toward this and other ends. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

03:20 PM - 03:45 PM

## **Abstract: A Fracture Analysis in the Quirk Creek "B" Sheet, S.W. Alberta, Canada**

Glen 206

**Charles Berg**

President, Resdip Systems

This is a fracture analysis, including density, height, length, and connectivity of fractures in the Rundle Group in Quirk Creek Field. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 111 - Colab

03:20 PM - 03:45 PM

## **Hydrodynamics and the Evaluation of CO2 Storage in Saline Aquifers**

Telus 111 - Colab

**Allison Gibbs**

Senior Hydrodynamicist, Canadian Discovery Ltd.

To be provided [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 201-204

03:20 PM - 03:45 PM

## **Multiple phases of diagenetic fluid flow and hydrocarbon migration in the Montney Formation: Fluid inclusion and stable isotope evidence**

Glen 201-204

**Andrew Kingston**

Geological Survey of Canada

We analyzed calcite-filled vertical fractures and brecciated horizons to assess the timing and origin of fluid flow and its implications for diagenetic history of the Montney Fm. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

03:20 PM - 03:45 PM

## **Geothermal Risk Mitigation through CO2 Storage**

Telus 101-102

**Alireza Rangriz Shokri**

Research Associate, University of Alberta

As a cost competitive zero-emission source of energy production, geothermal projects need to address the risks associated with exploration and early phase development. We present carbon sequestration as a value-added component of a geothermal project, reducing early phase exploration risk and stimulating more investment. By incorporation of carbon sequestration in geothermal projects, it is hoped that early and middle phase investment will be triggered to bring projects to successful commercial fruition. The research is focused on the challenges and issues revolving around co-injection or alternate injection of CO2 and brine in disposal wells or multiple completions of subsurface formations in ...

Tuesday, Jun 21: Glen 208-209

03:20 PM - 03:45 PM

## Facies-Driven Modelling of Reservoir Properties

Glen 208-209

**John Pendrel**

Product Strategy Manager, GeoSoftware

We examine how a knowledge of reservoir facies can be leveraged to gain an understanding of certain reservoir properties. The facies can come from an analysis of the outcomes of seismic inversions or from one of the recent facies-first approaches. The reservoir models are constructed then from the facies probability volumes and per-facies trends from logs or analogues. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

03:20 PM - 03:45 PM

## Advances in Distributed Fiber Optic Sensing for Autonomous, Real-time Monitoring of Dam Integrity

Glen 205

**Thomas Coleman**

Silixa LLC

This talk will describe the challenges associated with risk analysis in dam safety and explain the application of fiber optic distributed sensing for continuous monitoring of structure integrity and advance warning systems. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 106

03:20 PM - 03:45 PM

## Low tensor rank 5D seismic reconstruction via randomized parallel matrix

Telus 106

**Dawei Liu**

University of Alberta & Xi'an Jiaotong University

Five-dimensional seismic reconstruction can be characterized as a tensor completion problem. This problem involves reconstructing a low-rank tensor from a partially observed tensor. There are two powerful tensor networks that are capable of solving this problem: tensor train (TT) decomposition and tensor ring (TR) decomposition. As a practical matter, updating core tensors generates high computational costs. Different from explicitly updating core tensors, we propose two effective methods for exploiting low TT-rank and low TR-rank structures by employing different matrix unfoldings. Particularly, the former employs a well-balanced matricization scheme, while the latter utilizes a circular tensor unfolding. Additionally, we utilize randomized ...

Tuesday, Jun 21: Telus 104-105

03:20 PM - 03:45 PM

## Greenview Industrial Gateway

Telus 104-105

**Kyle Reiling**

Executive Director, Greenview Industrial Gateway, MD of Greenview

Tuesday, Jun 21: Glen 205

03:45 PM - 04:10 PM

## Converted Wave Travel Time Computation Using A Fast Marching Method And Level Set Interface Location

Glen 205

**Carlos Niño**

Universidad Industrial de Santander

A study is presented that allows defining a methodology for the calculation PS converted wave travel times, fundamental in construction of a PS wave tomography. PS conversion occurs on the modeled reflector with the Level Set function. In this paper, we want to adapt the methodology proposed in Rawlinson and Sambridge based on Fast Marching (RS-FMM), to have a fast eikonal, grid-based solver to compute converted wave times. We compared the travel times from RS-FMM with those calculated with a standard ray tracing technique that obeys Snell's law at each point of the reflector, where these points are determined by ...

Tuesday, Jun 21: Glen 201-204

03:45 PM - 04:10 PM

## Investigating Fault Sealing Effects on Induced Seismicity and Pore Pressure Distribution in NEBC

Glen 201-204

**Zahra Esmaeilzadeh**

PhD student, University of Calgary

This paper reviews Montney pore pressure data from Northeast of British Columbia, with the objective of reappraising pressure terrane boundaries and evaluating the relationship between fault structures, pressure terranes and induced seismicity. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 104-105

03:45 PM - 04:10 PM

## CO2 Geological Storage: Digital tools for Screening & Maturation of Marketable Volumes

Telus 104-105

Remote Presentation

**Diego Vazquez Anzola**

Pcpal. Carbon/GHG Storage consultant, Asia Pacific Energy Solutions

A user-friendly App has been developed to carry out assessments of suitable geological sites for permanent storage of CO2. Relevant criteria covering the full TECOP spectrum are incorporated. The App can be linked to a code that is used to quantify storage resources reliably and quickly, associated to a sensible notional development plan. This allows the highest chance of developing into a marketable Storage Capacity, through commercially viable storage development plans. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 206

03:45 PM - 04:10 PM

## Critical role of detecting fault structures in the induced seismicity risk analysis

Glen 206

**Naimeh Riazi**

University of Calgary

Prior knowledge of fault architecture tends to play an important role in the case of injection-induced seismicity and related risk and hazard analysis. In most cases, reactivated faults due to fluid injection are inferred by the spatial distribution of induced-seismicity hypocenters. The objective of this study is to combine precise event locations of induced seismicity during hydraulic fracturing with high-resolution 3-D seismic images, in order to investigate fault-system behavior. This case study is located in the foreland of the northern Canadian Rocky Mountains, where the complex architecture of the buried fault system is imaged by depth-migrated 3-D multicomponent seismic data, and ...

Tuesday, Jun 21: Telus 111 - Colab

03:45 PM - 04:10 PM

## CO2 Geological Storage Capacities: Consideration of Critical Parameters of Static and Dynamic Processes

Telus 111 - Colab

**Xiaojun (Albert) Cui**

AGAT Laboratories

This study demonstrates a simple and comprehensive workflow to quantify the contributions of different mechanisms to short- and long-term CO2 storage capacity and proposes a systematic way to understand the controlling effects of various parameters critical to static and dynamic processes governing short- and long-term CO2 geological storage potential. Overall, the approach and the results provide a useful guide for CO2 storage site study and capacity assessment. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Telus 101-102

03:45 PM - 04:10 PM

## Geothermal in Alberta - Creating a regulatory environment conducive to supporting the growth of a geothermal industry

Telus 101-102

**Catherine Hickson**

Alberta No. 1

In order to support the growth of a geothermal industry in Alberta the Government focused on creating a regulatory framework within which the province's geothermal resources could be developed. This regulatory framework was declared December 31, 2021 and the directives that govern the regulator are expected to be released in May 2022. The government states "This framework establishes a clear path forward for geothermal projects, while ensuring the resource is developed responsibly and in the best interest of Albertans." Although ABNo1 welcomes the certainty that a regulatory framework (and the attendant directives) brings, the legislation is not supportive of a ...



Tuesday, Jun 21: Glen 208-209

03:45 PM - 04:10 PM

## Modelling for interpreting the effects of thin beds on inverted elastic properties

Glen 208-209

**Carl Reine**

Chief Geophysicist, Sound QI Solutions Ltd.

From a seismic perspective, thin beds are those which cannot be resolved by separate reflections with non-interfering amplitudes. Even in thick formations, the presence of alternating sand-shale layers or coal beds introduces thin-bed considerations between a well-defined top and base reflection. However, despite the inability of these layers to be imaged properly, there is still information to be found by backing out how thin layers have changed the bulk properties of the overall seismic response, specifically for the elastic properties obtained through AVO inversion. I give examples from three scenarios where rock-physics modelling is used to extract useful reservoir information in ...

Tuesday, Jun 21: Telus 111 - Colab

04:10 PM - 04:35 PM

## A Technical - Economic Comparison of Deep Saline Aquifers vs. Depleted Gas Reservoirs Factoring in Risk for CCUS Projects

Telus 111 - Colab

**Richard Baker**

BRE group

The paper examines the critical subsurface risks for both Saline Aquifers (SA) and Depleted Gas Reservoir (DGR). Basin wide studies often quote that SA's have huge storage capacity vs. DGR's. That is correct, but ignores critical factors of reservoir continuity and large-scale permeability. The advantage of DGRs are that the capacity or volumetrics are well understood because of dynamic data but the risk of wellbore leakage is higher. The advantage of SA is that they have less well penetrations and thus lower leakage risk and possibly larger capacity. The optimum economic decision thus is a trade off of the disadvantages ...

Tuesday, Jun 21: Telus 104-105

04:10 PM - 04:35 PM

## Hydrogeology Perspectives on Carbon Sequestration

Telus 104-105

**Nelson Molina Giraldo**

Fluid Domains Inc

Numerical modelling should be used to support planning and decision making around CO2 sequestration projects. Given the importance of carbon sequestration and the apparent distrust of the science, this presentation provides perspectives from our experience with regional scale, long-term numerical modelling of deep aquifers. The presentation also provides support for a risk-based evaluation framework including the possible use of multiple, purpose-specific assessment methods that seek to evaluate containment risk. The central thesis is that when addressing a skeptical audience, it is more important to understand the likelihood of possible negative outcomes (hypothesis testing) than to develop a detailed simulation of ...

Tuesday, Jun 21: Glen 201-204

04:10 PM - 04:35 PM

## A Heuristic Interpretation of the Elastic Model for Minimum Horizontal Stress Estimation

Glen 201-204

**Chris Bird**

Geophysicist, ARC Resources

We present an interpretation of this elastic model for calculating minimum horizontal stress ( $S_{hmin}$ ) that isolate some important considerations for interpreters. By exploring the elements of the model which contribute to the low-frequency component and the high-frequency component of the resulting  $S_{hmin}$  curve we interpret the role those fitting parameters such as the strain constants and the biot coefficient have in constructing these  $S_{hmin}$  estimates. Pitfalls of various choices of parametrization are highlighted. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 205

04:10 PM - 04:35 PM

## Simulated removal of near-surface scattered waves by elastic wave modeling

Glen 205

**Ivan Sanchez-Galvis**

Universidad Industrial de Santander - University of Calgary (Visiting Student Researcher)

Ground roll attenuation of seismic data acquired in foothills areas is one of the most challenging problems in land seismic exploration. Irregular topography and near-surface heterogeneities produce near-surface scattered waves that mask the upcoming body-waves reflections. These scattered waves are treated as seismic noise that must be removed in the filtering stage to enhance the reflections. However, conventional methods such as filters don't work properly with this kind of noise because it is in the same frequency-velocity bandwidth than signal and there is not way to know what is the ideal expected result. In this work, we use elastic wave ...

Tuesday, Jun 21: Telus 101-102

04:10 PM - 04:35 PM

## Geothermal Prospecting using Interactive Analytics: Ethiopian Applications

Telus 101-102

**Philip Harms**

GEOSEIS Inc.

In this presentation, a variety of datasets will be used to perform a prospectivity analysis in the country of Ethiopia. Ethiopia is at the northern end of the East African Rift System (EARS). The EARS is a regionally extensive system where the earth's tectonic forces are pulling apart the African continental plate resulting in a rift complex greater than 4,000 km in length. As a result of the crustal pull-apart, there is a zone of thinned continental crust within the rift and a string of high volcanic activity and high heat flow. This results in a prospective fairway for high ...

Tuesday, Jun 21: Glen 208-209

04:10 PM - 04:35 PM

## Leveraging Stochastic Inversion to increase understanding of Drilling and Completion Hazards in the Midland Basin

Glen 208-209

**Dennis Ellison**

Principal Consultant - QSI, Emerson E&P

Advances in drilling and completions have unlocked large amounts of hydrocarbons, but geology remains the strongest driver of long-term production. Carbonate debris flows are an example of the significance that geology plays. These debris flows may represent drilling hazards and stress barriers, and when they are not avoided, they may increase rig time and costs. From a previous deterministic inversion, a carbonate debris flow within the target was identified but needed more information about its thickness and extent. Through stochastic inversion, we were able to create high-resolution property volumes models that better constrained the carbonate debris flow detecting layers as thin ...

Tuesday, Jun 21: Glen 206

04:10 PM - 04:35 PM

## The Evolution of Structural Style in Fold and Thrust Belts, an Open Discussion

Glen 206

**Andrew Newson**

Senior Technical Consultant, Folded Thrust Geology Ltd

This paper gives an overview of the development of structural style applied to crosssection construction in compressional tectonic settings. Emphasis is placed on the importance of a broad-based data base and awareness of what goes into the construction of a 3-dimensional model of a given structure, which ultimately determines whether its application in hydrocarbon exploration will be successful. [Click Here for the Full Abstract](#)

Tuesday, Jun 21: Glen 201-204

04:35 PM - 05:00 PM

## The Power of 3D Seismic Beyond Structure

Glen 201-204

**Mantu Sihota**

Director, Geoscience, Pulse Seismic

3D seismic has come a long way in the past 20 years, advancements in acquisition and processing have greatly improved the quality of the data. 3D seismic is used in exploration and development projects all over the world. In today's workflow the use of elastic parameters has become more and more common to help with reservoir characteristics, lithology mapping and mitigating geohazards. This talk is a general overview of using 3D seismic to map out various lithological facies and identify potential geological drilling and completions risks. The Montney formation was used to examine derived attributes to characterize the reservoir and ...

Tuesday, Jun 21: Glen 201-204

05:00 PM - 05:25 PM

## Bayesian geostatistical approach in rock physics modeling and seismic data analysis

Glen 201-204

**Naimeh Riazi**

University of Calgary

Higher accuracy of reservoir models plays an important role in reservoir characterization and flow simulation of unconventional reservoirs due to complexity and heterogeneity of this type of reservoirs. Moreover, it can mitigate the risk of induced seismicity during hydraulic fracturing activities and help in making better decisions in enhanced oil recovery scenarios. To build better geological models, our models should incorporate quantitative associated uncertainties. The Bayesian approach can produce possible models, illustrating how models are comparable with the input data and prior information, and how models can incorporate the associated uncertainties. In this study, we used a dataset from an ...

Wednesday, Jun 22

08:35 AM - 09:00 AM

## A study of the economic and technical viability of a salt cavern Compressed Air Energy Storage facility in Alberta

**Jesus Rojas-Parra**

MSc student, University of Calgary

Energy storage will play a vital role in Alberta's future electricity grid as the province transitions away from coal-fired power to meet the country-wide net zero target by 2050. Storage captures surplus electricity during off-peak hours and returns it to the grid during periods of high demand, providing a solution to the intermittency of renewables. Specifically, Compressed Air Energy Storage (CAES) provides long-term and cost-effective storage with low environmental impact. Alberta's geology is suited for Compressed Air Energy Storage (CAES) because of the existence of salt caverns in Cold Lake that could be used as storage reservoirs for compressed air. ...

Wednesday, Jun 22: Glen 201-204

08:35 AM - 09:00 AM

## Calgary's municipal buildings energy consumption analysis and forecast

Glen 201-204

**Marcelo Guarido**

University of Calgary

CO2 emissions are the leading cause of Global Warming, and countries worldwide are working to reduce their domestic emissions. Canada is set to zero-net emissions by 2050 and acts on different fronts. Although the emissions per capita are declining, the absolute emissions of the country are still increasing over the years. As part of the country's efforts, the Government of Calgary has set the same goal. We analyzed the Calgary corporate buildings data, which contains energy consumption from different municipal facilities. We pointed out that the overall electricity consumption in the city is declining, while natural gas consumption seems to ...

Wednesday, Jun 22: Glen 205

08:35 AM - 09:00 AM

## GPU applications for modelling, imaging, inversion and machine learning

Glen 205

**Daniel Trad**

Associate Professor, University of Calgary

Modelling seismic data is a key part of research for acquisition design, imaging, full waveform inversion (FWI) and machine learning (ML). The Finite Difference (FD) method is one of the most used for this purpose. FD is computationally expensive, but the use of Graphics Processing Units can reduce the computational cost by two orders of magnitude. This speed up reflects on many different aspects of seismic. In this abstract, we will discuss its application for generating synthetic data, reverse time migration, Full Waveform Inversion and Machine Learning. We will see why we can achieve such a high-speed up and its ...

Wednesday, Jun 22: Telus 103

08:35 AM - 09:00 AM

## Fresnel zone binning analysis for determining 3D seismic infill stations

Telus 103

**Mostafa Naghizadeh**

OptiSeis Solutions Ltd.

The Fresnel zone is an important concept for defining the horizontal resolution of seismic surveys. The concept of the Fresnel zone can also be utilized at the design stage of the seismic surveys for optimal positioning of shots and receivers based on the desired subsurface targets. The field deployment of the theoretical seismic surveys design will also encounter difficulties as the sources and receivers will need to be shifted/omitted based on the natural barrier and environmental considerations. Therefore, it is important to find alternative infill source and receiver stations that can effectively mitigate the seismic array gaps and irregularities. Here, ...

Wednesday, Jun 22: Telus 106

08:35 AM - 09:00 AM

## The Critical Role of Natural Gas in the Global Energy Transition

Telus 106

**Tako Koning**

Senior Geologist, Independent Geological Consultant

Due to significantly increasing CO<sub>2</sub> in the atmosphere, there is an undeniable need to decarbonize economic activity and reduce the atmospheric concentration of CO<sub>2</sub>. I believe that gas is the optimum "energy bridging fuel" since it is the cleanest burning of the hydrocarbon and also due to natural gas' global availability and significant unexplored and undeveloped potential. I believe that a global gas boom is underway which will help flatten and reduce atmospheric concentration of CO<sub>2</sub>. The importance of gas to assist in the energy transition must be recognized by the oil and gas industry but especially by governments and ...

Wednesday, Jun 22: Glen 206

08:35 AM - 09:00 AM

## Application of a fuzzy c-means and AIC based workflow for P/S arrival-time picking on microseismic data

Glen 206

**Jubran Akram**

University of Calgary

We present some arrival time picking results on the detected event waveforms from the Hoadley microseismic dataset. In our multi-step semi-automatic picking workflow, we use the unsupervised fuzzy c-means (FCM) clustering algorithm to identify the signal intervals in the event waveforms. For waveforms in these intervals, we pick the arrival times using the Akaike information criterion (AIC) algorithm. We also explain our approach to classify the arrivals as P and S-waves. The focus is more on the workflow performance; therefore, we emphasize the significance of manual intervention to make key decisions. Our workflow accurately picks the arrival times on the ...

Wednesday, Jun 22: Glen 208-209

08:35 AM - 09:00 AM

## Basinal and sedimentological controls on organic matter preservation and distribution in distal mudrocks of the Upper Cretaceous Colorado Group

Glen 208-209

Remote Presentation

**Jessica Flynn**

Saskatchewan Geological Survey

Allostratigraphic frameworks permit the comparison of time-correlative units within the Colorado Group across the foredeep, forebulge and backbulge sections of the Western Canada Foreland Basin (WCFB) - a task that had not yet been performed prior to the current study. This work focuses on the mudstone-dominated Fish Scales to Second White Specks formations and incorporates sedimentological and geochemical data into a basinwide allostratigraphic scheme to better understand subsidence history in the distal portions of the WCFB and, in turn, how basinal controls influenced sedimentation and organic matter preservation. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

08:35 AM - 09:25 AM

## Keynote address EOR - Multi-disciplinary Reservoir Characterization

Telus 104-105

**Brian Schulte**

Schiefer Reservoir

Multi-discipline Reservoir characterization is about understanding fluid flow which is critical for deciding the most optimal methodology to develop a reservoir with minimal costs. Some of what we are doing can be applied for CO2 sequestering for a gas reservoir or in a saline aquifer, with the difference being the fluids. If used in a saline aquifer there is a potential to create geothermal using CO2 plume. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

08:35 AM - 11:50 AM

## Microseismic and Strain

Session Chairs: Barry Fish and Henry Bland

Glen 206

**Ana Ortega Perez**

University of Alberta

**Jorge Monsegny**

PhD Student, University of Calgary

**Jubran Akram**

University of Calgary

**Rebecca O. Salvage**

University of Calgary

**Scott Leaney**

SLRDC

Session Chairs: Barry Fish and Henry Bland

Wednesday, Jun 22: Glen 208-209

08:35 AM - 11:50 AM

## Clastic Sedimentology

Session Chairs: Jon Noad and Mark Caplan and Jesse Schoengut

Glen 208-209

**Carolyn Furlong**

University of Calgary

**Daniel Bell**

Dr, University of Calgary

**Daniel Tersmette**

Senior Geologist, Taqa North

**Jessica Flynn**

Saskatchewan Geological Survey

**Jonathan Noad**

Sedimental Services; University of Adelaide

**TAofeek Ogunfolabo**

Session Chairs: Jon Noad and Mark Caplan and Jesse Schoengut

Wednesday, Jun 22: Telus 103

08:35 AM - 11:50 AM

## Seismic Acquisition

Session Chairs: Andrea Crook and Ivan Iantsevitch

Telus 103

**Greg Maidment**

Carbon Management Canada (CMC)

**MARIO A. RIVILLAS**

**Michael Hons**

5D Integrated Inc

**Mostafa Naghizadeh**

OptiSeis Solutions Ltd.

**Peter Vermeulen**

**Rongzhi Lin**

PhD Student, University of Alberta

Session Chairs: Andrea Crook and Ivan Iantsevitch

Wednesday, Jun 22: Telus 104-105

08:35 AM - 11:50 AM

## Enhanced Oil Recovery

Session Chairs: Andy Williams and Draga Talinga

Telus 104-105

**Alexandru Turta**

A T EOR Consulting

**Amin Alinejad**

PhD Student, University of Alberta

**ARSLAN ZHUMABEKOV**

Senior Geoscientist, China University of Petroleum Beijing

**Brian Link**

President, EBS Link Consulting Ltd

**Brian Schulte**

Schiefer Reservoir

**John Hirschmiller**

Senior Geologist, GLJ Ltd.

**Sajjad Ahmadigoltapeh**

University of Oslo

Session Chairs: Andy Williams and Draga Talinga



Wednesday, Jun 22: Glen 205

08:35 AM - 11:50 AM

## Seismic Imaging – Full Waveform Inversion

Session Chairs: Raúl Cova and Azer Mustaqeem

Glen 205

**Daniel Trad**

Associate Professor, University of Calgary

**He Liu**

University of Calgary

**Kristian Torres**

**Scott Keating**

**Tianze Zhang**

**Yang Yang**

Research Geophysicist, PGS

Session Chairs: Raúl Cova and Azer Mustaqeem

Wednesday, Jun 22: Telus 111 - Colab

08:35 AM - 12:15 PM

## Indigenous Partnerships in Science

Session Chairs: David Eaton and Jordan Phillips

Telus 111 - Colab

**Ekaterina Ossetchkina**

University of Toronto

**Evangeline Eldridge**

University of Calgary

**Jesus Rojas-Parra**

MSc student, University of Calgary

**Joelle French**

**Taylor Behn-Tsakoza**

Community Liaison, Tu Deh-Kah Geothermal

**Tim Leshchyshyn**

FracKnowledge

**Zachary Cunningham**

Session Chairs: David Eaton and Jordan Phillips

Wednesday, Jun 22: Telus 106

08:35 AM - 12:15 PM

## The Role of Geosciences in Nuclear and Alternative Energy

Session Chairs: Stephen Longfield and Brent Nassichuk

Telus 106

**Bernard Laugier**

Senior Geophysical Advisor, Scolty Energy Consulting LLC-Seisnetics

**Herfried Madritsch**

Nagra

**Ken Glover**

RESPEC

**Melissa Greig**

Associate Director, Upstream Consulting & Advisory Services, S&P Global

**Owen Lewis**

Fusion Energy Capital, Fusion is the Future

**Sam Voegeli**

Underground Storage and Cavern Consultant, RESPEC

**Tako Koning**

Senior Geologist, Independent Geological Consultant

**Vadim Milovanov**

Project Engineer, Upstream Consulting & Advisory Services, S&P Global

Session Chairs: Stephen Longfield and Brent Nassichuk

Wednesday, Jun 22: Glen 201-204

08:35 AM - 11:50 AM

## Machine Learning and AI

Session Chairs: Akshay Gulati and Dennis Ellison

Glen 201-204

**David Emery**

CREWES - University of Calgary

**FABIEN ALLO**

CGG

**Jonathan Downton**

Senior Research Advisor, GeoSoftware

**Lukas Sadownyk**

MSc candidate, University of Calgary - CREWES

**Marcelo Guarido**

University of Calgary

**Renjun Wen**

Geomodeling Technology Corp

Session Chairs: Akshay Gulati and Dennis Ellison

Wednesday, Jun 22: Telus 101-102

08:35 AM - 09:00 AM

## Lithium Exploration Tools from Source to Sink

Telus 101-102

**Edward Bunker**

Dr, CGG

Due to the mobility and incompatibility of lithium (Li) in the crust and on Earth's surface, the Li mineral system is complex and highly interlinked. In most cases, the development of economic Li brine systems depends upon the concentration, transport, deposition and remobilization of Li from magmatic systems. As such, a complete understanding of where and why Li becomes concentrated in the crust and at Earth's surface, from source to sink, is highly desirable and requires integrated knowledge of the Li mineral system. Development of integrated data and exploration tools for global and regional resource assessment is key for accelerated ...

Wednesday, Jun 22

08:35 AM - 11:50 AM

## Canadian Lithium Brines part 1

Session Chairs: Mark Caplan and Courtney Reimert and Eric Pelletier

**Brady Chapman**

Lawyer, MLT Aikins LLP

**Edward Bunker**

Dr, CGG

**Graham Banks**

Principal geoscientist (structural, exploration), Route To Reserves and Southern Geoscience Consultants

**Joanie Kennedy**

E3 Metals Corp

**Stefan Walter**

Lead Geologist, Summit Nanotech Corporation

Session Chairs: Mark Caplan and Courtney Reimert and Eric Pelletier

Wednesday, Jun 22: Telus 111 - Colab

09:00 AM - 09:25 AM

## Characteristics of surface casing vent flow methane emissions in Red Deer, Alberta

Telus 111 - Colab

**Zachary Cunningham**

This study intends to analyze what factors contribute to SCVF leaks, and what role they have in the underestimation of methane emissions in Red Deer, Alberta. Isotope analysis data is used from gas samples taken from wellbores that had active SCVFs, enabling an understanding of the source depth and formation from which the gas is from. To understand which wellbore characteristics are correlated with SCVF occurrences, statistical analyses (e.g., regression, PDFs) are conducted to understand if the likelihood of a SCVF leak is higher with certain attributes being present in a wellbore. The results of isotope analyses combined with understanding ...

Wednesday, Jun 22: Glen 201-204

09:00 AM - 09:25 AM

## Predicting Unconventional Shale Reservoir Properties from Seismic and Well Data Using Convolutional Neural Networks

Glen 201-204

**Jonathan Downton**

Senior Research Advisor, GeoSoftware

Convolutional neural networks (CNNs) are used to simultaneously predict elastic and rock properties from seismic and well data for an unconventional shale reservoir. In this methodology the seismic-to-rock property relationship is learned from well and seismic angle gather data. To overcome the issue of limited well training data, synthetic data are used to train the CNN. The synthetic data is generated from the statistics of the original well data in the study area along with a rock physics model (RPM) suitable for unconventional reservoirs. The RPM is used to vary key reservoir properties, such as porosity, thickness, kerogen and clay ...

Wednesday, Jun 22: Glen 206

09:00 AM - 09:25 AM

## Dense array monitoring in the Kiskatinaw Area of British Columbia reveals both expected, and unexpected, patterns of induced seismicity

Glen 206

**Rebecca O. Salvage**

University of Calgary

The installation of a dense seismic network within the Kiskatinaw Seismic Monitoring and Mitigation Area (KSMMA) in NE British Columbia between January 2020 and February 2022 has enabled the detection and analysis of over 19,000 seismic events, which appear temporally and spatially concurrent with ongoing hydraulic fracturing and waste-water disposal operations. Events recorded local magnitudes between -0.8 and 3.4, with a magnitude of completeness for the current catalog sitting at ~0.4. Typically, seismicity occurs within a well-defined corridor orientated NW-SE. We investigate in detail the largest felt events in the region during the dense array installation: an ML3.1 on 11 ...

Wednesday, Jun 22: Glen 208-209

09:00 AM - 09:25 AM

## The perfect storm: Stacking patterns and depositional processes of turbidites in a shallow-water basin, Upper Middle Montney Formation, Alberta.

Glen 208-209

**Daniel Bell**

Dr, University of Calgary

We document the facies and architectures of an Upper Middle Montney submarine fan in the Elmworth area. Discrete facies associations, consisting of process-based lithofacies, are attributed to seven key sub-environments: 1) background sedimentation; 2) outer lobe fringe; 3) frontal lobe fringe; 4) lateral lobe fringe; 5) lobe off-axis; 6) lobe axis; 7) shelf clinothem deposits. The temporal and spatial arrangement of these facies suggests the progradation of submarine lobes which exhibited compensational stacking patterns defined the frequent abrupt transitions between sub-environments. The compensational nature and general absence of thickening-up sequences of these stacking patterns detaches these deposits from the parasequence ...

Wednesday, Jun 22: Telus 106

09:00 AM - 09:25 AM

## Alternative Energy Industry Commodity Options for Western Canada

Telus 106

**Melissa Greig**

Associate Director, Upstream Consulting & Advisory Services, S&P Global

Alternative Energy Industry Commodity Options for Western Canada [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 103

09:00 AM - 09:25 AM

## Novel coverage assessment and decimation of a high-resolution 3D dataset

Telus 103

**Michael Hons**

5D Integrated Inc

Test of alternative seismic coverage using decimation and 5D interpolation of high resolution oilsands data. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

09:00 AM - 09:25 AM

## Simultaneous Inversion of Velocity and Reflectivity for Enhanced Seismic Imaging

Glen 205

**Yang Yang**

Research Geophysicist, PGS

We present a non-linear iterative inversion method to simultaneously estimate both velocity and earth reflectivity. The core of the inversion workflow is a novel wave-equation that provides the full acoustic wavefield, parameterized in terms of velocity and vector reflectivity. A key aspect is the separation of the low- and high-wavenumber components of the gradient based on inverse scattering theory, enabling the sensitivity kernels to update the velocity and the vector reflectivity, respectively. Our approach is equivalent to performing FWI and LSRTM in a single framework using the full wavefield. The output of the inversion is an updated and more well ...

Wednesday, Jun 22: Telus 101-102

09:00 AM - 09:25 AM

## **An integrated approach to optimize decision-making in lithium exploration: play-based exploration, chance of success and value of information**

Telus 101-102

**Graham Banks**

Principal geoscientist (structural, exploration), Route To Reserves and Southern Geoscience Consultants

Deep brines in sedimentary basins could be sources of lithium required to transition into a low carbon economy. Like professional poker, lithium brine exploration is an exciting, risky game played for high stakes and a modest chance of success. Most of the exploration-extraction projects are conducted by junior exploration companies and university departments. Meanwhile, an investor in exploration opportunities seeks a way to determine whether the lithium brine play being invested in is as good, or better, than the 'competing' lithium exploration-extraction opportunities. Ultimately, all lithium brine stakeholders need to repeatedly make the optimal business decisions with limited information, in ...

Wednesday, Jun 22: Glen 205

09:25 AM - 09:50 AM

## **Application of amplitude-encoding strategy to elastic full waveform inversion**

Glen 205

**He Liu**

University of Calgary

Elastic full waveform inversion (EFWI) is a powerful tool to characterize the underground P- and S-wave velocity profiles by matching the synthetic and observed waveform data, which requires super expensive data acquisition and processing costs. We have presented the synthetic examples of acoustic FWI using amplitude-encoding strategy, which requires much less calculation effort and provides inversion results with ignorable crosstalk noises. In this work, we further apply this strategy to EFWI using cosine basis, which provides comparable inversion results with conventional method with half reduced calculation time. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 201-204

09:25 AM - 09:50 AM

## **Shiny web applications for optimization of diagnostic fracture injection test (DFIT) event detection with unsupervised learning**

Glen 201-204

**Lukas Sadownyk**

MSc candidate, University of Calgary - CREWES

Diagnostic Fracture Injection Tests (DFIT) are commonly used to derive key hydraulic fracture design and modeling parameters. Although this process can identify properties needed for well completion, it can also be time-intensive and impacted by human interpretation bias. This report addresses this adversity by applying unsupervised clustering methods: K-Means, DB-Scan, Hierarchical modeling, and Gaussian mixture models to identify point density variation that correlates to key parameters on a DFIT curve. An R-Studio Shiny Web App has been developed to apply these methods and provide a user-friendly platform for adjusting input variables and hyperparameters. Exploring the clustering approach emphasizes the importance ...

Wednesday, Jun 22: Glen 208-209

09:25 AM - 09:50 AM

## **A Process Sedimentology Approach to Understanding the Deposition of Fine-Grained Mixed Siliciclastic-Carbonate Systems: A Case Study from the Altares Member within the Lower Triassic Montney Formation, Western Canada Sedimentary Basin**

Glen 208-209

**Carolyn Furlong**  
University of Calgary

A process sedimentology approach was used to better understand the deposition of the fine-grained, mixed siliciclastic-carbonate system of the Altares Member within the Montney Formation. Through the use of thin sections, microfacies were identified to describe subtle changes in sedimentary fabric within the Altares Member, which lithologically consists of centimeter- to decimeter-scale bituminous siltstone and very fine-grained sandstone, interbedded with bioclastic packstone to grainstone beds. Through this study, a better understanding of depositional processes associated with the short-lived period of carbonate deposition of the Altares Member and its larger association with the surrounding siliciclastic-rich Montney Formation can help further refine ...

Wednesday, Jun 22: Telus 103

09:25 AM - 09:50 AM

## **Turn your seismic program into a lean, green, resolution machine**

Telus 103

**Peter Vermeulen**

Diligent seismic acquisition planning always involves careful modelling of field parameters that maximize subsurface resolution and minimize program costs. Traditionally, finding the balance between these two outcomes has been challenging but progressively achievable with skilled field management/crews, simultaneous source techniques, and new recording technologies. As industry progresses and the lasting footprint of our work are better understood, our geophysical diligence has expanded to include the people and ecosystems our seismic programs impact. Additionally, full cycle economics become glaringly unsustainable if future costs of reclamation are included in seismic acquisition program costs. New technologies such as miniaturized source and receiver technologies ...

Wednesday, Jun 22: Telus 106

09:25 AM - 09:50 AM

## **Taking CO2 sequestration projects from the concept stage through to the permitting stage**

Telus 106

**Ken Glover**  
RESPEC

We describe the key geoscience inputs to successful CO2 sequestration projects using recent experience bringing projects from proposal stage through to permitting. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

09:25 AM - 09:50 AM

## The use of several base boundaries to improve the ability of Duplex Wave Migration to delineate zero throw, sub vertical fractures and their permeability

Telus 104-105

**Brian Link**

President, EBS Link Consulting Ltd

Duplex Wave Migration (DWM) is a pre-stack depth migration that images only duplex or second bounce (prism) wave energy. This direct detection method results in a 3D image of zero throw, sub vertical faults and fractures. The technology has been shown to provide predictive information about the fracture permeability. New refinements to the process have produced higher resolution maps of fracture porosity in a case history that will be shown. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

09:25 AM - 09:50 AM

## Hypocenter locations: Semblance-weighted stacking versus travelttime inversion

Glen 206

**Jubran Akram**

University of Calgary

Hypocenter locations are one of the key outcomes of microseismic data processing. Typically, these are estimated using one of the travelttime inversion, waveform stacking or migration-based approaches. One of the key requirements of the travelttime approach is that the P and S arrival times are picked/available for a reasonable number of receiver levels which is not always possible due to the strong noise or weak signal in the input waveforms. The waveform complexity also prevents reliable arrival picking. Furthermore, the performance of most if not all automatic pickers deteriorates for noisy waveforms and hence more manual effort is required to ...

Wednesday, Jun 22: Telus 101-102

09:25 AM - 09:50 AM

## Regulating the Impending Lithium Boom: lithium-rich brine extraction's place in the subsurface

Telus 101-102

**Brady Chapman**

Lawyer, MLT Aikins LLP

There is growing competition in Western Canada's subsurface, as novel industries - from hydrogen to geothermal to CCS - begin their descent into territory that has traditionally been the domain of the oil and gas industry. One new participant, the lithium-rich brine extraction industry, has captured the attention of law and policy makers across Western Canada. In late 2021, the Government of Alberta released a new comprehensive minerals strategy and action plan and subsequently enacted the Mineral Resource Development Act. The creation of a new stand-alone legal regime provides some much needed clarity for the development of the novel lithium-rich ...



Wednesday, Jun 22: Telus 111 - Colab

09:25 AM - 09:50 AM

## In Love with Seaweed? Kelp Farming for CO2 Sequestration

Telus 111 - Colab

Joelle French

Wednesday, Jun 22

10:00 AM - 10:10 AM

## Experimental Investigation of Natural Gas Huff-n-Puff on Organic Shale Samples

Poster Board 7

**Amin Alinejad**

PhD Student, University of Alberta

Poster Board 7 We studied experimentally the application of natural gas HnP on organic shale samples. We conducted the experiments at elevated reservoir pressure and temperature conditions using our custom-designed visual cell under miscibility conditions. Our results showed that the significant oil production occurs during depletion stage and it was attributed to the solution-gas drive mechanism. We observed higher and faster oil production by enrichment of injected gas with ethane. This was consistent with higher solubility of ethane in oil. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

10:00 AM - 10:10 AM

## A study of the economic and technical viability of a salt cavern Compressed Air Energy Storage facility in Alberta

Poster Board 19

**Jesus Rojas-Parra**

MSc student, University of Calgary

Poster Board 19 Energy storage will play a vital role in Alberta's future electricity grid as the province transitions away from coal-fired power to meet the country-wide net zero target by 2050. Storage captures surplus electricity during off-peak hours and returns it to the grid during periods of high demand, providing a solution to the intermittency of renewables. Specifically, Compressed Air Energy Storage (CAES) provides long-term and cost-effective storage with low environmental impact. Alberta's geology is suited for Compressed Air Energy Storage (CAES) because of the existence of salt caverns in Cold Lake that could be used as storage reservoirs ...

Wednesday, Jun 22

10:00 AM - 10:10 AM

## **The complexity of micro- to centimeter-scale heterogeneities in geological and geomechanical properties in fine-grained deposits and how to quantify it**

Poster Board 31

**Patricia Fraino**

University of Calgary

Poster Board 31 Sedimentological, compositional, and geomechanical heterogeneities exist vertically and laterally at multiple scales in fine-grained rocks; however, current literature has focused on the meter- to kilometer-scale heterogeneities. Here, we investigate the influence of three centimeter-scale sedimentary fabrics (massive, stratified, and bioturbated siltstone) have on mechanical properties and natural calcite-filled fractures in the Lower Triassic Montney Formation (Northeastern British Columbia, Canada) by analyzing the samples through a gridding system to evaluate for fabric, composition, and geomechanical properties with the aid of micro-scale scanning electron microscope. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

10:00 AM - 10:10 AM

## **Cenozoic Structural Evolution of the Enping Sag, Pearl River Mouth Basin, northern South China Sea margin**

Poster Board 42

**Jie Zhang**

University of Alberta

Poster Board 42 The Enping Sag is located at the west of Zhu I Depression in the Pearl River Mouth Basin of the northern South China Sea margin. The study area is targeted for petroleum exploration. Enping Sag is an important oil and gas enrichment area in the Pearl River Mouth Basin, with a total geological resource of 8.43\*10<sup>8</sup> m<sup>3</sup> oil equivalent. There is a wide range of source rocks in Enping 17 depression in the south, and there are many oil fields that have been successfully exploited. Structural traps and hydrocarbon fields are associated with fault systems in the ...

Wednesday, Jun 22

10:00 AM - 10:10 AM

## **Natural and Enhanced Weathering of Basic Silicates: An Effective Process to reach Net-zero Emissions**

Poster Board 49

**Willem Langenberg**

Dr., University of Alberta

Poster Board 49 The achievement of reaching 363 MT of CO<sub>2</sub> emission reduction per year for Canada by 2030 is a difficult task. The efficiency of natural and enhanced weathering of basic silicates (mineral carbonation) and natural uptake of CO<sub>2</sub> by plants and oceans is much larger than Carbon Capture and Storage (CCS). Canada needs to increase funding for research on mineral carbonation, the uptake of CO<sub>2</sub> by plants and water, and energy efficiency. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

10:00 AM - 10:10 AM

## Geoexchange to Deep Conventional Geothermal Energy Extraction Technology Comparison

Poster Board 61

**Catherine Hickson**  
Alberta No. 1

Poster Board 61 There is a range of understanding of what "geothermal" actually means. By way of graphics and a simple matrix, this paper seeks to outline the major differences and similarities between shallow geoexchange "earth as a battery" and deep conventional closed and "open" loop systems. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

10:10 AM - 10:20 AM

## Implications of free phase gas production on oil recovery

Poster Board 8

**Yuan Zhang**  
University of Calgary

Poster Board 8 This work provides some insights on microbial enhanced oil recovery through denitrification. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

10:10 AM - 10:20 AM

## In Love with Seaweed? Kelp Farming for CO2 Sequestration

Poster Board 20

**Joelle French**

Poster Board 20 Global CO<sub>2</sub> emissions need to be targeted with carbon capture utilization and storage (CCUS) technologies to achieve targets preventing more than 1.5°C average temperature increase by 2070. Several CCUS technologies have faced opposition from various stakeholders due to the cost, potential environmental impact, and public concern. We present an overview of one potential small project addressing the potentials and limitations of brown algae (kelp) for CO<sub>2</sub> capture, utilization, and the potential sequestration. We provide a techno-socio-economic analysis of a proposed kelp farm along the coast of British Columbia near Vancouver Island for the offsetting of CO<sub>2</sub> production ...

Wednesday, Jun 22

10:10 AM - 10:20 AM

## Converted Wave Travel Time Computation Using A Fast Marching Method And Level Set Interface Location

Poster Board 32

**Carlos Niño**  
Universidad Industrial de Santander

Poster Board 32 A study is presented that allows defining a methodology for the calculation PS converted wave travel times, fundamental in construction of a PS wave tomography. PS conversion occurs on the modeled reflector with the Level Set function. In this paper, we want to adapt the methodology proposed in Rawlinson and Sambridge based on Fast Marching (RS-FMM), to have a fast eikonal, grid-based solver to compute converted wave times. We compared the travel times from RS-FMM with those calculated with a standard ray tracing technique that obeys Snell's law at each point of the reflector, where these points ...

Wednesday, Jun 22

10:10 AM - 10:20 AM

## Planning Projects for Direct Heat Solutions Anywhere

Poster Board 50

**Rocky Mottahedeh**  
Green Source Energy

Poster Board 50 The presentation will explore the processes and geological/geophysical considerations for moving from raw Oil & Gas data to green heat at the surface where we need it. Consulting through 40 years of practice on the Oil & Gas side are providing the path to renewable energy space for direct heat for buildings with emphasis to closed-loop systems that work like radiators. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

10:10 AM - 10:20 AM

## The feasibility of re-purposing oil and gas wells for geothermal applications

Poster Board 62

**Catherine Hickson**  
Terrapin Geothermics Inc.

Poster Board 62 In regions where oil and gas extraction has been on-going for decades, there is an inventory of wells that range from fully abandoned to operational. In Alberta, there are over 400,000 wells that have been drilled since the early 20th century. Given the potential reclamation costs and re-utilization possibilities of these wells, our team has begun the investigation of wells in Alberta for geothermal potential. Many factors will be considered to create a robust screening and ranking system. Phase (1) will evaluate the publicly available downhole and production information. This will remove wells with known downhole problems ...

Wednesday, Jun 22

10:10 AM - 10:20 AM

## Water Valuation: How to put a price on priceless?

Poster Board 73

**Sheila Duchek**  
Water Valuation: How to put a price on priceless?, SNC-Lavalin

Poster Board 73 Severe water stress and water scarcity can bring political disorder. Conflict, and even war, over water resources has been observed. According to UNESCO (UNESCO website accessed in 2022), "Water is a unique and non-substitutable resource of limited quantity. As the foundation of life, societies and economies, it carries multiple values and benefits. But unlike most other valuable resources, it has proven extremely difficult to determine its true 'value'. Because most of the world's freshwater supply is underground, known as groundwater, it is often overlooked and undervalued. In addition, there is a perception that groundwater is poorly understood, ...

Wednesday, Jun 22

10:20 AM - 10:30 AM

## **Integrated Reservoir Geology, Seismic Facies, and Production Studies to Determine the Potential of Well Development Area**

Poster Board 9

**ARSLAN ZHUMABEKOV**

Senior Geoscientist, China University of Petroleum Beijing

Poster Board 9 The new, integrated workflow proposed here should enable the operating company to efficiently review production enhancement opportunities within the bypassed zones of reservoir layers, whether targeting structural or stratigraphic oil zones. Moreover, new drilling and workover opportunities to access remaining oil along the edges of the main sand bodies and in discontinuous areas have been identified from their seismic attributes. We ranked these targets based on their expected flow rates, ultimate recoveries, and associated reservoir and operational risks. This approach also provides a means of developing an in-depth understanding and for conducting a detailed exploration of the ...

Wednesday, Jun 22

10:20 AM - 10:30 AM

## **Techno-Economic Feasibility Analysis of a Geothermal District Heat System in Rainbow Lake, Alberta**

Poster Board 21

**Ekaterina Ossetchkina**

University of Toronto

Poster Board 21 In line with global decarbonizing trends, Canada pledged a 30% reduction of its emissions by 2030. Building heating, representing 60% of a building's total energy use, must be transitioned to renewable energy. Geothermal energy is a renewable resource, using the Earth to provide a steady heat source. This project focuses on the feasibility of developing a geothermal district heating system in Rainbow Lake municipality, a shallow high-temperature anomaly in Western Canada Sedimentary Basin, and comparing this to current heating sources, natural gas and diesel. HOT2000 will simulate the current building thermal efficiency and energy demands, referencing the ...

Wednesday, Jun 22

10:20 AM - 10:30 AM

## **Determination of soil loss conditions and spatio changes of Hoz-e-Sultan playa based on Albedo index**

Poster Board 33

**khadijeh alinoori**

Shahid Beheshti University

Poster Board 33 In this study, the albedo and pca index. The albedo index in 1991 with a maximum of 0.72 reached 0.85 in 2016, which indicates an increase in albedo, soil loss, increased salinity and reduced vegetation. The albedo index in 1991 and 2016 showed that the Playa Center has values greater than 0.42, which occupies about 15% and 10% of the study area, respectively. Which has decreased from the very high albedo area in the center of Playa from 1991 (9.1%) to 2016 (3.5%).The decrease in the area of albedo with very low values in the margin of ...

Wednesday, Jun 22

10:20 AM - 10:30 AM

## **Sedimentology and biostratigraphy of the Chorgali Formation, Potwar and Hazara sub-basins of the Upper Indus Basin, Pakistan: Implications for the closing stage of the eastern Neo-Tethys Ocean**

Poster Board 51

**Muhammad Khan**  
University of Regina

Poster Board 51 In Pakistan, the Chorgali Formation is an early Eocene carbonate dominated strata that occur in the Potwar and Hazara basins of the Upper Indus Basin. It conformably overlies on early Eocene Sakesar Formation in southern Potwar sub-basin and Margala Hill Limestone in the northern Potwar sub-basin and Hazara sub-basin. This study addresses the Chorgali Formation of the Potwar and Hazara sub-basins. The Chorgali Formation is either covered by the Rawalpindi Group in the southern Potwar sub-basin (Himalayan molasse deposits) or middle mixed clastic-carbonate succession of marine to continental beds of the middle Eocene Kuldana Formation. This study intends to explore the spatial and temporal evaluation of ...

Wednesday, Jun 22

10:20 AM - 10:30 AM

## **Renewal of the crustal architectural map and plate kinematic model of the Flemish Cap, offshore Newfoundland margin**

Poster Board 63

**Pei Yang**  
Memorial University of Newfoundland

Poster Board 63 In this study, thirteen newly acquired long-offset multichannel seismic profiles over the Flemish Cap, a continental fragment along the offshore Newfoundland, are used to investigate its crustal architecture and tectonic history through combination with vintage seismic data. Significant margin-parallel and margin-perpendicular structural variations are observed and these are used to map the crustal architecture in terms of rifted margin domains (proximal, necking, hyperextended, exhumed, and oceanic domains included). The newly-mapped edges of the necking and hyperextended domains are used to locally update an existing deformable plate reconstruction model, improving our understanding of the formation of continental fragments ...

Wednesday, Jun 22

10:20 AM - 10:30 AM

## **Towards net zero: lowering steam-to-oil ratios with thermophilic bacteria and N<sub>2</sub> biogas**

Poster Board 75

**Casey Hubert**  
University of Calgary

Poster Board 75 Dormant thermophilic bacteria are present throughout heavy oil reservoirs, and can be awoken by conductive heating in zones adjacent to steam injection that reach temperatures of 50-100 degrees Celsius. Nutrient injection can stimulate these bacteria to generate non-condensable gas in the form of N<sub>2</sub> (nitrogen gas). This creates an enhanced oil recovery mechanism akin to compaction drive owing to the dormant microorganisms being distributed ubiquitously throughout the reservoir sandstone; their biogas production promotes an evenly distributed 'squeezing' mechanism throughout the target zone of the reservoir creating a uniformly distributed source of reservoir energy that drives a primary ...

Wednesday, Jun 22: Glen 205

10:35 AM - 11:00 AM

## An implicit neural representation for full waveform inversion

Glen 205

**Tianze Zhang**

We introduce and analyze implicit full waveform inversion (IFWI), which uses a neural network to generate velocity models and perform full waveform inversion. IFWI has two main parts: a neural network that generates velocity models, and a recurrent neural network FWI to perform the inversion. IFWI is distinct from conventional waveform inversion in two key ways. First, it does not require an initial model as does conventional FWI. Instead, it requires general information about the target area, for instance means and standard deviations of medium properties in the target area, or alternatively well-log information in the target area. Second, within ...

Wednesday, Jun 22: Telus 111 - Colab

10:35 AM - 11:00 AM

## Techno-Economic Feasibility Analysis of a Geothermal District Heat System in Rainbow Lake, Alberta

Telus 111 - Colab

**Ekaterina Ossetchkina**

University of Toronto

In line with global decarbonizing trends, Canada pledged a 30% reduction of its emissions by 2030. Building heating, representing 60% of a building's total energy use, must be transitioned to renewable energy. Geothermal energy is a renewable resource, using the Earth to provide a steady heat source. This project focuses on the feasibility of developing a geothermal district heating system in Rainbow Lake municipality, a shallow high-temperature anomaly in Western Canada Sedimentary Basin, and comparing this to current heating sources, natural gas and diesel. HOT2000 will simulate the current building thermal efficiency and energy demands, referencing the Alberta Building and ...

Wednesday, Jun 22: Telus 104-105

10:35 AM - 11:00 AM

## Low Salinity Water Impact on the Calcite-Water Interface: A Molecular Dynamic Study

Telus 104-105

**Sajjad AhmadiGoltapeh**

University of oslo

In recent years, low salinity water (LSW) injection into carbonates and sandstone reservoirs, known as water flooding, has been adopted as a promising technique for enhanced oil recovery (EOR). This technology which is appealing to industry because of its low cost, can maintain pressure after initial depletion and displace oil by exploiting the effect of the viscous forces. Despite the rising industrial interest in LSW method, a coherent mechanism explanation for the technology has yet to be developed. Unknown molecular interactions in a rock-brine system are the primary cause for the lack of a cohesive mechanism driving LSW. In order ...

Wednesday, Jun 22

10:35 AM - 11:00 AM

## Local anisotropy and multi-offset DAS data for CO2 monitoring

**Scott Leaney**  
SLRDC

Local anisotropy estimation using phase slowness and strain at location of virtual DAS receivers [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 103

10:35 AM - 11:00 AM

## Ultra-High Density Seismic Survey at Carbon Management Canada's Field Research Station

Telus 103

**Greg Maidment**  
Carbon Management Canada (CMC)

In 2021, STRYDE, Carbon Management Canada and Explor collaborated to acquire an ultra-high density seismic survey at the Containment and Monitoring Institute (CaMI) site in Alberta. The CaMI Field Research Station is a small-scale CO2 injection site that provides facilities and equipment to test and develop monitoring technologies to track CO2 stored underground and to determine the detection threshold of CO2 at shallow to intermediate depths. The survey was acquired using 19,872 STRYDE receiver nodes (7.5m x 7.5m grid), 9,041 Explor PinPoint impulsive sources points and 3,910 Vibroseis source points. A total of 257.4 million raw traces were acquired into ...

Wednesday, Jun 22: Glen 201-204

10:35 AM - 11:00 AM

## Machine Learnings, lesson learned on improvements to Castagna (1985) mud rock, Gardner (1974) density, and Faust (1951) velocity estimation.

Glen 201-204

**David Emery**  
CREWES - University of Calgary

of petrophysical logs to improve the correlation with seismic AVO response. Acquisition of a complex set of logs for all wells in a seismic survey is impractical and estimation of shear and density log using imperial relationships is the norm. While these imperial relationship has worked for recon analysis they have generally not be adequate for detail geophysics. Machine Learning has provide a new way of investigating these relationship and this presentation will provide the insights we learned for analysis using over 60 wells with Vs & RHOB logs from the North Sea, Australia and Canada. [Click Here for the Full ...](#)



Wednesday, Jun 22: Glen 208-209

10:35 AM - 11:00 AM

## Chasing Waterfalls: interpreting Cardium Formation reservoir properties from falls geomorphology

Glen 208-209

**Jonathan Noad**

Sedimental Services; University of Adelaide

What can waterfall morphology tell us about the reservoir properties of the Cardium Formation outcrops over which the falls flow?[Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 106

10:35 AM - 11:00 AM

## Introduction to Nuclear Fusion

Telus 106

**Owen Lewis**

Fusion Energy Capital, Fusion is the Future

Fusion energy has the potential to transform the energy industry, but most people believe it's still "30 years away." Though it has been decades in development without reaching energy breakeven, in recent years significant progress has been made. Much of this is due to the rise of the private fusion industry, which has been made possible by increases in funding and investment, advances in computers & modeling, and the development of high temperature superconductors. Once it arrives, fusion will provide abundant, reliable, and affordable energy that is free from emissions, and has a small environmental footprint. Oil & gas companies have ...

Wednesday, Jun 22: Telus 101-102

10:35 AM - 11:00 AM

## Lithium Production Using Wisdom Grounded in Economic Decision Analysis and Cradle-to-Grave Sustainability Standards

Telus 101-102

**Stefan Walter**

Lead Geologist, Summit Nanotech Corporation

Lithium production economics and sustainability [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

11:00 AM - 11:25 AM

## Experimental Investigation of Natural Gas Huff-n-Puff on Organic Shale Samples

Telus 104-105

**Amin Alinejad**

PhD Student, University of Alberta

We studied experimentally the application of natural gas HnP on organic shale samples. We conducted the experiments at elevated reservoir pressure and temperature conditions using our custom-designed visual cell under miscibility conditions. Our results showed that the significant oil production occurs during depletion stage and it was attributed to the solution-gas drive mechanism. We observed higher and faster oil production by enrichment of injected gas with ethane. This was consistent with higher solubility of ethane in oil. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

11:00 AM - 11:25 AM

## Hydraulic fracture monitoring: Integrated analysis of DAS, pumping information, and microseismicity.

Glen 206

**Ana Ortega Perez**

University of Alberta

Ortega Perez & Van der Baan perform an integrated analysis of one hydraulic fracturing treatment using low-frequency DAS, pumping curves, and microseismicity to gain insight into the relationship between microseismic events, strain changes, hydraulic fractures, and injection rates, as well as to find characteristic features and properties of failed stages in all the records. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 208-209

11:00 AM - 11:25 AM

## The Hoadley Glauconitic Trend: Poised for a Renaissance, New Insights into an Old Field

Glen 208-209

**Daniel Tersmette**

Senior Geologist, Taqa North

Recent increases in gas price position the ~10 Tcf OGIP Hoadley Glauconitic deep basin gas field of west-central Alberta for a drilling renaissance. This study integrates and synthesizes a massive dataset including over 2500 well penetrations, 300 cores, and 1100 producing wells from across this 3000+ km<sup>2</sup> field. This practical study focuses on variations in reservoir quality, well deliverability, and liquids yields across the Hoadley Glauconitic field. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 106

11:00 AM - 11:25 AM

## An Enhanced Sealing Method for Geological Nuclear Waste Disposal

Telus 106

**Sam Voegeli**

Underground Storage and Cavern Consultant, RESPEC

Presentation of a recent project completed for the US Department of Energy to design and validate a method for sealing nuclear waste disposal sites. The project integrates the characterization and modeling of salt and rock layers with evaluation of disposal site instrumentation and testing. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

11:00 AM - 11:25 AM

## Deep decomposition learning for thin-bed reflectivity inversion

Glen 205

**Kristian Torres**

We investigate the use of null space regularizing networks for thin-bed reflectivity inversion by combining a classic regularization method with the learned deep decomposition framework. This method extends the popular learned post-processing approach by learning how to improve an initial reconstruction with estimated missing components from the null space of the forward operator while naturally enforcing that the high-resolution prediction is always consistent with the low-resolution input. Unlike traditional model-based reconstruction algorithms, this approach does not make any prior explicit assumption on the solution. Employing a deep decomposition architecture, we consider the inversion of noisy data sets where an additional ...

Wednesday, Jun 22: Telus 111 - Colab

11:00 AM - 11:25 AM

## Tu Deh-Kah Geothermal: Lessons Learned and Next Steps

Telus 111 - Colab

**Taylor Behn-Tsakoza**

Community Liaison, Tu Deh-Kah Geothermal

Will be forthcoming. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 201-204

11:00 AM - 11:25 AM

## Interactive training for AI based seismic interpretation, workflows and examples

Glen 201-204

**Renjun Wen**

Geomodeling Technology Corp

We show an an interactive workflow to dramatically improve the efficiency and accuracy of major seismic interpretation tasks, such as fault and horizon picking, channel and geobody interpretations. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 103

11:00 AM - 11:25 AM

## Seismic reconstruction for compressive irregular-grid acquisition with I-FMSSA and EPOCS: A comparative study

Telus 103

**Rongzhi Lin**

PhD Student, University of Alberta

Spatially irregularly sampled seismic data is inevitable in field acquisition due to either natural obstacles or recently compressive-sensing design. Mapping seismic data from irregular-grid to regular-grid is a long-standing problem for seismic processing. In this study, we compare the extended POCS (EPOCS) method and the interpolated-FMSSA (I-FMSSA) method for reconstructing compressive arbitrary irregular-grid acquisition data. A fast and computational efficient MSSA (FMSSA) algorithm is applied as the projection operator to accelerate the low-rank estimation. An interpolation operator is adopted to connect irregular-grid observations and desired regular-grid data for both EPOCS and I-FMSSA methods. For the synthetic and real data examples, ...

Wednesday, Jun 22: Telus 101-102

11:00 AM - 11:25 AM

## Drilling Deeper into the Leduc: From hydrocarbons to lithium, an evolutionary resource

Telus 101-102

**Joanie Kennedy**

E3 Metals Corp

The Leduc formation, historically one of Alberta's prolific oil and gas reservoirs, is now a major player for bringing a lithium brine extraction resource to Canada. It has been known since the 1990's that elevated lithium concentrations in the Leduc brine exist, and advancements in direct lithium extraction technologies in recent years have made concentrating lithium out of these brine waters a reality. The Leduc conventional oil traps, which set the stage for the oil boom in Alberta in 1947, are the same traps, where now the water leg/brines that lie below the hydrocarbon window are being produced for lithium ...

Wednesday, Jun 22: Glen 208-209

11:25 AM - 11:50 AM

## Structural and Sequence Stratigraphic Analyses of Fuzzal Field, Niger Delta

Glen 208-209

**TAofeek Ogunfolabo**

Stratigraphic and structural analyses of Orlawah field, Niger Delta were carried out with the aim of evaluating the hydrocarbon potential of the field. A suite of wireline logs and 3D seismic data were quality controlled and processed. Computation of petrophysical properties of reservoir units identified from log data (i.e porosity, permeability and volume of shale) from well-established equations was executed. Lithologic interpretation and hydrocarbon reservoir identification were carried out using gamma ray and resistivity log responses. Log sequence evaluation was done by the analysis of log amplitude and stacking patterns of facies succession. Identification and mapping of network of eleven ...

Wednesday, Jun 22: Glen 201-204

11:25 AM - 11:50 AM

## Cost effective characterization of a geothermal carbonate reservoir by application of deep neural networks to legacy seismic data

Glen 201-204

**FABIEN ALLO**  
CGG

In order to evaluate the geothermal potential of a carbonate reservoir located in the Paris Basin, porosity and permeability of the formation are inferred from seismic data using deep neural networks. As limited well data is available, a large number of synthetic pseudo-wells is simulated from the original wells to create a statistically more representative training dataset for the neural networks. The estimated acoustic impedance compares favorably with the impedance obtained through a traditional acoustic seismic inversion. But unlike the inversion, the neural network can be parameterized to directly output predictions of the rock properties of interest facilitating a quantitative ...

Wednesday, Jun 22: Telus 111 - Colab

11:25 AM - 11:50 AM

## Nipiih (Water) quality study of the Lesser Slave Lake: Working together in science, engagement and youth outreach

Telus 111 - Colab

**Evangeline Eldridge**  
University of Calgary

This talk will describe a water quality study of the Lesser Slave Lake, conducted jointly by the University of Calgary and the Sucker Creek First Nation (SCFN) using western scientific method integrated with Indigenous ways of knowing. It will also demonstrate how this study was used as the foundation for outreach activities, connecting graduate, undergraduate and high school students to discuss the applicability of post-secondary education in science, technology, engineering and math disciplines, also known as STEM, in community life. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

11:25 AM - 11:50 AM

## An encoder-decoder CNN for DAS-to-geophone transformation

Glen 206

**Jorge Monsegny**  
PhD Student, University of Calgary

Distributed acoustic sensing is a technology that uses optical fibre to record seismic waves. While traditional geophones record the particle velocity created by a passing wave, optical fibre records the strain or strain rate. The conversion between the two kinds of signals allows seismic time lapse imaging applications with data from these two different recording systems. Here we use convolutional neural networks to transform fibre to geophone data. Instead of using a supervised model where we provide examples of corresponding fibre and geophone traces, we utilize an encoder decoder scheme that receives fibre traces and produces fibre traces. The important ...

Wednesday, Jun 22: Glen 205

11:25 AM - 11:50 AM

## **Bypassing the near surface in full-waveform inversion of VSP data at the containment and monitoring institute field site**

Glen 205

**Scott Keating**

We apply full-waveform inversion to the site of a CO2 monitoring program to provide a baseline for later time-lapse inversion. We make use of a novel technique to avoid characterizing the near surface when using VSP data.[Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

11:25 AM - 11:50 AM

## **Detecting and characterizing a high permeability, thin micro-layer at the bottom of a heavy oil formation**

Telus 104-105

**Alexandru Turta**  
A T EOR Consulting

Given the importance of identifying and characterizing a high permeability, thin micro-layer at the bottom of a heavy oil formation, both a theoretical investigation and a technological one has been considered in this project. The theoretical investigation is related to the evaluation of the depositional system which favors an increase of permeability in a downward direction, otherwise expressed a coarsening in a downward direction. The signs of regional geology elements indicated such a trend are investigated. As far as the detection of a high permeability, thin micro-layer at the bottom of a heavy oil formation by using the logs is concerned, the ...

Wednesday, Jun 22: Telus 103

11:25 AM - 11:50 AM

## **Application Of Full-Wave Forward Modeling For Seismic Exploration Feasibility Studies**

Telus 103

**MARIO A. RIVILLAS**

This article provides a technique to use full-wave forward modeling to validate seismic survey designs as well as to project a potential seismic data processing flow based on the obtained modeling results. Some examples on the use of this technique are presented for different seismic-geological conditions modeled with the full wave forward modeling package Tesseral.[Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 106

11:25 AM - 11:50 AM

## **Foothills seismic exploration for definition, characterization and selection of nuclear waste disposal sites in northern Switzerland (Jura Mountains): key challenges**

Telus 106

**Herfried Madritsch**  
Nagra

We present foothills seismic exploration from northern Switzerland in the context of the siting process for the national nuclear waste repository. The talk will showcase this task's specific challenges addressing aspects of acquisition, processing and interpretation. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 106

11:50 AM - 12:15 PM

## **Unsupervised AI workflow to evaluate the transition of a 50-year giant gas field quickly and thoroughly to potential multiple CO2 storage and geothermal viable projects.**

Telus 106

**Bernard Laugier**  
Senior Geophysical Advisor, Scolty Energy Consulting LLC-Seisnetics

Seismic data remain a pillar of subsurface modeling and the understanding of the potential for transitioning from oil and gas production to applications such as CO2 storage and geothermal projects. However, interpretation is a biased and time-consuming process forcing geoscientists to spend more energy picking horizons and building models than focusing their attention on evaluating the results. A new unsupervised Artificial Intelligence based on genetic algorithm to automatically process the seismic data in an unbiased way and record time was applied to the Groningen giant gas field depleted area, using data available online from the multiple seismic campaigns. After 12 ...

Wednesday, Jun 22: Telus 111 - Colab

11:50 AM - 12:15 PM

## **Industry Study Collaborating with Our Aboriginal Partners for Economic Development**

Telus 111 - Colab

**Tim Leshchyshyn**  
FracKnowledge

This study in collaboration defines the major parts of a drilling and completions costs tracking to identify the areas of opportunity for industry to partner with aboriginals for a synergistic relationship and success for field development. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

11:50 AM - 12:15 PM

## Beyond EOR - Evaluating the Geothermal Potential of Historic Gas and Oil Fields

Telus 104-105

**John Hirschmiller**

Senior Geologist, GLJ Ltd.

Reservoir life does not have to end when water cuts are high. With the vast knowledge from oil and gas reservoirs, we can use this data to understand and calculate any additional geothermal potential of historic oil and gas fields. By utilizing heat in place calculations, thermal energy can be calculated to understand the thermal energy which resides in the subsurface waiting to be extracted. This presentation will walk through a case study of how to calculate heat in place as well as reviewing the regional geothermal potential in the western Canadian sedimentary basin. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

01:25 PM - 01:50 PM

## Numerical Modeling of Hydraulic Fracturing Effectiveness, Fault Activation and Reservoir Drainage in The Presence of a Strong Lateral Pore-Pressure Gradient

Glen 205

**Zahra Esmaeilzadeh**

PhD student, University of Calgary

This paper characterizes the influence of a lateral pore-pressure gradient on completion effectiveness and fault activation. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 103

01:25 PM - 01:50 PM

## The Pan-Canadian Geoscience Strategy: Integration and Cooperation for Critical Minerals Exploration and Energy Transformation

Telus 103

**Daniel Lebel**

Director General, Geological Survey of Canada / NRCan

The Pan-Canadian Geoscience Strategy (PGS) builds on existing collaborations and represents a renewed commitment to strong relationships for delivering new accessible geoscience data and knowledge for all Canadians. The need for this Strategy was identified in the Canadian Minerals and Metals Plan (2019), and agreed upon by Canada's Mines Ministers under the related Action Plan 2020. This presentation will outline the main priorities and their contribution to Energy Transformation and the supply of Critical Minerals toward this and other ends. [Click Here for the Full Abstract](#)



Wednesday, Jun 22: Telus 106

01:25 PM - 01:50 PM

## **Methane Emissions from Abandoned and Suspended Oil and Gas Wells in Alberta and Saskatchewan**

Telus 106

**Lauren Bowman**

M.Sc. Student, McGill University

Methane emissions from suspended and abandoned oil and gas wells are a recent addition to national greenhouse gas (GHG) inventories in Canada and the United States and are yet to be included in any other national GHG inventories. Alberta and Saskatchewan are the two largest oil and gas producing provinces in Canada, however there are currently no published direct measurements of methane emissions from suspended oil and gas wells in these regions. Recent studies highlight the need for measurements from abandoned and suspended wells in Canada to improve GHG inventories. Moreover, characterizing methane emissions from abandoned and suspended oil and gas wells ...

Wednesday, Jun 22: Telus 111 - Colab

01:25 PM - 01:50 PM

## **Trends in organic matter distribution and characteristics among rock formations in Peninsular Malaysia: Implications on hydrocarbon generation potential**

Telus 111 - Colab

**Alidu Rashid**

Trends in organic matter distribution and characteristics among rock formations in Peninsular Malay, Universiti Teknologi PETRONAS

This paper talks about the characteristics of several rock formations in Peninsular Malaysia pertaining to their organic matter and how it affects the generation of hydrocarbons. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

01:25 PM - 01:50 PM

## **Quantitative Prediction of Microseismic Density Volumes and SRV from Surface Seismic Attributes and Completion Data**

Glen 206

**Renjun Wen**

Geomodeling Technology Corp

A new workflow to quantitatively predict microseismic density volume and SRV from surface seismic attributes and stimulated reservoir volumes (SRV) through neural network [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 208-209

01:25 PM - 01:50 PM

## The Sedimentology of Palaeontology: how to accumulate highly fossiliferous deposits

Glen 208-209

**Jonathan Noad**

Sedimental Services; University of Adelaide

How does sedimentology affect the abundance of preserved macrofossils [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

01:25 PM - 01:50 PM

## Application of Migration Modeling to Unconventional Reservoirs: An Example from the Montney Formation, Northeastern British Columbia, Canada

Telus 104-105

**Victoria Chevrot**

University of Alberta

During migration, two main forces are present: buoyancy and capillary pressure. Fluid compositions govern the buoyancy force and affect the capillary pressure through interfacial tensions. Rock properties also impact the capillary pressure, a rock with smaller pore throat will have a higher capillary pressure. We test models for fluid distribution in an unconventional reservoir by simulating the migration of the hydrocarbons in the Montney Formation reservoir at Septimus field in northeast British Columbia where oil is present up-dip of gas. By injecting different fluid compositions in the model, and applying different capillary pressures to the rocks, we can look at the ...

Wednesday, Jun 22: Glen 201-204

01:25 PM - 04:35 PM

## Future of Integrated Geosciences in Energy Transformation

Session Chairs: John Duhault and Julia McElgunn

Glen 201-204

Session Chairs: John Duhault and Julia McElgunn

Wednesday, Jun 22: Telus 106

01:25 PM - 04:35 PM

## Methane Emission Reductions: Success Stories and Trends

Session Chairs: Travis Brookson and Maren Blair

Telus 106

**Allan Fogwill**

COO, PTAC

**Gabriela Gonzalez Arismendi**

**Heather Jones**

EO100 Program Director, Equitable Origin

**Jean-Philippe Gagnon**

Field Application Scientist, Telops

**Kyle Dreher**

ESG and Sustainability Specialist, West Lake Energy

**Lauren Bowman**

M.Sc. Student, McGill University

Session Chairs: Travis Brookson and Maren Blair

Wednesday, Jun 22: Telus 111 - Colab

01:25 PM - 04:10 PM

## Using organic matter in your reservoir

Session Chairs: Stan Stancliffe and Michael Webb

Telus 111 - Colab

**Alidu Rashid**

Trends in organic matter distribution and characteristics among rock formations in Peninsular Malay, Universiti Teknologi PETRONAS

**Carmen Li**

University of Calgary

**Casey Hubert**

University of Calgary

**Martin Fowler**

Applied Petroleum Technology (Canada)

**Thomas Demchuk**

Business Development Manager, Petrostrat, Inc.

Session Chairs: Stan Stancliffe and Michael Webb

Wednesday, Jun 22: Telus 101-102

01:25 PM - 03:45 PM

## Offshore Atlantic Canada Resource Exploration & Economics

Session Chairs: Michael Wamsteeker and Thomas Greig

Telus 101-102

**Masoud Aali**

Dalhousie University/ Scient Analytics

**Michael King**

Ph.D. Candidate, Memorial University of Newfoundland

**Neil Hodgson**

searcher

**Pei Yang**

Memorial University of Newfoundland

Session Chairs: Michael Wamsteeker and Thomas Greig

Wednesday, Jun 22: Glen 206

01:25 PM - 04:10 PM

## Microseismic Integration

Session Chairs: Adam Baig and Tom Eyre

Glen 206

**Adam Baig**

Nanometrics

**Amna Feroz**

University of Alberta

**Jorge Monsegny**

PhD Student, University of Calgary

**Randall Hickman**

Senior Geomechanics Engineer, Ikon Science

**Renjun Wen**

Geomodeling Technology Corp

Session Chairs: Adam Baig and Tom Eyre

Wednesday, Jun 22: Glen 208-209

01:25 PM - 05:00 PM

## Sedimentology, Stratigraphy and Paleontology

Session Chairs: Sean Fletcher and Erin Pemberton

Glen 208-209

**Bob Lee**

Graduate student, University of Calgary

**Jonathan Noad**

Sedimental Services; University of Adelaide

**Jonathan Schueth**

University of Nebraska Omaha

**Sean Fletcher**

Serafina Energy

**Thomas Peploe**

University of Calgary

**Waqar Ahmad**

PhD Candidate, University of Alberta

Session Chairs: Sean Fletcher and Erin Pemberton

Wednesday, Jun 22: Telus 104-105

01:25 PM - 05:00 PM

## Reservoir Optimization

Session Chairs: Chris Bird

Telus 104-105

**Courtney Lucente**

Geologist and Data Analyst, TRE Altamira Inc

**Hojjat Khani**

Computer Modelling Group

**Mark Mlella**

University of Alberta

**Tim Leshchyshyn**

FracKnowledge

**Victoria Chevrot**

University of Alberta

Session Chairs: Chris Bird

Wednesday, Jun 22: Glen 205

01:25 PM - 05:00 PM

## Induced seismicity and risk mitigation

Session Chairs: Sepideh Karimi and Neil Taylor

Glen 205

**David Eaton**

Professor, University of Calgary

**Honn Kao**

Research Scientist, Geological Survey of Canada, Natural Resources Canada

**Javad Yusifbayov**

Alberta Geological Survey, Alberta Energy Regulator

**Mark Novakovic**

Engineering Seismologist, Nanometrics Inc.

**Stephen Rogers**

WSP Golder

**Terry Zwicker**

Vesta Energy

**Thomas Eyre**

ASEISMIC Solutions Inc

**Zahra Esmaeilzadeh**

PhD student, University of Calgary

Session Chairs: Sepideh Karimi and Neil Taylor

Wednesday, Jun 22: Telus 101-102

01:25 PM - 01:50 PM

## Lithium Exploration in Saskatchewan: New data from the 2021 sampling season.

Telus 101-102

**Gavin Jensen**

Saskatchewan Geological Survey

Since 2011 the Saskatchewan Geological Survey has been sampling brines from wells producing from Paleozoic-aged strata in southeastern and west-central Saskatchewan and a database of major and minor elements in the formation waters in Saskatchewan has been developed. Standard brine analysis completed by the oil and gas industry typically measures only the major elements, making these results the first publicly available data for trace elements in the province. The aim of the Saskatchewan Geological Survey's brine sampling project is to determine the distribution and concentration of the major and minor elements present in the subsurface brines of Saskatchewan, with an ...

Wednesday, Jun 22

01:25 PM - 02:40 PM

## Canadian Lithium Brines part 2

Session Chairs: Mark Caplan and Courtney Reimert and Eric Pelletier

**Gavin Jensen**

Saskatchewan Geological Survey

**Gordon MacMillan**

Principal Hydrogeologist, Fluid Domains Inc

**Mark Caplan**

Resource Manager, Prairie Lithium Corporation

Session Chairs: Mark Caplan and Courtney Reimert and Eric Pelletier

Wednesday, Jun 22

01:25 PM - 04:35 PM

## Mining Geophysics

Session Chairs: Robert Hearst

**Aamna Sirohey**

Expert Geophysics Limited

**Daniel Lebel**

Director General, Geological Survey of Canada / NRCan

**Patrick Mah**

DMT Geosciences Ltd.

Session Chairs: Robert Hearst

Wednesday, Jun 22: Telus 104-105

01:50 PM - 02:15 PM

## Maximizing Liquids Rich Cuts in the Montney through GOR Control from Optimized Frac Design

Telus 104-105

**Tim Leshchyshyn**

FracKnowledge

One of the largest impacts to economics in the Montney liquids rich wells is the condensate cut. Although the geology and reservoir properties determine a large portion of this insitu, the following part of the interdisciplinary team impacts the final results of what is produced out the wellhead. Using the Montney formation, the control of pressure drops in the frac through proper frac design and proppant selection shows that a 200-300% increase of condensate yield can be achieved through analysis of the historical 203 wells in this study.[Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

01:50 PM - 02:15 PM

## Hybrid Foreshock Patterns of Injection-Induced Earthquakes in Western Canada

Glen 205

**Honn Kao**

Research Scientist, Geological Survey of Canada, Natural Resources Canada

Foreshock pattern of major injection-induced earthquakes can vary significantly across the Montney Play. We try to delineate possible physical factors for the observed variation, and discuss the implications of our results for effective mitigation of seismic hazard due to induced seismicity. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

01:50 PM - 02:15 PM

## Passive source location by diffraction scanning

Glen 206

**Jorge Monsegny**

PhD Student, University of Calgary

During CO<sub>2</sub> injection monitoring several events generated by passive sources at different locations are recorded. Some events are from surface operations while others are consequence of the CO<sub>2</sub> injection. We use a technique that analyzes the moveout of the passive seismic events for a series of potential sources located at different positions in the subsurface. The technique generates a plot that catalogs the events by source location making it possible to discern events produced the zone of interest from events generated elsewhere. We apply the technique to passive seismic records at the Containment and Monitoring Field Research Station in Alberta, ...

Wednesday, Jun 22: Telus 111 - Colab

01:50 PM - 02:15 PM

## Petroleum from Source Rock to Reservoir; Using two offshore eastern Canada basins as examples

Telus 111 - Colab

**Martin Fowler**

Applied Petroleum Technology (Canada)

This presentation reviews the factors influencing the type of petroleum in the reservoir, whether gas, oil or heavy oil, using two offshore eastern Canada basins as examples. The factors include source rock depositional environment and the source of the organic matter in the source rock, temperature of hydrocarbon generation, fractionation during migration, reservoir cracking, biodegradation, and the possibility of multiple charges. It highlights the need for petroleum systems analysis for understanding risk during exploration and development of oil and gas resources. [Click Here for the Full Abstract](#)



Wednesday, Jun 22: Telus 106

01:50 PM - 02:15 PM

## Technology Solutions to Achieve a 45% Reduction in Methane Emissions in the Oil and Gas sector

Telus 106

**Allan Fogwill**  
COO, PTAC

PTAC in collaboration with its industry and government partners has developed technology options for the oil and gas sector to reduce methane emissions by over 48%. Over several years, industry funds have sponsored the development and deployment of baseline technologies, monitoring technologies and processes, and the development of smart regulations. The sponsorship of over 450 projects, many focused on the assessment of methane has provided to the sector with practical tools to manage this evolving challenge. The set of technologies and processes for the management of methane has the capability to reduce emissions by 48% by 2025. Some of the ...

Wednesday, Jun 22: Glen 208-209

01:50 PM - 02:15 PM

## The coastal plain to Clearwater stratigraphy of central Alberta: differentiating the Mannville Group.

Glen 208-209

**Bob Lee**  
Graduate student, University of Calgary

Across most of central Alberta, the Mannville Group stratigraphy is noted as undifferentiated in stratigraphic tables. This situation has persisted for decades and is the result of a collective belief that there was no economic potential across the region. The maps presented in this talk are the result of this author's work to understand indications of bypassed oil that took Lloydminster correlations from Saskatchewan to Rge10W5. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 101-102

01:50 PM - 02:15 PM

## Water, Water Everywhere But Not A Drop To Drink! Lithium-Rich Brine Potential in Southeastern Saskatchewan

Telus 101-102

Remote Presentation

**Mark Caplan**  
Resource Manager, Prairie Lithium Corporation

This presentation will focus on lithium exploration in the province of Saskatchewan and business activities of Prairie Lithium. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 103

01:50 PM - 02:15 PM

## **An Investigation of a Salt Dome Interior using In-Mine Seismic Reflection**

Telus 103

**Patrick Mah**

DMT Geosciences Ltd.

An in-mine seismic reflection survey was executed at an underground salt mine in Louisiana, USA. In-mine seismic surveys are typically completed to map the inner structures and boundaries of the salt dome, which are near typically vertical geological features. Similarly to surface seismic, reflections are the result of faults and geologic boundaries. In contrast to surface seismic reflection, these reflections may occur anywhere in 3D space. Specific survey parameters and post processing of data are required to account for out-of-plane reflections and map the interior of the salt dome effectively. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 106

02:15 PM - 02:40 PM

## **Isotopic fingerprinting of atmospheric methane in Western Canada compared to oil and gas well emissions**

Telus 106

**Gabriela Gonzalez Arismendi**

Both industry and governments are now committed to massive reductions of methane emissions to the atmosphere. To most efficiently achieve these ambitious goals, detailed information on the concentration and isotopic composition of atmospheric methane and its putative sources are necessary. Here, we combined the concentration of atmospheric methane and its carbon isotopic composition acquired by ECCC successively in three different sites in Alberta and Saskatchewan from 2016 to 2020 with contour maps of isotope compositions methane from thousands of surface casing vent flows (SCVF), ground migration and production gases samples collected across the region. A concomitant variation of the atmospheric ...

Wednesday, Jun 22: Glen 205

02:15 PM - 02:40 PM

## **Quantifying detection thresholds and their variabilities for earthquakes catalogued in Alberta, Canada**

Glen 205

**Javad Yusifbayov**

Alberta Geological Survey, Alberta Energy Regulator

Utilization of the numerical simulations to quantify stations detection thresholds and the overall detection capabilities of the seismic networks deployed in Alberta. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 111 - Colab

02:15 PM - 02:40 PM

## An Overview of Palynofacies/Kerogen Analysis and its Assistance in Paleoenvironmental and Geochemical Interpretations

Telus 111 - Colab

**Thomas Demchuk**

Business Development Manager, Petrostrat, Inc.

Palynofacies describes the total acid-resistant organic matter content of sedimentary rocks within a specific sedimentary environment (Combaz, 1964). Palynofacies analysis involves the identification of palynomorphs, plant debris and amorphous particles, their absolute and relative proportions, size spectra and preservation states (Tyson, 1995). When integrated with sedimentological and stratigraphic data, palynofacies adds a unique aspect to paleoenvironmental interpretations. When integrated with geochemical information, it helps develop a greater understanding of a source rock, its quality, and the expected (or observed) hydrocarbon phase (gas versus oil). [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 208-209

02:15 PM - 02:40 PM

## Sedimentology and Ichnology of a tide-influenced river delta: An example from the Lower Permian of North Pakistan

Glen 208-209

**Waqar Ahmad**

PhD Candidate, University of Alberta

The lower Permian Dandot Formation (Salt range, north-west Pakistan) is studied through integrated sedimentologic and ichnologic analysis. The integrated facies analysis allows recognizing a tide-influenced deltaic succession with prodelta, delta front (tide, and river-dominated), distributary mouth, tidal bars, Interdistributary-bay deposits, and channels, forming coarsening-upward succession, up to 35m thick. Sedimentological characteristics (spring-neap cycle, single and double mud and mud drapes, soft-sediment deformation structures, syneresis cracks, rare wave ripples, bidirectional paleocurrent, coal seams, and fragments) and ichnological signatures (sporadic bioturbation, low diversity-low intensity impoverished trace fossils suite, the dominance of deposit-feeding traces, and rare occurrence of suspension-feeding traces) indicate several ...

Wednesday, Jun 22: Telus 104-105

02:15 PM - 02:40 PM

## Clustering of Geological Models for Reservoir Simulation

Telus 104-105

**Hojjat Khani**

Computer Modelling Group

A clustering technique based on static data is used to select a few representative models from a set of geological realizations. The Jensen-Shannon (JS) divergence is used as the dissimilarity distance to calculate the dissimilarity between any pair of realizations. Geological realizations consist of patterns that have complex structures. These structures may not be detectable and classifiable by simple linear techniques. Hence, Kernel k-means algorithm is used to identify nonlinear structures inherent in the data. Multidimensional scaling (MDS) is used to project the realizations into 2D space. This visualization can be used as supporting visual evidence to show the relative ...

Wednesday, Jun 22: Telus 101-102

02:15 PM - 02:40 PM

## Approaches to Subsurface Lithium Production - Benefits and Risks of Water Injection

Telus 101-102

**Gordon MacMillan**

Principal Hydrogeologist, Fluid Domains Inc

There has recently been a rapid growth of commercial interest in the production of the lithium from the WCSB including preliminary economic assessments under NI 43-101 guidelines. These and other projects consider pumping formation water to surface, extracting lithium from the formation water, and then injecting the lithium-depleted water back into the lithium-rich aquifer or into a new disposal zone. The decision of where to inject the lithium-depleted water is an important factor to a Project's feasibility and economics. This presentation explores the benefits and risks associated with injecting lithium-depleted water into the lithium-rich aquifer. The presentation: describes the difference

...

Wednesday, Jun 22: Telus 103

02:15 PM - 02:40 PM

## Airborne EM MobileMTm – technical details and applications

Telus 103

Remote Presentation

**Aamna Sirohey**

Expert Geophysics Limited

This case study demonstrates the potential of the MobileMTm system to aid in the identification of discrete targets including kimberlites, located at the surface and ranging up to several hundreds of meters depth, through acquisition of magnetic and EM data. In addition to the greater depth of investigation, the passive field technology can detect superconductors and distinguish between rock types with high resistivities, i.e., in excess of thousands and tens of thousands of ohm-m, and is free of distortions from parasitic IP and SPM effects inherent to systems with impulse type, artificially driven transmitters. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

02:15 PM - 02:40 PM

## Do Moment Tensors Flip During Hydraulic Fractures?

Glen 206

**Adam Baig**

Nanometrics

Surface microseismic monitoring exists in a very low signal-to-noise environment complicating the need to pick first motions for accurate moment tensors. Here, we investigate how we can appeal to the background stress regime to optimize the production of moment tensors over a hydraulic fracture. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:45 PM - 02:55 PM

## **Numerical Modeling of Hydraulic Fracturing Effectiveness, Fault Activation and Reservoir Drainage in The Presence of a Strong Lateral Pore-Pressure Gradient**

Poster Board 10

**Zahra Esmaeilzadeh**

PhD student, University of Calgary

Poster Board 10 This paper characterizes the influence of a lateral pore-pressure gradient on completion effectiveness and fault activation. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:45 PM - 02:55 PM

## **A Case Study on InSAR as a High Frequency Decision Making Tool for SAGD Operations**

Poster Board 17

**Courtney Lucente**

Geologist and Data Analyst, TRE Altamira Inc

Poster Board 17 A case study on the use of InSAR (Interferometric Synthetic Aperture Radar) as a decision making tool for SAGD operations. A comparison between the qualitative results of 4D seismic and InSAR highlighting the similarity between the two surveillance techniques and the potential ability of each to lead to the same operational decision. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:45 PM - 02:55 PM

## **Characteristics of surface casing vent flow methane emissions in Red Deer, Alberta**

Poster Board 22

**Zachary Cunningham**

Poster Board 22 This study intends to analyze what factors contribute to SCVF leaks, and what role they have in the underestimation of methane emissions in Red Deer, Alberta. Isotope analysis data is used from gas samples taken from wellbores that had active SCVFs, enabling an understanding of the source depth and formation from which the gas is from. To understand which wellbore characteristics are correlated with SCVF occurrences, statistical analyses (e.g., regression, PDFs) are conducted to understand if the likelihood of a SCVF leak is higher with certain attributes being present in a wellbore. The results of isotope analyses ...

Wednesday, Jun 22

02:45 PM - 02:55 PM

## **A SHAPLEY Approach to Williston Rock Quality**

Poster Board 58

**Emily Head**

Senior Geology Associate, Enverus

Poster Board 58 The purpose of this study is to identify areas of over- and under-performing assets given an operator's geological quality. We leveraged SHAP (Shapley Additive Explanation) values to characterize rock quality differences across the Williston Basin. Each SHAP value represents the marginal contribution to 36-month oil recoveries, the target variable, which can be summed to get the total contribution that geology plays in oil productivity. A resulting rock quality map compared against actual well results highlights areas where productivity is lower than anticipated and assists operators in understanding the upside potential. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:45 PM - 02:55 PM

## **Application of a numerical tectonic modeling and source-to-sink system models to petroleum systems of the Scotia Basin**

Poster Board 64

**Eren Berberoglu**

University of Alberta

Poster Board 64 The Scotia Basin represents the northern part of the 2000-km-long North American-African rifted system that formed during the rifting of Pangea and opening of the Central Atlantic Ocean at the end of Triassic period. The NE-SW-trending passive margin basin lying along the Nova Scotia Margin extends an area of approximately 300 000 km<sup>2</sup> in the Atlantic Ocean and reaches a thickness of up to 18 km at its deepest area (Wade and MacLean, 1990). The history of hydrocarbon exploration in the Scotia Basin stretches back to the 1950s. However, the generation mechanism, timing, and potential of source ...

Wednesday, Jun 22

02:45 PM - 02:55 PM

## **Preliminary Results from a long-period magnetotelluric (MT) investigation of the Fort à la Corne area and surrounding Trans-Hudson Orogen, Saskatchewan**

Poster Board 70

**Brandon Chase**

Poster Board 70 A 3-D resistivity model created from a 35 station long-period magnetotelluric array over the Trans-Hudson Orogen and Fort à la Corne kimberlite field is presented. Preliminary results and interpretations of the resistivity anomalies are discussed in relation to regional tectonics, lithosphere structure, and kimberlite magmatism. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:45 PM - 02:55 PM

## Hydrocarbon Generation Potential of the Zagros Basin, Pabdeh Formation Using Rock-Eval Pyrolysis Technique

Poster Board 76

**Mehdi Poor Jahangiri Pilehrood**

Poster Board 76 One of the most important petroleum source rocks in the Zagros basin is the Pabdeh Formation that has been evaluated by geochemical techniques. The aim of this study was to assess the quality of organic matter, check thermal evolution and highlight Pabdeh Formation potential as a source rock of Mansouri oilfield located in Zagros Basin. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:55 PM - 03:05 PM

## IERisk: A novel tool for induced earthquake mitigation

Poster Board 11

**Thomas Eyre**  
ASEISMIC Solutions Inc

Poster Board 11 We have developed a new computational toolbox to aid in producing quantitative mitigation and response plans by combining reservoir-simulation methods with advanced geomechanical and seismological computational tools. The toolbox includes modules for site-specific induced seismicity operational risk assessment, by augmenting relevant public data sources with additional site-specific information. Using case studies from western Canada, we demonstrate that the methodology shows good potential for providing realistic estimates of induced earthquake magnitudes based on operational design. This is the first tool aiming to address all areas integral to modeling and mitigating induced seismicity arising from hydraulic fracturing, and able ...

Wednesday, Jun 22

02:55 PM - 03:05 PM

## Maximizing Liquids Rich Cuts in the Montney through GOR Control from Optimized Frac Design

Poster Board 18

**Tim Leshchyshyn**  
FracKnowledge

Poster Board 18 One of the largest impacts to economics in the Montney liquids rich wells is the condensate cut. Although the geology and reservoir properties determine a large portion of this insitu, the following part of the interdisciplinary team impacts the final results of what is produced out the wellhead. Using the Montney formation, the control of pressure drops in the frac through proper frac design and proppant selection shows that a 200-300% increase of condensate yield can be achieved through analysis of the historical 203 wells in this study. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:55 PM - 03:05 PM

## **Industry Study Collaborating with Our Aboriginal Partners for Economic Development**

Poster Board 23

**Tim Leshchyshyn**  
FracKnowledge

Poster Board 23 This study in collaboration defines the major parts of a drilling and completions costs tracking to identify the areas of opportunity for industry to partner with aboriginals for a synergistic relationship and success for field development. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:55 PM - 03:05 PM

## **How to Use Machine-learning and Computer Vision (LithoSearch) to Find Similar Lithology in Core-photo Library and Mapping The Results into 3D Space**

Poster Board 59

**Shervin Azad**  
Goldspot Discoveries

Poster Board 59 In mineral exploration, core photos ranging from several hundred to thousands of metres in length are brought up to surface and used by geologists for profiling the mineral composition at different depths. With LithoSearch, we leverage the images of these drill holes to find depths that have similar patterns, structures, and textures. The application scans through thousands of metres of drill holes and return areas of the drill holes that have some similarity giving the user the ability to filter the results through visual inspection and retain the good matches. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

02:55 PM - 03:05 PM

## **Stratigraphic analysis of the Jurassic and Cretaceous sequence of the Scotia Basin, Atlantic Canada**

Poster Board 65

**Lucia Vivanco**  
University of Alberta

Poster Board 65 The Nova Scotia margin of Atlantic Canada has been explored for hydrocarbons for more than 50 years. The exploration of the deeper Scotia Basin has not been successful (OETR, 2011), especially in slope and deep-water settings, resulting in only one non-commercial gas discovery (Hogg, 2002). Current state of exploration of the frontier Scotia Basin led to questions about the distribution, quality, extension, and thickness of source rocks, seals, and reservoirs. This study addresses these questions by building a stratigraphic framework of depositional sequences and system tracts through the integration of subsurface (well and seismic) data. Additionally, numerical stratigraphic ...



Wednesday, Jun 22

02:55 PM - 03:05 PM

## **Effect of External Dynamic Processes on the Quality of Aggregate resources in the Kermanshah Region**

Poster Board 71

**Saeid Zarghami**

Poster Board 71 The main objective of this study is the identification of quality and resistance of aggregates in Kermanshah plain where Kermanshah city needs large amounts of aggregates for urban development. In the first step we have selected 3 alluvial fans, 2 river terraces and 3 colluviums debris by satellite image processing to organize a field sampling. Quality and resistant analyses of the aggregates were carried out both in the field and the laboratory, with 240 coarse sediment particles collected from 16 pits, measuring approximately 80-90 cm in depth, made in the field. Sediment particle samples had been broken ...

Wednesday, Jun 22

02:55 PM - 03:05 PM

## **An Overview of Measurement and Reduction of Drill String Vibrations**

Poster Board 77

**Darlington Etaje**

University of Calgary

Poster Board 77 The understanding of the accurate measurement of torque, torsional vibrations, tensile load (hook-load is the weight of the drill string and the BHA added together, hanging on the traveling blocks), axial vibration, pressure and lateral vibration are prerequisite to understanding the way and manner drill bit, drill strings and BHA operates in drilling operation. The possibility for stick-slip increases as the drill-bit gains stabilizations against lateral-vibration when WOB is increased. On the other hand, the increase in rotary speed has frequently helped to mitigate stick-slip with the tendency to produce more lateral-vibration. When no sweet spot can ...

Wednesday, Jun 22

03:05 PM - 03:15 PM

## **Earthquake Detection and Focal Mechanism Calculation Using Artificial Intelligence**

Poster Board 12

**Shane Quimby**

Director of Borehole Geophysics, GeoTomo

Poster Board 12 We discuss a method to that utilizes artificial intelligence to detect and locate earthquakes and induced seismicity accurately and without manual picking. Our results compare favorably with accepted results for both large quakes and smaller events associated with induced seismicity. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

03:05 PM - 03:15 PM

## **The CREATE-REDEVELOP program: Supporting relationships with Indigenous communities within an interdisciplinary training environment**

Poster Board 24

**David Eaton**

Professor, University of Calgary

Poster Board 24 This presentation will provide an update on current status of the CREATE-REDEVELOP project, to serve as an introduction to presentations by four student teams. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

03:05 PM - 03:15 PM

## Analyzing and Classifying Groundwater Quality in the Western Tehran Using Multi-Criteria Decision Models

Poster Board 27

**Saeid Zarghami**

Poster Board 27 . Univariate or multivariate statistical approaches are one of the strategies used to examine spatial and temporal changes in groundwater quality and quantity. The significance of water resources in Iran is heightened by its location in the desert belt, particularly in dry and interior areas. Consequently, as one of the marginal parts of the inland basin, the present research used multivariate statistical analysis to analyze and classify geomorphic landforms and their influence on groundwater quality in the west of Tehran province. For this objective, statistical techniques were used to generate temporal and geographic fluctuation statistics for 13 ...

Wednesday, Jun 22

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## The Complete Bakken History of Refracs and Re-completes in the North Dakota: Determining Detailed Type of Refrac and Incremental Production

Poster Board 25

**Tim Leshchyshyn**  
FracKnowledge

Poster Board 25 Refracturing is a practice to re-use and re-vitalize production without drilling a new well or abandoning a horizontal well before it is needed because the refracturing is tougher. The uncertainty is higher on refracturing and the industry experience is light. This study highlights the experience from a major play in the USA, the Bakken in North Dakota. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

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## High-resolution seismic investigation in phosphate mining

Poster Board 26

**Anas CHARBAOUI**  
PhD Student, Mohammed VI Polytechnic University

Poster Board 26 The present project is concerned with the study of the Bahira basin, which hosts some of the most important phosphate deposits of Morocco. Its main objective is to provide a detailed seismic imaging of the phosphatic series, particularly in the area where it is hidden by a plio-quaternary cover. The Bahira phosphatic series is made of a Maastrichtian to Ypresian regular intercalation of phosphate beds and sterile layers. Through this project, we intend to develop a methodological approach that would allow improving the vertical resolution of the SHR method in order to provide a precise characterization of ...

Wednesday, Jun 22

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## Evaluating Geothermal Energy Production from Suspended Oil and Gas Wells by Using Artificial Intelligence

Poster Board 60

**Tamer Moussa**  
University of Alberta

Poster Board 60 Canada has more than 65,000 suspended oil and gas wells completed in the Western Canadian Sedimentary Basin (WCSB) with reported bottomhole temperature at the public database, with more than a thousand of suspended multi-fractured horizontal wells (MFHWs). Can these wells be retrofitted to generate geothermal power? The objective of this study is to answer this question by investigating the geothermal potential of suspended wells completed in WCSB and identify the best candidate wells for repurposing. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

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## Multidisciplinary data integration: A case study from a heavy oil reservoir

Poster Board 66

**Amna Feroz**  
University of Alberta

Poster Board 66 We analyze monitoring data over a heavy-oil steam injection field, including time-lapse 2D reflection seismic data, microseismic data, production data, and tiltmeter recordings. During cyclic steam stimulation, the reservoir-caprock system undergoes multiple changes due to imposed high pressures and temperatures, including dilation, compaction, and alterations of rock physics properties. We find that microseismic activity is more likely to occur in the overburden due to stress-induced failure in brittle rocks, whereas seismic reflection data highlight the changes at the reservoir level, predominantly because of temperature-induced viscosity changes in the in situ heavy oils. A joint interpretation of multiple ...

Wednesday, Jun 22

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## Investigating Fault Sealing Effects on Induced Seismicity and Pore Pressure Distribution in NEBC

Poster Board 72

**Zahra Esmaeilzadeh**  
PhD student, University of Calgary

Poster Board 72 This paper reviews Montney pore pressure data from Northeast of British Columbia, with the objective of reappraising pressure terrane boundaries and evaluating the relationship between fault structures, pressure terranes and induced seismicity. [Click Here for the Full Abstract](#)

Wednesday, Jun 22

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## The impacts of glacial sediments on slope instability the case of Songhor. Dinevar Basin

Poster Board 78

**Saeid Zarghami**

Poster Board 78 Due to limited water resources, many cities in Iran have developed near the mountains and have gradually expanded to the foothills. Due to glacial erosion in the Quaternary period, these domains contain sediments that have characteristics such as permeability and particles separation. If accompanied by high slope, heavy rainfall and earthquakes, they may lead to instability and environmental changes. This paper aims to identify a relationship between glacial sediments and the potential instability of the Dinur Basin slopes and Songhor. Accordingly, in the first step, traces and extent of glacial sediments were identified through field observations, temperature ...

Wednesday, Jun 22: Telus 111 - Colab

03:20 PM - 03:45 PM

## Towards net zero: lowering steam-to-oil ratios with thermophilic bacteria and N2 biogas

Telus 111 - Colab

**Casey Hubert**

University of Calgary

Dormant thermophilic bacteria are present throughout heavy oil reservoirs, and can be awoken by conductive heating in zones adjacent to steam injection that reach temperatures of 50-100 degrees Celsius. Nutrient injection can stimulate these bacteria to generate non-condensable gas in the form of N2 (nitrogen gas). This creates an enhanced oil recovery mechanism akin to compaction drive owing to the dormant microorganisms being distributed ubiquitously throughout the reservoir sandstone; their biogas production promotes an evenly distributed 'squeezing' mechanism throughout the target zone of the reservoir creating a uniformly distributed source of reservoir energy that drives a primary recovery process. In ...

Wednesday, Jun 22: Telus 104-105

03:20 PM - 03:45 PM

## A Case Study on InSAR as a High Frequency Decision Making Tool for SAGD Operations

Telus 104-105

**Courtney Lucente**

Geologist and Data Analyst, TRE Altamira Inc

A case study on the use of InSAR (Interferometric Synthetic Aperture Radar) as a decision making tool for SAGD operations. A comparison between the qualitative results of 4D seismic and InSAR highlighting the similarity between the two surveillance techniques and the potential ability of each to lead to the same operational decision. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 106

03:20 PM - 03:45 PM

## A comprehensive summary of methane quantification using Telops' airborne hyperspectral instrument

Telus 106

**Jean-Philippe Gagnon**

Field Application Scientist, Telops

Methane is a powerful greenhouse gas and several organizations in multiple countries are taking significant steps toward sharply reducing emissions from the oil and gas sector [1] [2]. A large portion of such emissions come from a small fraction of "super-emitting" sources. Airborne infrared hyperspectral imaging can visualize and quantify these emissions and gas leaks under various environmental conditions and industrial contexts. The capabilities of the Telops airborne-based methane emission detection system was demonstrated in multiple controlled releases with methane flow rates varying from 3 to 55 m<sup>3</sup>/h. Results show that the system is able to detect methane emission rates

...

Wednesday, Jun 22: Telus 101-102

03:20 PM - 03:45 PM

## Reconstructing the southern North Atlantic Ocean back through time

Telus 101-102

**Michael King**

Ph.D. Candidate, Memorial University of Newfoundland

The offshore rifted margins of the southern North Atlantic Ocean have been demonstrated to have a complex present day crustal structure comprised of sedimentary basins, inherited structures, variable basement affinities, and continental blocks. In this study, we use deformable plate tectonic models to reconstruct the plate kinematic and crustal evolution of the Newfoundland, Irish, and West Iberian margins back through time. The results of our models reveal the pre-rift crustal thickness template of the southern North Atlantic Ocean and the crustal thickness evolution of continental blocks and sedimentary basins within. In addition, this study highlights the potential impact of Appalachian ...

Wednesday, Jun 22: Glen 205

03:20 PM - 03:45 PM

## No Surprise! Mineralogy influences Induced Seismicity in the Duvernay East Shale Basin

Glen 205

**Terry Zwicker**

Vesta Energy

Middle Duvernay carbonate content vs clay content seems to influence the depth location, the magnitude, and the frequency of occurrence of seismic events induced by hydraulic fracture programs. This relationship between mineralogy and seismicity will be examined further utilizing both microseismic data and Vesta's passive surface seismic array catalogue. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 206

03:20 PM - 03:45 PM

## 3D Geomechanics Model Integration With Microseismic Surveys Using Fluid-Induced Seismicity Constraints

Glen 206

**Randall Hickman**

Senior Geomechanics Engineer, Ikon Science

Information from static 3D geomechanics models may be integrated with microseismic survey data to better understand and predict fracture behavior during stimulation programs. We review how 3D static geomechanics models may be developed from calibrated 1D geomechanics models and seismic inversion volumes, which can be interpreted to determine the possible extent of hydraulic fracture development. Complementary interpretation of microseismic data can be complicated by multiwell, multistage stimulation programs. We employ a fluid-induced seismicity framework to enhance the interpretation of microseismic surveys, including assigning microseismic events to the proper stimulation stages. Examples from the Montney are presented to illustrate the workflow. Click ...

Wednesday, Jun 22: Glen 208-209

03:20 PM - 03:45 PM

## Facies and stratigraphic analysis of three scales of clinothems in an exhumed basin margin succession, southern Chile

Glen 208-209

**Thomas Peploe**

University of Calgary

Studies of exhumed, subsurface, and modern deltas and basin margin successions reveal clinothems develop at several scales. The wide range of dimensions, from metre-scale (e.g., mouth bar) to km-scale (e.g., continental basin margin), has limited our ability to compare them along a single system, and therefore understand how smaller clinothems stack to form the larger ones. A basin-margin succession of the Upper Cretaceous Dorotea-Tres Pasos formations at Cerro Cazador, Magallanes Basin, Chile, offers a unique opportunity to analyse several scales of clinothems in a single outcrop belt. Click Here for the Full Abstract

Wednesday, Jun 22: Telus 101-102

03:45 PM - 04:10 PM

## Renewal of the crustal architectural map and plate kinematic model of the Flemish Cap, offshore Newfoundland margin

Telus 101-102

**Pei Yang**

Memorial University of Newfoundland

In this study, thirteen newly acquired long-offset multichannel seismic profiles over the Flemish Cap, a continental fragment along the offshore Newfoundland, are used to investigate its crustal architecture and tectonic history through combination with vintage seismic data. Significant margin-parallel and margin-perpendicular structural variations are observed and these are used to map the crustal architecture in terms of rifted margin domains (proximal, necking, hyperextended, exhumed, and oceanic domains included). The newly-mapped edges of the necking and hyperextended domains are used to locally update an existing deformable plate reconstruction model, improving our understanding of the formation of continental fragments during the opening ...

Wednesday, Jun 22: Glen 206

03:45 PM - 04:10 PM

## Multidisciplinary data integration: A case study from a heavy oil reservoir

Glen 206

**Amna Feroz**

University of Alberta

We analyze monitoring data over a heavy-oil steam injection field, including time-lapse 2D reflection seismic data, microseismic data, production data, and tiltmeter recordings. During cyclic steam stimulation, the reservoir-caprock system undergoes multiple changes due to imposed high pressures and temperatures, including dilation, compaction, and alterations of rock physics properties. We find that microseismic activity is more likely to occur in the overburden due to stress-induced failure in brittle rocks, whereas seismic reflection data highlight the changes at the reservoir level, predominantly because of temperature-induced viscosity changes in the in situ heavy oils. A joint interpretation of multiple datasets thus provides ...

Wednesday, Jun 22: Telus 106

03:45 PM - 04:10 PM

## Methane Reduction Funding Opportunities for Upstream Producers

Telus 106

**Kyle Dreher**

ESG and Sustainability Specialist, West Lake Energy

With operations that span across Alberta and Saskatchewan, West Lake's carbon intensity is quite high per barrel of oil extracted. However, West Lake is dedicated to strong environmental, social and governance practices, including methane mitigation strategies that meet and exceed AER compliance standards. This presentation will point out multiple funding avenues that are available for projects focused on methane reduction within the upstream oil and gas sector. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

03:45 PM - 04:10 PM

## Interpreting subsurface connectivity patterns in order to better understand Induced Seismicity Controls in the BC Montney

Glen 205

**Stephen Rogers**

WSP Golder

This paper presents ongoing work on characterising and understanding subsurface structures and their role in transmitting pressure from stimulated wells to critical structures, resulting in induced seismic events. This is based upon both the interpretation of induced seismic lineaments, estimation of pathway diffusivity from time of flight measurements associated with induced events and Discrete Fracture Network modelling of the system to simulate structural patterns and observed seismic events. It provides insights into how completion designs might be modified to reduced they risk of induced events [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 111 - Colab

03:45 PM - 04:10 PM

## Bacterial anomalies indicative of deep-sea sediment hydrocarbon seeps

Telus 111 - Colab

**Carmen Li**

University of Calgary

A bioassay was developed for hydrocarbon exploration in the deep-sea using a DNA-based assessment of in situ bacterial species in shallow and deep marine sediments. Bacterial OTUs affiliated with Caldatribacteriota and Campilobacterota are indicative of thermogenic and biogenic hydrocarbons. These OTUs were readily detected in shallow <50 cmbsf sediments in hydrocarbon-positive sites. Preliminary testing of application of this bioassay at sea with visual (ROV) control at seabed seepage sites corroborates these findings. Anomalies in seabed sediment microbial diversity patterns can be used as bioindicators for hydrocarbon seeps in the deep sea and provide a complementary tool for de-risking offshore oil ...

Wednesday, Jun 22: Glen 208-209

03:45 PM - 04:10 PM

## The Search for the World's Fastest Sand Dunes

Glen 208-209

**Jonathan Schueth**

University of Nebraska Omaha

We present a new method that uses Google Earth historical imagery to measure sand dune migration. We measured the world's fastest sand dunes and discovered they are in areas of high windspeed and low vegetation cover possibly indicating higher migration risk with climate change induced desertification. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 104-105

03:45 PM - 04:10 PM

## Well deformation: Simulation and reconstruction of multi- finger caliper observations

Telus 104-105

**Mark Mlella**

University of Alberta

MFCs can give information about wellbore damage. However, MFC data needs to be processed to give correct pipe geometries (which is a tricky reconstruction). So, we hope to develop algorithms to better get the wellbore geometry which will, in turn, allow a better understanding of the downhole stresses. [Click Here for the Full Abstract](#)



Wednesday, Jun 22: Telus 101-102

04:10 PM - 04:35 PM

## The role of re-imaing in the re-imagining of the Proven Hydrocarbon Basins Offshore Nova Scotia

Telus 101-102

**Neil Hodgson**  
searcher

Exploration on the shelf of Nova Scotia halted before the recent advances in seismic imaging could be applied. New Imaging of the Shelf yields new insights into sedimentology, structure, DHI's and source rocks. Using these new tools we can re-ignite exploration in this proven hydrocarbon basin. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

04:10 PM - 04:35 PM

## Enhancement of Risk Mitigation Strategies for Induced Seismicity by Utilizing Hazard Scenarios

Glen 205

**Mark Novakovic**  
Engineering Seismologist, Nanometrics Inc.

We present an example case study to demonstrate how ground motion hazard can be used to inform risk mitigation strategies for induced seismicity both before, and during the operations. To this end, an assessment was carried out to understand the seismic hazard posed by induced earthquakes generated at disposal wells on nearby oil and gas facilities. The exceedance probability of critical ground motion levels at the facilities is calculated using a probabilistic framework. The approach considered uncertainties in terms of earthquake location, size, rate and ground motions. Hazard findings are presented as distinct seismicity scenarios to enhance an operator's ability ...

Wednesday, Jun 22: Telus 106

04:10 PM - 04:35 PM

## Incentivizing Continuous Improvement of ESG Practices Through Independent Certification

Telus 106

**Heather Jones**  
EO100 Program Director, Equitable Origin

Independent certification to environmental, social and governance (ESG) standards can provide a mechanism to recognize responsible energy producers and operators while incentivizing improvements in company practices and providing more transparency within the sector. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 208-209

04:10 PM - 04:35 PM

## Sedimentology from Low Earth Orbit - How Time-lapse Earth Motion from Remote Sensing Imagery Aids Reservoir Characterization and Challenges Static Depositional Paradigms

Glen 208-209

**Sean Fletcher**

Serafina Energy

The accessibility of open source and commercially available satellite imagery has increased substantially allowing earth science professionals and the public to view geomorphological features from new perspectives. The progressively large database of imagery, georeferenced and overlayed give the capability for multi-decadal earth processes to unfold as time-lapse motion at a variety of temporal and spatial scales. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Glen 205

04:35 PM - 05:00 PM

## Fault activation by induced aseismic slip

Glen 205

**David Eaton**

Professor, University of Calgary

**Thomas Eyre**

ASEISMIC Solutions Inc

This paper describes recent research that links aseismic slip, or slow earthquakes, to induced seismicity and casing deformation. [Click Here for the Full Abstract](#)

Wednesday, Jun 22: Telus 101-102

04:35 PM - 05:00 PM

## Chasing Mass Transport Deposits with Deep Neural Networks; The Good, the Bad, and the Ugly

Telus 101-102

**Masoud Aali**

Dalhousie University/ Scient Analytics

We apply machine learning, incorporating a state-of-the-art deep neural network (DNN) to identify convoluted mass transport deposits (MTD) features in seismic data. We trained the DNN with over 48,000 interpreted images showing the full variety of geometries, seismic architectures and facies of MTDs. These datasets are conditioned, and manually interpreted to produce the biggest machine learning dataset available worldwide for MTD identification. The output of the resulting model shows >97% overlap with manual interpretations in the validation phase. We evaluate the robustness of the candidate DNN, compared to the human interpretation, in a variety of geological environments, input seismic attributes, ...



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