



URTeC2021

July 26-28 | Houston & Online



Presentation Schedule

Mon, July 26	Title
10:30 AM	SHALE PETROPHYSICS Integrated Petrophysical Interpretation to Unlock Unconventional Reservoirs
11:00 AM	SHALE GEOPHYSICS A Comprehensive Fracture and Fault Characterization of a Shale Play – Multi-Scale Fault/Fracture Delineation Using Full-Azimuth Seismic Data
11:30 AM	SHALE MODELING Modeling Shale Heterogeneities with Automated Data Integration Workflows
1:30 PM	FLOW ASSURANCE & PRODUCTION OPTIMIZATION Life of Field Simulation Utilizing Your Asset's Surface-to-Subsurface Data in Tandem
2:00 PM	SHALE GEOPHYSICS Quality Sweet Spot Identification Using a Comprehensive Integration of Seismic Attributes
2:30 PM	DATA ANALYTICS & AUTOMATION Automated Decline Curve Analysis
3:00 PM	SHALE PETROPHYSICS Quantify Uncertainty throughout Formation Evaluation Workflows
3:30 PM	SHALE MODELING Using 3D Structural Attributes to Estimate Fracture Probability
4:00 PM	FLOW ASSURANCE & PRODUCTION OPTIMIZATION Optimize Efficiencies with Virtual Flow Metering
4:30 PM	SHALE GEOPHYSICS Precision Depthing Using Well Marker Mistie Tomography and Demigration/Remigration Improves Well Placement and Steering
Tues, July 27	
9:30 AM	SHALE GEOPHYSICS Quality Sweet Spot Identification Using a Comprehensive Integration of Seismic Attributes
10:00 AM	SHALE MODELING Modeling Shale Heterogeneities with Automated Data Integration Workflows
10:30 AM	FLOW ASSURANCE & PRODUCTION OPTIMIZATION Life of Field Simulation Utilizing Your Asset's Surface-to-Subsurface Data in Tandem
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11:30 PM	DATA ANALYTICS & AUTOMATION Automated Decline Curve Analysis
1:30 PM	SHALE GEOPHYSICS Precision Depthing Using Well Marker Mistie Tomography and Demigration/Remigration Improves Well Placement and Steering
2:00 PM	SHALE PETROPHYSICS NMR T1-T2 and T2-D Mapping of the Bakken Reservoir Complex

2:30 PM	SHALE MODELING Using 3D Structural Attributes to Estimate Fracture Probability
3:00 PM	FLOW ASSURANCE & PRODUCTION OPTIMIZATION Optimize Efficiencies with Virtual Flow Metering
3:30 PM	DATA ANALYTICS & AUTOMATION Automated Well Space Optimization and New Well Opportunity Identification Using a Machine Learning-based Workflow
4:00 PM	SHALE GEOPHYSICS A Comprehensive Fracture and Fault Characterization of a Shale Play – Multi-Scale Fault/Fracture Delineation Using Full-Azimuth Seismic Data
4:30 PM	SHALE MODELING Extract More from Seismic Data for Improved Shale Modeling
Wed, July 28	
9:30 AM	DATA ANALYTICS & AUTOMATION Automated Well Space Optimization and New Well Opportunity Identification Using a Machine Learning-based Workflow
10:00 AM	FLOW ASSURANCE & PRODUCTION OPTIMIZATION Optimize Efficiencies with Virtual Flow Metering
10:30 AM	SHALE PETROPHYSICS Quantify Uncertainty throughout Formation Evaluation Workflows
11:00 AM	SHALE MODELING Extract More from Seismic Data for Improved Shale Modeling
11:30 PM	SHALE GEOPHYSICS A Comprehensive Fracture and Fault Characterization of a Shale Play – Multi-Scale Fault/Fracture Delineation Using Full-Azimuth Seismic Data

Abstracts

Integrated Petrophysical Interpretation to Unlock Unconventional Reservoirs

Monday, 10:30 am; Tuesday, 11:00 am

Presented by Kim McLean

Shale reservoirs are heterogeneous by nature, with facies that differ in mineralogy and geomechanical properties. We will evaluate the mineralogy and geomechanical properties of a pilot well, and use the resulting logs as part of a machine learning workflow to identify sweet spot facies in terms of original oil in place, mineralogy and mechanical properties. This information is used to determine the optimal well path that leads to better placement within the reservoir sweet spot.

Featured technology: Geolog™

A Comprehensive Fracture and Fault Characterization of a Shale Play – Multi-Scale Fault/Fracture Delineation Using Full-Azimuth Seismic Data

Monday, 11:00 am; Tuesday, 4:00 pm; Wednesday, 11:30 am

Presented by Elive Menyoli

North America shale basins and their target formations have been exposed to numerous deformation events, resulting in large scale faults, small faults, and fractures. These deformation features are critical to economic drilling and prospecting. Modern seismic shale acquisitions are rich in azimuthal coverage, making them suitable for the recovery of these features using both imaging and azimuth inversion methods. However, approximations in many traditional seismic processing and imaging procedures can prevent their recovery.

This presentation shows the effectiveness of full-azimuth directivity methods to generate diffraction images that can expose small and modestly large faults that were previously unimaged. It also demonstrates how fractured media (HTI or Orthorhombic) can be parameterized for seismic imaging or full azimuthal inversion (AVAZ or VVAZ) for more accurate fracture characterization and a more complete seismic image.

Featured technologies: EarthStudy 360™ Diffraction Imaging, Orthorhombic Imaging, Full-Azimuth Inversion for Fracture Determination

Modeling Shale Heterogeneities with Automated Data Integration Workflows

Monday, 11:30; Tuesday, 10:00 am

Presented by David Garcia

Geoscientists and engineers working on unconventional plays face many challenges during exploration, appraisal, and development. Rock properties in shale plays are often highly complex and heterogeneous, and correlations with sweet spots, resources and production are not obvious to establish. This makes the task of planning wells and forecasting production rather difficult. In this context of high uncertainty, the integration of all available data and interpretations through subsurface modeling is key to better understanding of the play. It is the model that will reconcile multiple data sources and scales to produce an accurate representation of the subsurface. Such a model will be centric to any productive collaboration between team members and will enable rapid querying of the data.

This presentation will highlight an automated workflow for data integration and modeling in the unconventional plays leveraging workflow flexibility and advanced technologies to build accurate 3D heterogeneity models from wells and interpretations.

Featured technologies: SKUA-GOCAD™

Life of Field Simulation Utilizing Your Asset's Surface-to-Subsurface Data in Tandem

Monday, 1:30 pm; Tuesday, 10:30 am

Presented by Andrey Klimushin

METTE™ provides flow assurance and production optimization services to the upstream oil and gas industry. Ensuring successful and economical flow of the hydrocarbon stream from the reservoir to the surface is crucial, and both risk mitigation and optimal design are needed to reach a profitable target. Gain a deep understanding of the network with our solution of life-of-field simulation networks, from reservoir to production facilities. Our module takes into account user-defined production constraints, employing a powerful built-in event module. It automatically determines the need for choking, artificial lift and pressure boosting. Quantify the effect of artificial lift, determine the phasing of pressure boosting equipment, identify bottlenecks, evaluate new tie-backs, get expected variations in mass and energy balances. Coupling with subsurface model it produces a digital twin of your asset from reservoir to surface.

Featured technologies: METTE™ and Tempest™

Quality Sweet Spot Identification Using a Comprehensive Integration of Seismic Attributes

Monday, 2:00 pm; Tuesday, 9:30 am

Presented by Joanne Wang

To ensure a successful well in a shale play we must drill at the target which is favorable in fluid content, in-situ stress and rock properties. Due to their unique nature, shale plays have demonstrated challenges in reservoir exploration and production. Geoscientists have been searching for solutions that can determine and qualify the “sweet spots” in the shale formation, where the production and recovery rates are the highest. Because of its highly heterogeneous nature, identifying and ranking the “sweet spots” require several measurements to qualify them. Seismic data provides one of these measurements. Seismic data provides valuable information for all stages of shale play exploration and production since it carries signatures related to lithology, TOC, brittle/ductileness and in-situ stress. Transforming the seismic data into much-needed reservoir quality information requires support from several technologies and workflows.

In this presentation we evaluate and integrate various seismic attributes including structural and stratigraphic attributes, rock properties and fracture/stress attributes to characterize an Eagle Ford play.

Featured technologies: EarthStudy 360™, Full-azimuth Seismic Attributes, Modified Stochastic Inversion (MSI)

Automated Decline Curve Analysis

Monday, 2:30 pm; Tuesday, 11:30 am

Presented by Andrey Klimushin

SpeedWise® Decline Curve (SDC) is a unique cloud-based SaaS solution that applies advanced computational algorithms coupled with data-driven methods to generate robust decline curves on a well-by-well basis for any given field or portfolio. With SDC, technical teams and planning departments are able to greatly streamline the process of decline curve analysis. Allow more time to focus on result interpretation by leveraging SDC's fully automated capabilities, with flexible parameter selection and adjustments. The patented numerical engine and machine learning-based type curving substantially reduces the time for estimating ultimate recovery while performing unbiased and systematic analysis to any number of wells.

Featured technology: SpeedWise®

Quantify Uncertainty throughout Formation Evaluation Workflows

Monday, 3:00 pm; Wednesday, 10:30 am

Presented by Kim McLean

Petrophysical analysis and formation evaluation provide vital input to most geoscience workflows. Key information regarding shale volume, porosity, saturation and permeability and mineral volumes, together with the identification of fluid contacts and free water level, all guide and aid subsequent modeling and reservoir simulation. The ability to provide a level of uncertainty around these various petrophysical inputs increases confidence in reserves estimation and producibility, enabling better, more informed economic decisions. Geolog allows Monte Carlo uncertainty to be performed in a wide variety of petrophysical workflows, producing customizable uncertainty range with each output: Whether running environmental corrections, performing deterministic or optimized petrophysical analysis, verifying an oil water contact, or simply running a user-created algorithm.

Featured technology: Geolog™

Using 3D Structural Attributes to Estimate Fracture Probability

Monday, 3:30 pm; Tuesday, 2:30 pm

Presented by David Garcia

Horizontal well drilling and hydraulic fracturing technologies are critical for economic production of oil and gas from unconventional reservoirs. Identifying specific zones which have mechanical properties favorable for hydraulic fracture creation and propagation is a key step in the process of optimal horizontal well placement and completion design. Multiple data types are typically used to characterize these sweet spots for fracking, including seismic and well measurements. In this presentation, we investigate the use of structural information to derive fracture-related attributes including strain and fracture probability and how it can be integrated with other data for a full fracture characterization workflow.

Featured technology: SKUA-GOCAD™

Optimize Efficiencies with Virtual Flow Metering

Monday, 4:00 pm; Tuesday 3:00 pm; Wednesday, 10:00 am

Presented by Andrey Klimushin

Virtual metering is a very cost-effective solution for monitoring and interpreting operational data to find well phase flows, requiring only a computer linked to a production database for retrieval of measured source data. Based on multiple boundary conditions dictated by measured sensor data, estimate in-situ well production rates. Tune or validate flow models with reference data. Use well flow rates to tune reservoir models. Get answers to determine what is flowing anywhere in your system, and what is needed to optimize the flow of these materials from the reservoir to the sales outlet.

Featured technology: METTE™

Precision Depthing Using Well Marker Mistie Tomography and Demigration/Remigration Improves Well Placement and Steering

Monday, 4:30 pm; Tuesday, 1:30 pm

Presented by Joanne Wang

Drilling engineers endeavor to optimize both the landing of a well and its contact with the reservoir while in the target formation. Seismic-driven depthing, often used in the well planning and drilling process, is subject to errors in the velocity model building process. For shale plays, these errors can originate from approximations in parameterizing the shallow velocity model or in deriving anisotropic models with a combination of seismic, well, check shot, and VSP data.

This presentation incorporates two global solutions – well marker mistie tomography and demigration/remigration to ensure a more defensible pre-drill velocity model for depthing. When used together, they provide a powerful tool for rapid and accurate correction to the model and well plan. They will be applied to a Marcellus Shale dataset.

Featured technologies: GeoDepth™ Well Marker Mistie Tomography, Kaleidoscope Demigration/ Remigration

Automated Well Space Optimization and New Well Opportunity Identification Using a Machine Learning-based Workflow

Tuesday, 3:30 pm; Wednesday 9:30 am

Presented by Adrien Caudron

Producing unconventional plays requires a precise understanding of sweet spot distribution combined with an agile and robust process in place to detect and de-risk new well opportunities. The Emerson E&P Software group has teamed up with QRI to create a modeling package that takes into account the subsurface architecture and relies on a Machine Learning approach to detect and rank well opportunities. This drastically shortens the decision-making process and increases success rates and ROI.

Featured technology: Speedwise Reservoir Opportunity®

NMR T1-T2 and T2-D Mapping of the Bakken Reservoir Complex

Tuesday, 2:00 pm

Presented by Dick Merkel - Denver Petrophysics

Calculations of OIP, oil and water volume production, and formation recovery factor are problematic in the Bakken-Three Forks reservoir complex. This study was designed to use Nuclear Magnetic Resonance logs, Array Dielectric logs and core to determine: 1) variations in water and oil volumes, 2) pore size distribution, 3) in-situ oil viscosity, 4) wettability, and 5) free vs. clay bound water throughout the oil-bearing intervals in the Middle Bakken and Three Forks.

Featured technology: Geolog™

Extract More from Seismic Data for Improved Shale Modeling

Tuesday, 4:30 pm; Wednesday, 11:00 am

Presented by David Garcia

Geologists confront a multitude of problems when trying to analyze seismic data to produce a model of the subsurface that can help identify where oil and gas are deposited, or assist reservoir engineers in optimizing production of a field. Emerson offers a range of solutions that address the limitations of conventional seismic imaging and interpretation, and reveal clearer, more detailed information about the structure of the subsurface using all available data. These solutions allow oil companies to minimize risk by providing more accurate information. This enables them to pursue the optimal reservoir management and development program while using all the resources available in the most efficient way. In this presentation, we demonstrate the use of seismic data to improve shale modeling. We build a high-resolution model with high-resolution seismic interpretation, and calibrate wells and seismic attributes to model shale properties.

Featured technology: SKUA-GOCAD™