



Newfoundland Technology Day
Beyond Traditional Interpretation and Modeling
 The H.M.S. Briton Room, Murray Premises Hotel
 5 Beck's Cove, St. John's, Newfoundland & Labrador, Canada, A1C 6H1
September 1 & 2, 2015

The Paradigm® integrated interpretation, visualization, and modeling software suite is engineered to deliver more information from existing data and more confidence in decision making. Paradigm interpretation and modeling encompasses all stages of the geoscience workflow and is powered by an advanced modeling engine that brings all the information together. The result is a verified and accurate earth model inclusive of all subsurface data. Paradigm interpretation and modeling solutions include:

- Geologic Interpretation
- Seismic Interpretation
- Interpretation Validation
- Subsurface Modeling

We invite you and your colleagues to join us on September 1 and 2, as we demonstrate how your company can benefit from precise and geologically consistent results with Paradigm. Over the two days, you will learn:

- How Paradigm interpretation workflows are asset-focused and operate across multiple domains.
- How to strengthen quality control with the ability to move between each stage of the upstream workflow – all without leaving the interpretation environment
- How you can significantly enhance workflow efficiency and productivity with Paradigm workflows.
- New insights into how easy usability, interactivity and scalability can enable interpreters to fast track interpretation and modeling of complex structures.

Agenda: Day 1 – Interpretation - Tuesday, September 1, 2015

Time	Presentation
12:00 – 1:00	Networking Lunch
1:00 – 2:00	Seismic Interpretation Overview: Paradigm® SeisEarth® <ul style="list-style-type: none"> ● Integrated 3D/2D Interpretation and Visualization, including Opacity viewing ● Horizon Picking, including Propagator ● Fault Picking, including Fault Track ● Mapping ● Synthetics
2:00 - 2:45	Seismic Facies Classification: Paradigm® Stratimagic® <ul style="list-style-type: none"> ● Neuronal Classification ● Attribute Cross-Plot Classification (SeisFacies) ● View in 3D Canvas
2:45 - 3:00	Break
3:00 – 3:30	Pre-Stack/Quantitative Seismic Intepretation (QSI): Paradigm® SeisEarth® and Paradigm® Probe® <ul style="list-style-type: none"> ● 3D Visualization of Pre-stack ● Gather Conditioning ● AVO Inversion ● QC prospects

3:30 - 4:00	Geologic Interpretation: Paradigm® StratEarth® <ul style="list-style-type: none"> • Well Display (Templates) • Correlation • Mapping (Structure, Pay, Production)
4:00 – 4:20	Petrel Connector <ul style="list-style-type: none"> • Import/Export • Wells, Interpretation, Seismic
4:20 – 5:00	Questions & Answers and Closing Remarks

Abstracts: Day 1 – Interpretation - Tuesday, September 1

Seismic Interpretation Overview

This presentation will demonstrate an overview of Paradigm’s primary seismic interpretation solution, SeisEarth. In this integrated environment, 3D and 2D seismic data can be interpreted and visualized: multi-survey, multi-domain, multi-user. Using the volume interpretation, base-map, and section modules, we will examine opacity rendering, horizon picking including automatic waveform-based horizon propagation, fault picking including semi-automatic fault generation, mapping, and seismic-well calibration.

Seismic Facies Classification

Seismic facies analysis provides a link between exploration and reservoir characterization. This technique can assess the variability of the seismic signal within an interval of interest and map this variability throughout the reservoir. We will examine Stratimagic where we will investigate trace shape classification using neural network techniques, and its add-on SeisFacies, which will classify multiple seismic property volumes based on cluster analysis.

Pre-Stack Seismic Data and Quantitative Seismic Interpretation

In this demonstration we will examine the visualization of pre-stack seismic data in a 3D interpretation environment along with well data and post-stack seismic data and interpretation. We will further see how in the same environment we can use the pre-stack as input for AVO and seismic inversions. The inversion results can be cross-plotted, displayed in 2D and 3D, and from these displays, potential hi-value hydrocarbon areas can be identified and ranked.

Geologic Interpretation

This presentation will show highlight some of the geologic interpretation solutions in Paradigm and present a workflow to correlate markers, generate structure and net pay maps, and examine production and completion data. StratEarth, Paradigm’s log correlation and cross-section tool will be shown, along with SeisEarth Basemap and 3D Canvas.

Petrel Connector

Paradigm has always strived to provide robust 3rd party data connections to its Data Management solution, Epos. Recently we have added two-way connectivity with Schlumberger Petrel. We will discuss how this easy-to-use link transfers and receives well and seismic data.

Agenda: Day 2 – Modeling, Wednesday, September 2, 2015

Time	Presentation
12:00 – 1:00	Networking Lunch
1:00 – 2:00	Modeling Overview: Paradigm® SKUA-GOCAD™ <ul style="list-style-type: none">• SKUA concept (UVT)• Geophysical Highlights• Geologic Highlights• Reservoir Engineering Highlights• Live demonstration on constructing a model and examining a complex offshore model
2:00 - 2:30	Structural Uncertainty <ul style="list-style-type: none">• Fault and Horizon Uncertainty
2:30 - 3:00	Interpretation Modeling <ul style="list-style-type: none">• Fault-Likelihood Attribute Fault Propagation• Horizon Propagation and Formation Patches• UVT Flattening of Seismic
3:00 – 3:15	<ul style="list-style-type: none">• Break
3:15 – 4:00	Facies Modeling <ul style="list-style-type: none">• 1D/2D/3D Facies Trends• Facies Proportion Cubes• Combining Facies Trends
4:00 – 4:30	Macros <ul style="list-style-type: none">• Overview• Live Examples
4:30 – 5:00	Questions & Answers and Closing Remarks

Abstracts Day 2 – Modeling, Wednesday, September 2, 2015

Modeling Overview

This presentation will demonstrate an overview of Paradigm’s modeling suite, SKUA-GOCAD. Of particular interest will be how SKUA’s new model construction techniques can build more accurate models with more complex geology in less time than ever before. We will touch on how our advanced modeling solutions apply in the domains of geology, geophysics, and reservoir engineering. Examples will be shown of models constructed in complex faulted environments.

Structural Uncertainty

SKUA’s new geo-model construction allows it to build models in unparalleled regimes of geologic complexity. Now SKUA allows the investigation of uncertainty in the production of the structural framework. Multiple scenarios of faults and horizons may be used due to uncertainty in interpretation and velocity modeling. This demonstration will show how these multiple inputs can be stochastically simulated to generate a range of geologic models and analyze rock volume uncertainty.

Interpretation Modeling

The new modeling approach of SKUA based on the UVT-Transform parameter space enables increased efficiency in combining interpretation and modeling to enhance both processes. We will demonstrate how delineation of zones and fault blocks can be assisted by interpretation from a new fault-likelihood attribute, and by the automatic generation of horizons and formation layers. We will also show how the UVT-Transform can “paleo-flatten” seismic data and interpretation results to help QC structural interpretation and assist in stratigraphic interpretation.

Facies Modeling and Trend Analysis

Paradigm’s modeling suite offers processes enabling easy and efficient facies modeling based on the combination of different data types, whether working with 1D, 2D or 3D data. This presentation will highlight different ways well and seismic data can be integrated to generate facies proportion cubes, how facies trends can be generated and incorporated, and how multiple facies proportions can be combined.

Macros in SKUA-GOCAD

The construction, maintenance, and manipulation of models in SKUA-GOCAD can be enhanced by the use of macros. These macros are useful when a process needs to be applied to many pieces of data or when multiple processes need to be combined. Macros can record modeling commands to provide an initial capture of the process steps and then be modified for particular situations or for use on large amounts of data. They include the ability to do custom programming. We will introduce the concepts and show some examples.

About Paradigm

Paradigm® is the largest independent developer of software-enabled solutions to the global oil and gas industry. Customers rely on Paradigm software to discover and extract hydrocarbon resources and make better business decisions. Paradigm solutions span critical exploration and production disciplines, from seismic processing and imaging to interpretation and modeling, reservoir characterization, and well planning and drilling. Paradigm offers a rich portfolio of productivity tools and scientifically advanced applications for geologists, geophysicists and engineers who construct subsurface models from oilfield and other measurements. Paradigm solutions share a unified 3D visualization canvas and a network-based data management infrastructure.

Paradigm E&P Domains

Seismic Processing & Imaging – Paradigm technologies and methodologies provide a robust velocity analysis solution that can reduce positional uncertainty, improve reliability of all information derived from the seismic data, and integrate interpretation and modeling with the seismic imaging framework.

Reservoir Characterization – Paradigm solutions enable users to transform wellbore data into answers for governing reservoir management programs and optimizing hydrocarbon recovery. Users can seamlessly connect geophysical and petrophysical data to locate and evaluate new prospects and maximize production in proven fields.

Well Planning & Drilling Engineering – Paradigm offers a highly integrated portfolio of well planning and drilling technologies designed to help improve well planning accuracy, reduce drilling risk and optimize wellbore placement.

Interpretation & Modeling – Paradigm offers innovative tools to improve productivity without compromising quality, by merging interpretation and modeling processes in a common environment, and by providing automated and interactive tools that enable users to interpret and accurately model complex structures and identify stratigraphic features in a highly efficient manner.

Reservoir Engineering - A collaborative environment to facilitate transfer and iterations between geological models and flow simulation for reliable production forecasts, reserves estimation and development risks assessment.

Data Management & Interoperability – The Epos® data management and interoperability framework provides users with a robust, scalable platform for the management of exploration and development data. Epos offers a common database, unified look and feel, and shared access to software.

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