ID #128

Geostatistical Reservoir Modelling with PETREL: Practical Workshop (Part I)

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www.mineaoil.com

jh

This may also be of interest

- Basics of Petrophysics
- Petrophysics Characterization of Hydrocarbon Reservoirs
- Seismic Applications

Specialist Trainer

Angel is a known geostatistical modeler mathematician from the Universidad Central of Venezuela, with over 30 years experience in the industry.
He worked for YPF, Repsol, Halliburton, Schlumberger, Pacific Rubiales, PDVSA, Pemex, PDVSA and Intevep, in Argentina, Mexico, Colombia and Venezuela and specializes in Clastic Reservoir projects, Visualization and Data Analytics, Uncertainty Analysis, Integrating Petrophysical, Geochemistry, and Geophysics.
Interpretations: Sedimentary Modelling and Reservoir Data Integration, Seismic Inversion and AVO Results. Construction of Structural-Stratigraphic frameworks, Facies Modelling, Population of Petrophysical Properties and Volumetric Analysis.
His knowledge adds value and supports decision making in the Exploration and Exploitation of Hydrocarbons Reserves quantification and Certification and he lectures in Geomodelling with PETREL, a Schlumberger Geosciences application.

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Description

A practical training workshop designed to present the Foundations, Principles and Applications of Geostatistical Reservoir Modelling techniques, applicable to Clastic Reservoirs, supported in up to date modelling tools (Petrel), the workshop methodologies comprise interactive activities, field cases and exercises designed for beginner to intermediate Geoscientist and Engineers interested in the understanding and application of geocellular modelling workflows to optimize the characterization and development of hydrocarbons reservoirs.
The workshop pursues practical orientation, covering the creation of the project Data Repository containing the essential data and information (well basic data, petrophysical and facies data, well picks, faults/horizons interpretation, OWCs, etc.) in the formats required, upload in PETREL, Visualization (base maps, well sections, etc.) and inputs QC, build the reservoir Structural-Stratigraphic framework, construction of the Facies Model, Population of Petrophysical Properties, Volumetric Calculations, the conformation of the Base Case of the Geostatistical Model, Visualization (maps, well sections, etc.) and QC of the final results.

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Objectives

- Learn to create the Geomodeling Project Data Repository that includes the required data/information in the appropriate formats; and loads them into PETREL
- Learn about input data Visualization and its QC, using maps, well sections, statistics, histograms, etc.
- Build the Structural Stratigraphic framework of the reservoir, integrating well-picks, reservoir lateral limits, fault/horizon interpretations, etc.
- Construction of the Stochastic Facies Model of the reservoir, integrating facies logs, bodies´ geometric parameters, etc.
- Learn how to distribute petrophysical properties stochastically, and conditioned to the reservoir facies
- Carry out Volumetric Calculations and the conformation of the Base Case of the Geostatistical Model.

At the end of this workshop the delegates will be able to build a geocellular model applicable to quantify the hydrocarbons volumes in place from scratch to the final quality checked product, and the apply the workflows to optimize the field development. challenges, environmental constrains and study cases

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Audience

- Geologists
- Geophysicists
- Petrophysicists
- Reservoir Engineers and Reservoir Managers
- Production Engineers
- Technical field personnel from oil companies or service companies that need to gain or increase their understanding of reservoir performance under Enhanced Oil Recovery projects

This training can be delivered in house, based on workshop sessions for groups of delegates with interest in understanding the principles of Geostatistical Geocellular Reservoir modelling; it can be tailored to specific company needs.

Content

Day 1
Data Repository Visualization and QC of Inputs

- Gather and organize the relevant data; and verify input formats (.TXT, .LAS, .DAT, etc.).
- Create a PETREL project, add folders and objects to the Input-Tree, corresponding to each data type to be uploaded (Polygons, Surfaces, Logs, Fault-Sticks, Horizons, etc.).
- Upload inputs in PETREL, and build histograms of basic logs and petrophysical properties for each well, to identify inconsistencies, outliers, etc.
- 3D visualizations of polygons, surfaces, fault, and horizon interpretations; to visualize and identify inconsistencies, outliers, etc.
- Construction of cross-sections, for individual and multiple wells, to visualize and check out well-picks consistency, basic logs/petrophysical curves anomalies, etc.
- Construction of a Fully Integrated well-section, including, along with the well-picks, basic logs, petrophysical properties, and facies log, perforated intervals, mudlogging images, etc.

Day 2

Construction of the Reservoir´s Structural-Stratigraphic Framework

- Structural Framework: Fault network modelling
- Structural Framework: model boundary and horizons modelling
- Structural Framework: Structural gridding
- Structural-stratigraphic framework: model QC.

Day 3

Construction of the Reservoir´s Facies Stochastic Model

- Upscaling facies log calibration and Data Analysis.
- Stochastic facies modelling: geometrical parameter sensibilities.
- Stochastic Facies Model of the reservoir: visualization and model QC; base case conformation.

Day 4
Propagation of Petrophysical Properties and Volumetric Calculations

- Upscaling of petrophysical properties calibration and Data Analysis.
- Stochastic petrophysical modelling: parameter sensibilities.

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Content (cont.)

Day 4 (cont.)
Propagation of Petrophysical Properties and Volumetric Calculations

- Stochastic Petrophysical Model of the reservoir: visualization and model QC; base case conformation.
- Volumetric calculation: estimation of the Original Oil In Place (OOIP).

Day 5
Propagation of Petrophysical Properties and Volumetric Calculations

- OOIP: volume distribution, cross-sections, maps, synthetic log, and model calibration.
- OOIP: maps and examples of new well proposals.
- OOIP: synthetic log and examples of trajectory proposals and prospective intervals.
- Summary and conclusion.

End of training.

Geocellular Modelling to Maximize Oil & Gas Production Rates and Recovery Factor

Our associated geoscience consultants with experience building multidiscipline integrated geocellular reservoirs models with multiple realizations for uncertainty analysis, and expertize applying industry-standard software: Petrel, Interactive Petrophysics (IP),PowerLog, SMT, Eclipse, VIP, tNavigator, STARS, GEM and OFM, is available to Develop 3D dynamic simulations to predict the production performance under various scenarios and sensitivities to determine the optimal exploitation scheme.