
High-Resolution Stochastic Modeling Conditioned to Seismic Rock Property Inversions: Practical Workflows for Middle East Reservoirs

Gordy G. Shanor, Reservoir Modelling Advisor, Ødegaard A/S, Titangade 15, Copenhagen N DK-2200 Denmark, phone: +47 93888347, gs@oedegaard.com

Utilizing robust seismic reservoir characterization outputs as inputs to detailed reservoir models is not a new or particularly difficult concept to understand. The application of this workflow is, unfortunately, under-utilized by both exploration and development asset teams.

Seismic data provides excellent spatial resolution for structural interpretation, and seismic inversion processing, especially AVO inversions to rock property cubes, provides tremendous insight into the spatial distributions of reservoir rock properties and fluids in two-way time.

Well log data and their derived interpretations (petrophysics, facies, rock physics, etc.) provide excellent vertical resolution and insight into the distribution of the logs and interpreted variables at the well locations.

High vertical resolution reservoir modelling is often performed based solely on mapping and well-log interpretations without direct integration with seismic reservoir characterization results, leading to discipline independent 3D models generated through interpolation or geostatistical modelling.

The reservoir modelling workflow described provides integrated reservoir models which couple the spatial coverage of 3D seismic inversions with high vertical resolution reservoir modelling through applications of conditional geostatistical simulation techniques.

This paper presents several carbonate workflow examples from the Middle East and the North Sea which incorporate seismic reservoir characterization such as full stack impedance and AVO rock property inversions with high resolution geostatistical analysis and conditional stochastic simulation of petrophysical data.
