

# **Modeling Pore Pressures and Fluid Flow in a Faulted Shelf System Using a 3-D Basin Model Coupled to Seismic Velocities**

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Basin modeling can provide important insights into fluid flow and pore pressure patterns when input information is of sufficient quality to allow for meaningful results. An example of modeling results from a shelf setting in which the depth of pressure onset is variable and was poorly understood demonstrates how the modeling exercise can clarify which processes are likely producing observed patterns. Pressure evaluation was needed both for prospect assessment and for well planning as pressures approach lithostatic in some offset wells. It was hypothesized that sand distribution, fault juxtaposition and resultant cross-fault flow were the keys to understanding the variability of the onset depth and severity of overpressure in the area. Model results with relatively simple lithology maps based on seismic facies and some special handling of surfaces near faults allowed for a good match to the pattern of well and seismic velocity data. The result of coupling the seismic interval velocity model to the basin model demonstrates the importance of understanding cross-fault flow in this setting, and greatly enhances the value of the simulations. Results also underscore the importance of appropriate model bounds and boundary condition selection.