

Pore Pressure Prediction

A Paradigm Geoscience Data Service

Pore pressure predictions and transformations that make use of seismic velocity measurements have a huge impact on drilling safety and the economics of drilling design and well construction. Pore pressure models derived from the integration and careful calibration of traditional wireline logs, petrophysical logs, seismic velocity data, VSP data, and field test data provide the information needed to make critical pre-drill stress and overpressure predictions, and the pathway to secure a safe and economic well program. An accurate pore pressure prediction can help to prevent a variety of wellbore stability problems, including wellbore collapse, lost circulation, stuck pipe, and even complete loss of the wellbore.

The Paradigm pore pressure solution brings together high-resolution velocity model determination, chronostratigraphic structural and property modeling, well data and petrophysical analysis, geostatistics, and seismic inversion to enhance the predictive capacity of petrotechnical data to model pore pressure. The solution is strengthened by powerful technologies for co-visualizing geophysical and geological models, transforming seismic velocity measurements to pore pressure and stress properties, calibrating predicted pressures, interpreting pore pressure models, and modeling pore pressure in deep water and in the presence of complex salt bodies.

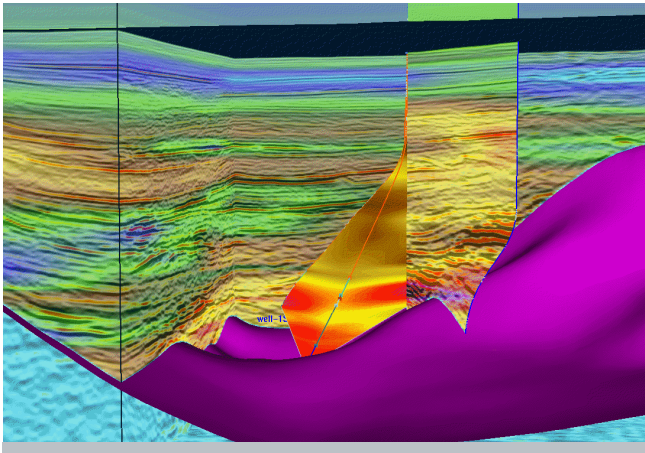
Paradigm Pore Pressure Prediction Solutions

- Integrated solutions for high-resolution seismic velocity model determination, seismic inversion, geologic modeling, petrophysical analysis, and visualization, for a defensible pore pressure prediction model

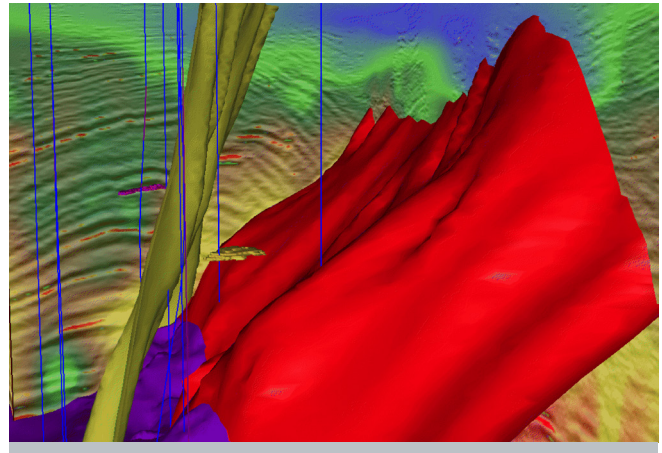
- Pore pressure interpretation and analysis carried out in interpretation and modeling canvases to better understand the sources of overpressure, the distribution of overpressure, and their correlation with geologic and production data
- Calibrations with field data (mud weights, leak off tests, etc.) to test assumptions, confirm results, improve well economics, and plan safe wells
- High-quality, voxel-based co-visualization to understand the sources of overpressure and their controlling influences, and isolate areas of anomalously high overpressure
- 3D volumes or models of structurally-constrained properties (e.g. overburden pressure, fracture gradients, pore pressure, sand/shale lithology)
- Well planning that bypasses areas of high overpressure, for safe well engineering

Paradigm Pore Pressure Prediction Advantages

The Paradigm Geoscience Data Services team is able to deliver the industry's most comprehensive solution for pore pressure prediction and updating, at and away from the wellbore. Our geoscientists and engineers work to concurrently carry out the key tasks of petrophysical and well log analysis, velocity modeling, structural interpretation, and lithology prediction, in preparation for the key transformation and interpretation tasks of pore pressure estimation and calibration, sand pressure estimation, structural deformation (strain) analysis, and co-visualization of results.



- ▲ Co-visualization of prestack migrated amplitude image, pore pressure field, interpretation data and well paths. Interwell pore pressure sections show connectivity of pore pressures.



- ▲ Predicted pore pressure co-rendered with seismic and interpretation data. Higher pore pressures are rendered with warmer colors. Note the high pore pressure area bounded by a sealing fault. The growth fault in red and the interpreted higher angle fault in yellow appear to form pressure bound.