Abstract

Clear trends are apparent in geomodelling and reservoir characterization. These include data proliferation, incorporation of uncertainty, and integration of data from numerous disciplines. These trends, if handled correctly, will all lead to better reservoir characterization, and ultimately higher levels of hydrocarbon recovery.

While the quality and quantity of subsurface data continue to increase, our knowledge of the subsurface cannot be absolute. There will always be uncertainties in reservoir characterization and we must do our best to quantify and understand these unknowns. This understanding leads to a spectrum of possible subsurface scenarios with ranges of values for various parameters. Not least among these are multiple possible structural scenarios wherein the positions of faults, horizons, fluid contacts and other spatial entities are all subject to uncertainty. Key to handling this is the rapid, automated generation and evaluation of possible structural scenarios. Our current developments generate multiple structurally reasonable scenarios that can be quickly and easily visualized for validation.

Within the framework of a various structural scenarios, the development team should also have visual access to all the data that influences their development and production decisions. These include, but are not limited to, seismic data (of various vintage), cellular models, property information, well logs, driller's notes, production and injection history, pressure regimes, completion histories, recurrent reservoir simulation output, 2D maps and cross sections, cultural data, remote sensing, potential fields etc. Clearly these data can be both spatial and temporal, with the changes in spatial data through time as an important component.

We are developing interfaces and methodologies whereby all these data can be quickly and easily accessed. When all relevant data can be displayed graphically in an easily accessible manner, interrogation becomes simpler, and associations between the various data become more apparent. As levels of data collection continue to rise, these covisualization methods become increasingly imperative for rapid and accurate decision making within the multidisciplinary team.