

Geological – Seismic Work Flows and the Construction of Integrated Maps

B. D. Clement, A. Wojciechowski, M. Gierach, and D. J. Birnie
GEOSEIS Inc., Calgary, AB, Canada
bclement@geoseis.ca

Abstract/Excerpt

Geologists and geophysicists working together in the E&P business have been actively working at integrating their complimentary interpretations for over 50 years. Modern G&G software toolkits enable better attempts at this in 2007 versus previously. However, in the authors' opinion, many existing methods tend to focus on software brand-centric work flows rather than on problemcentric and geoscientist-centric work flows. This study explores a work flow designed to demonstrate a geological / seismic data integration methodology which is map-focused and generic in nature.

The creation of integrated maps requires disciplined, systematic but flexible techniques for combining two domains: seismic time interpretations and geological well-based depth interpretations. Geological maps based on well picks only tend to be both sparsely-populated and locally-accurate, often emphasizing what has been drilled rather than highlighting undrilled trends and features. Seismic maps tend to have a higher spatial resolution (due to data distribution) and show both drilled and undrilled features (some of potential future interest), but are often uncalibrated in depth. The best possible maps are integrated well and seismic maps in depth which show the potential of undrilled features/ anomalies properly tied to, and in the context of, what has already been drilled. Practice has shown that these are difficult to create easily and in a timely fashion. Our experience is that the best quality products require multiple iterations.

An intelligent work flow is required to optimize the well-seismic integration process and produce high quality maps and the most useful results. The work flow must be efficient, understandable, and repeatable. The objective of this study was to develop a work flow that fits these characteristics and can be readily applied to exploration / exploitation projects in Western Canada.