



What are you Interpreting? Is your Seismic Image Flawed?

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Abstract

Heart and Soul

As seismic interpreters we often put our heart and soul into our interpretation. We incorporate structural style and stratigraphy with well logs and surface geology to create a picture of the subsurface. We stand behind our interpretation and say with confidence that given the available information this is an accurate representation of the subsurface. But (and this is a large 'but'), what if the seismic image itself is flawed?

Over the past few years seismic imaging has progressed from isotropic post stack time imaging to anisotropic prestack depth imaging. The implementation of anisotropic depth imaging has provided phenomenal improvements in both the focusing and positioning of geological structures, especially in areas of complex deformation. But (again this is a large 'but') the image is highly dependent upon the input velocity and anisotropy models.

Interpreter Input Critical

The reality of depth imaging is that it is an iterative process in which the interpreter should be closely involved. As interpreters we must understand seismic processing, know which steps and parameters are critical and be able to defend our velocity model as vigorously as the final interpretation. We must Q.I. the imaging process and be confident that all criteria for a robust velocity model and image are met. Ask yourself a few critical questions. Are the common image gathers flat? Is the stack focused? How does a small change in velocity affect the final image? Does the velocity model make geological sense?

Examples from Canada and Colombia highlight the necessity for an accurate velocity model and illustrate the dramatic effect of a small percentage change in velocity. We show that confidence in the velocity model provides confidence in the final image. Only then are we justified in putting our hearts and souls into our interpretation.