
Uses, Abuses, and Examples of Seismic-Derived Acoustic Impedance Data: What Does the Interpreter Need to Know?

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Inversion of seismic data into acoustic impedance provides a natural tie to the log impedance data and forces the geoscientist, in analyzing seismic data, to extract appropriate wavelets, determine the phase and amplitude of the data, determine whether or not the phase is stable throughout the volume, and very intimately tie the well log impedance data to the seismic data. Utilizing inverted data at the beginning of the interpretation process requires that the geoscientist understand the rock properties in their target area before embarking on an "attribute" interpretation. Even when the P impedance data do not clearly distinguish between fluids or lithologies, value is added by using these data as the first interpretation tool. The simplicity in knowing that the change of values represents a change in rock properties without the complexity of wavelet variability is a distinct advantage to the interpreter and the sequence stratigrapher. This initial process is critical to undertaking any interpretation of seismic data. Inverted data, a layer property, are a more intuitive geologic tool that allows interpreters to utilize their natural ability to "see" the geology in the seismic data.

This presentation will demonstrate the necessity for inversion and explain why it is beneficial in an interpretation and sequence stratigraphic workflow. It will examine both the strengths and drawbacks of using inverted data as compared with the seismic data and the original rock data. It will also show • how scale differences between various data types can effect the results, • how the interpreter and the sequence stratigrapher utilize the inverted data and • how to spot pitfalls in the overuse of impedance data.
