Seismic Attribute Studies – A Tool for Sedimentary Geologists

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ABSTRACT
Three-dimensional seismic data are known to provide sedimentary geologists with spectacular images of depositional features such as channels, carbonate build-ups and others. However these images, derived from conventional amplitude data, do not necessarily provide geoscientists with all the information that is contained in the seismic data. By integrating attributes derived from seismic data with physical properties (e.g., lithology, porosity) obtained from wireline log data, it is possible to predict the distribution of those properties throughout the area of a 3-D seismic survey. With appropriate data, either physical property maps or volumes may be generated. Seismic attributes include measures of amplitude, frequency, phase and others that may be readily derived from seismic data using interpretation software. "Seismic attribute studies" are commonly used during reservoir development projects, and sedimentary geologists are not always part of the process. In this presentation I will: a) examine the methods used to undertake seismic attribute studies (regression, geostatistics, artificial intelligence), b) discuss various means for independently validating the results of the attribute studies (incorporate geological, geophysical and engineering data and concepts), and c) show examples of how seismic attribute studies have revealed information about stratigraphic and even diagenetic processes that could not be obtained otherwise. Sedimentary geologists need to become involved in these projects to make sure that vital geoscience information is not neglected during an attribute project and to benefit from the stratigraphic insights they yield.