

Seismic Attributes for Deep Water Depositional Systems

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Abstract

Deep water depositional systems can be characterized by using 3D Seismic surveys. Seismic attributes exaggerate different characteristics of 3D seismic surveys to reveal different geomorphology and help identify geological features. Coherent energy, an amplitude-dependent seismic attribute, helps identify low and high-energy depositional environments; such attributes can show relatively high values for the sand-filled channels, canyons, and fans. Discontinuity attributes such as Sobel filter similarity can find the edges of different geological features, including channel, canyon, and fan edges. GLCM attributes to capture the different textural patterns from seismic signals. Different frequencies of seismic data resonate with varying thicknesses of strata; an RGB blend of low, mid, and high spectral decomposition volumes shows details of different deep water depositional features. Further, unsupervised algorithms, such as SOM and GTM, can use various seismic attributes to generate seismic facies. Such seismic facies volumes are color consistent, meaning similar geological features will have a similar color in the data set.