Study of Channel Morphology and Infill Lithology in the Wilcox Group in Central Louisiana in Using Seismic Attribute Analysis

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ABSTRACT

The fluvial and deltaic Wilcox Group is a major target for hydrocarbon and coal exploration in northern and central Louisiana. However, the characterization and delineation of fluvial systems is a difficult task due to the variability and complexity of fluvial systems and their internal heterogeneities. Seismic geomorphology is studied by recognizing paleogeographic features in seismic stratal slices, which are seismic images of paleo-depositional surfaces. Seismic attributes, which are extracted along seismic stratal slices, can reveal information that is not readily apparent in raw seismic data. The existence and distribution of fluvial channels are recognized by the channel geomorphology in seismic attributes displayed on stratal slices. The lithologies in the channels are indicated by those seismic attributes that are directly related to the physical properties of rocks. Selected attributes utilized herein include similarity, spectral decomposition, sweetness, relative acoustic impedance, root mean square (RMS) amplitude, and curvature. Future drilling plans for oil and gas exploration may benefit from the identification of the channels and the lithologies that fill them.

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