

# **Integration of Seismic Geomorphology and Seismic Stratigraphy: Principles and Applications**

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## **ABSTRACT**

3D seismic data can play a vital role in hydrocarbon exploration and development especially with regard to mitigating risk associated with presence of reservoir, source, and seal facies. Such data can afford direct imaging of depositional elements, which can then be analyzed using seismic geomorphology and seismic stratigraphy to yield predictions of lithologic distribution, insights to compartmentalization, and identification of stratigraphic trapping possibilities. Benefits can be direct, whereby depositional elements at exploration depths can be identified and interpreted, or they can be indirect, whereby shallow-buried depositional systems can be clearly imaged and provide analogs to deeper exploration or development targets. Examples of imaged depositional elements from both shallow and deep sections are presented.

A variety of techniques can be employed to extract stratigraphic insights from seismic data. These include: 1) time slices, 2) flattened time slices (i.e., horizon slices), 3) reflection attribute mapping, 4) interval attribute mapping, 5) sub-volume detection (i.e., opacity rendering), and 6) voxbody picking. Each of these approaches affords essentially map view images of the subsurface, which require interpreters to be familiar with geomorphic patterns. To ground truth map-based interpretations, section views must be integrated to yield the most robust and accurate interpretations.