

## Geobody Extraction of Karst Reservoir: A Thailand Onshore Case Study

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### Abstract

Several gas discoveries and gas fields in Northeastern Thailand are produced from the Permian carbonate reservoir. It has been found that high-productivity zones are related to diagenesis processes such as karstification and hydrothermal dissolution. This study aimed to extract karst reservoir geobody which is an essential input for reservoir characterization and reservoir model. Seismic data were the main input for this study. Strong isolated bright spot seismic anomalies have been observed. The anomalies were the result of low acoustic impedance bodies embedded in hard carbonate rock. 2D forward models of the seismic response of a diagenetic geobody with various sizes and porosities were created. A set of seismic attributes was tested to observe which attribute can provide the closest approximation of geobodies' size. Relative acoustic impedance (RAI) was picked among other seismic attributes to represent the reservoir geobodies. Three cases of geobody sizes and connectivities were generated to assess the uncertainty by varying the cutoff value of the relative acoustic impedance. Then the geobodies were compared with the gas production of each well. Low, base and high cases of geobody distributions were generated by varying cutoff values of the relative acoustic impedance. Well production results were used to calibrate the geobodies. The result from geobody extraction can be used in well targeting and reservoir modeling.

**Keywords:** karst reservoir, collapsed paleo cave, hydrothermal dissolution, carbonate reservoir, Thailand onshore gas field