

**SHELF-BAR VARIATIONS AND A MODEL FOR
THEIR PREDICTION IN THE SUBSURFACE**

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Shelf-bar sandstones of the Western Interior seaway of North America are encased in marine shales and form excellent stratigraphic traps for hydrocarbons.

A new model has been developed for the prediction of shelf-bars in the subsurface, both on a regional scale as well as at the prospect level. This model is based upon processes that were active during deposition of the shelf-

bars, knowledge of the paleogeography during deposition, and analogy with modern shelf systems.

On a regional scale, the shelf-bar sandstones appear to have been deposited south of major shoreline irregularities. Initially, sub-aqueous spits formed that later became detached, creating migrating shelf-bar ridges. Depending upon water depth, the relative importance of fair weather shelf currents versus storm currents varies. This controlled the direction of shelf-bar migration, and varied the preserved stratigraphic record.

Because these shelf-bars were very large bedforms that migrated along the shelf, they left behind a bar-track that can be used to help predict their location at the prospect level. The bar-track is a trail of the lowermost portion of the shelf-bar deposits that is preserved during migration, and it can be recognized through the use of wire-line logs. By identifying the migration path of shelf-bar, one can better predict its possible location.