

Shelf Margin Deltas: A New (But Old) Play Type Offshore Nova Scotia, Canada

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ABSTRACT

Although shelf margin deltas contain significant hydrocarbon reserves in many passive margin basins (e.g. offshore western Africa, Gulf of Mexico), they have not been explicitly recognized as a play type offshore Nova Scotia, perhaps because Mesozoic shelf margin positions are rarely well resolved in seismic data. However, it is argued that several of the largest gas accumulations offshore Nova Scotia are trapped in shelf margin delta complexes that formed at or near the shelf edge during periods of lowered relative sea level (e.g. Alma, Venture, Glenelg). Shelf margin deltas are excellent exploration targets for several reasons: they commonly have laterally-extensive shale seals and expanded sandstone reservoirs, are often overpressured, and are associated with early movement on growth fault structures. Also, because they commonly link downdip to sand bodies on the slope and basin floor, identification of shelf margin depocenters can significantly improve the effectiveness of "deepwater" exploration strategies. Criteria that have proved useful in identifying shelf margin deltas offshore Nova Scotia include: (1) proximity to large-scale (i.e. at least several hundred meters relief) basinward-dipping slope reflectors, (2) association with large-scale listric growth faults, (3) evidence for delta-front/prodelta gravity-flow deposition in core, (4) relatively large scale upward-coarsening deltaic/shoreface successions (several tens-of-meters to over two hundred meters thick), and (5) paleoecological evidence for rapid shallowing and deepening.

Recognition of the shelf-margin play type will not only improve exploitation strategies in offshore Nova Scotia, but provide an important framework to guide the identification of new exploration opportunities in genetically-related parts of the stratigraphic section.