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Modeling Migration Pathways in Washover Fans Using Modern Geometries and Subsurface Data

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Washover fan (WOF) deposits are part of a much larger system of highly heterolithic barrier and shoreline margin deposits which form notoriously hard to produce reservoirs (e.g. large amounts of hydrocarbons are often stranded in these systems). A review of production data from these heterolithic systems reveals that little data specific to WOFs exist, and very little is understood regarding their subsurface character. A spatial analysis on modern WOFs using satellite imagery to quantify various morphometric characteristics shows that fan length increases exponentially with total fan area, but no other fan attributes display any correlation. Data from modern geometries will be combined with data from a WOF found in the subsurface in the McMurray Formation of Canada that has excellent well-control. Geometries, facies, facies associations, and petrophysics will be used to construct a three-dimensional facies model of a WOF with a goal of identifying barriers to flow. With this model of a WOF we will assess how hydrocarbons inhabit, migrate through, and potentially become stranded within these complex systems.

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