New Insights into Petroleum Potential from Multi-disciplinary Data Integration for the Carson Basin, Grand Banks of Newfoundland

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The Carson Basin is a slope basin separated from the prolific, intracratonic Jeanne d'Arc Basin by the Morgiana High. Four wells drilled along the basin flank penetrated a section capable of hosting a petroleum system. Basin history is complex, with rifting, erosion, deposition and drifting, overprinted by salt tectonism. We present a fresh look at existing gravity and magnetic data integrated with new biostratigraphic and seismic interpretations, that are part of a new Geological Survey of Canada project to investigate lesser-known basins of Grand Banks. We describe this history with a cross-section from Carson to Jeanne d'Arc Basin, tied to seismic lines that show our sequence stratigraphy, and with the connection to magnetic and gravity maps.

The Carson Basin wells were structural tests. The Osprey well was on an anticline that encountered 2100 m of virtually undisturbed salt. It may provide clues to the amount of salt deposited in this, the Whale, South Whale and Horseshoe basins. The Skua well tested a roll-over on a fault block. The St. George well was drilled on a collapsed Jurassic section, and Bonnition tested Lower Cretaceous sands against a major fault. Porous intervals were present in all wells, but no visible shows. These wells penetrated Jurassic and older formations, overlain by Upper Cretaceous and younger rocks, yet by testing the inboard basin margin, they hardly begin the exploration process. Kimmeridgian source rocks equivalent to those that produced the Jeanne d'Arc Basin oil may be present in the distal, anoxic part of the basin.