New Insights on Hydrocarbon Prospectivity Moroccan and Nova Scotian Conjugate Margins

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Emerging plays in Brazil Ghana and Morocco have triggered interest in searching for analogue plays in conjugate margins. Using paired margins is a powerful way to evaluate basins in search of overlooked plays. Insights gained from the Rockall Porcupine and Orphan have been used to evaluate systems and plan exploration programmes.

Interest in Morocco and NS has been triggered by licence activity. Using data/maps across the margin is vital in understanding the critical synrift/early post rift play systems. The paper is based on work undertaken for OETR in Halifax and studies completed on the Moroccan margin. Both margins show that when integrated into play analyses there is potential for significant volumes of hydrocarbons. The use of conjugate margin models is critical in developing models for de-risking hydrocarbon prospectivity.

Jurassic and Cretaceous delta systems with associated slope turbidites can be postulated and de-risked using high quality seismic data. Reservoir deposition and salt movements are inter-related and numeric models backed by seismic data show that reservoir quality facies can exist. The Jurassic carbonate bank is a proven play system in NS and Morocco. Proving a world class source system is vital to the hydrocarbon prospectivity of both margins. Extensive shows, commercial discoveries, and evidence of by-passed oil demonstrate source systems that produce hydrocarbons. The paper will show forensic geochemical work being used to type the shows and link the fluids to specific source bed sequences. Traditional sourcing models rely on Jurassic and Cretaceous delta systems, but may not be supported by the geochemical data. We postulate there must be a deeper source. The location of the break up unconformity and the relationship between evaporite deposition and lacustrine environments will be explained. The models are based on plate scale tectonic modelling combined with fault mapping using high quality deep seismic on both margins.

We will show the development of Jurassic and Cretaceous models, several plays, including Jurassic carbonates, delta and deep marine reservoir systems, sourced locally or from deeper syn-rift lacustrine sediments. Extensive large-scale salt related structures show potential of a high value petroleum province on both sides of the Atlantic. The play evaluations are based on a rigorous understanding of sequence stratigraphy built on existing and new biostratigraphic and seismic stratigraphic studies.