

## The role of re-imaging in the re-imagining of the Proven Hydrocarbon Basins Offshore Nova Scotia

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### Summary

Every hydrocarbon basin experiences the same cycle of evolving maturity as it moves from an unknown frontier to a mature and understood basin. Yet every basin has its own unique path as plays and prospects are defined, drilled, and discoveries appraised and developed. That path will reflect the information that can be collected economically at a given maturity and the value of the discoveries being made. Each play will be examined systematically by the exploration process, yielding a creaming curve of discoveries that evolves with changes in both subsurface understanding, plays pursued and changes in the applied technologies of imaging the subsurface.

We will show that whilst the development of the hydrocarbon industry on the margin of Nova Scotia has been unique, it has also been no different to any other basin successfully exposed to the exploration machine. 2D seismic defined the first play systems explored and led to the discovery of the Sable Island and Panuke Deep Fields, where 3D allowed the rapid development of these areas. These discoveries at the end of the last century were heroic achievements based on visionary interpretation and understanding of the available data at that time. However, the exploration machine has stopped too early.

In this century perhaps the greatest collective advance in our industries science, arguably to the greatest scientific benefit for all mankind has been in the field of seismic processing. Tools such as SRME, shallow water demultiple and de-ghosting which are now standard, have revolutionized imaging of sedimentology, structure, DHI's and source rocks (Figure 1).

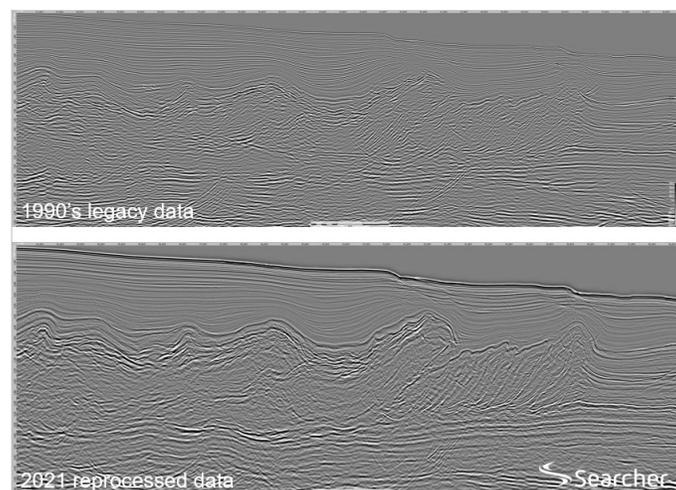


Figure 1: Offshore Oman reprocessed seismic example illustrating the benefits of De-ghosting, SRME and SWM

Unfortunately, the first phase of exploration on the Nova Scotia shelf ceased before the benefits of these new tools in exploration could be applied (Figure 2).

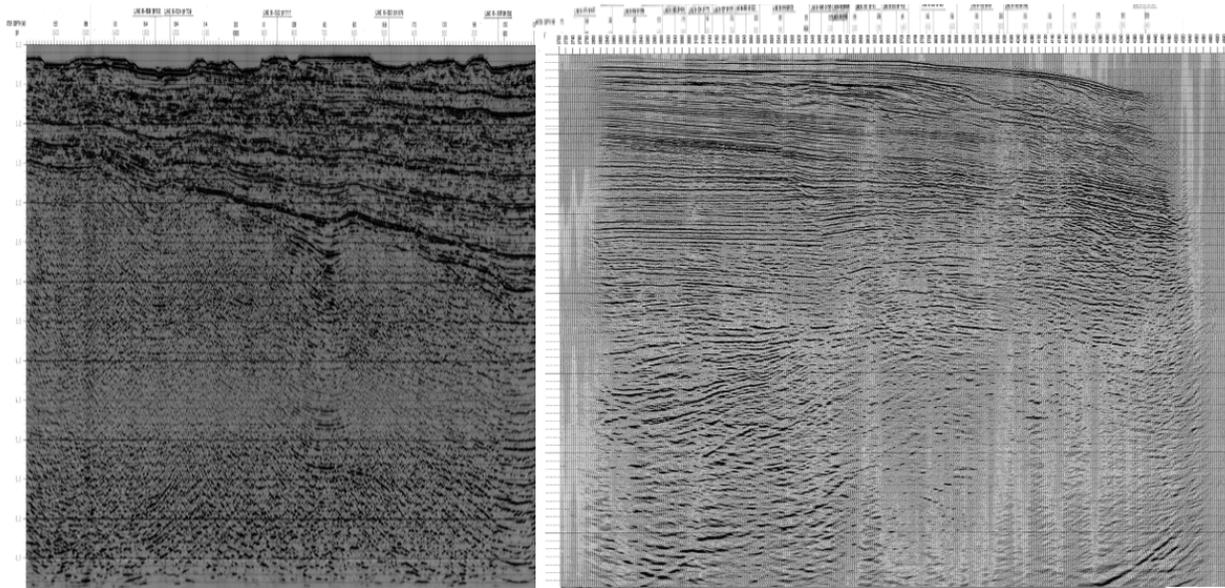


Figure 2: Examples of never reprocessed original 2D and 3D Seismic Data around Sable Island

In the Deep Basin, some of the most novel and technically advanced of any seismic surveys acquired in frontier basins on Earth have been acquired. The encouraging results of hydrocarbon indications encountered by the Aspy well (Figure 3), and sea bed coring studies indicate that play success is close and yet the margin is largely unexplored, despite multiple opportunities identified in the area of the Tangier 3D.

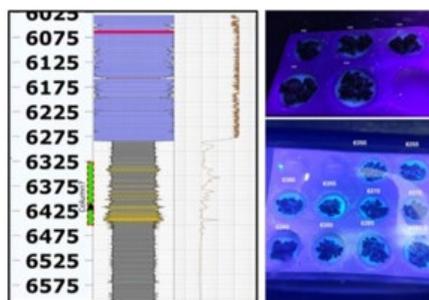


Figure 3: Cuttings fluorescence Aspy well (Aspy D-11A)  
Subsurface Well History Report for CNSOPB)

On the shelf reprocessing of data will bring a new level of insight and opportunity will usher in a second phase of exploration for advantaged gas, one where the combatants are able to use 21<sup>st</sup> Century imaging tools. Examples of reprocessed Nova Scotia shelf seismic will be shown addressing the advances in understanding on sedimentology, structure, DHI's and source rocks.