

Shelf to Basin Architecture and the Integrated Stratigraphic Framework of the Cretaceous Strata, Scotian Basin, Offshore Eastern Canada

Mihaela Ryer*, Robert Sullivan, Jim Dyess, Carl Kaupp, and Saverio Spagnuolo
Marathon Oil Company, 5555 San Felipe, Houston, TX 77056, USA
mryer@marathonoil.com

ABSTRACT

The Scotian Shelf is a relatively mature hydrocarbon province, where a significant volume of hydrocarbons have been discovered in the fields around Sable Island. These fields produce primarily from Cretaceous shallow- and marginal marine reservoirs deposited by a long-lived fluvio-deltaic system. Our working hypothesis is that at times this system bypassed the shelf depositing a significant amount of sand prone sediment into the deep water. This new deep-water play constitutes the focus of exploration in recent years.

The Cretaceous strata of the Scotian Basin, off Sable Island, were studied using an integrated sequence stratigraphic approach, with the goal of understanding and predicting the stratal architecture and depositional environments along the shelf-to-basin depositional profile. The study utilized a database consisting of high resolution biostratigraphy, well logs, cores, 2D and 3D seismic data.

Our interpretation to date suggests that the Cretaceous section in the study area comprises five transgressive-regressive cycles bounded by key surfaces with regional significance. These key surfaces are interpreted on the basis of distinct biostratigraphic events, abrupt basinward shifts in facies recognized in core and well logs, changes in stacking patterns and seismic reflection terminations. Special emphasis was placed on understanding the shelf paleogeography during times of maximum regressions. This has important implications regarding mapping of sediment fairways into the basin and predicting the quality, distribution and internal architecture of sand-prone deep-water depositional systems.