

## Geoscience Research Themes 2018

### Basin Evolution

The Scotian Basin formed in Nova Scotia's offshore as a passive margin sequence along the North American side of the central Atlantic Ocean during the late Triassic and early Jurassic periods. Although central Atlantic breakup is well-studied generally, key questions regarding the timing, paleo-geography and lithological architecture of failed versus favored extension centers during pre-rift and syn-rift stages remain. How the early crustal evolution controlled the movement and accumulation of sediments in depocenters and the formation and maturation of hydrocarbon source and reservoir rocks is a key part of this history as well. This theme seeks research that addresses the basic evolution of the Scotian Basin between early Triassic and early Cretaceous time in domains including, but not limited to, crustal dynamics, tectonics, basin modeling, seismic interpretation, sequence stratigraphy, and petroleum systems science.

### Reservoir Distribution/Reservoir Quality

This theme is meant to address the reservoir delivery stories across the Scotian Basin. Topics can include and/or integrate provenance, reservoir quality, localized and regional mapping with an ideal focus on paleogeographic settings and sediment delivery into deep water and/or new basins.

### Source Rock/Petroleum Geochemistry

Residual uncertainty associated with the petroleum geochemistry of source rock remains in deep water Nova Scotia. Strong evidence of a source rock has been assembled from Nova Scotia's offshore and the presence of hydrocarbon sources from deep water piston core data has been established by the NSDOE. Furthermore data is available from the conjugate margin of Morocco that can be linked to a shared geologic story. Topics would have an objective to firm up the new source rock story and illuminate any possibility of a new or older source rock.

### Biostratigraphy, Sequence Stratigraphy

Additional understanding is needed regarding the history of sedimentation in offshore Nova Scotia between the Triassic to middle Jurassic periods. Work in this area will better help in understanding where, for example, rocks within this age interval lie, implications for the early rifting history of the offshore and the potential for hydrocarbon deposits in the nearer offshore areas. There are several aspects to this work encompassing biostratigraphy, provenance, thermal history and the nature of the hydrocarbon systems.

### New Depositional and Petroleum Systems Modeling

Nova Scotia is looking to build research capacity in this field of geologic modelling. Regional baseline models established in the Play Fairway Analysis can be used as stepping stones into more detailed and iterative analyses of select areas where data lends itself. The focus of this theme is to explore geologic ideas and concepts integrated from basin evolution, geochemistry, stratigraphy and applied through a depositional and/or petroleum system. One goal could be to establish an iterative model that can change with evolving ideas of sediment delivery, new geochemistry or biostratigraphy.