



The Middle Triassic Sequence of the Sverdrup Basin, Canadian Arctic Islands

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Abstract

The Middle Triassic, 2nd order sequence of the Sverdrup Basin is bound by unconformable shoreface ravinements on the basin flanks. Basinward the boundaries become conspicuous maximum regressive surfaces that are readily mapped on the surface and in the subsurface. The offshore facies is characterized by phosphatic, bituminous shales that are excellent petroleum source rocks. The shallow marine facies is calcareous, variably bioturbated very-fine to fine sandstone and has low porosity. Foreshore to shoreface sandstones are often coarse-grained with porosities up to 20%.

The sequence is subdivided into two third order sequences by a prominent boundary that approximates the Anisian-Ladinian boundary. The Anisian third order sequence contains four fourth order sequences that are recognizable in most areas of the basin. The overlying Ladinian fourth order sequence consists of three fourth order sequences. Many smaller magnitude, higher order sequence boundaries, which likely reflect Milankovitch cyclicity, are present.

The bounding second order sequence boundaries, as well as the internal third order boundary, were generated by tectonics and are found in many other basins throughout the world. The origin of the fourth order boundaries is debatable although in other basins equivalent boundaries are clearly of tectonic origin. It appears that during the Middle Triassic the Sverdrup Basin was subjected to short-lived tectonic events of variable magnitude and with a frequency of about 1 million years.

The strata represent an attractive exploration target given the juxtaposition of source and reservoir strata and the occurrence of numerous tectonic and erosional episodes. The growth of salt structures during this time enhances the prospectivity.