

## **On the Shore of a Brackish Sea**

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The Rhaetian sequence (uppermost Triassic) is widespread throughout the Sverdrup Basin of the Canadian Arctic Archipelago and is bound by unconformities over most of its extent. Notably it exhibits a variety of clastic facies. In the east and central portion of the basin the sequence is dominated by thick fluvial plain strata that contain numerous coal seams. To the west the sequence thins dramatically and is represented by marine shelf and shoreline deposits.

These marine strata are distinguished by a complete lack of burrowing which indicates that the Rhaetian sea was most likely of abnormal salinity. Given the occurrence of the thick coal-bearing deltaic strata to the east, it is interpreted that the Rhaetian sea had a very low salinity. Furthermore, free exchange to the open ocean that lay to the southwest may have been hampered by a tectonic sill that formed during the development of the major unconformity at the base of the sequence.

The transgressive systems tract in the west consists of thin, pebbly, oolitic ironstone. The thicker regressive systems tract consists of a progradational, shoreface-beach-lagoon facies succession and varied sedimentary structures, which are most often destroyed by burrowing, are preserved in the shoreface deposits.

The beach to shoreface deposits have excellent porosity and permeability and are host to two very large gas fields (9 TCF) on Sabine Peninsula, Melville Island. The traps are very low amplitude anticlines cut by normal faults and a stratigraphic component exists where the sandstones are truncated southward by the upper sequence boundary.