Comparison of the Paleoproterozoic Uraniferous Siliciclastic Basins, Thelon and Athabasca Basins, Western Churchill Province, Canada to the Roraima Basin, Amazonian Craton/Guiana Shield South America.

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A feature that draws a comparison between the polymetamorphic cratonic domains like the Western Churchill Province and the Amazonian craton/Guiana Shield is the presence of thick sequences of circa 1.8 – 1.7 Ga sedimentary basins that were filled with siliciclastic sedimentary rocks. In the Western Churchill Province, the strikingly similiarities that correlate the ca. 1.72 Ga Thelon Basin with the ca. 1.69 Ga Athabasca basins, support a comparison to the ca. 1.78 Ga Roraima basin, Amazonian Craton/Guiana Shield. The tectonostratigraphic assemblages that comprised the Archean-Paleoproterozoic crust beneath these basins in Canada and South America record similiar tectonic and granitoid emplacement histories associated with the 1.93-1.83 Ga Trans-Hudson Orogen in the Western Churchill Province and 1.95-1.8 Ga Trans-Amazonian Orogen in the Amazonian Craton/Guiana Shield. Craton-scale subsidence is related to reactivation of crustal-scale inhomogeneities as boundaries along granitoid-dominated domains.

Basin-scale sedimentological features and sequence stratigraphy indicate that all three basins progressed from initial continental fluvial sedimentation with an aeolian component into deltaic - shallow marine sedimentation. The compositional maturity of the siliciclastic sedimentary rocks in these basins is in part a function of the protracted and high-grade diagenesis that is recorded by multi-staged quartz, chlorite, illite kaolinite, phosphates and hematite cements. The diagenetic evolution in the Thelon and Athabasca basins spans an interval of at least 0.7 Ga. The path towards high-grade diagensis is associated with the formation of world-class polymetallic unconformity-type uranium deposits in the Thelon and Athabasca basins. The potential for unconformity-type uranium deposits in and beneath the Roraima basin will be assessed using uranium deposit models from the Thelon and Athabasca basins, Canada.