



Can the South China Sea tell us anything about Canada Basin?

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The Canada Basin (a sub-basin within the Amerasia Basin) and the South China Sea both preserve oceanic spreading centres and adjacent passive continental margins characterised by broad continent-ocean transition zones with hyper-extended continental crust. There are indications that hyper-extension in the South China Sea occurred mainly as a result of flow within a weak lower crustal layer and that it occurred both before and after plate break-up and the onset of ocean lithosphere formation at the sea-floor spreading axis. Available geophysical data from Canada Basin permit similar inferences. Both basins are about the same size and the oceanic segment in both is about the same size. Seafloor spreading in the South China Sea took place in the Cenozoic whereas in Canada Basin it is widely believed to have occurred during the Cretaceous. Widespread magmatism expressed as the High Arctic Large Igneous Province (HALIP) may or may not have played an intrinsic, linked, role in Canada Basin formation. No similar LIP is associated with the South China Sea although one mechanism proposed to have driven its formation is ascribed to mantle plume activity in its northernmost part. More conventionally the mechanism of opening of the South China Sea is considered to be “passive” rather than “active”, related to plate reconfigurations in the southeast Asia region linked or not linked to the nearby collision of India and Eurasia and/or subduction of a “proto-South China Sea”. The driving mechanism for opening of Canada Basin is poorly discussed in the literature but is generally ascribed to paleo-tectonic plate reconfigurations and subduction in the northern Pacific (Eurasia-North America plates) region in the Mesozoic. Can the South China Sea tell us anything about Canada Basin in terms of the pre-existing lithosphere of each and the geodynamic processes leading to its hyper-extension and eventual break-up?