Seismic Stratigraphy and Development of Large Basins and Structures Offshore Southern West Greenland

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ABSTRACT

The study area covers offshore southern West Greenland between c. 62° N–67° N latitude. During the recent years a significant amount of new data makes it possible to improve the mapping of the basins and structures and to discuss the tectonic development. The results presented here are based on geophysical and geological data including data from the deep exploration wells. The amount and the diversity of data types provide opportunity to look at different aspects of the geological development of the region including basin development and timing. Eight major seismic stratigraphic units (A–H) with sub-units were defined and correlated to the wells on the West Greenland continental shelf. Some of the units can be correlated throughout the West Greenland continental shelf. The seismic stratigraphic units are related to the geological development also in the surrounding regions including Pre-Mesozoic, Mesozoic and Cenozoic basins. Extensive developed volcanics in areas with oceanic- and continental crust have also been mapped. The large structures and basins were formed by a number of tectonic phases during mainly Cretaceous to Cenozoic time. The Mesozoic units are affected by W–E to SW–NE extensional faulting with rifted units, whereas some of the younger units of Paleogene age also show features suggesting trans-tensional and compressional related tectonism including anticlines and thrusts faults. The latest large scale tectonism in the region was influenced by the Cenozoic separation between Canada and Greenland. The tectonic development of southern West Greenland resulted in formation of rifted fault blocks with closures at crests, anticline closures and some drape closures. In some places, late Cenozoic thick depositional systems developed towards south and SW and the younger sections are affected by glaciations, late faulting and seafloor channel erosion.