Geophysical Research Abstracts
Vol. 17, EGU2015-5530, 2015
EGU General Assembly 2015

Canadian Arctic Plate Reconstructions based on revised geological and geophysical data

Trond H. Torsvik and Carmen Gaina
University of Oslo, CEED, Oslo, Norway (t.h.torsvik@geo.uio.no)

We present a revised rifting and seafloor spreading history around Greenland based on geological and geophysical constraints. Palaeomagnetic data from (i) Neoproterozoic dykes and sills in North America, NW Greenland, Devon and SW Ellesmere (Franklin and Clarence Head), (ii) Early Permian volcanism (Esayoo unit) in Ellesmere and (iii) Cretaceous volcanism and intrusive activity (Isachsen and Strandfjord Formations) in Axel Heiberg and Ellesmere have also been re-evaluated and used to develop a new Canadian Arctic plate model from Silurian to Paleogene times. We have tentatively divided the Canadian Arctic into seven tectonic units, including Pearya, which accreted to the northern sectors of Ellesmere and Axel Heiberg islands as part of the mid-Silurian Caledonide Orogeny. The Canadian Arctic was variable deformed during the Late Devonian Ellesmere and the Tertiary Eurekean events, the latter including c. 250 km of shortening and ultimately amalgamating all the Canadian Arctic units in the Late Eocene. Two of the units, Devon and SW Ellesmere must have been closely tied to NW Greenland (the 'Greenland Plate') in order to minimize Palaeocene-Eocene deformation across the Nares Strait during Labrador Sea and Baffin Bay seafloor spreading. We model 100 and 60 km of Late Cretaceous-Eocene transtension/extension in the Lancaster and Jones Sounds but in order to avoid too much continental overlap between Devon and North America (Lancaster Sound) we must include 150 km of pure strike-slip faulting along the Nares Strait.