



Burial and exhumation history of southern Sweden estimated from apatite fission-track data, stratigraphic landform analysis and the geological record

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We present new apatite fission-track analysis (AFTA) data from 87 samples of basement and sediment from southern Sweden, including samples from a 1.7 km deep borehole. The new AFTA data allow us to confirm the development of the South Swedish Dome as inferred from stratigraphic landform analysis (e.g. Lidmar-Bergström et al., 2013) and also to define the timing and magnitude of the events of burial and exhumation that shaped this prominent feature.

Southern Sweden underwent a complex Palaeozoic – early Triassic history of burial and exhumation, but after a mid-Triassic event of uplift and exhumation, rocks on the Sub-Cambrian Peneplain cooled from palaeotemperatures $\geq 100^{\circ}\text{C}$. This event, that also affected southern Norway, West and East Greenland, marks an important phase in the breakup of Pangea.

A second, regional phase of cooling and exhumation affected the area in the mid-Jurassic and eventually lead to stripping of the basement along the western and southern flanks of the South Swedish Dome prior to Late Cretaceous subsidence and burial and thus to formation of the sub-Cretaceous hilly relief. This event affected much of NW Europe as well as West and East Greenland, and it is coeval with the initial opening of the central Atlantic.

A third, regional phase of cooling and exhumation from palaeotemperatures of 50–60°C took place in the Miocene and lead to the formation of the South Småland Peneplain. This phase affected southern Scandinavia but has no counterpart in Greenland. A final uplift phase that raised the South Småland Peneplain to its present elevation and lead to re-exposure of sub-Cretaceous hilly relief is not resolved in the AFTA data.

The results underline the importance of epeirogenic movements (both uplift and subsidence) in regions that are often considered as stable cratons (cf. Green et al., 2013).

Green, P.F., Lidmar-Bergström, K., Japsen, P., Bonow, J.M., Chalmers, J.A., 2013. Stratigraphic landscape analysis, thermochronology and the episodic development of elevated, passive continental margins. Geological Survey of Denmark and Greenland Bulletin 2013/30, 150 pp.

Lidmar-Bergström, K., Bonow, J.M., Japsen, P., 2013. Stratigraphic Landscape Analysis and geomorphological paradigms: Scandinavia as an example of Phanerozoic uplift and subsidence. Global and Planetary Change 100, 153-171.