Geophysical Research Abstracts, Vol. 8, 09869, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09869
© European Geosciences Union 2006

Significance of elevated planation surfaces for conclusions of uplift and tectonic events on passive margins

J.M. Bonow (1,2), P. Japsen (1), P.F. Green (3), J.A. Chalmers (1), K. Lidmar-Bergström (2)

(1) Geological Survey of Denmark and Greenland (GEUS), DK-1350, Copenhagen K, Denmark, (2) Department of Physical Geography and Quaternary Geology, Stockholm University, SE-10691, Stockholm, Sweden, (3) Geotrack International, West Brunswick, Victoria 3055, Australia (jbon@geus.dk / Fax +45 38142050)

Elevated erosion surfaces are common features on the passive margins around the North Atlantic and elsewhere. The idea by geomorphologists working in Scandinavia during the early 1900 was that these quasi-planar landforms were the end-result of long-term planation near former base-levels, that after formation had been uplifted in the late Cenozoic. Simultaneously as the interest for process geomorphology arose in the 1960s, studies of large-scale landforms as relevant for conclusions of tectonic events became out-of-fashion and were even rejected. This paradigm is beginning to change due to development in a number of separate disciplines. The possibility to analyse large-scale erosion surfaces in digital elevation models to create relative event chronologies gives more objective analysis than in earlier studies. By combining landform analysis with interpretation of apatite fission track data and sequence stratigraphic interpretations offshore based on seismic and of hydrocarbon industry wells, it has been possible to constrain absolute amount and absolute timing of uplift tectonism on a passive margin, issues that cannot be solved by single disciplines alone. A passive margin of West Greenland consists of elevated planation surfaces at c. 2 km above sea level and by using our integrated model we show that this passive margin has experienced multiple uplift and erosional events since cessation of rifting in the Labrador Sea in the mid Eocene. We conclude that the present relief was formed during the late Neogene and that planated erosion surfaces, interpreted to be governed by different base-levels are valid and can be used as uplift markers. The conclusions

from this study also point to that the common assumption, that elevated passive continental margins are mainly rift-shoulders and have remained high since rifting, should be re-evaluated.