



Erosion surfaces as markers for deciphering uplift events

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

(1) Department of Physical Geography and Quaternary Geology, Stockholm University, SE-11634 Stockholm, Sweden, (2) Geological Survey of Denmark and Greenland (GEUS), DK-1350, Copenhagen K, Denmark, (3) Now at Geological Survey of Denmark and Greenland (GEUS), DK-1350, Copenhagen K, Denmark, johan.bonow@natgeo.su.se / Fax: +46-8-164818 / Phone +46-8-162000

Erosion surfaces are important markers for deciphering uplift events. Recent investigations in Scandinavia and West Greenland reveal two types of erosion surfaces over basement rocks of importance in this context. The first type includes palaeosurfaces of different character that have been exhumed from cover rocks of different age after recent uplift and erosion. The second type is planation surfaces formed across geological units of different age and resistance and graded to common base levels. Planation surfaces affected by uplift may develop into stepped landscapes by incision of fluvial systems, followed by surface development. At low elevations the planation surfaces often cut off inclined older exhumed surfaces, constraining the maximum age of the planation event. Absolute time scales for events of uplift and erosion can be given by correlation with geology and thermochronological data. Uplift amounts can be estimated with erosion surfaces as markers of their former base levels. Neogene events of rock uplift have in this way been estimated to about 2000 m for West Greenland, and southern Norway has been uplifted at least 800–1200 m. The amounts are too high to only reflect isostatic readjustment and the uplift must include a tectonic component. The West Greenland surfaces are tilted, which is another argument for a deep-seated cause. The different relief types on the flanks of the Northern and Southern Scandes is an argument for uplift separated in time, with most uplift in the Paleogene in the north and in the Neogene in the south. This differential uplift must have an endogenetic cause.