



The role of fault reactivation and growth in the late uplift of western Norway

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New structural data from the Møre area in combination with analysis of published apatite fission-track (AFT) and topographic data suggests that the enigmatic latest Cretaceous to Cenozoic uplift of western Norway was associated with normal-sense reactivation of the Møre-Trøndelag Fault Complex (MTFC). Reactivation was focused along the base of what developed into a topographic 'great escarpment' along the SE boundary of the MTFC inboard of the Møre Basin. The AFT data suggest that displacements across the MTFC in the 'great escarpment' area are on the order of 2-3 kilometres. Combined structural and AFT data indicate that reactivation occurred along a displacement gradient with least displacement to the NE and increasing displacements towards the SW. We suggest that the Late Cretaceous-Cenozoic development of topography and associated drainage patterns in the Scandes Mountains followed the templates laid down by structurally induced topographic gradients. The young reactivation of the MTFC represents a back-stepping of fault activity towards the mainland that likely represents an ongoing tectonically-controlled scarp retreat as opposed to significant post-Mesozoic extension or footwall uplift. Normal re-activation of the MTFC most likely commenced in connection with the Triassic to earliest Cretaceous phases of rifting on the Norwegian margin, and continued at least until after 90 Ma (and most likely through most of the Tertiary). Previously published work on offshore stratigraphy and onshore geomorphology place some constraints on main phases of uplift of southwestern Norway, and suggest main phases of denudation and fault growth along the reactivated MTFC may have taken place in the Palaeocene, during the Eocene-Oligocene transition, in the Late Miocene-Early Pliocene and possibly in the Late Pliocene-Pleistocene time. A fault model for the Cenozoic uplift of the Norwegian mainland provides a framework for provenance, erosion and trans-

port of sediments eventually deposited in the offshore post-rift basins in the Latest Cretaceous, Palaeogene and Neogene. Because the asymmetric topographic profile of Fennoscandia is reflected also in the apatite fission-track data we suggest that isostasy and lithospheric flexure place a first-order control on the uplift and shape of the Scandes Mountains ~ the 'ghost' of the Mesozoic.