



## **Normal faulting, block tilting and landscape development in Lofoten and Vesterålen constrained by Apatite Fission Track data**

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Mesozoic and possibly younger normal faulting and block tilting in the Lofoten–Vesterålen archipelago can be constrained by Apatite Fission Track data. Previous studies have documented the polyphase structural evolution of the archipelago, based on field data and onshore–offshore correlations. Our new AFT data document vertical movements on a more regional scale, with kilometer-scale offset on some faults. We observe a clear connection between these movements and the present-day landscape in the region. Below Sortlandsundet, the Hadsselfjord Fault Zone forms the eastern limit of the Sortlandsundet half-graben and our data reveal latest Cretaceous and younger half-dome shaped uplift of the footwall. East of the Western Lofoten Border Fault, on Vestvågøya, southeastward tilting is indicated both by the pattern of AFT ages, ranging from  $81 \pm 7$  Ma to in the NW to  $167 \pm 16$  Ma in the SE, and tilted paleosurfaces. AFT ages immediately east of Sortlandsundet ( $72 \pm 5$  Ma) and on Vestvågøya ( $81 \pm 7$  Ma) are among the youngest ones found on the Norwegian mainland. We conclude that the present-day landscape of the Lofoten–Vesterålen archipelago cannot represent a re-exposed and glacially modified Mesozoic landscape. Although most of our data indicate cooling to below  $60^\circ\text{C}$  took place during the Mesozoic, the youngest footwall ages are hard to explain without alluding to Cenozoic normal faulting. A Cenozoic structural control on the landscape can thus be inferred for Lofoten and Vesterålen.