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Episodes of subsidence and uplift of the conjugate margins of Greenland and Norway after opening of the NE Atlantic

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We have undertaken a regional study of the thermo-tectonic development of East Greenland (68–75°N; Bonow et al. 2014; Japsen et al. 2014) and of southern Norway (58–64°N) based on integration of apatite fission-track analysis (AFTA), stratigraphic landscape analysis and the geological record onshore and offshore.
Volcanic and sedimentary rocks accumulated on the subsiding, East Greenland margin during and following breakup and then began to be exhumed during late Eocene uplift that preceded a major, early Oligocene plate reorganization in the NE Atlantic. The Norwegian margin also experienced Eocene subsidence and burial; there are hemipelagic, deep-marine sediments of Eocene age along the coast of southern Norway. End-Eocene uplift of the NW European margin led to the formation of a major unconformity along the entire margin and to progradation of clastic wedges from Norway towards the south.
Our AFTA data from East Greenland and southern Norway reveal a long history of Mesozoic burial and exhumation across the region, with a number of broadly synchronous events being recorded on both margins. AFTA data from East Greenland show clear evidence for uplift at the Eocene–Oligocene transition whereas the data from Norway do not resolve any effects of exhumation related to this event.
AFTA data from the East Greenland margin show evidence of two Neogene events of uplift and incision of the in the late Miocene and Pliocene whereas results from southern Norway define Neogene uplift and erosion which began in the early Miocene. A Pliocene uplift phase in southern Norway is evident from the stratigraphic landscape analysis and from the sedimentary sequences offshore.
In East Greenland, a late Eocene phase of uplift led to formation of a regional erosion surface near sea level (the Upper Planation Surface, UPS). Uplift of the UPS in the late Miocene led to formation of the Lower Planation Surface (LPS) by incision below the uplifted UPS, and a Pliocene phase led to incision of valleys and fjords below the uplifted LPS, leaving mountain peaks reaching 3.7 km above sea level. In southern Norway (as also in southern Sweden), the sub-horizontal Palaeic surfaces truncate the tilted, sub-Mesozoic erosion surface along the coasts. Lidmar-Bergström et al. (2013) used this relationship to conclude that the Palaeic relief is of Cenozoic age.
In Greenland, definition of the chronology of events benefits from the availability of AFTA data from boreholes onshore where the plateau surfaces truncate Palaeogene basalts, and thus make it possible to date formation of these surfaces and correlate them with offshore unconformities. In Norway, the absence of post-rift rocks onshore precludes such integrated analysis. However, the presence of offshore unconformities, coupled with similar onshore landscapes and Cenozoic cooling history suggest a similar overall style of evolution. The similarities between the two margins lead us to us suggest that these margins developed in broadly similar fashion, and that the mountains of Norway also reached their present elevation long after Atlantic breakup.

Bonow, Japsen, Nielsen 2014. Global and Planetary Change 116.
Japsen, Green, Bonow, Nielsen, Chalmers 2014. Global and Planetary Change 116.
Lidmar-Bergström, Bonow, Japsen 2013. Global and Planetary Change 100.