

## **Evolution of a Continental Margin in a Regional Rift-Shear Tectonic Setting: the Lofoten-SW Barents Sea Margins in the NE Atlantic**

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The pre-opening sedimentary basins off northern Norway formed in response to successive phases of regional tectonism within the North Atlantic-Arctic region. During early Tertiary breakup, the study area was the locus of two structural mega-lineaments: the North Atlantic rift zone between the present Charlie Gibbs and Senja fracture zones, and the DeGeer Zone - a mega-shear system linking the Late Mesozoic-early Tertiary crustal extension in North Atlantic to the Arctic region. The Lofoten-SW Barents Sea margins developed at the interaction of these mega-lineaments. From deep and conventional seismic reflection profiles, and crustal velocity data combined with potential field images, we have constructed a series of margin transects which show that the continent-ocean transition is confined within a narrow, 10-20-km-wide, zone along the sheared margin, but is more obscure and masked by breakup lavas at the rifted margin segments. Furthermore, the first-order crustal margin structure and the tectonic development is largely governed by three controlling parameters: (1) the pre-breakup crustal configuration, (2) the geometry of the plate boundary at the time of opening, and (3) the subsequent direction of relative plate motion. The interplay of these boundary conditions largely explains striking differences in structural development and post-opening vertical motion history between different margin segments.