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The Mesozoic and early Tertiary opening of the North Atlantic and its impact on the development of the Faeroe-Shetland basin system

Triassic/Early Jurassic deformation of western Europe was partitioned into a broad rift-system that linked from continental Europe, through the North Sea, and northwards into the East Greenland/Norway region. This rift-system also extended along the western margin of Ireland and the UK where it reactivated many older post-Caledonian basin elements. The subsequent Middle to Late Jurassic rift-system, so prominent in Mid Norway and the North Sea, did not extend in any substantial way through the Faeroe Shetland region. The Faeroe-Shetland basin-system was established as a major sediment depocenter by rifting in the late Early Cretaceous (Apto-Albian.) Initial rifting was oblique to the trends of earlier Paleozoic and Mesozoic structures. Pre-rift basin elements are offset by a series of prominent transfer systems (e.g. the Judd transfer system.) The stretch for the Cretaceous event was high and fault planes are interpreted to underlie substantial portions of the basin. Additional rifting in the Paleocene significantly modified the basin configuration and created the present-day form of the principal ridges that frame the basin. Many Cretaceous basin-margin fault-systems were reactivated and new faults formed at a high angle to earlier trends. Large volumes of igneous material were intruded into the deep basinal areas causing localised fault reactivation. Following breakup of the North Atlantic, differential subsidence formed a deepwater trough -- the Faeroe-Shetland Channel. Inversion, beginning in the Eo-Oligocene, created a series of arches and monoclines throughout the region. Their distribution was strongly controlled and partitioned by earlier transfer systems as the underpinning basement architecture was reactivated.