



## **Geodynamic and geological analysis of the Barents and Norwegian Seas (Mohns and Knipovich Ridges).**

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The majority of the oceanic crust of the Norwegian-Greenland Sea was formed in the Mohns Ridge. This ridge is extended from southwest to northeast and has the spreading rate of 0.8 cm/y. Morphologically this structure represents the rift valley with axial fault and volcanic ridges over the slopes. Volcanic ridges connected, probably, with the single magmatic source, extend to about 40 km. The structure of the oceanic crust in the ridge corresponds to the "normal" oceanic crust. Its thickness is 6-8 km. It differs from the "normal" crust in the velocity of seismic waves which is higher in the second layer that demonstrates wide extension of sub-intrusive bodies such as dykes and sills in this layer. Judging from the age of linear magnetic anomalies, the opening of the basin started in the Early Eocene (about 55 My). The narrow oceanic basin began to form along the spreading center axis extended southwest – northeast. The basin was limited from the Norwegian continental crust by the Voring Fracture Zone and from the Greenland continental block by the Greenland Fracture Zone. The oceanic crust over the northeastern slope of the Mohns Ridge is removed along the southwestern margin of the Barents Sea along the Greenland and Seniya Fracture Zones. The graben of the Hornsund Fracture Zone with submeridional extending originated in the same period on the northern continuation of the tensile axis.

In the Late Eocene the width of the Norwegian-Greenland Sea basin reached 300 miles. Active breaking of the northwestern Barents Sea continental crust along a series of deep faults with different extensions started to the north of the Greenland Fracture Zone. This process was finished in the Late Miocene by the origin of the Knipovich Ridge subparallel to the Hornsund graben. The favorable conditions for the origin of

the third spreading axis (triple junction) to cut the Barents Sea crust in the eastern – southeastern direction at  $72-73^{\circ}\text{N}$  were set in joined zone of the graben and the Mohns Ridge. Due to low spreading rate and high sedimentation rate in the Barents volcanism in the southeastern graben appears only in the form of sub-volcanic bodies such as sills and dykes penetrating into sedimentary cover.