



## **Cenozoic basin development and petroleum exploration possibilities of the Faroes area**

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**Geologisk Museum, Øster Voldgade 5-7**

The talk reviews the geological development of the Faroes part of the NE Atlantic Margin in the Cenozoic Era. The Faroes area is located west of the post Caledonian rift basin system formed back in the Devonian after the collapse of the Caledonian mountains. Tectonic movements and plate reorganisations during several phases have strongly influenced sedimentation and erosion along the Caledonian front.

During the Cenozoic four main tectonic phases with uplift, non-deposition or erosion had a major influence on basin development and structural setting. Firstly the arrival of the Icelandic plume to the Faroes area caused a series of uplift phases, which are monitored in the Selandian–Early Ypresian sedimentary succession. Secondly, tectonic uplift in the Middle Eocene ended the period of almost continuous subsidence of the Judd Basin since the Danian. In the Middle and Late Eocene new depocentres formed in the northern part of the Faroe-Shetland Trough and in the Faroe Bank Basin. Thirdly, due to uplift and sea level fall in the Late Oligocene, widespread erosion of the Eocene and Oligocene successions resulted in a major unconformity on the shelf. Finally in Neogene times folding and uplift of the Fugloy Ridge occurred contemporaneously with renewed subsidence in the northern part of the Faroe-Shetland Trough and the Faroe Bank Basin.

The first small petroleum discoveries in the Faroe–Shetland Channel were made in Mesozoic reservoirs. About 100 structures were drilled but no major discoveries were done. In 1990 the Foinaven Field was discovered, by occasion, in Paleocene sandstone, which together with Kimmeridgian source rocks form basis for the petroleum system in the southwestern part of the Faroe-Shetland Channel. Good reservoir sequences occur in settings where sedimentary entry points were located. The area was strongly influenced by inversion in Middle Eocene to recent time and reservoirs and source rocks were uplifted up to 600 m with gas flushing, seal breakage and interruption in petroleum generation as consequences.

Petroleum systems are also believed to exist in the northern part of the Faroe-Shetland Channel and in the Faroe Bank Basin.

*Aage Bach Sørensen dimitterede fra Aarhus Universitet i 1980 med speciale i stratigrafi og kvartærgeologi. Ansat hos Prakla-Seismos i Hannover med arbejdsområde indenfor seismisk dataindsamling, processering og tolkning. Har derefter arbejdet som geofysiker med olieeftersøgning hos Dansk Olie og Naturgas og på GEUS.*