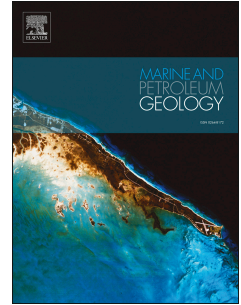


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Igneous intrusions in the Faroe Shetland basin and their implications for hydrocarbon exploration; new insights from well and seismic data

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1 **Igneous Intrusions in the Faroe Shetland Basin and their Implications for Hydrocarbon**
2 **Exploration; New Insights from Well and Seismic Data**

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16 **ABSTRACT**

17 Igneous sills and dykes that intrude pervasively into prospective sedimentary basins are a
18 common occurrence in volcanic margins, impacting the petroleum system and causing
19 geological and technical drilling challenges during hydrocarbon exploration. The Faroe-
20 Shetland Basin (FSB), NE Atlantic Margin, has been the focus of exploration for over 45 years,
21 with many wells penetrating igneous intrusions. Utilising 29 FSB wells (with 251 intrusions)
22 and 3D seismic data, this study presents new insights into the impacts that igneous
23 intrusions have on hydrocarbon exploration. Examination of cores reveals additional igneous
24 material in individual wells, compared to estimates using seismic or petrophysical data alone,
25 leading to potential underestimation of the volume of the igneous component in a basin.
26 Furthermore, analysis of petrophysical data shows that within the FSB there are silicic
27 intrusions such as diorite and rhyolite, in addition to the commonly encountered mafic
28 intrusions. These silicic intrusions are difficult to recognise in seismic and petrophysical data
29 due to their low density and compressional velocity and have historically been misidentified

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