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Glacigenic reservoirs characterisation using sedimentology, geomorphology and virtual outcrop mapping

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Sedimentary packages of ancient glacigenic origin are recognized in numerous locations around the world conditions are often targeted during hydrocarbon exploration efforts(e.g. in Oman, Saudi Arabia, North Africa and Australia).
Recent discoveries of hydrocarbon accumulations made in the North Sea in the Quaternary succession (Aviat and Peon fields) that are clearly of glaciogenic origin are presenting new opportunities to unlock additional resources in the easily accessible, Quaternary section. Furthermore new studies show that glacial ice was present in the North Sea Basin as early as MIS 100(2.52Ma). Direct evidence for grounded ice at MIS 64 (∼1.78 Ma) can be found From Aviat field sediments in core implicating a thicker glacial or glacially influenced sedimentary package than previously thought, and >1 km thick in places. The repeated high-lowstands characteristic of the glacial-interglacial cycles provide sufficient organic material during lowstands that the North Sea glacigenic section is characterised by numerous small and large gas accumulations which appear to have formed from biogenic sources. As the North Sea becomes an ultra-mature province these shallow gas accumulations, previously viewed as drilling hazards are now being considered as an attractive target for relatively low cost/low risk exploration to both provide fuel for infrastructure and when large enough for full scale production.
This project aims to broaden our knowledge regarding glacigenic sediments and landform distribution in order to assess potential reservoir candidates within glacial sedimentary packages. The study is focused on ice sheet derived sediments due to them having the highest preservation potential and the large spatial scale of depositional systems. This goal will be achieved by integration of fieldwork involving studies of modern (Pleistocene) analogues in Scotland, Poland and Finland together with ancient outcrops in Oman with satellite imagery of modern glaciated regions (Iceland/Greenland) and high resolution seabed bathymetry (MBES).