

Constraining the Seismic Expression of Shallow Marine Clinoforms Using Outcrop Analogues to Calibrate Interpretations of the Krossfjord and Fensfjord Formations, Norwegian North Sea

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The Middle-to-Upper Jurassic Krossfjord and Fensfjord formations are shallow marine sandstones situated on the eastern margin of the Viking Graben, Norwegian North Sea, and form a prospective reservoir interval in the area around the existing Troll, Brage and Gjøa fields. They are poorly understood as they have not been the focus of previous work. Results from core and wireline-log analysis indicate the Krossfjord and Fensfjord formations represent two prograding sandstone packages punctuated by transgressive marine shales of the Heather Formation. The facies associations identified represent wave- and tide-dominated deltaic, shoreline and shelf depositional environments.

Future work will focus on seismic interpretation. However, the limited distribution of core and well-log data restricts the detail and confidence with which seismically imaged architectures can be interpreted. It is therefore intended that these seismic interpretations will be calibrated by numerical modelling of the seismic expression of stratigraphic architectures observed in outcrop analogues. Forward seismic modelling of a range of outcrop analogues to the various shallow-marine depositional environments identified in core would allow the sensitivity of modelled seismic response to different lithology distributions and stratigraphic architectures to be evaluated. A wide range of shallow-marine sandbodies containing clinoforms are exposed in outcrops of the US Cretaceous Western Interior in Utah, Colorado and Wyoming. Field work on a range of outcrop analogues will quantify the geometry, distribution and lithological character of clinoform-bearing units in order to create a range of detailed Earth models from which forward seismic modelling can be implemented.