Oral presentation, session T4

Tracking the Triassic – early results of linking the Longyearbyen CO_2 reservoir across the northern Barents Shelf

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Abstract

The Longyearbyen CO_2 Lab has identified a late Triassic reservoir with potential to sequester carbon dioxide generated by the local power-plant. The aim of this study is to provide a detailed regional understanding of Triassic sedimentation across the northern Barents Shelf.

Study of the offshore development of the northern Barents Shelf is hampered by limited well-data and varying reflection seismic data quality. The ages of seismic sequence boundaries in the northern Barents Sea has been debated but by tying it to the geological development and previous studies we can identify and define the main seismic boundaries. The Triassic is delineated by the base Triassic (Top Permian) reflector and late Triassic/early Jurassic erosion and condensation forming a boundary to the overlying mid-Jurassic sediments. The Mesozoic sediments on the northwestern Barents Shelf form SW-NE elongated depocentres with units thinning toward the Edgeøya Platform and Storfjorden.

Early-middle Triassic sediment influx sourced from the Uralian orogeny and Fennoscandian Shield prograded westward across the Barents Shelf and deposited large sandstone successions east of Svalbard. From seismic studies it is apparent that local highs such as the Gardarbanken High acted as obstacles to influx from the Uralian sourced sediments from the southeast. Early interpretation suggests that subaerial exposure of highs in the northern Barents Sea were important controls on early Triassic deposition. Late Triassic sedimentation appears to have transgressed most Highs and the delta-front had moved toward the present exposed island of Edgeøya. The three main early Triassic progradational units offshore correlate partly to similar successions onshore, although the exposures on Svalbard represent far more silty and shaly intervals with limited sand representing deeper environments. How and where the eastern and western influence is linked is a chief objective of this study.

Correlation from the offshore regions across Storfjorden onshore Svalbard is difficult due to limited and generally poorer data quality, fold-and-thrust influence in the southern region and thin and subcropping Triassic sequences. Using well and seismic data from Adventdalen and Reindalen and the available seismic lines across Svalbard, we can provide a regional mapping of the base Triassic reflector and look at internal characteristics of the offshore Triassic successions and compare to onshore exposures, including new paleocurrent data. The study will provides a more accurate palaeogeographic understanding of the Triassic and links the extent of western and eastern source influences on Triassic sedimentation.