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Advance of Triassic prograding clinoforms in the Barents Sea from the Norwegian mainland to Kvitøya in the Svalbard Archipelago

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New 2D seismic and new stratigraphic information from shallow boreholes in Northeastern Barents Sea have increased the knowledge of the prograding Triassic deltaic systems in the Barents Sea. During the Triassic, clinoform beds were build up by sediments supplied from a number of large rivers, pouring sediments into a marine environment. The accommodation space was caused by subsidence, initiated in late Permian time.

In the area between the Finnmark Platform and Kvitøya, there are two prominent prograding overlapping clinoform systems. The oldest system starts close to the Permian/Triassic boundary at the Finnmark Platform and prograde to north of the Olga Basin in the Induanian time. In the central part of the Barents Sea, a major transgression started at the Induan-Olenekian boundary and created a new overlapping accommodation space. The transgression associated with the subsidence gave space for a second main prograding clinoform system in Olenek-Anisian-Ladinian time. At the Sentralbanken High this clinoforms are seismically well defined and continues to the northern Svalbard area in the Carnian time. Each of these main sequences, which of nature are second order sequences, can be divided into a number of third order sequences.

When the deltas and the marine clinoform beds prograded north and westwards, they buried the old salt basins in the Tiddybanken Basin, Nordkapp Basin and the Maud Basin. When the load reached a critical weight, the salt started to move, and created local accommodation space close to the salt diapirs. Despite local salt tectonics, the Lower and Middle Triassic sediment infill of the Barents Sea was an overall continuous process, interrupted by the main Olenekian transgression. The base of the Norian transgression (Slottet bed) may define the bottom of a third second order sequence, where shale in the Flatsalen Formation form a central part of this sequence. The relationship between the marin shale in the Flatsalen Formation and the sandstones in the Svenskøya and Kongsøya Formations is still unclear. Ongoing age determinations of the boundary between the Flatsalen and the Svenskøya Formations, in a

new shallow borehole close to Kvitøya, may give the answer if there exist a larger unconformity between the Norian and the Rhaetian sediments at this position.

Provenance for the Triassic infill of the Barents Sea is interpreted to be part of Russia, including the Uralian Mountains, the Scandinavian Caledonides and the basement rocks situated between Norway and Russia. In late Triassic, the large delta complex covers all the northern Barents Sea including large part of the Svalbard Archipelago, and may very well be the source for the northern supply of sediments to the Sverdrup Basin in late Triassic, and may explain the missing Crockerland in many papers. New data from the shallow stratigraphic boreholes, close to Kvitøya confirm the presence of Triassic deltaic deposits, including coal seams in this area. A more precise age determination for the deltaic sediments are in progress.

The Botneheia Formation is interpreted to be the bottom sets in the prograding delta system. The black shale is thought to be developed in an anoxic zone in front of the prograding delta. Supply of nutrients, during flooding with seasonal blooming of algae, expects to be the mechanism behind the geneses of black shale in the Botneheia Formation.

