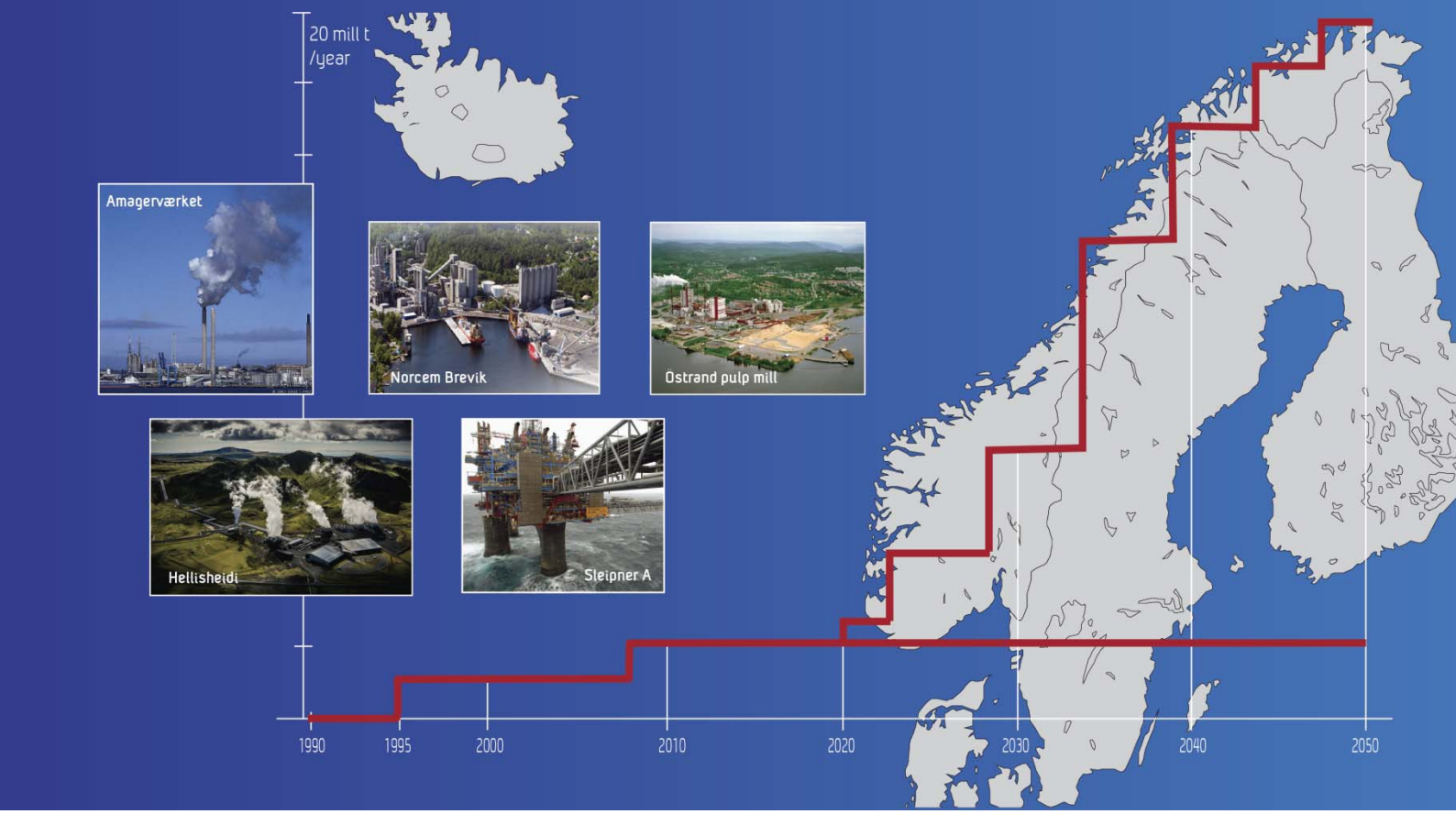

Compilation of GIS-data for all Nordic Countries

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Sandra Ó. Snæbjörnsdóttir, Yuefeng Gao

NORDICCS Technical Report D 6.1.1405 (D 22)

March 2015

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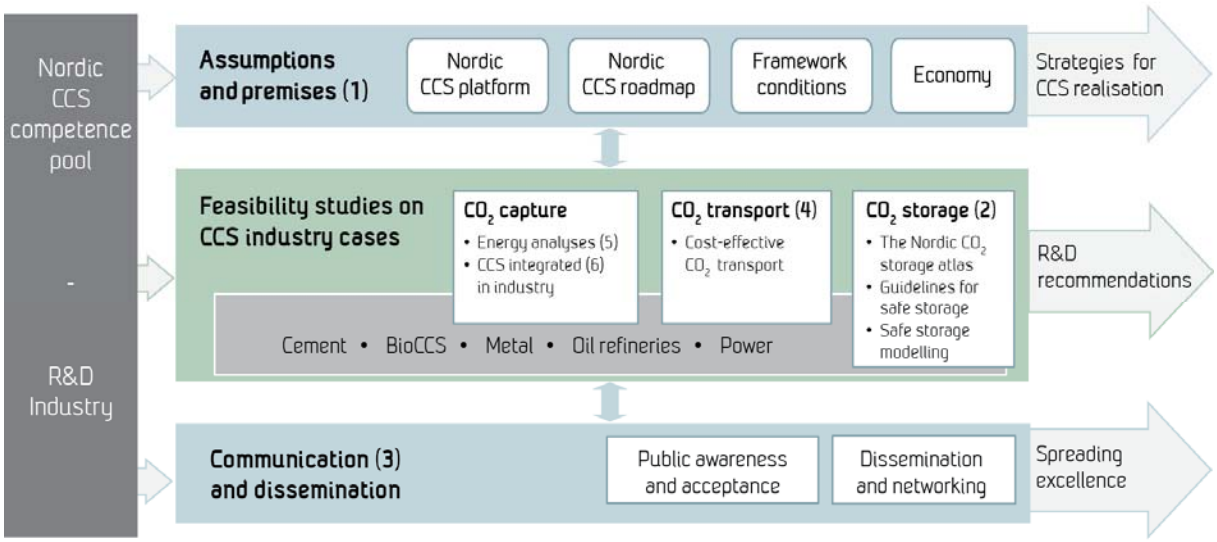
CO_2

NORDICCS concept:



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Summary

Overview of the GIS-databases which are the basis for the Nordic CO_2 webGIS storage atlas. Followed by maps of all mapped storage formations, aquifers, storage units, traps, caprocks and geology of Iceland.

Keywords GIS, formations, storage units, traps, aquifers, caprock, basalts.

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Date March 2015

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About NORDICCS

Nordic CCS Competence Centre, NORDICCS, is a networking platform for increased CCS deployment in the Nordic countries. NORDICCS has 10 research partners and six industry partners, is led by SINTEF Energy Research, and is supported by Nordic Innovation through the Top-level Research Initiative.

For more information regarding NORDICCS and available reports, please visit http://www.sintef.no/NORDICCS.

Project 11029

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1. Introduction

The GIS-data generated from Iceland, Sweden, Norway and Denmark during 2014 has been complied and integrated into 8 geodatabase (the basis for the webGIS), figure 1. One geodatabase for Denmark, one for Sweden, one for Iceland and one database containing data covering all countries as e.g. background map, borderlines and sedimentary basins. Because of the large amount of Norwegian GIS-data they are divided into 4 databases; one for the Norwegian North Sea, one for the Norwegian Sea, one for the Barents Sea and one with all caprock formations. All GIS-data has been structured in a MXD-file (ESRI ArcGIS). The following sections will show maps of all mapped Nordic storage formation, aquifers, storage units, traps and caprocks. The mapped formations are coloured to match their lithostratigraphic age, see figure 2.

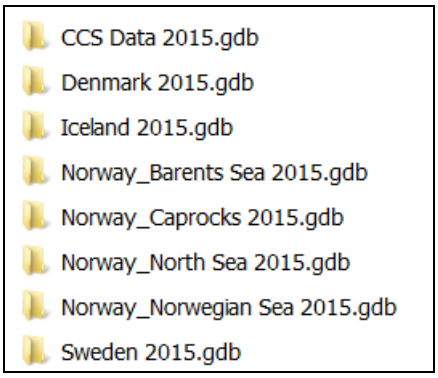

Figure 1. The 8 GIS-databases.

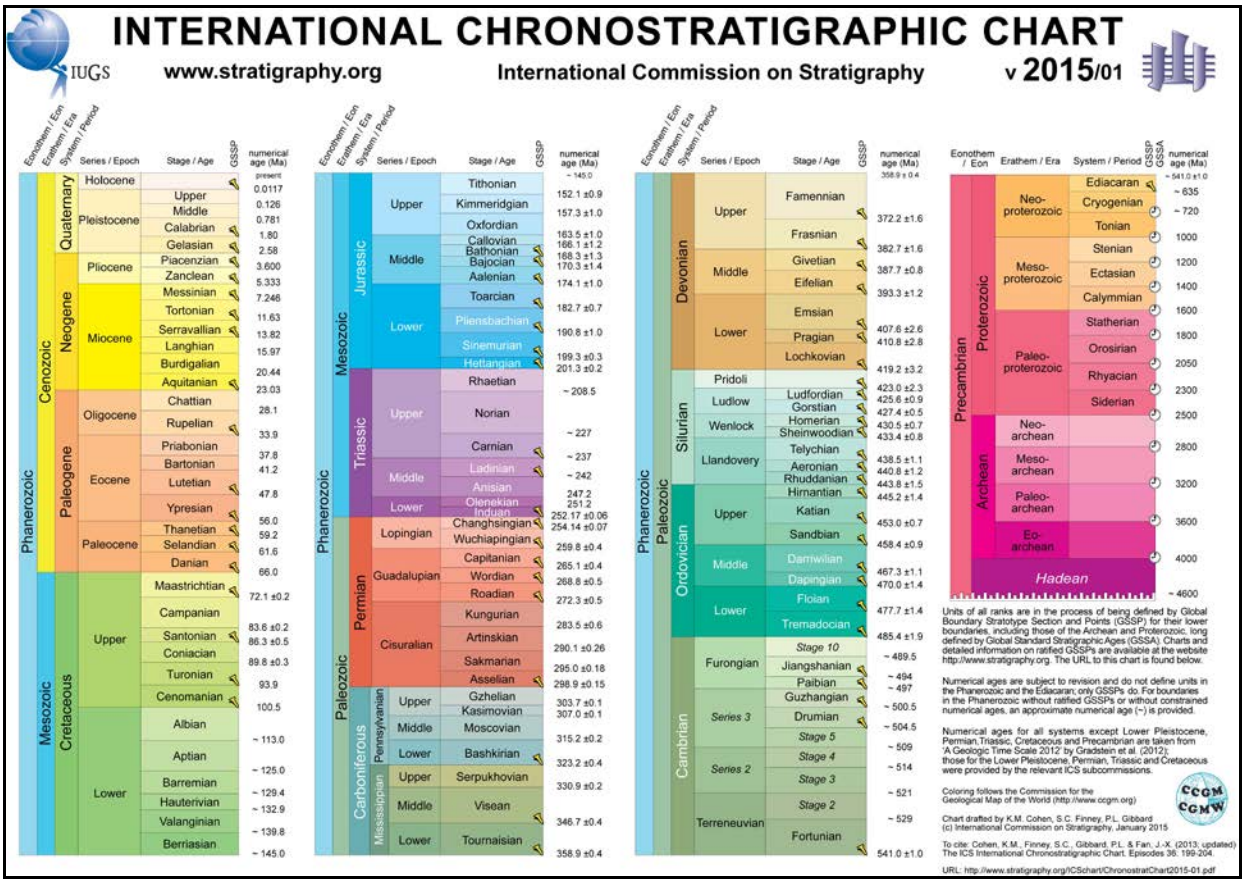

Figure 2. International geological time scale.

2.The Baltic Sea

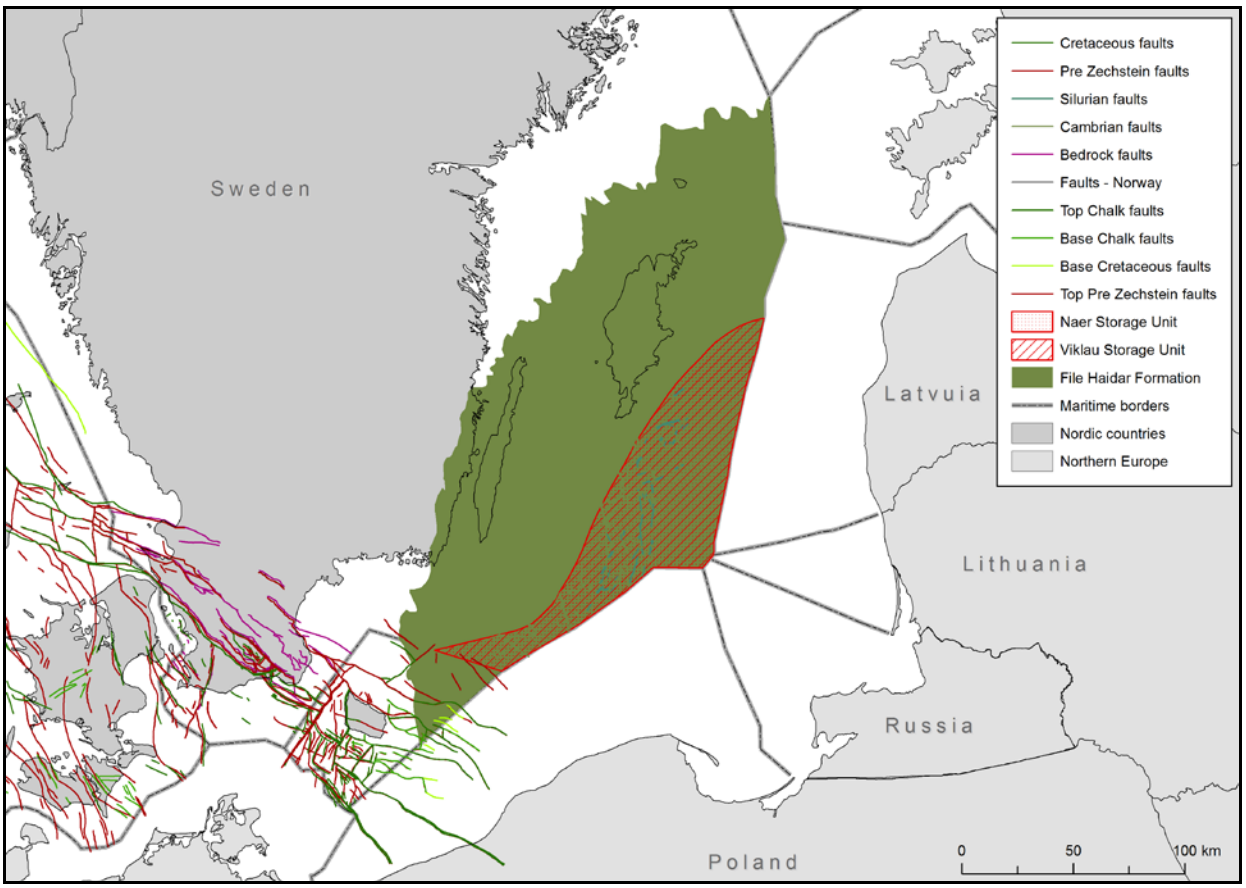

Fig. 3. The Cambrian File Haidar Formation.

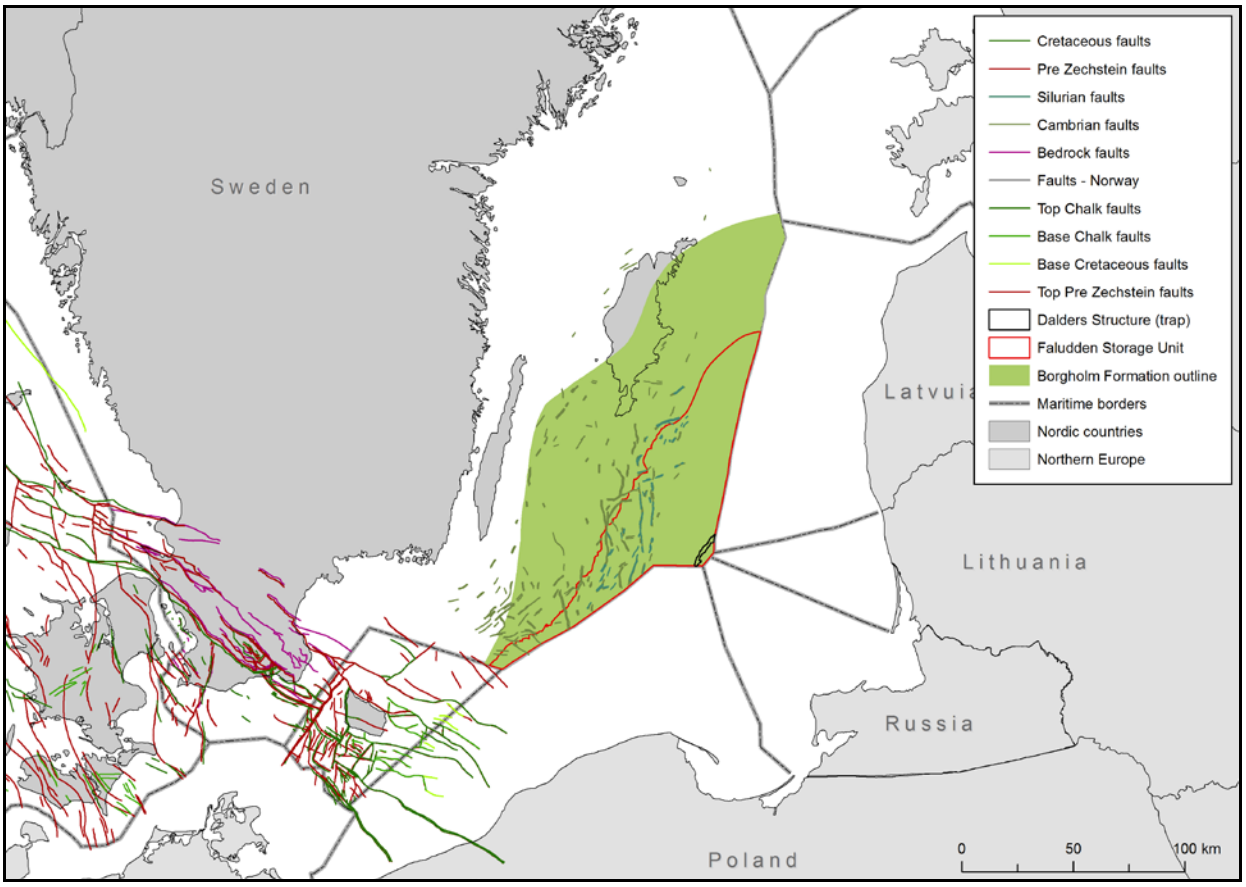

Figure 4. The Cambrian Borgholm Formation.

3.The South-western Sweden

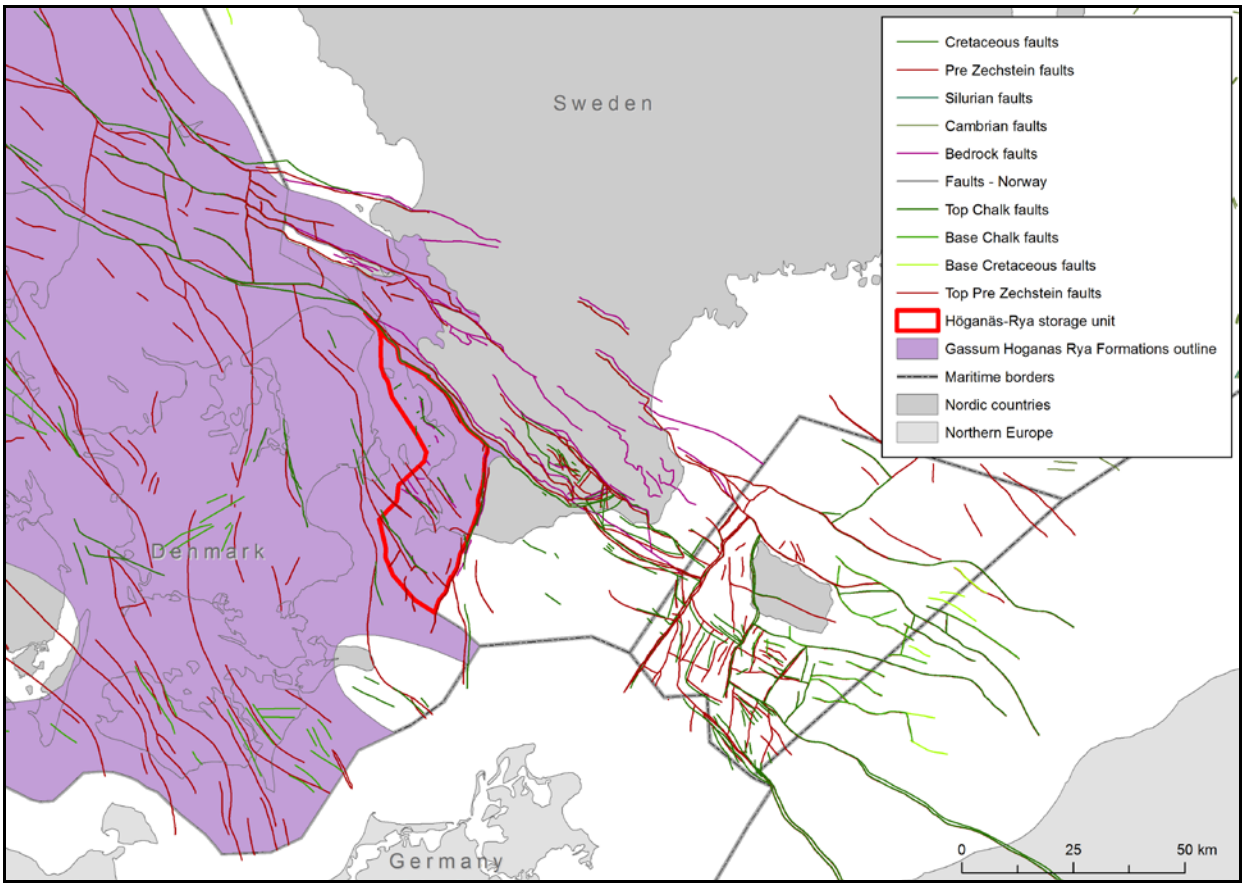

Figure 5. The Late Triassic Höganäs-Rya Formation (Gassum Formation in Denmark and Norway).

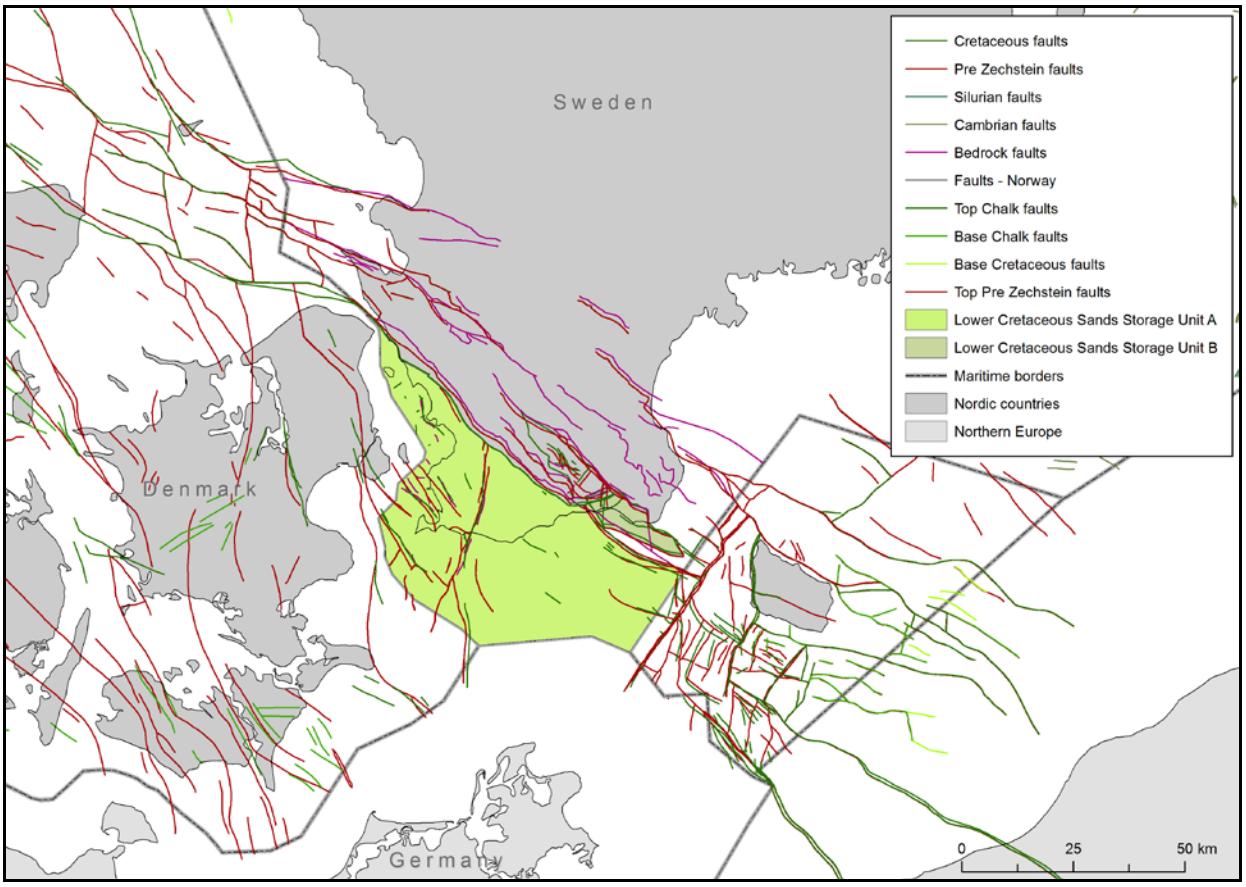

Figure 6. The Lower Cretaceous Sand storage units A and B.

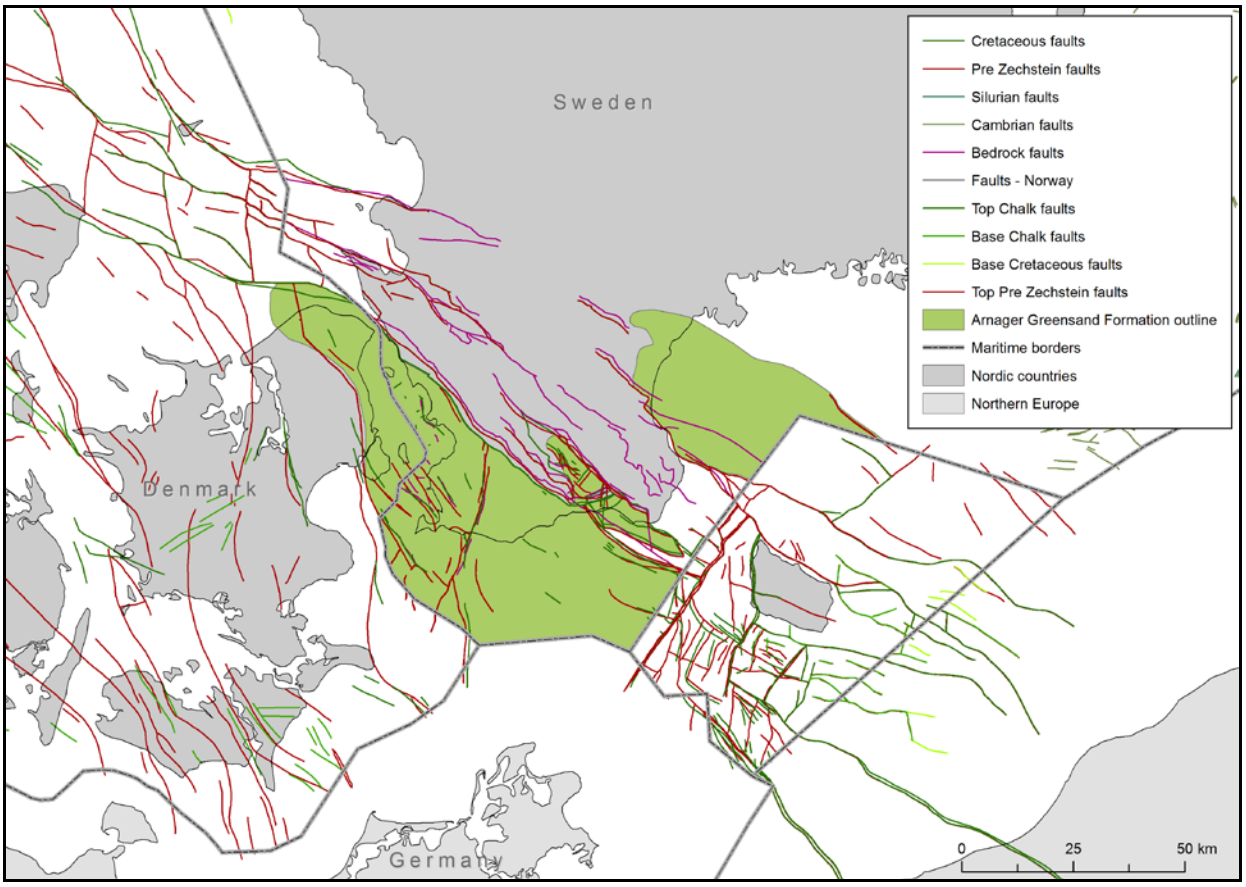

Figure 7. The Late Cretaceous Arnager Greensand Formation.

4.Denmark and the southern part of the Norwegian North Sea

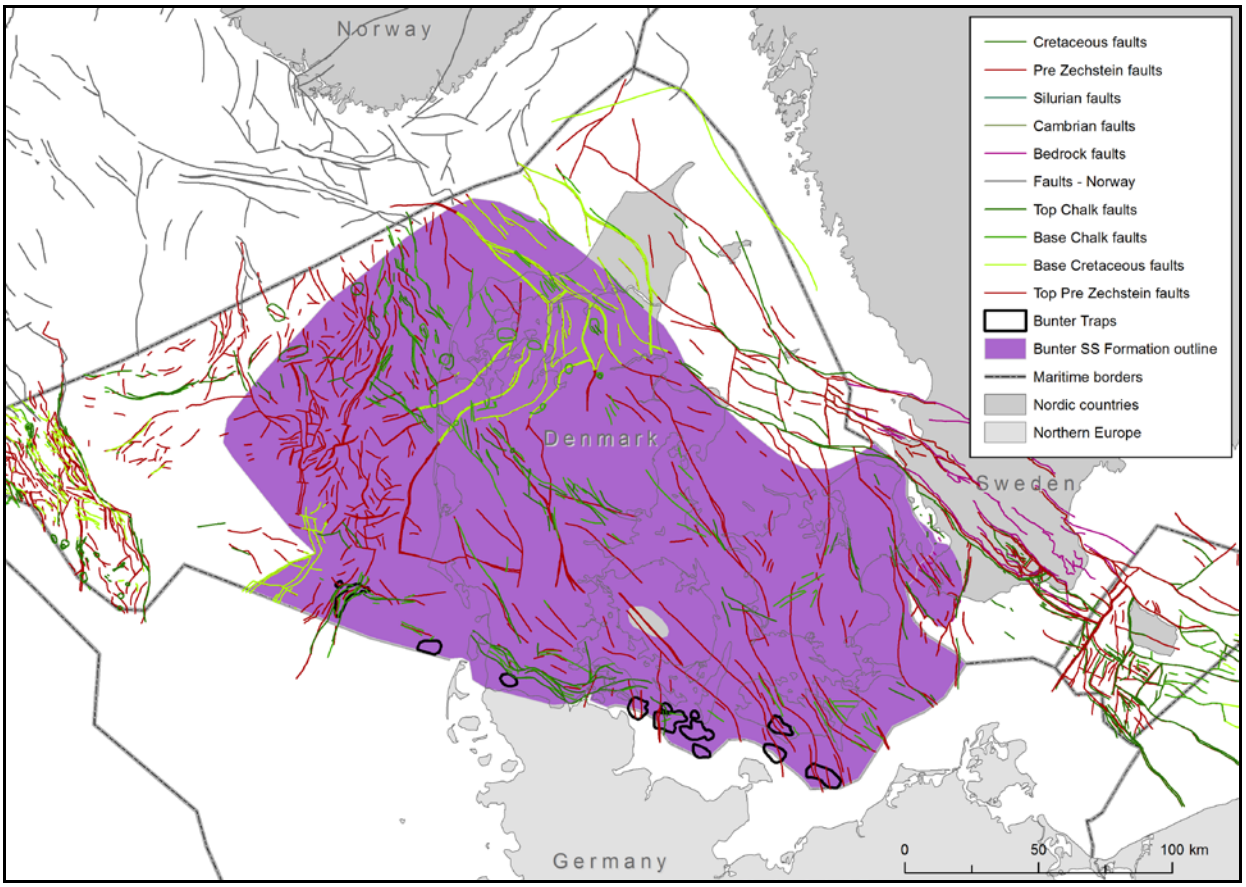

Figure 8. The Early Triassic Bunter Sandstone Formation.

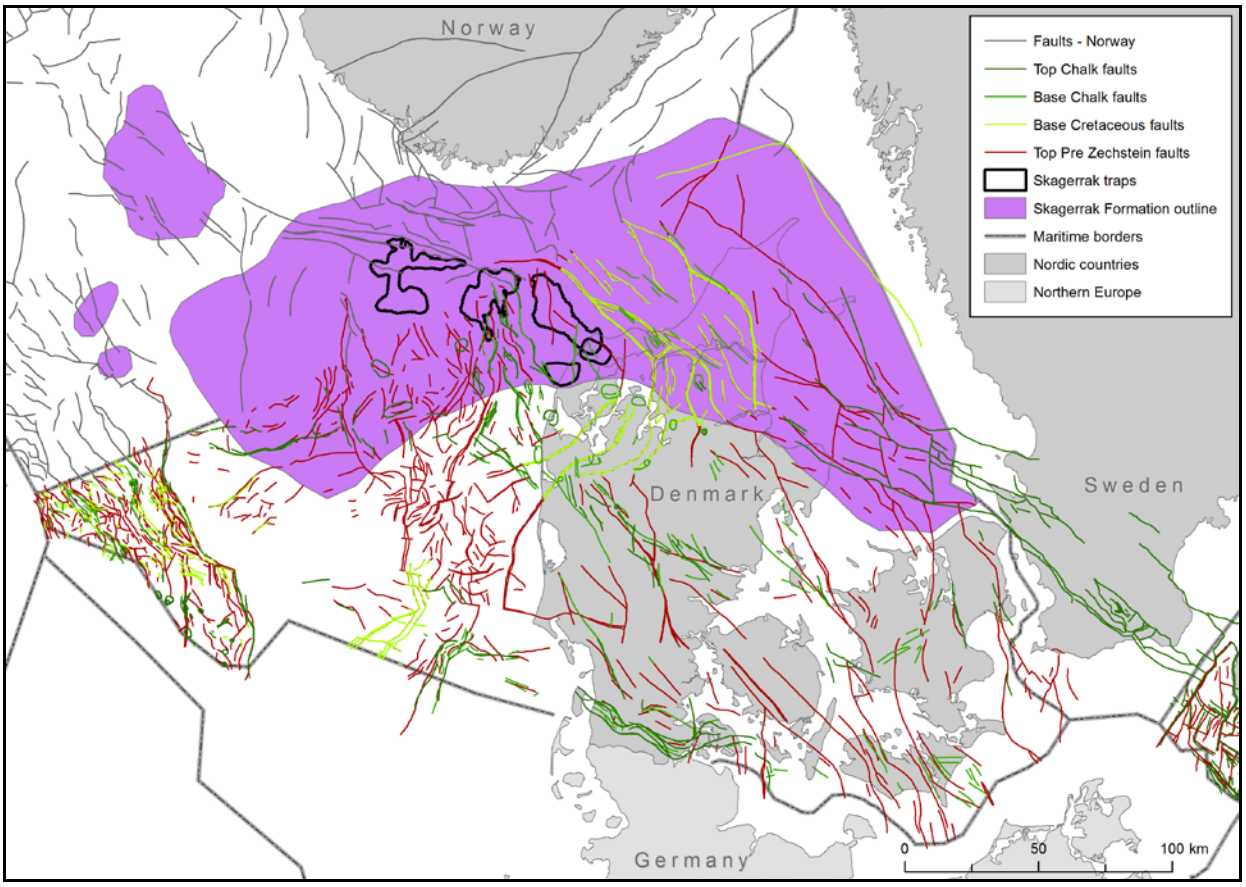

Figure 9. The Triassic Skagerrak Formation.

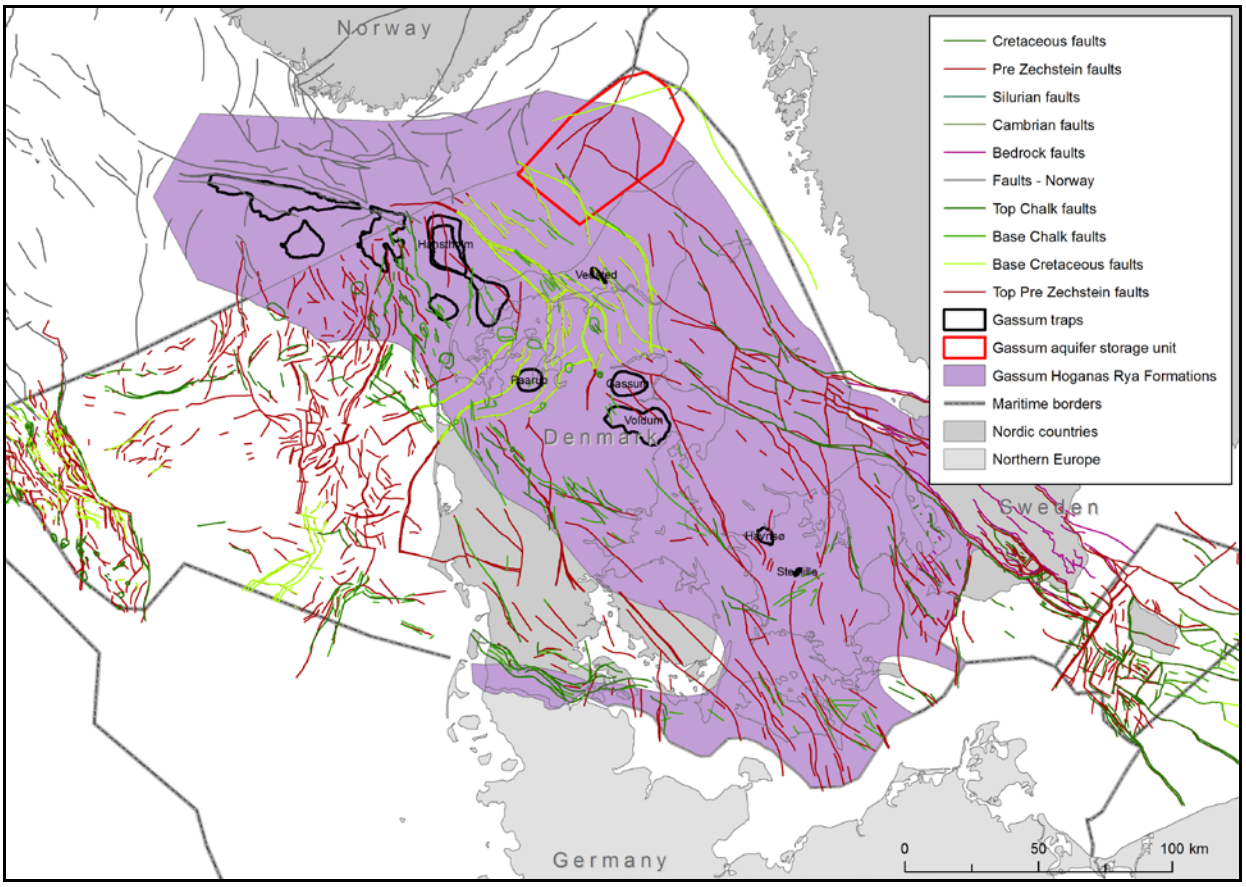

Figure 10. The late Triassic – Early Jurassic Gassum Formation (Denmark and Norway), Höganäs-Rya Formation (Sweden).

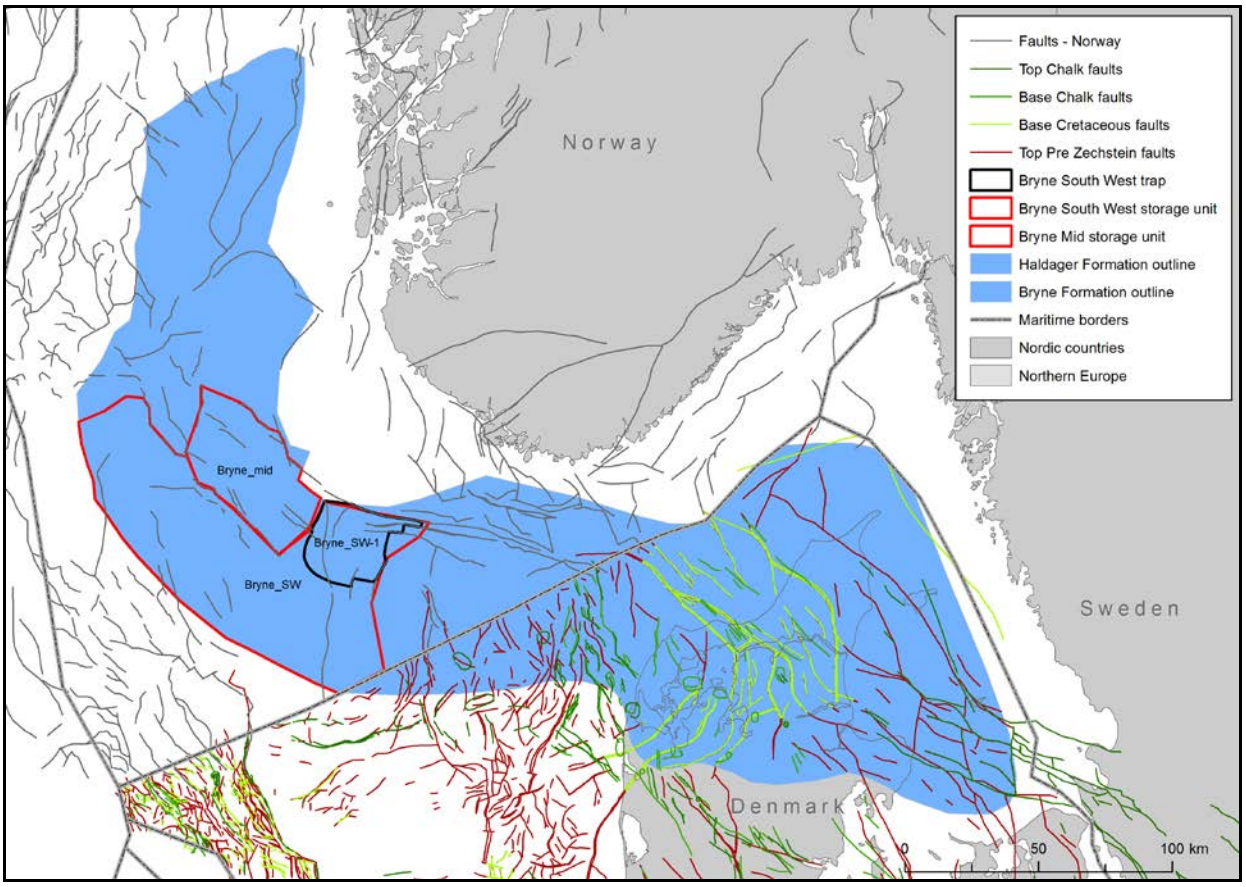

Figure 11. The Jurassic Haldager Formation (Denmark) and Bryne Formation (Norway).

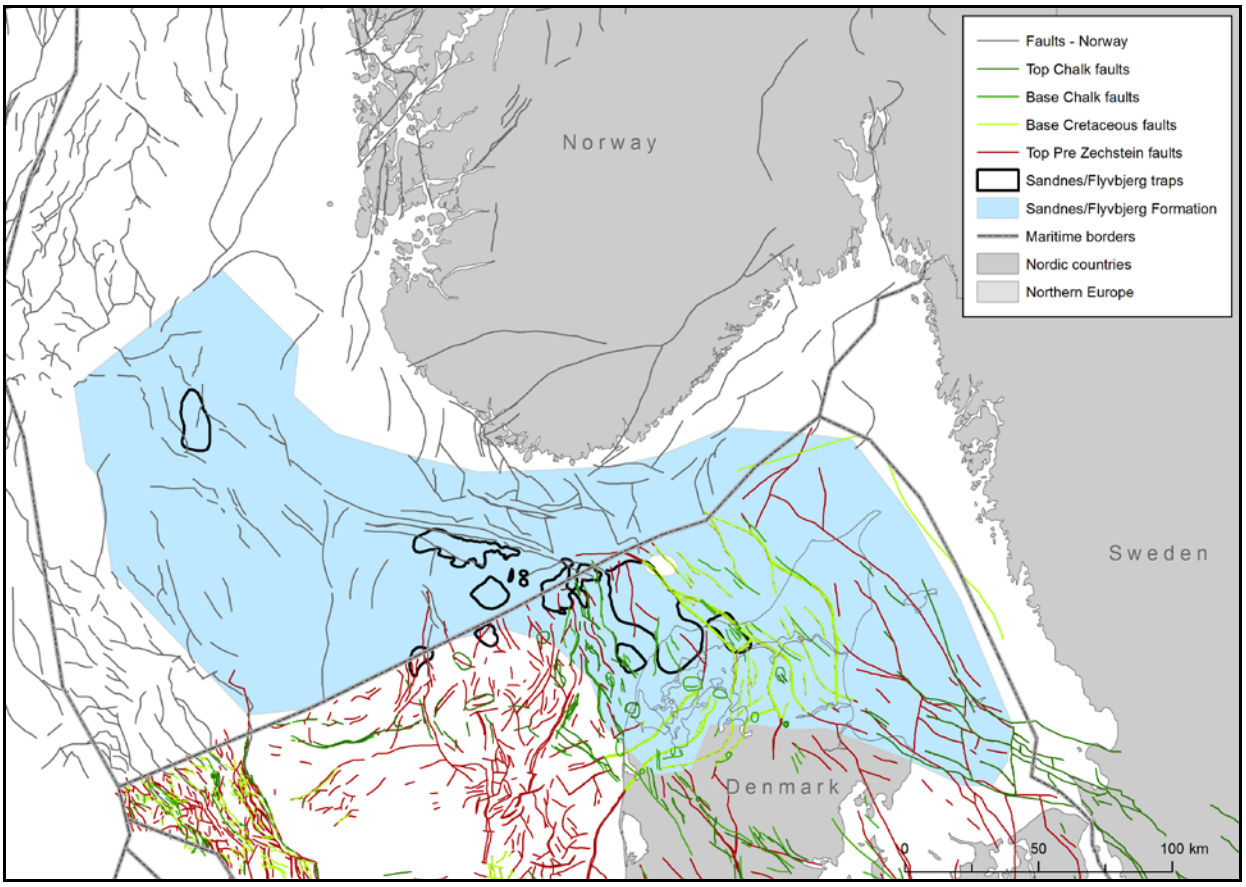

Figure 12. The Jurassic Sandnes Formation (Norway), Flyvbjerg Formation (Denmark).

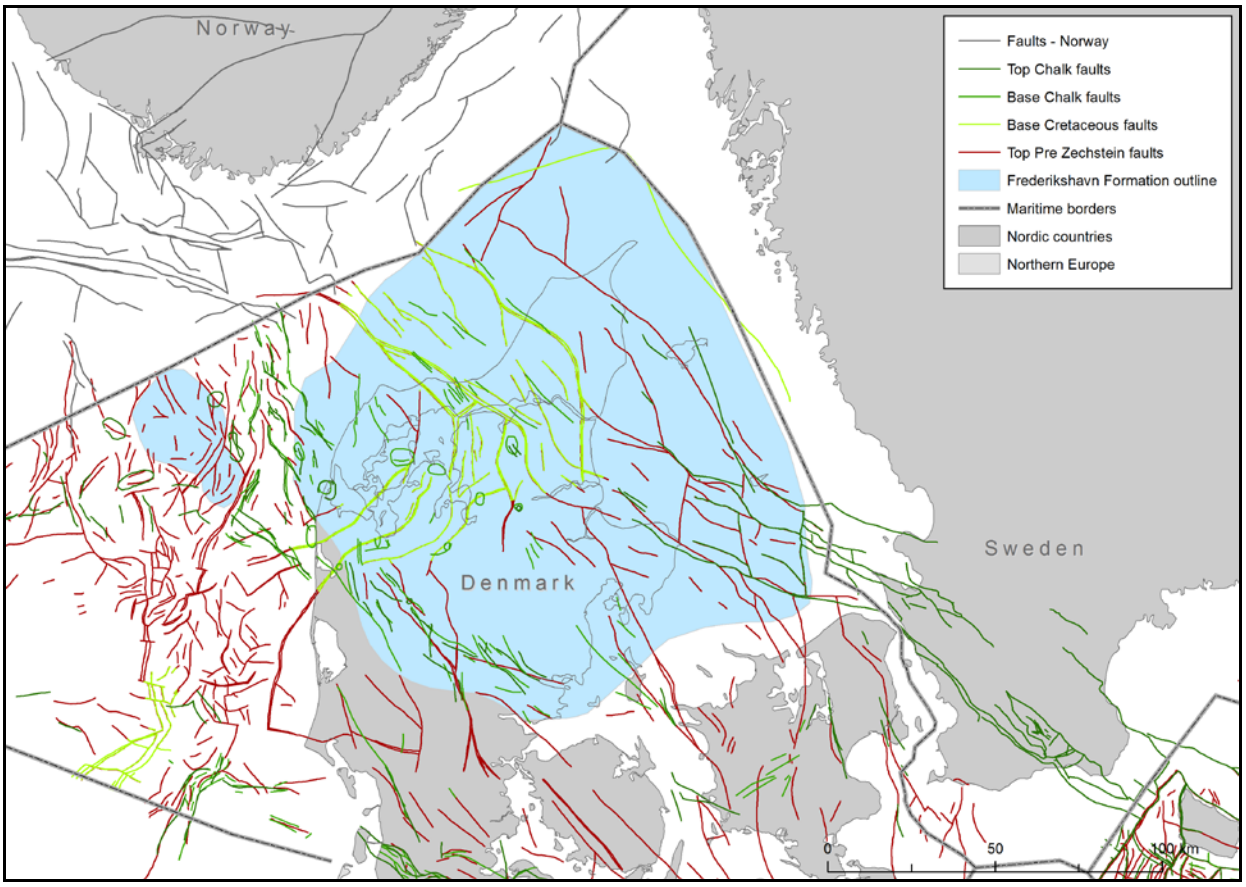

Figure 13. The Late Jurassic Frederikshavn Formation.

5.Norwegian North Sea

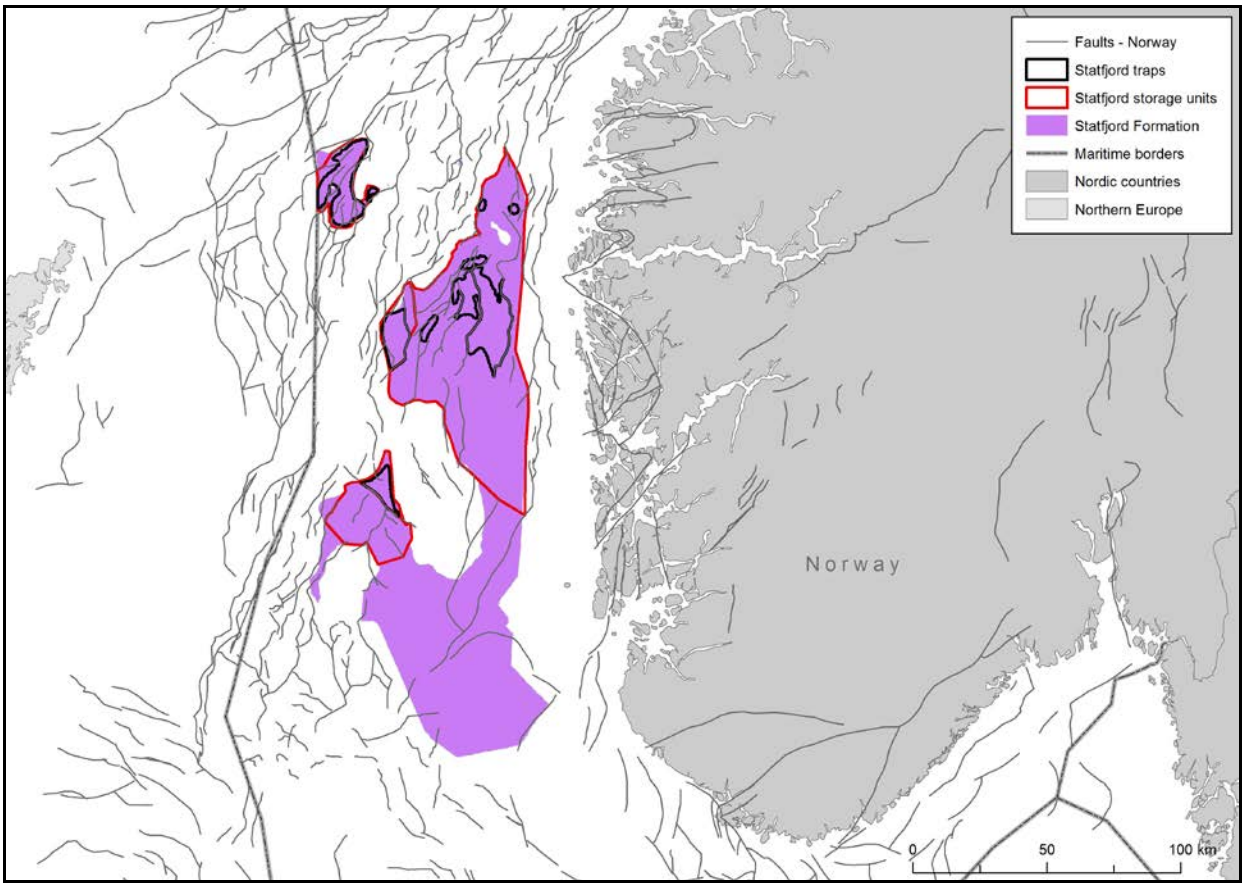

Figure 14. The Early Jurassic Statfjord Formation.

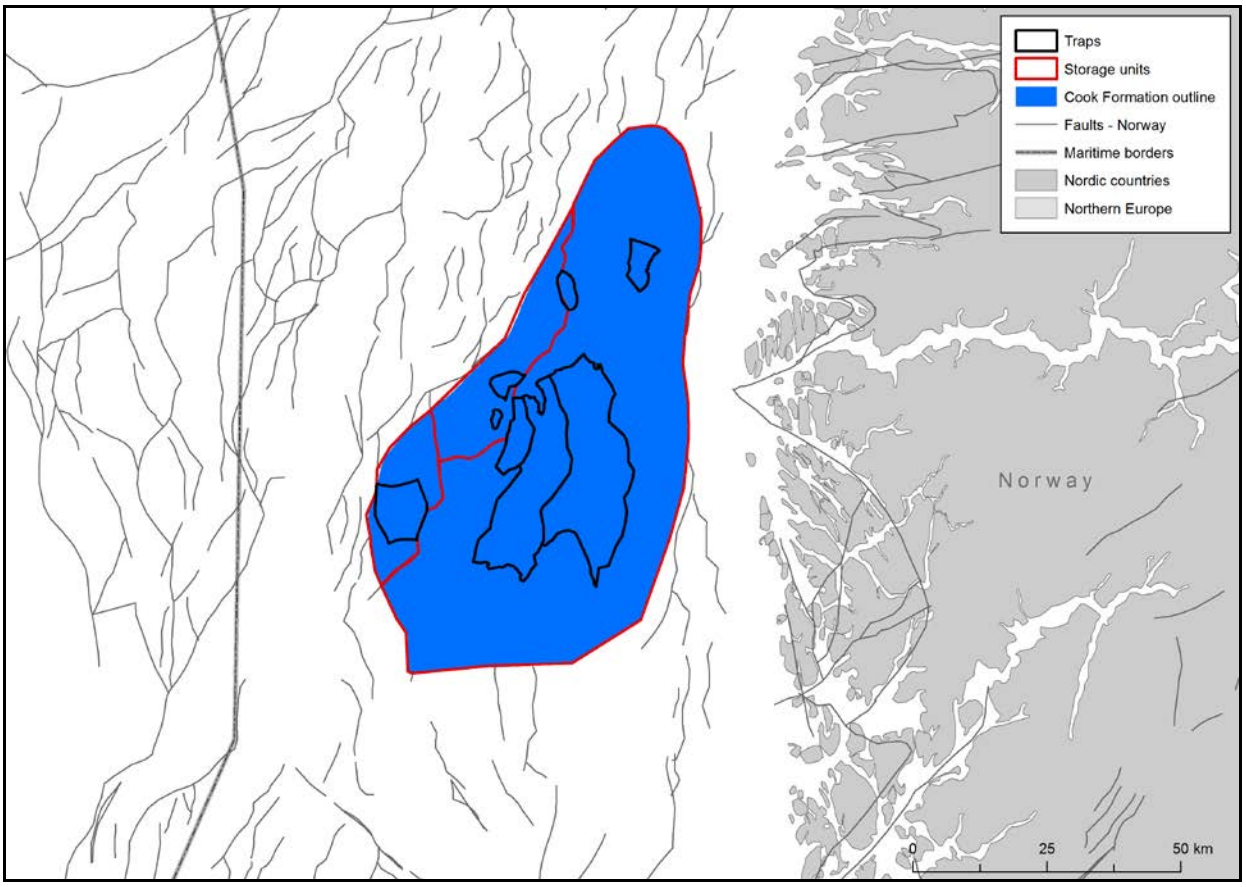

Figure 15. The Early Jurassic Cook Formation.

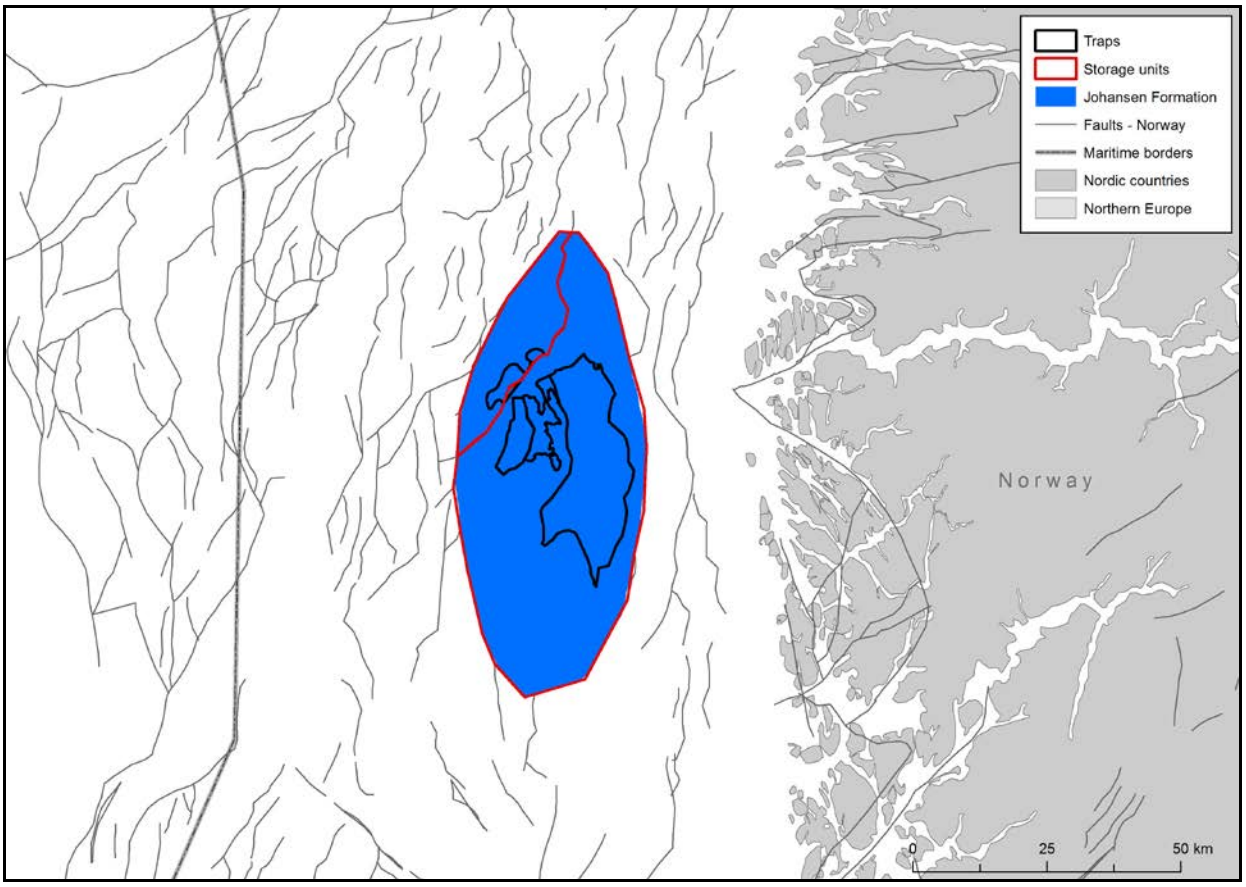

Figure 16. The Early Jurassic Johansen Formation.

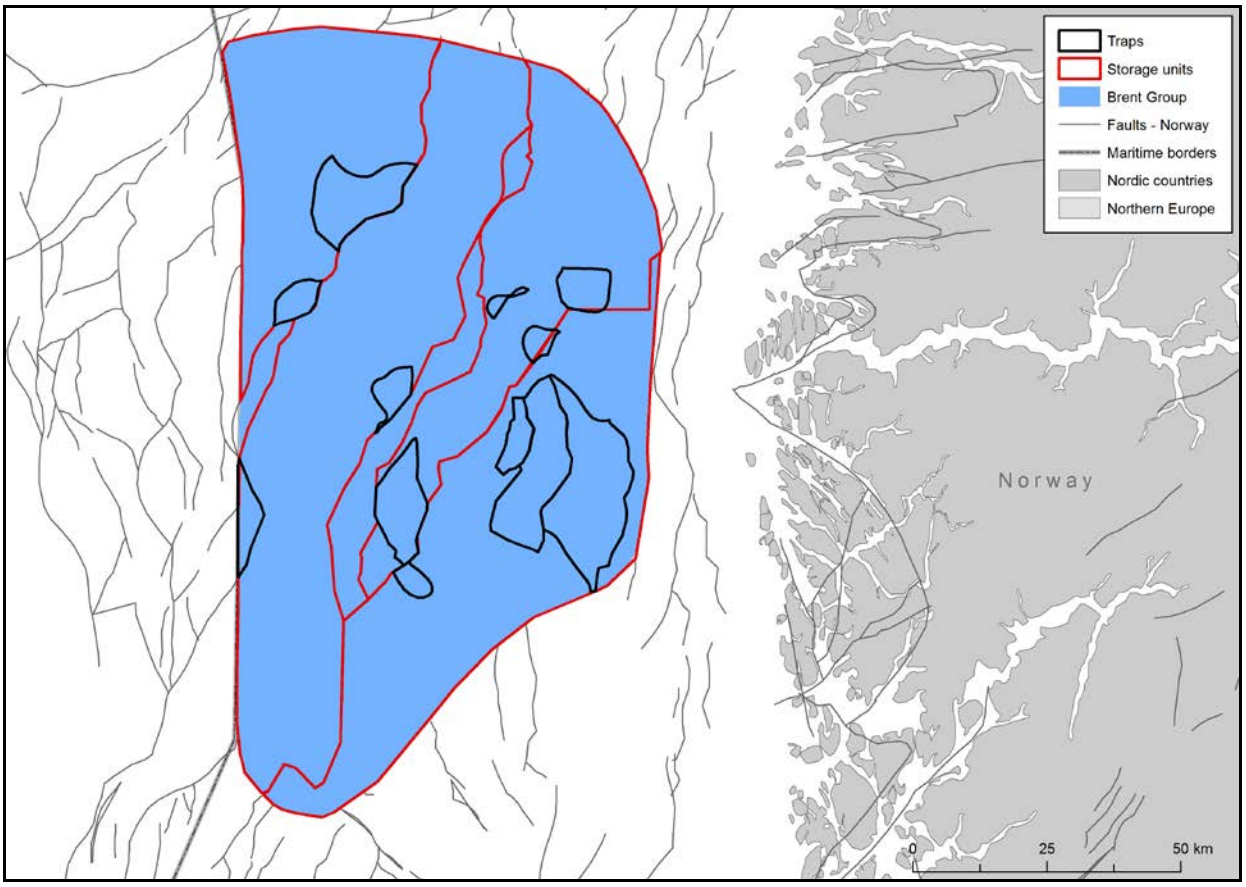

Figure 17. The Middle Jurassic Brent Group.

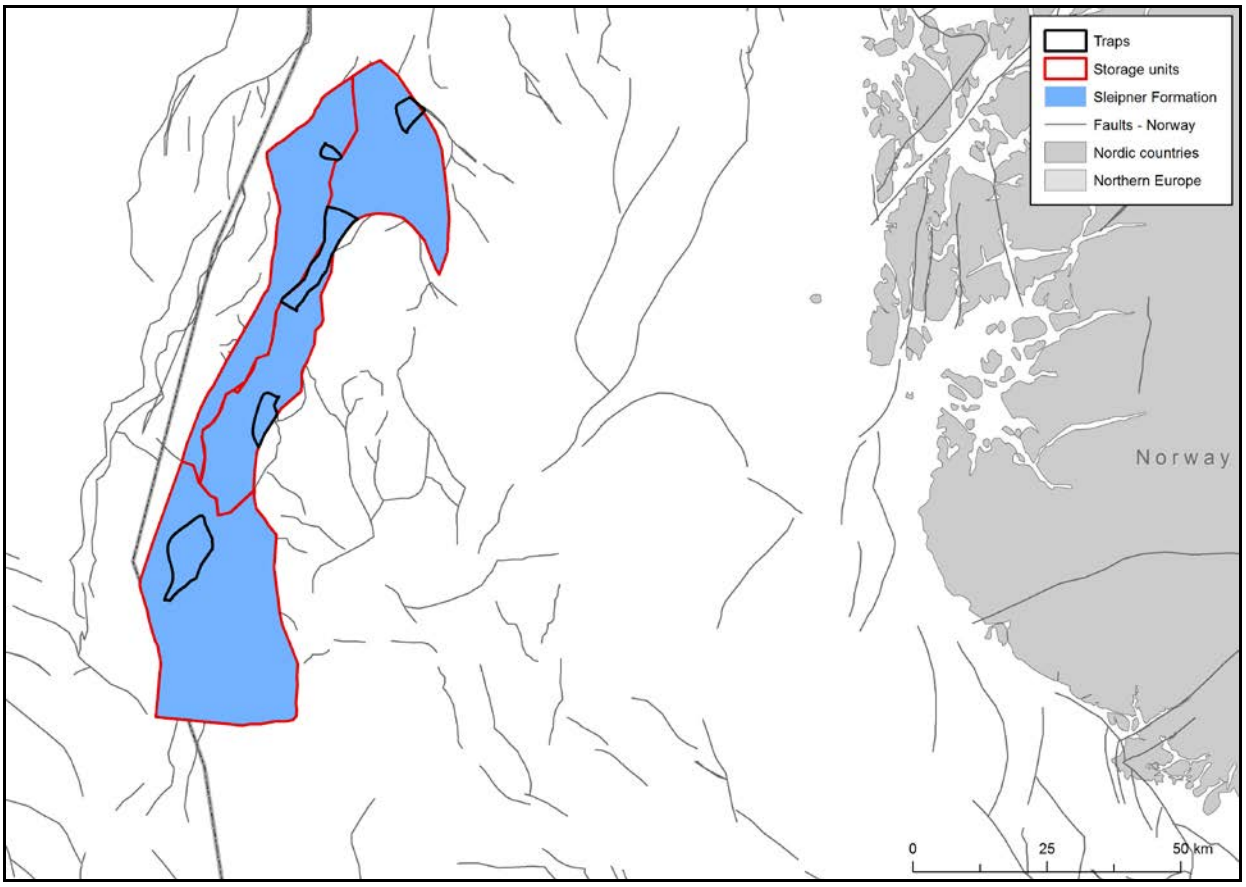

Figure 18. The Middle Jurassic Sleipner Formation.

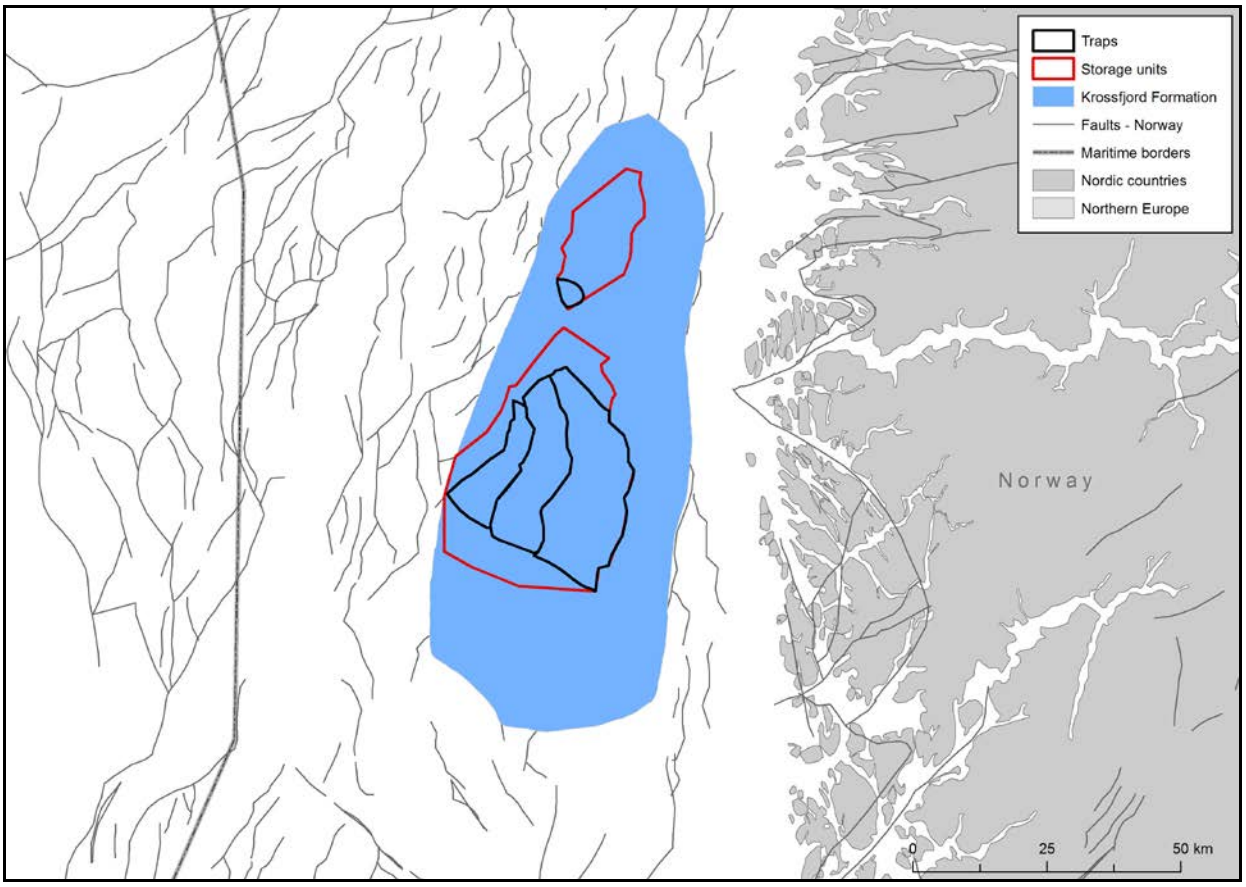

Figure 19. The Middle Jurassic Krossfjord Formation.

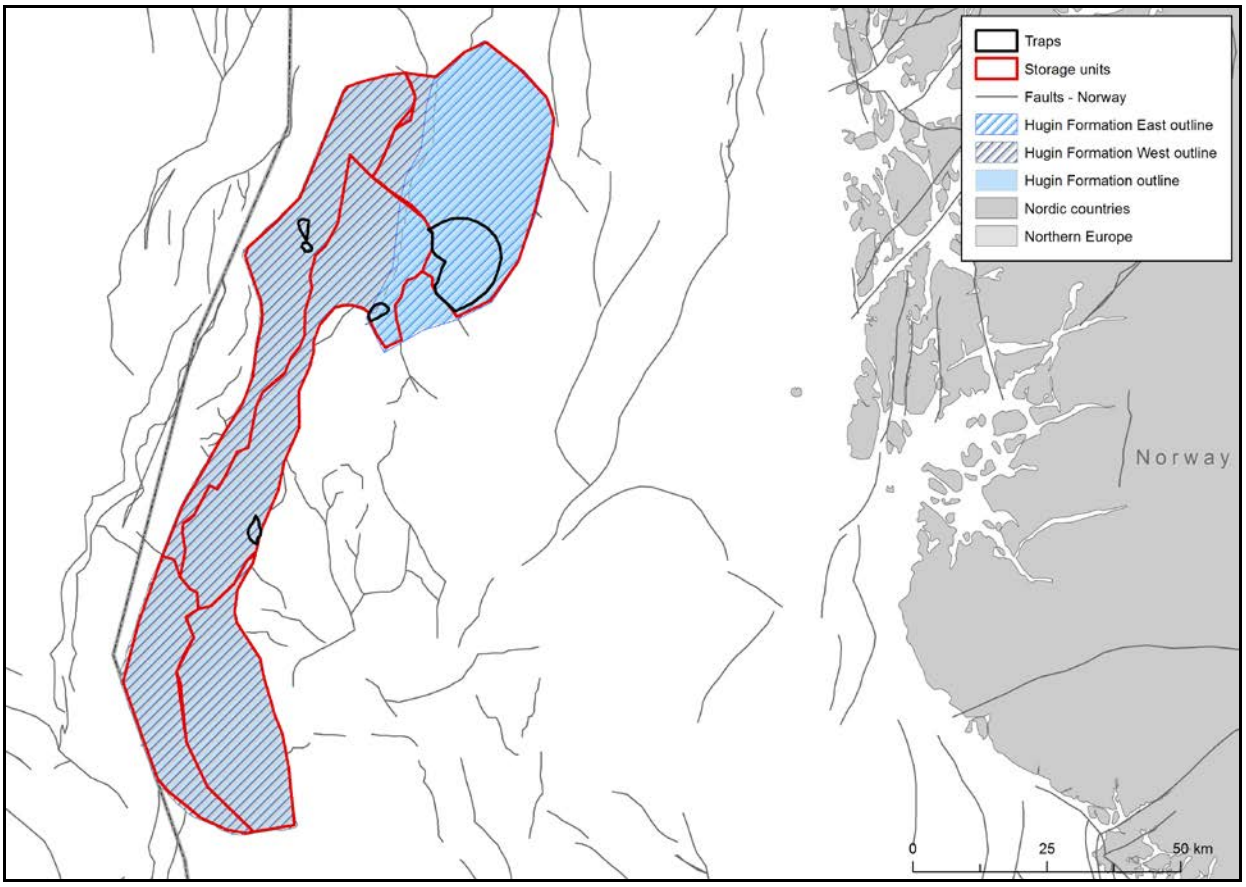

Figure 20. The Middle Jurassic Hugin Formation.

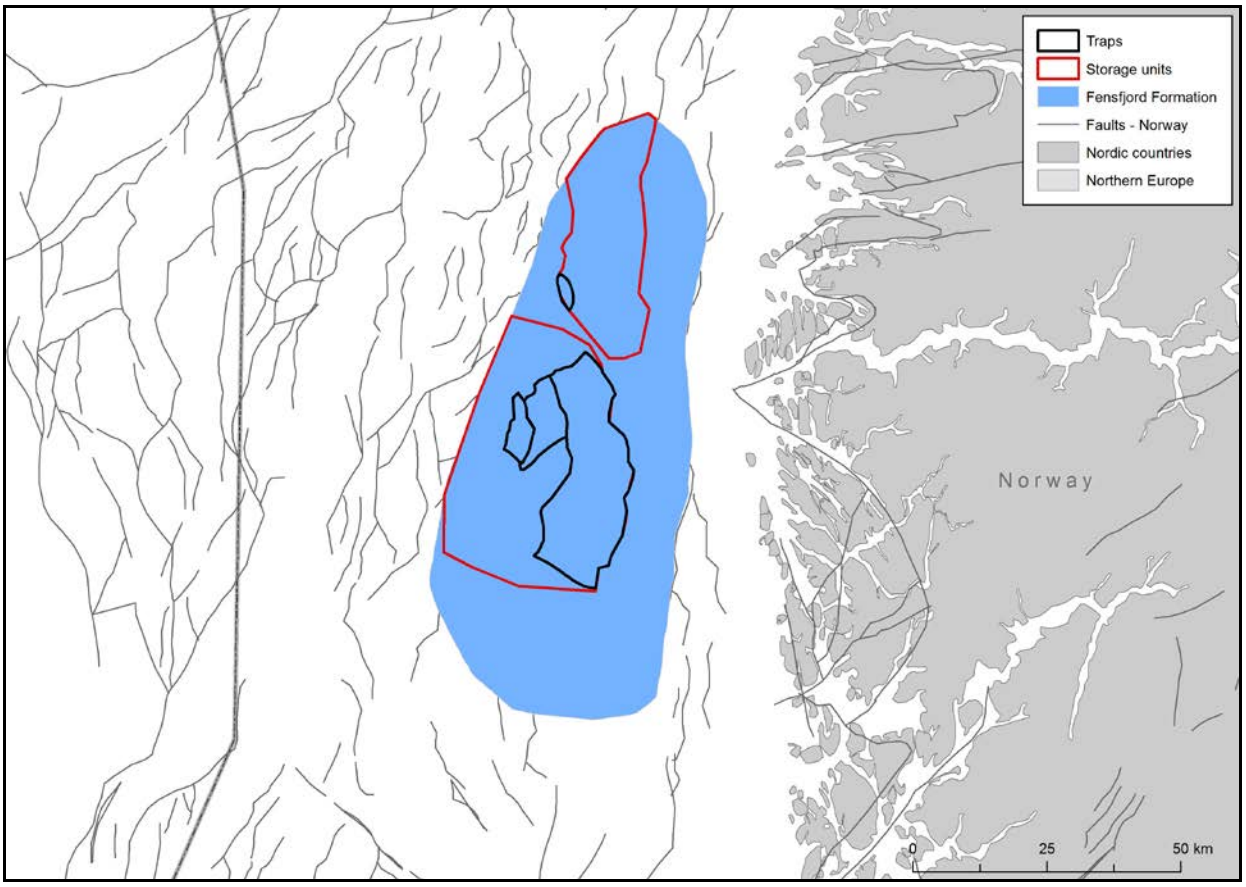

Figure 21. The Middle Jurassic Fensfjord Formation.

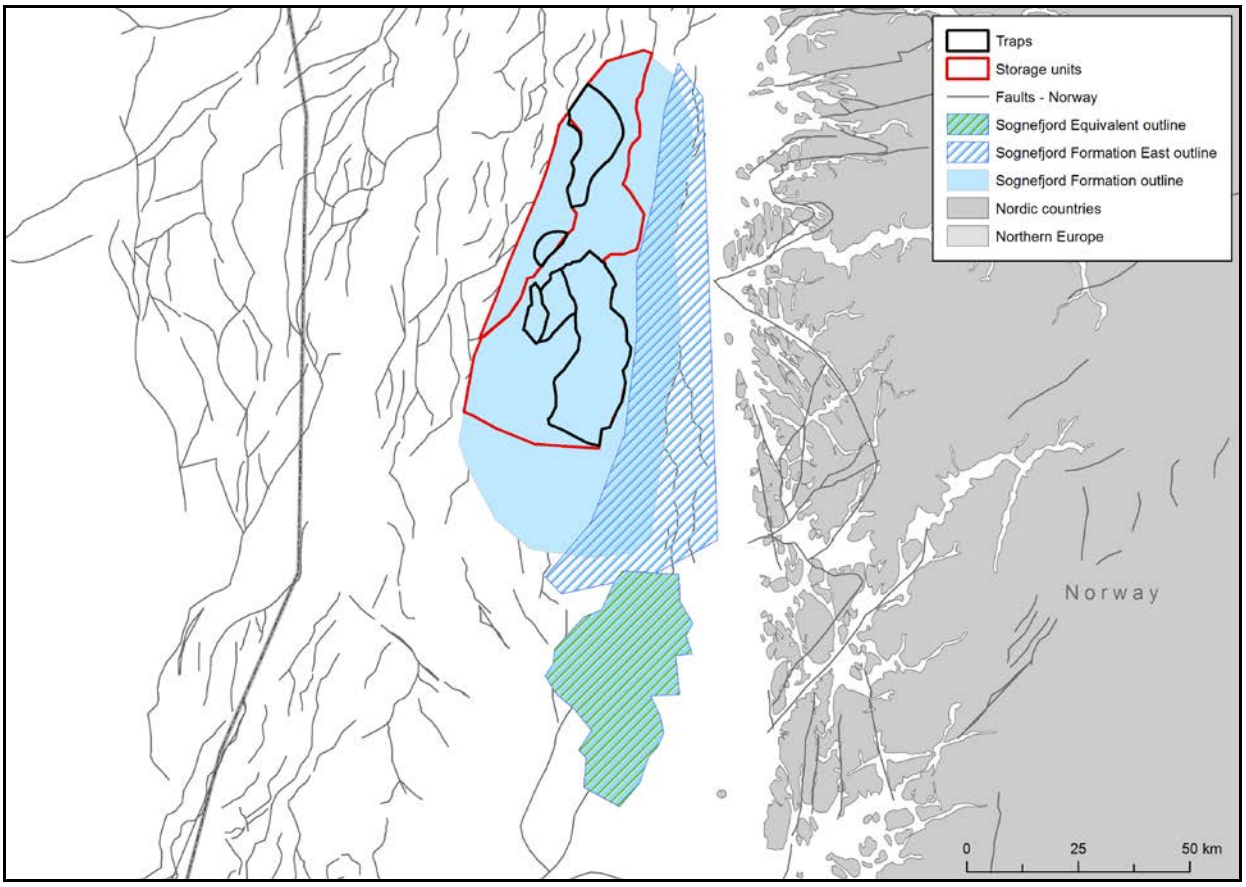

Figure 22. The Late Jurassic Sognefjord Formation.

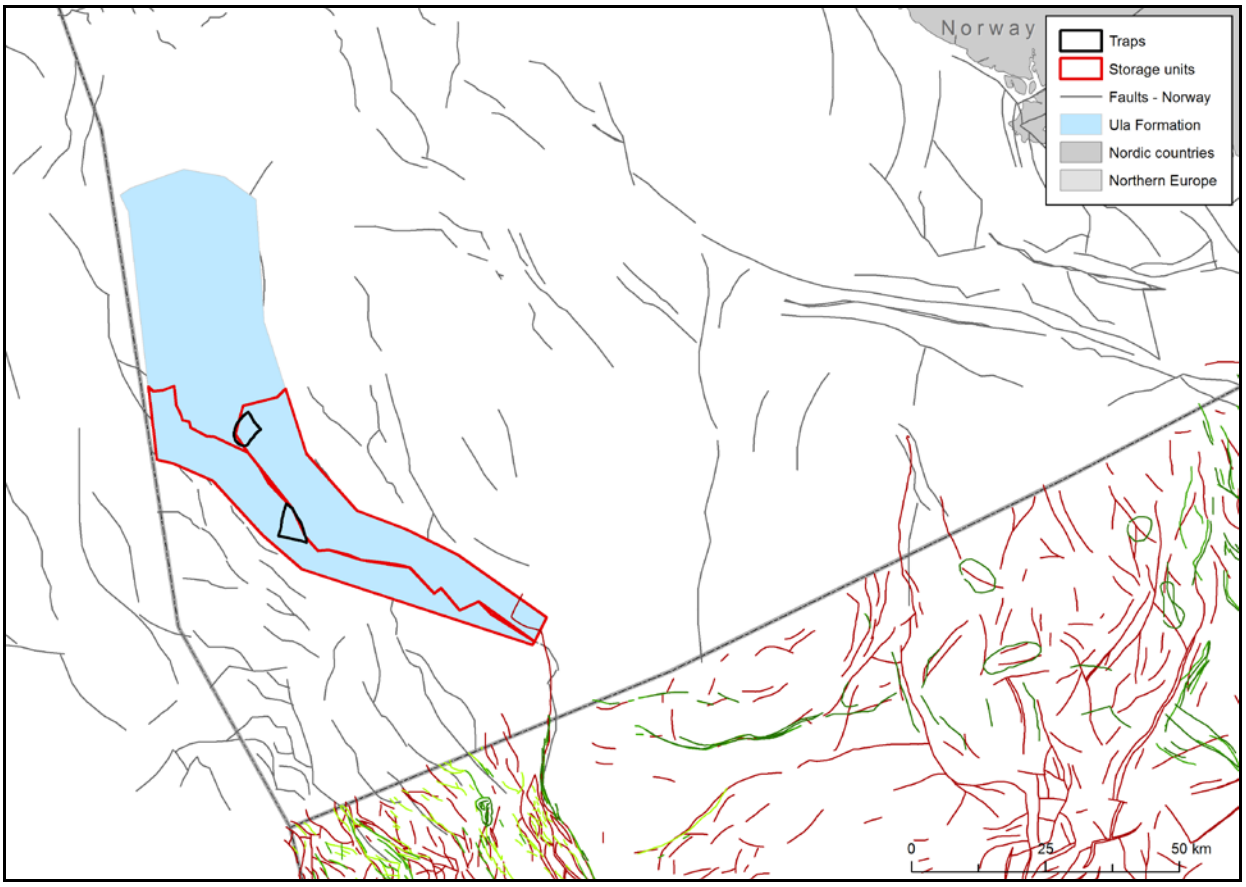

Figure 23. The Late Jurassic Ula Formation.

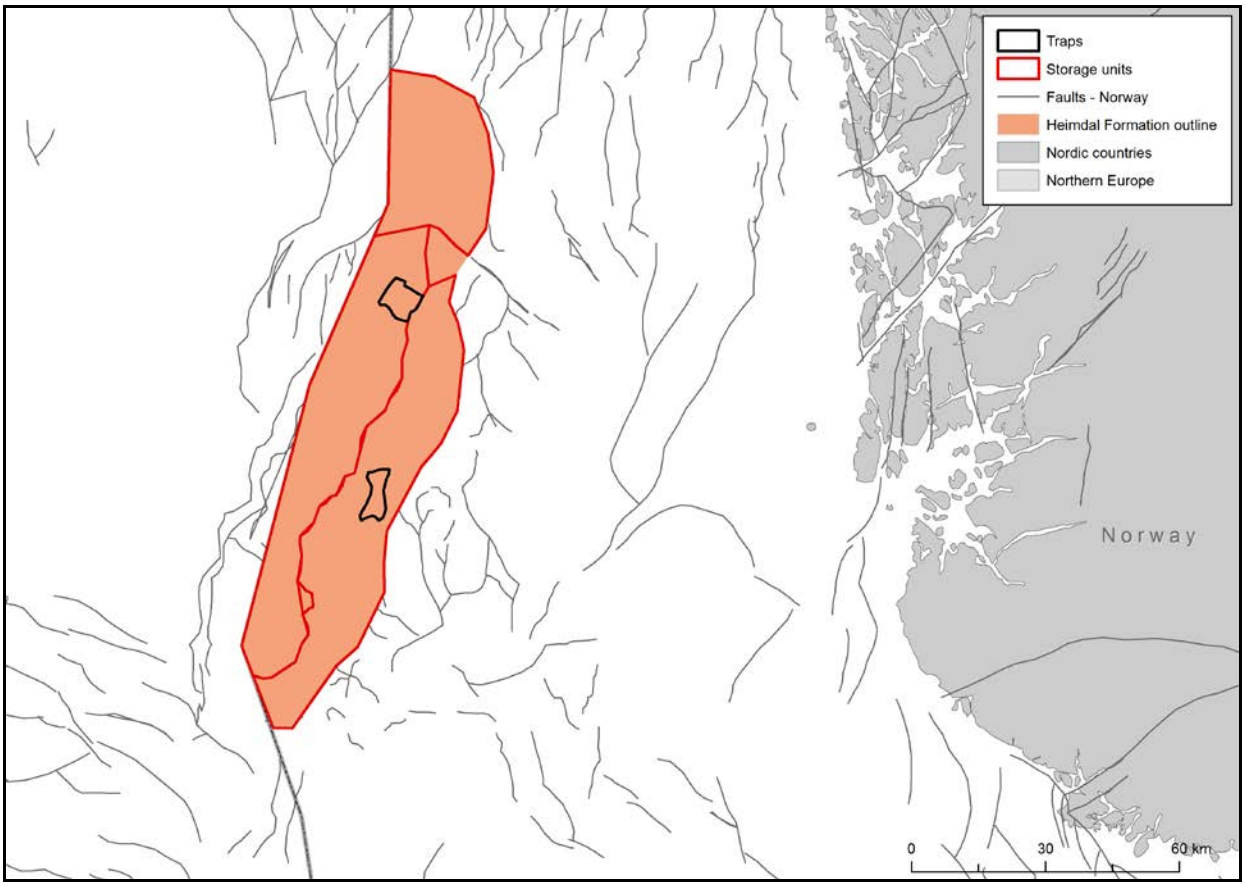

Figure 24. The Paleocene Heimdal Formation.

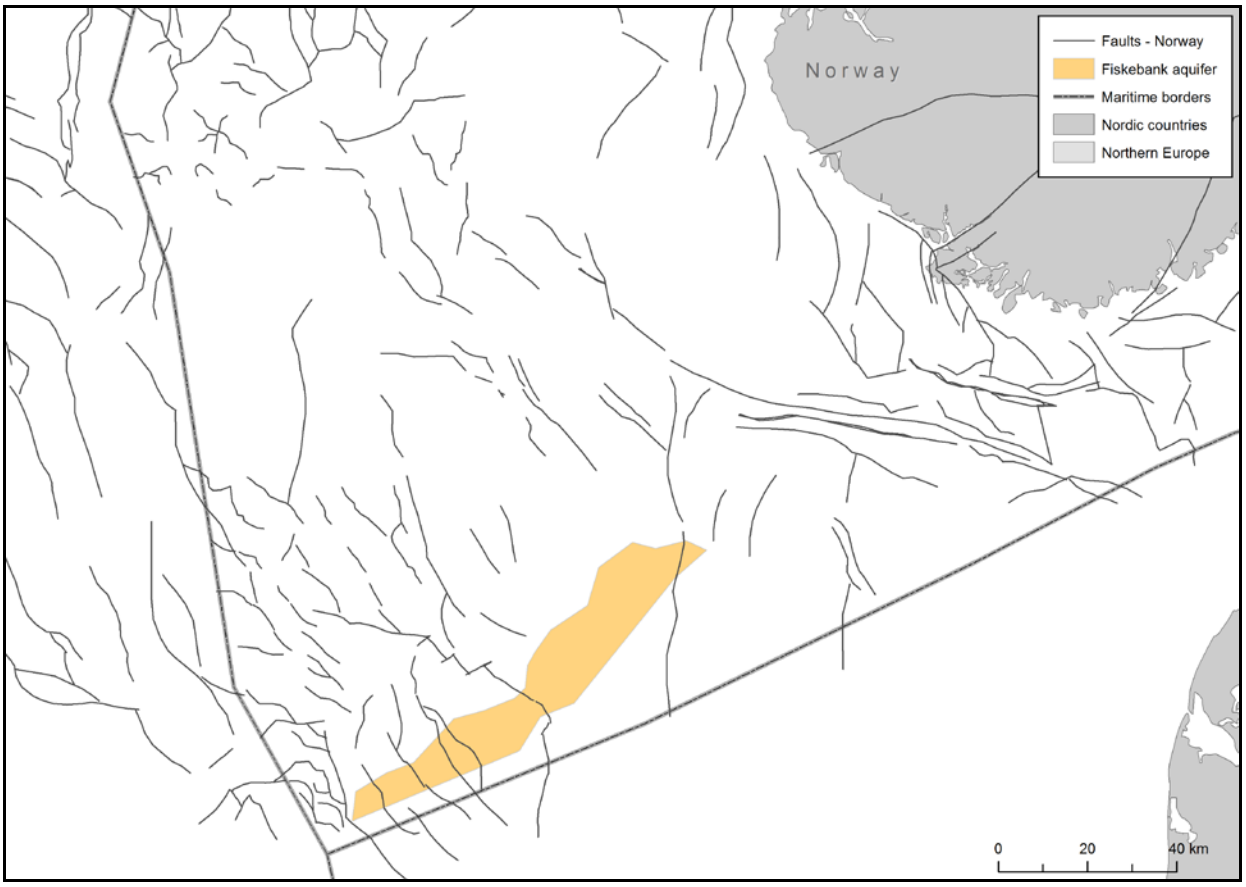

Figure 25. The Paleocene Fiskerbank aquifer.

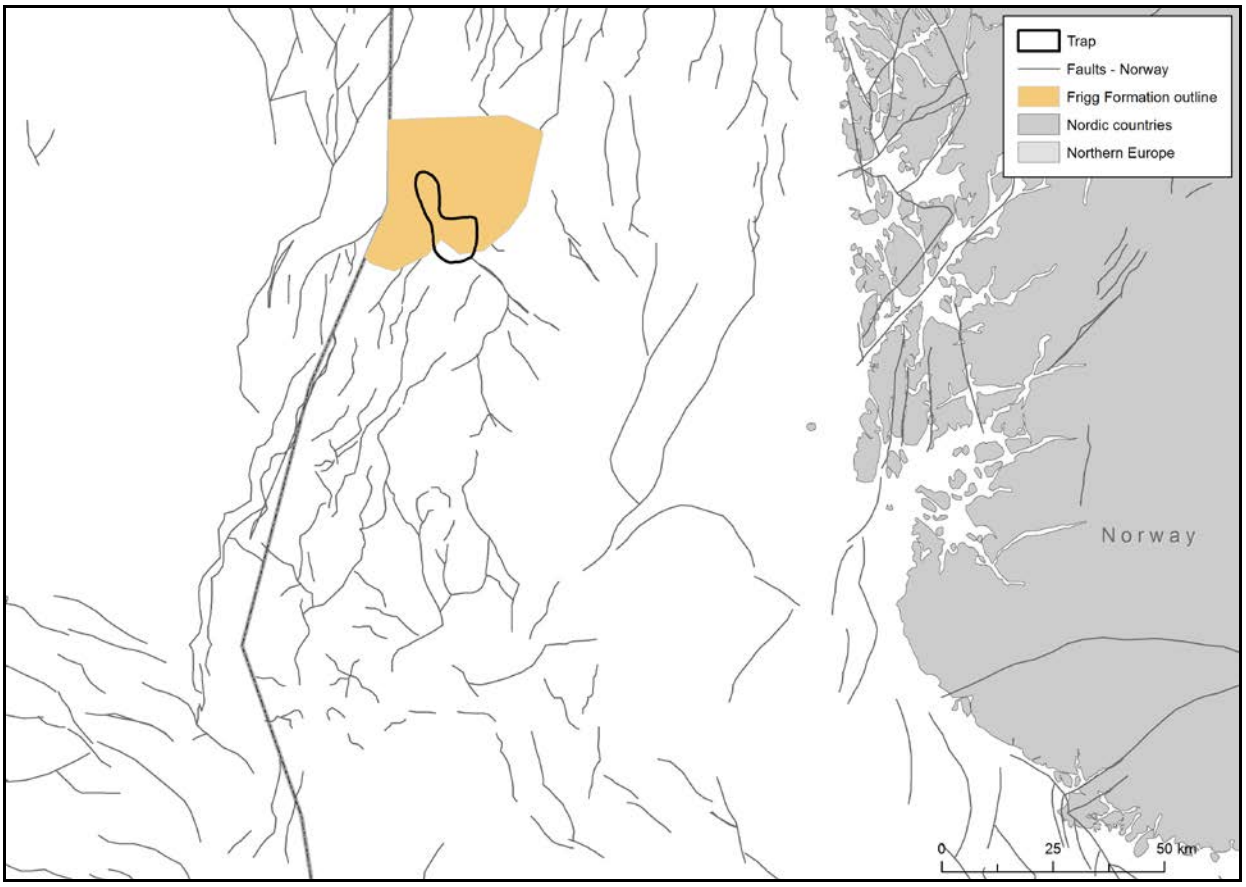

Figure 26. The Eocene Frigg Formation.

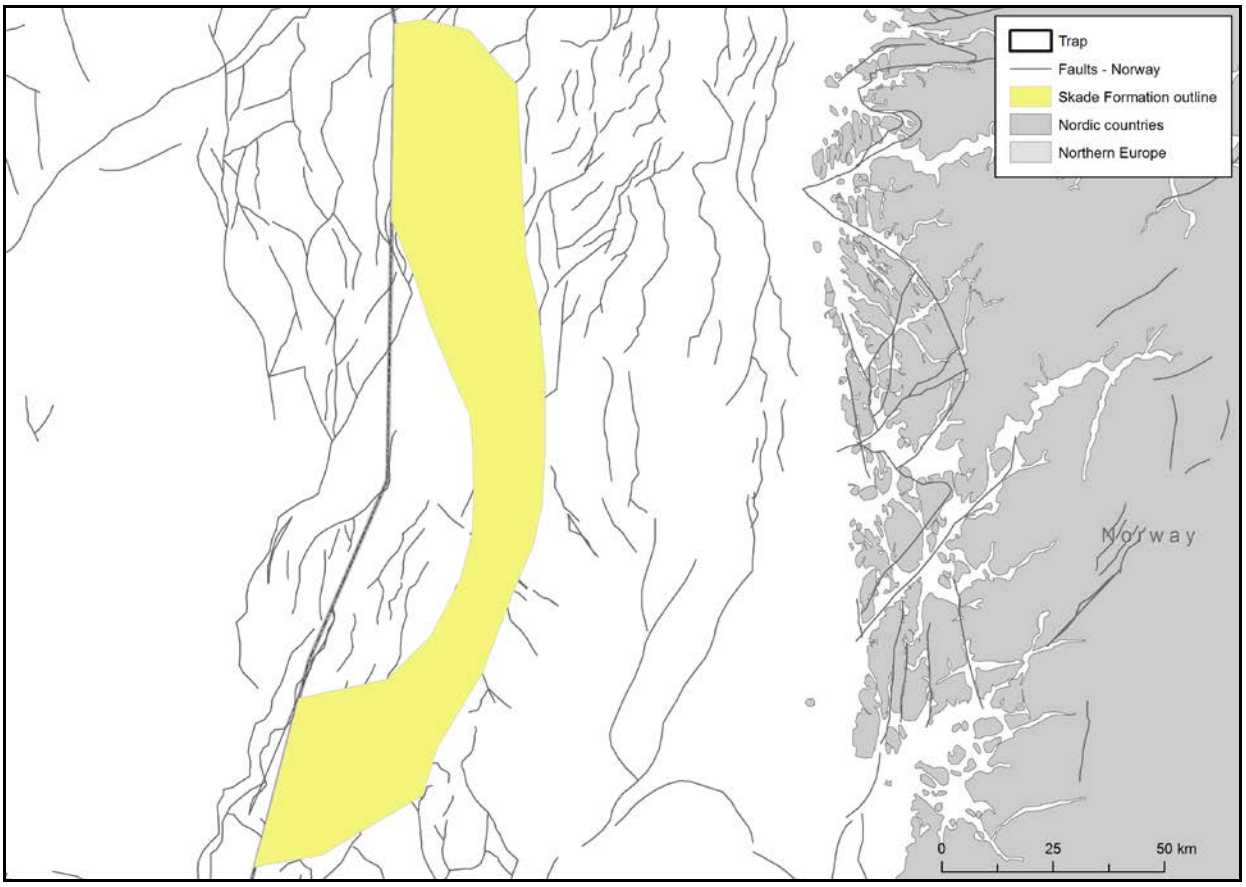

Figure 27. The Miocene Skade Formation.

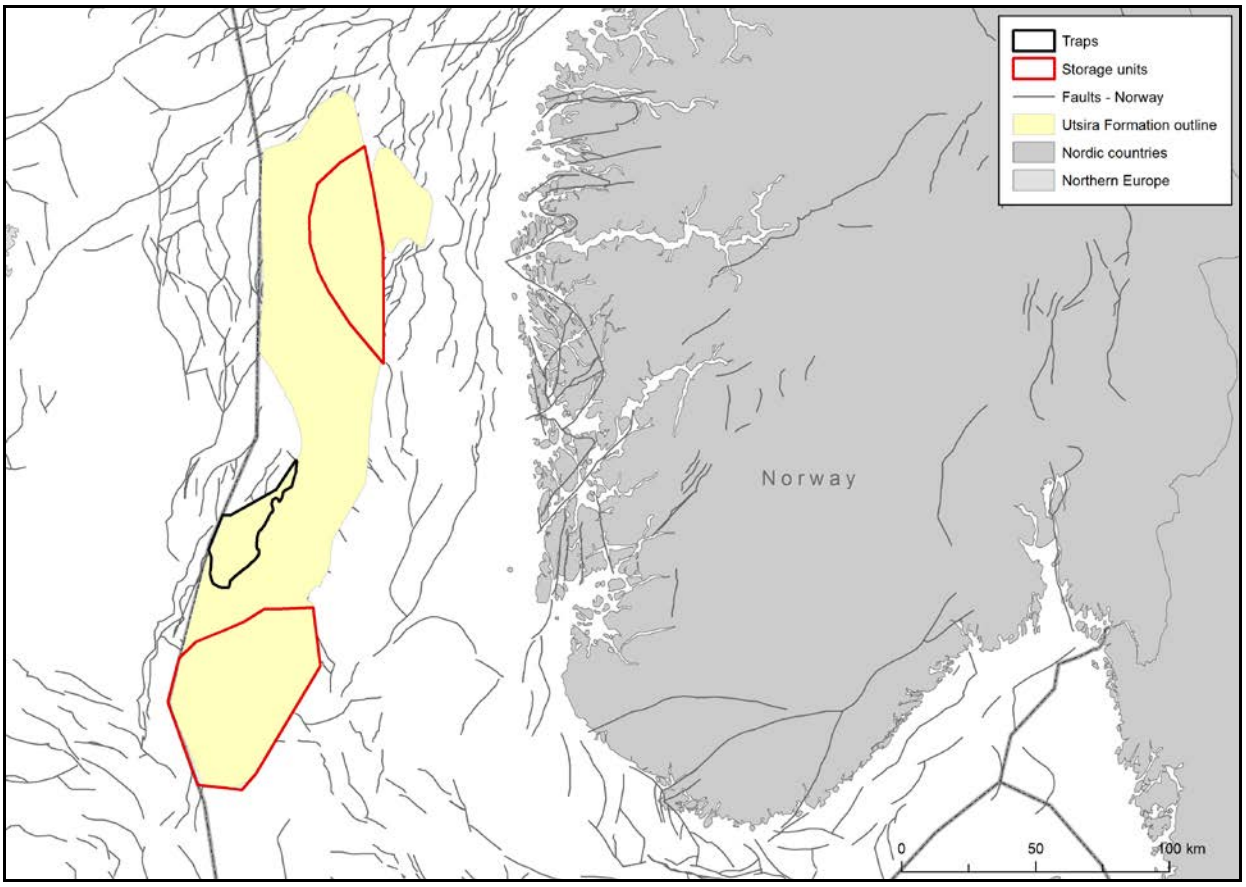

Figure 28. The Miocene-Pliocene Utsira Formation.

Figure 29. Paleocene mounds.

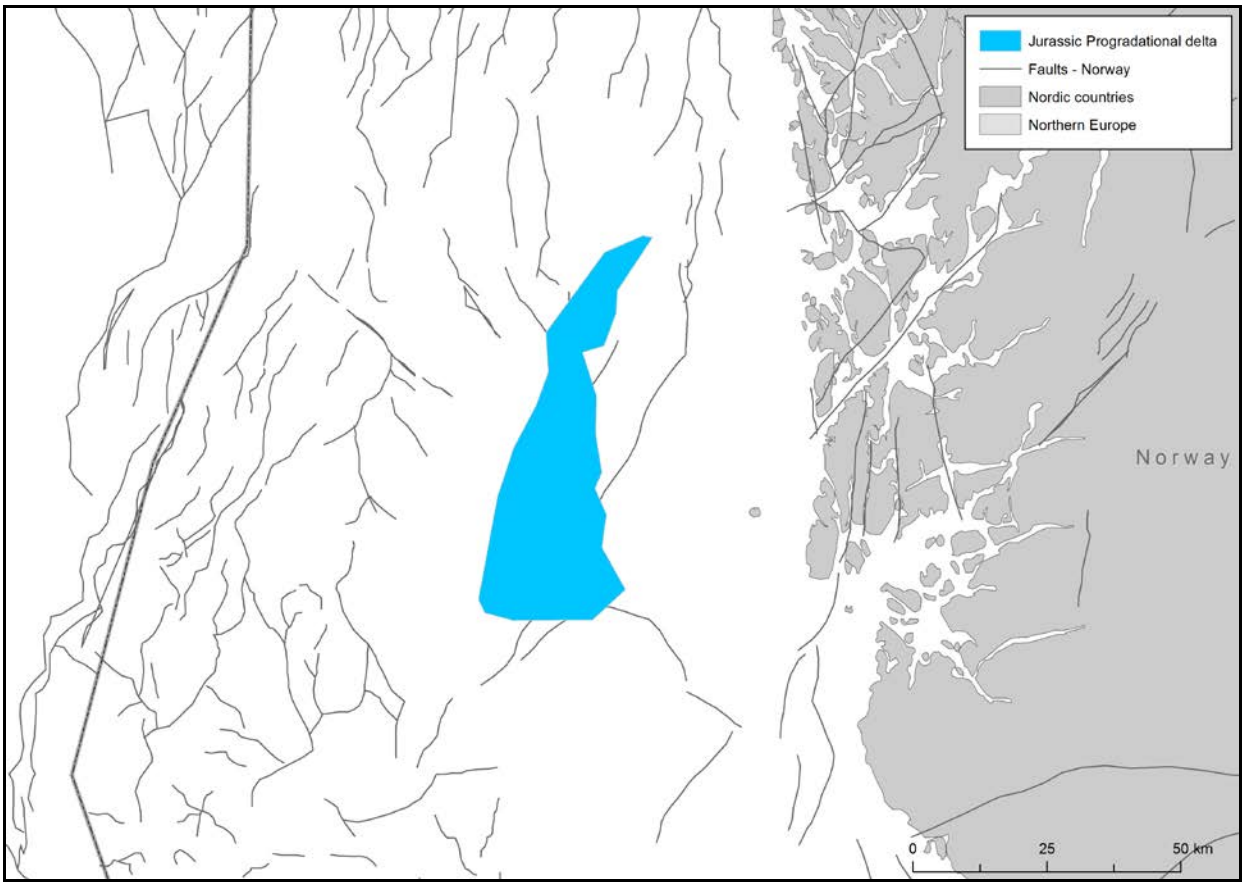

Figure 30. The Jurassic progradational delta sand.

6.The Norwegian Sea

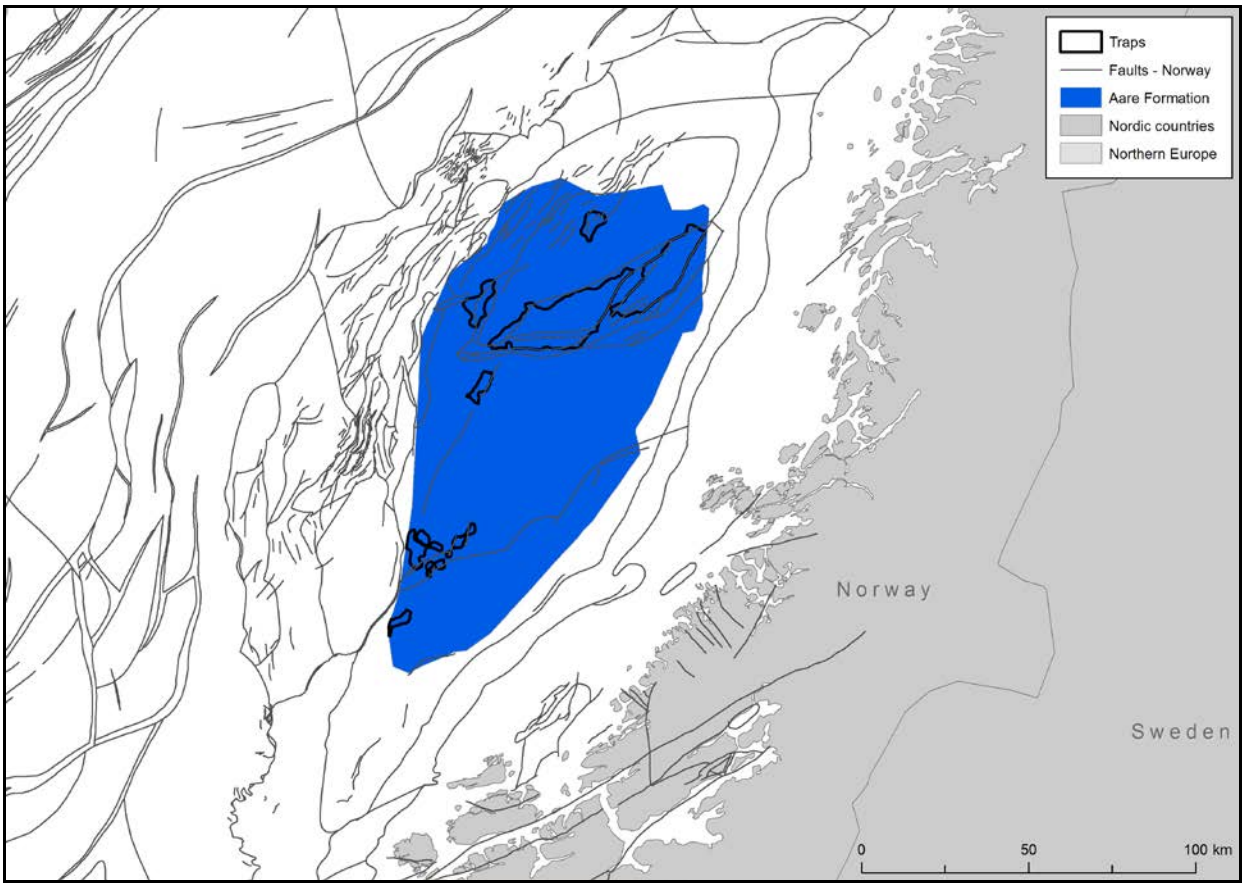

Figure 31. The Early Jurassic Åre Formation.

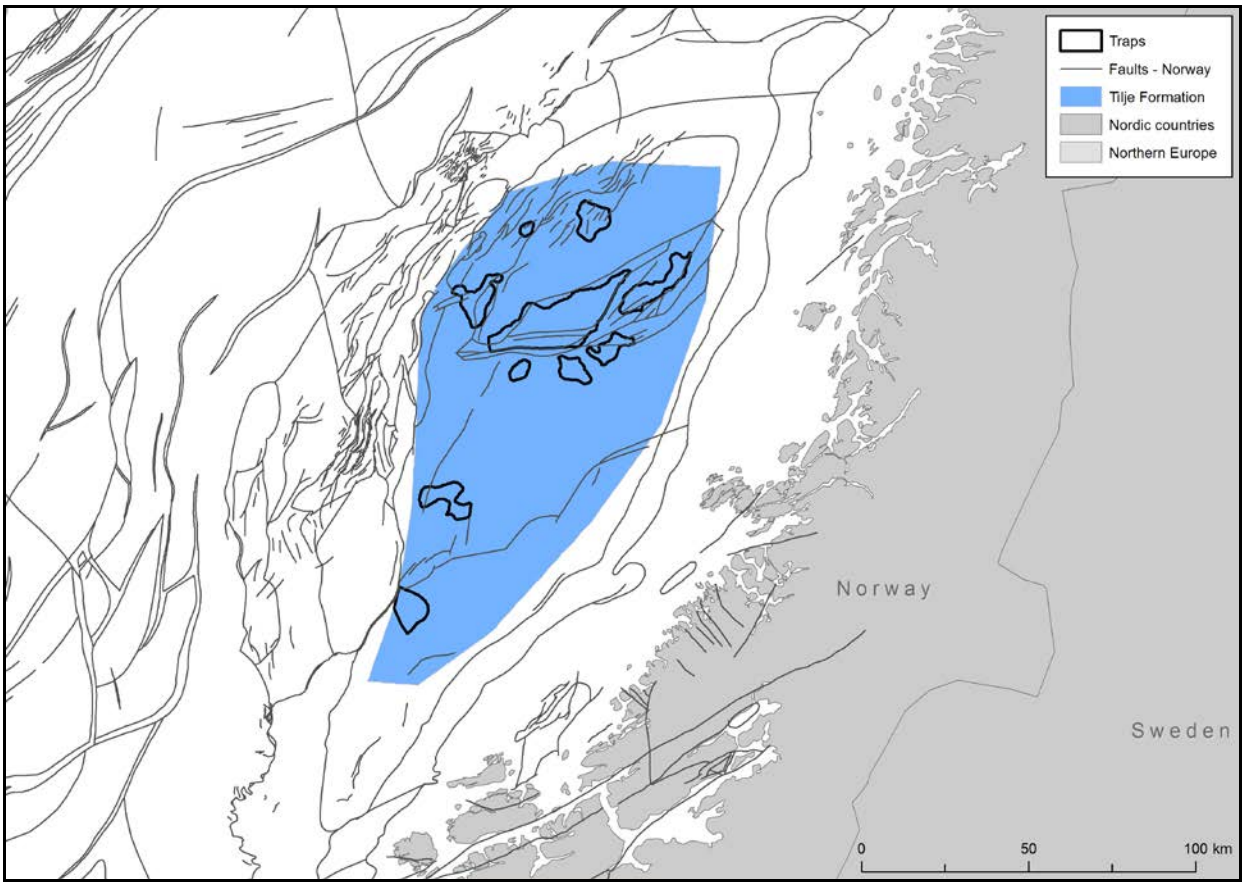

Figure 32. The Jurassic Tilje Formation.

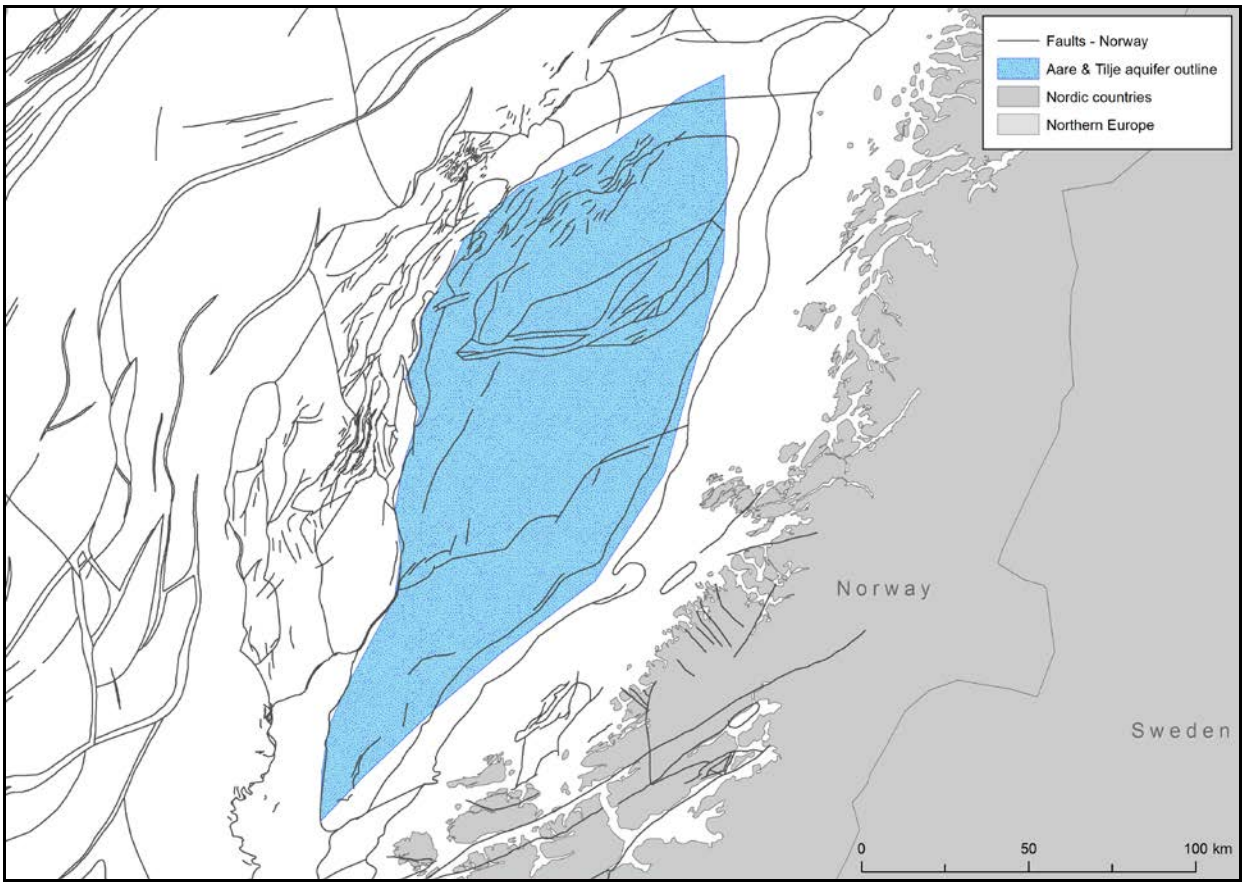

Figure 33. The Åre and Tilje aquifer.

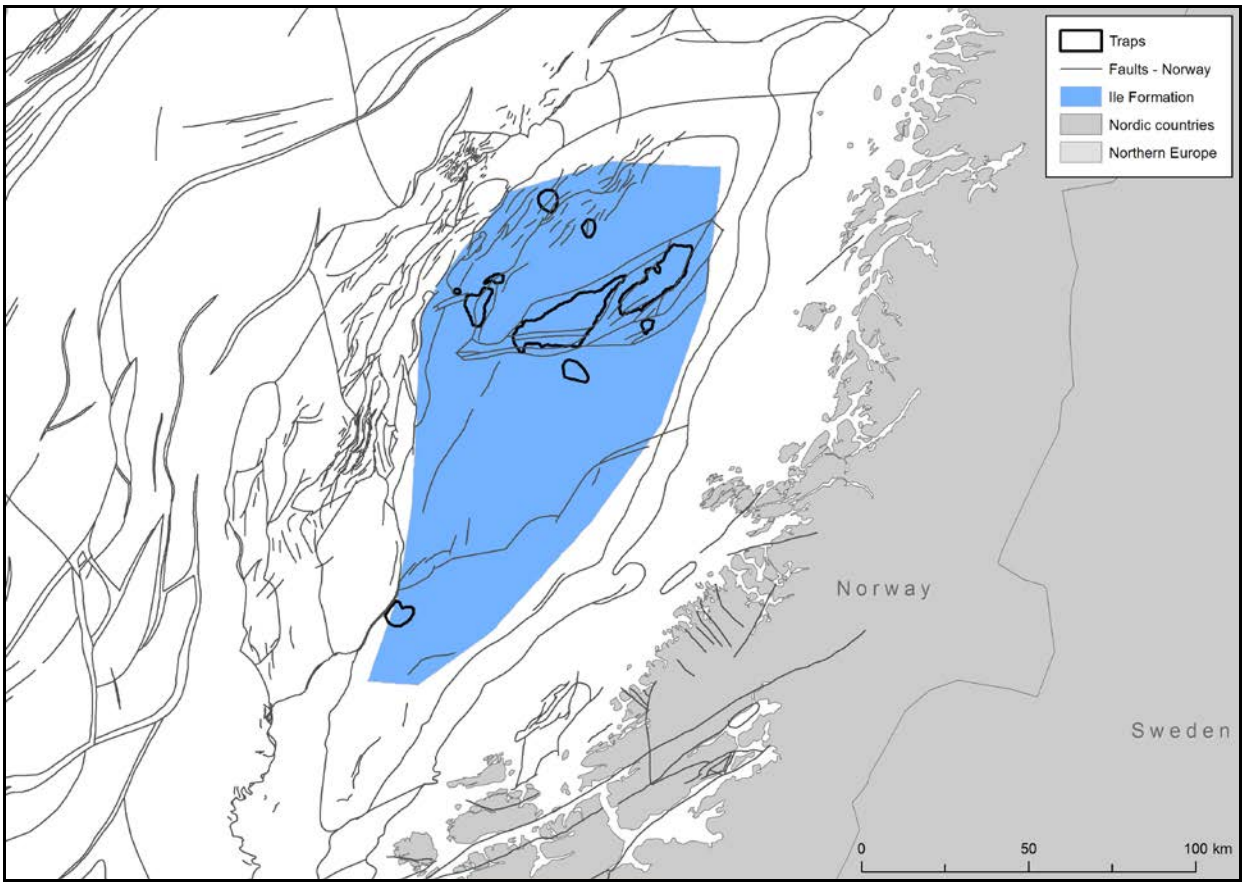

Figure 34. The Middle Jurassic Ile Formation.

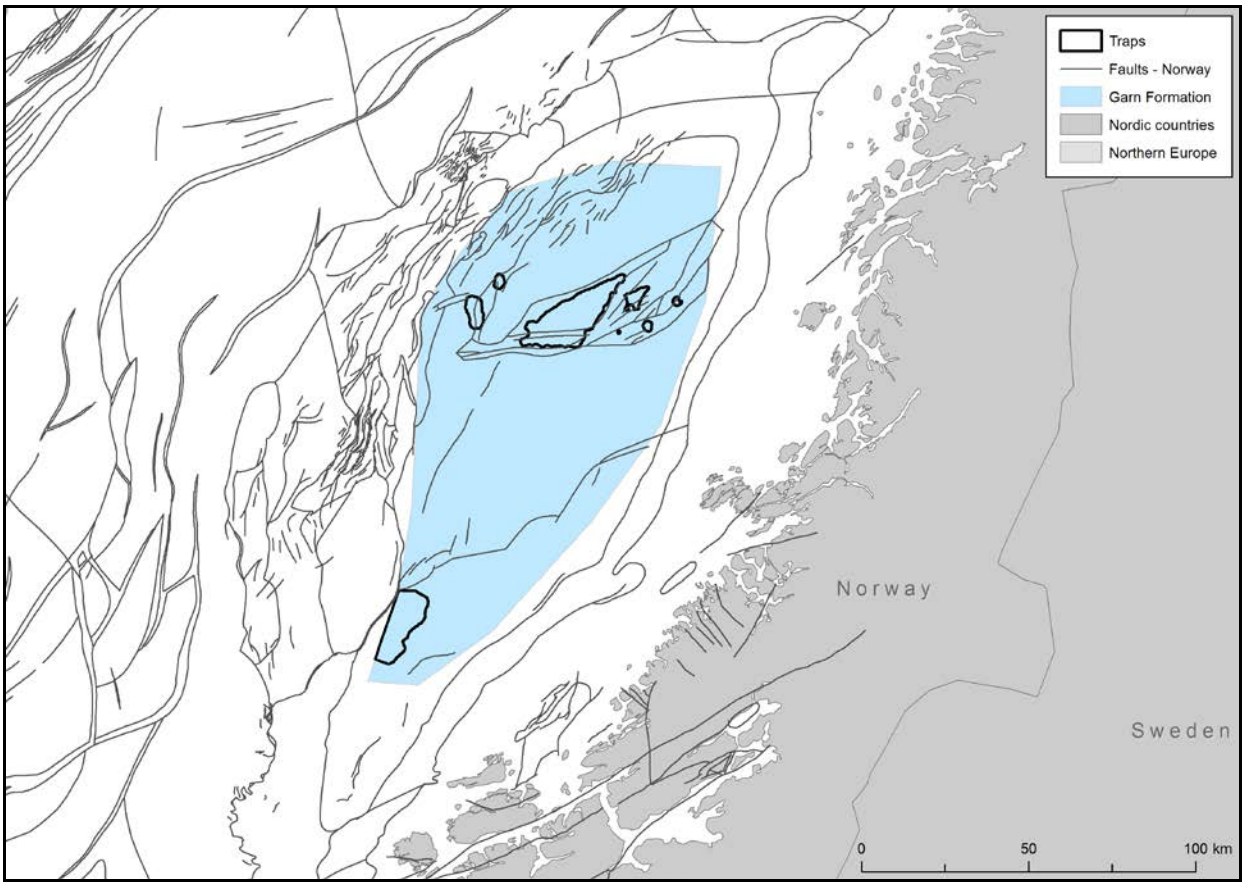

Figure 35. The Middle Jurassic Garn Formation.

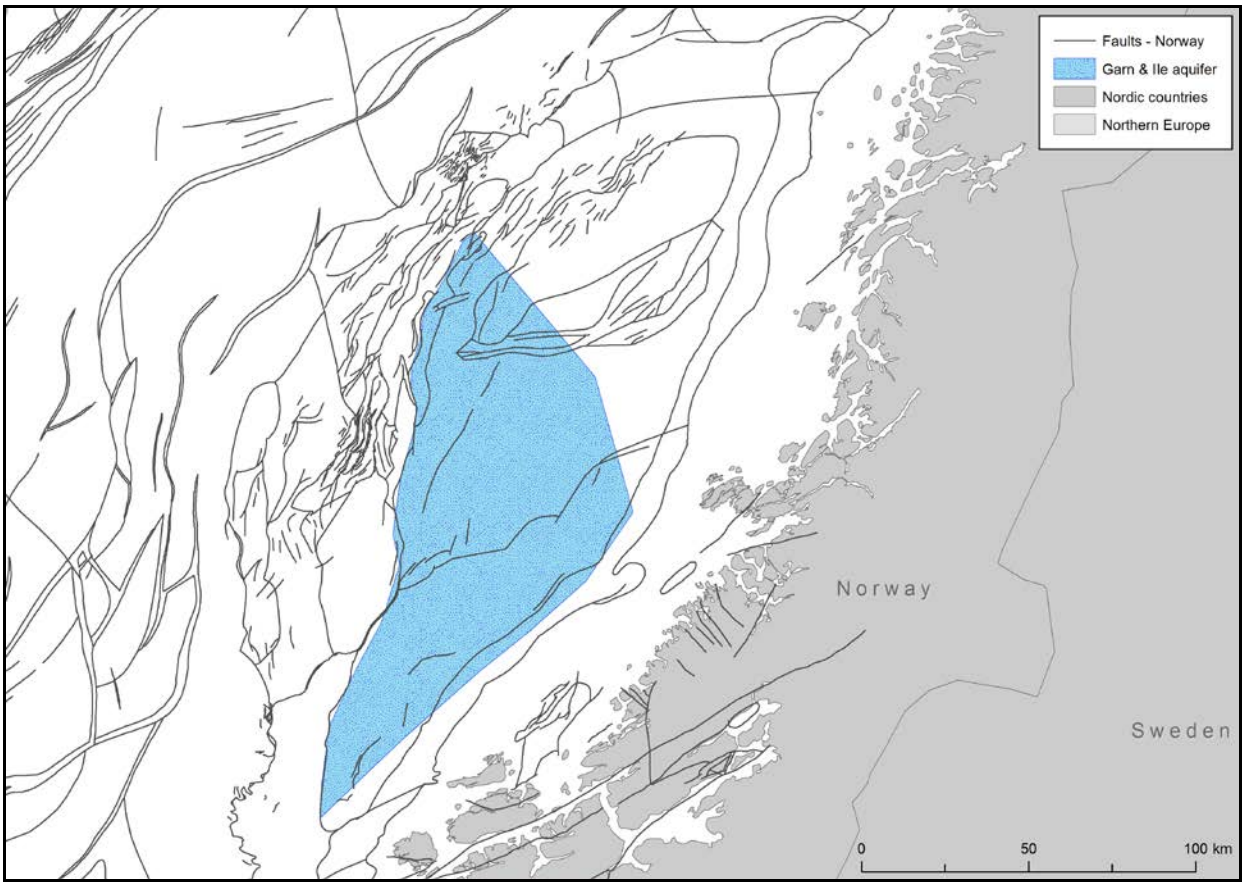

Figure 36. The Ile and Garn aquifer.

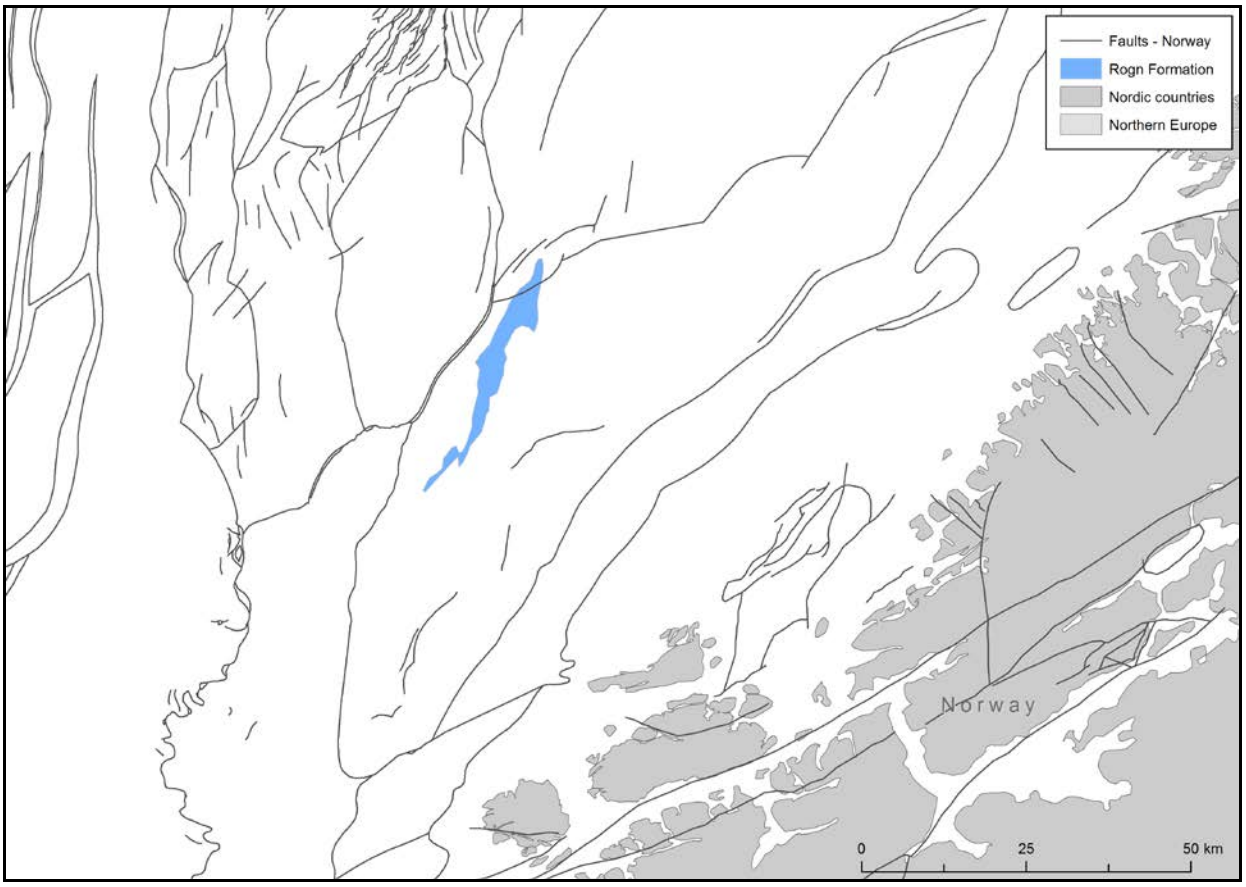

Figure 37. The late Jurassic Rogn Formation.

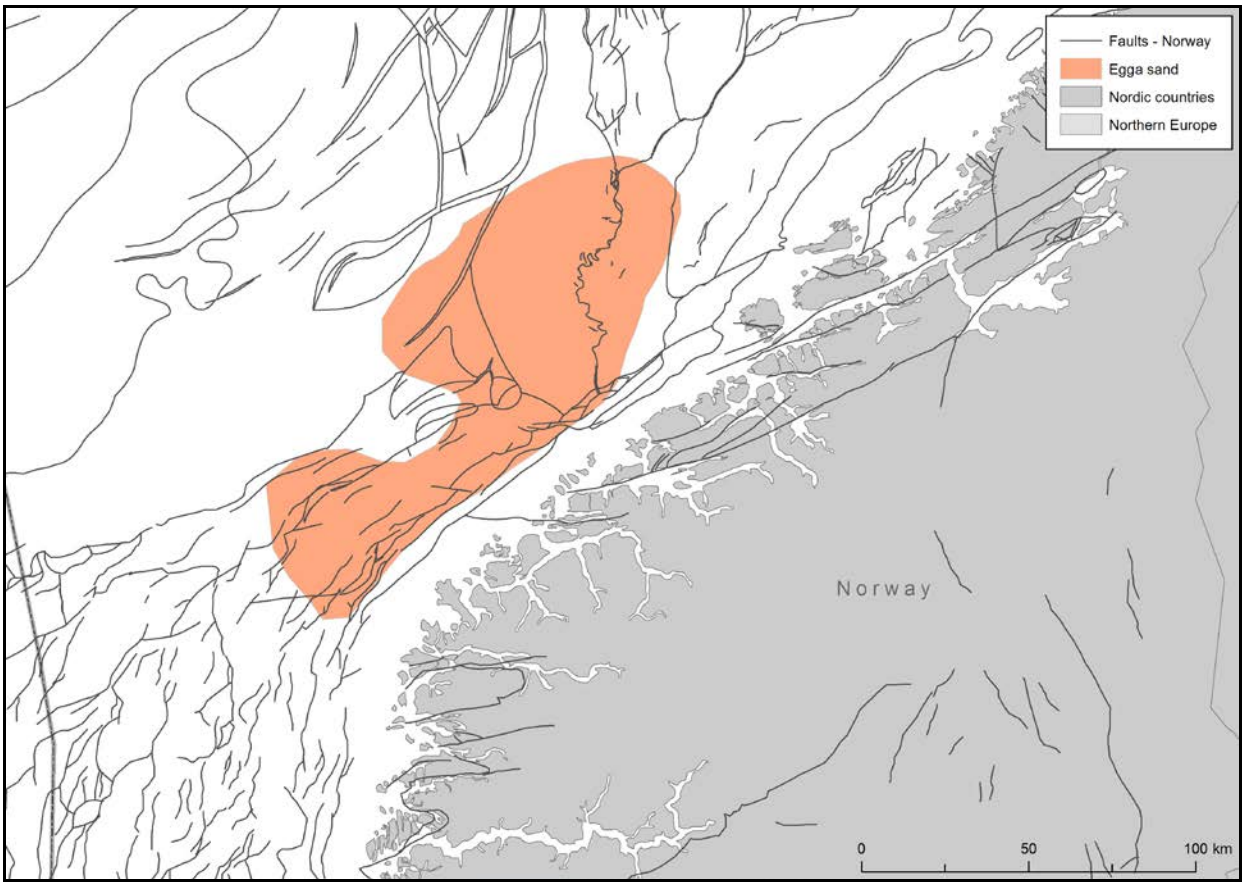

Figure 38. The Paleocene Egga sand.

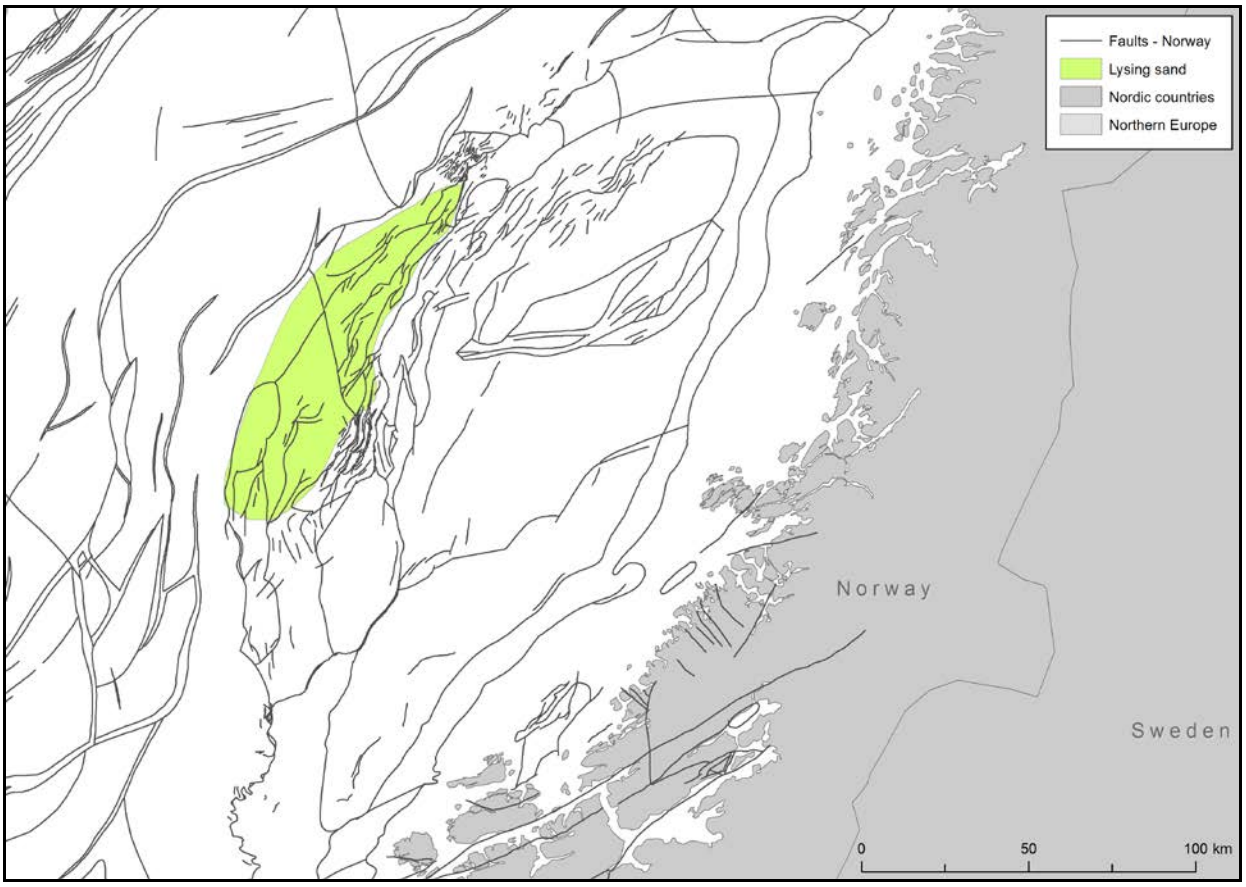

Figure 39. The late Cretaceous Lysing sand.

7.The Barents Sea

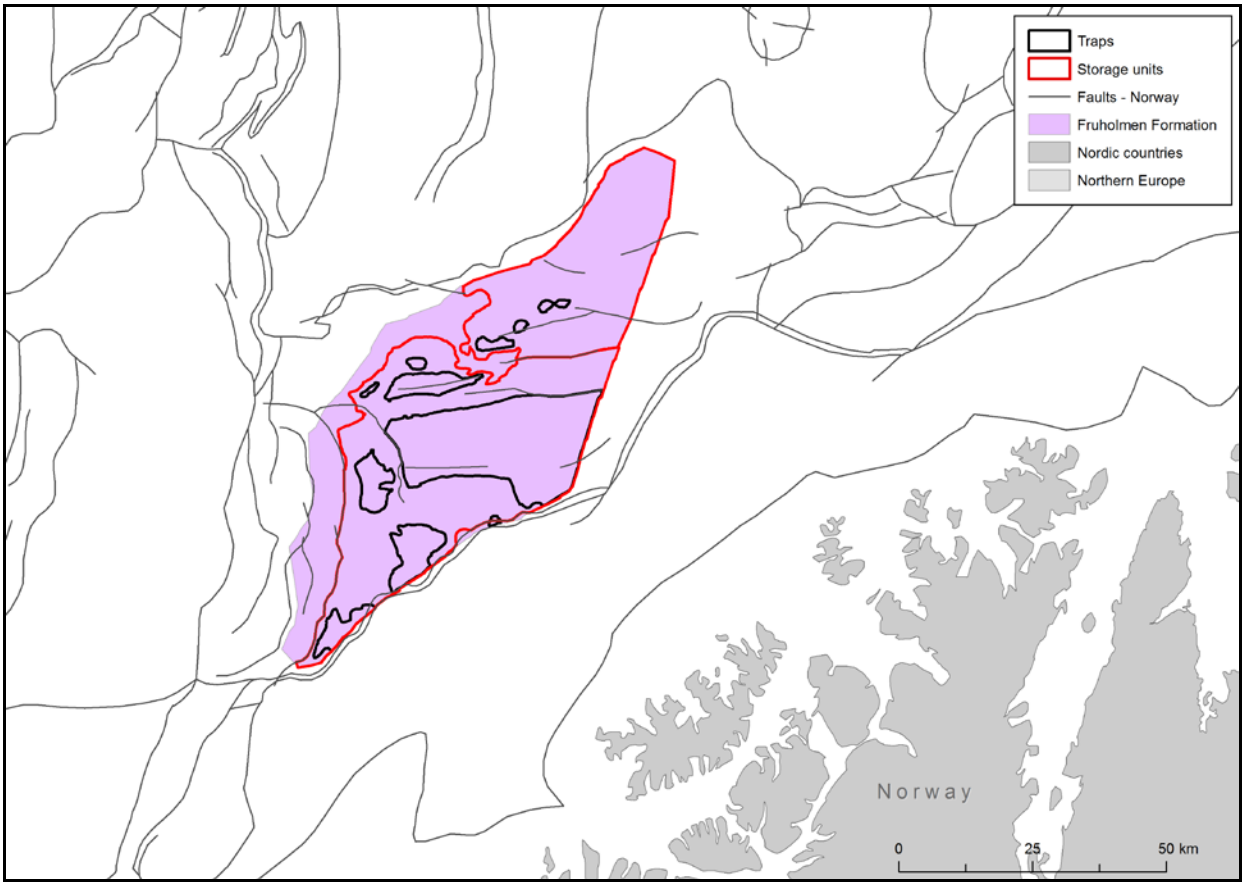

Figure 40. The Late Triassic Fruholmen Formation.

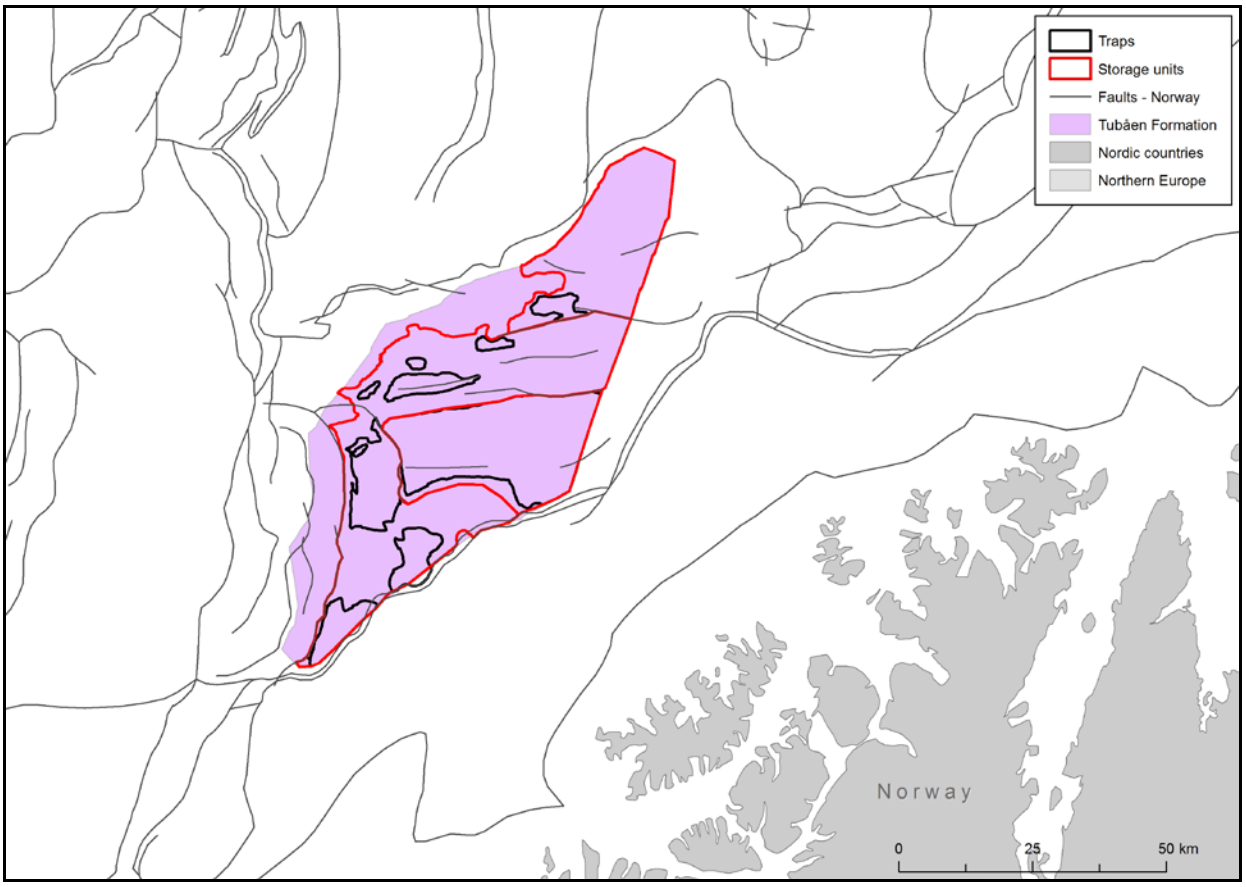

Figure 41. The Late Triassic Tubåen Formation.

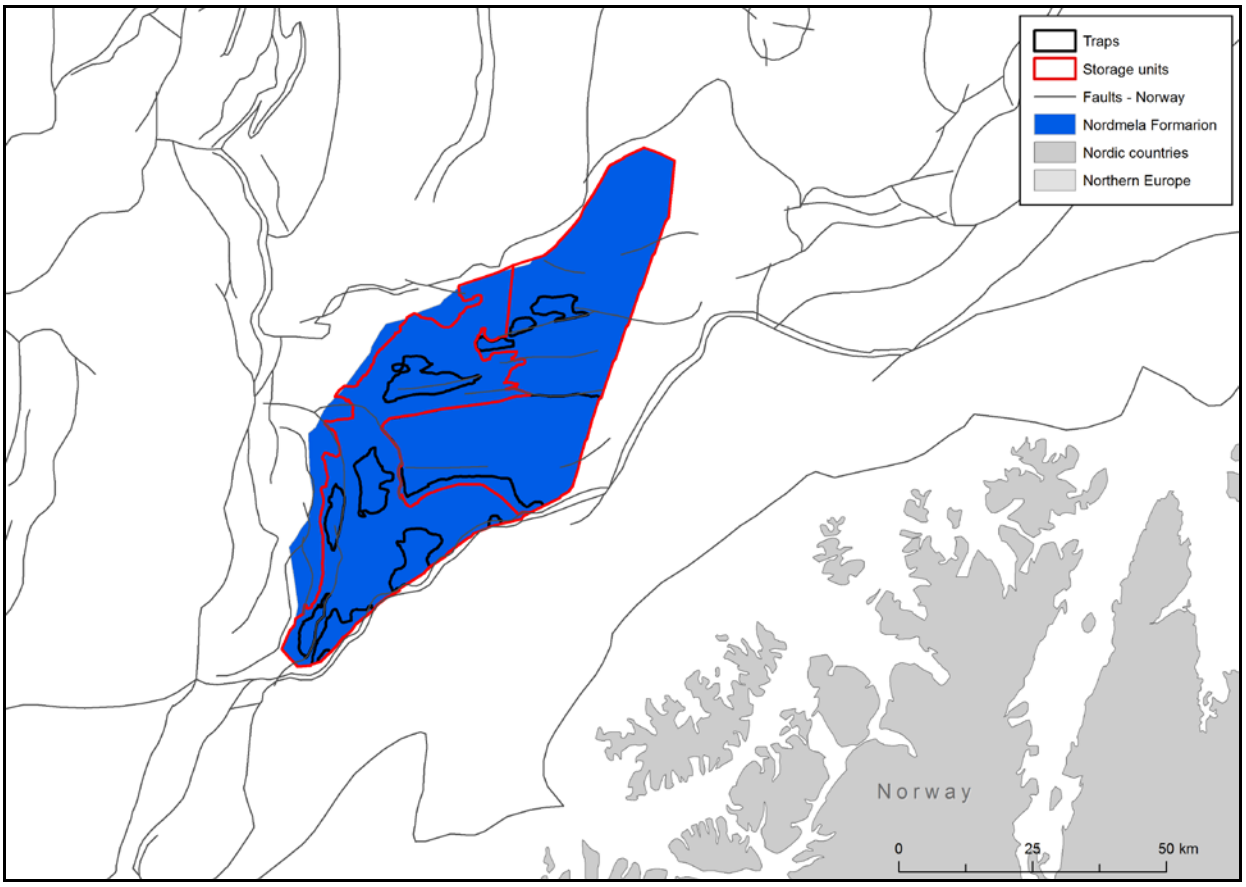

Figure 42. The Early Jurassic Nordmela Formation.

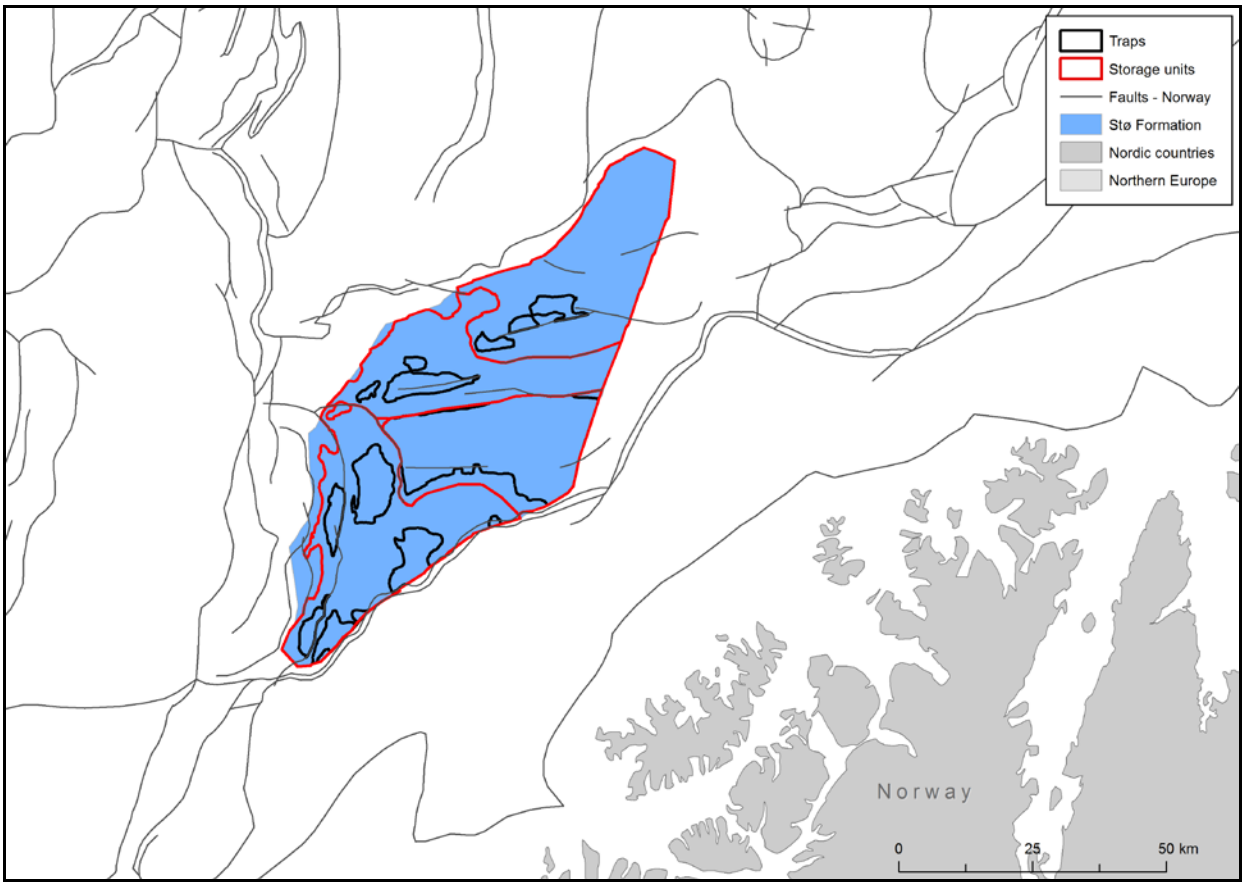

Figure 43. The Middle Jurassic Stø Formation.

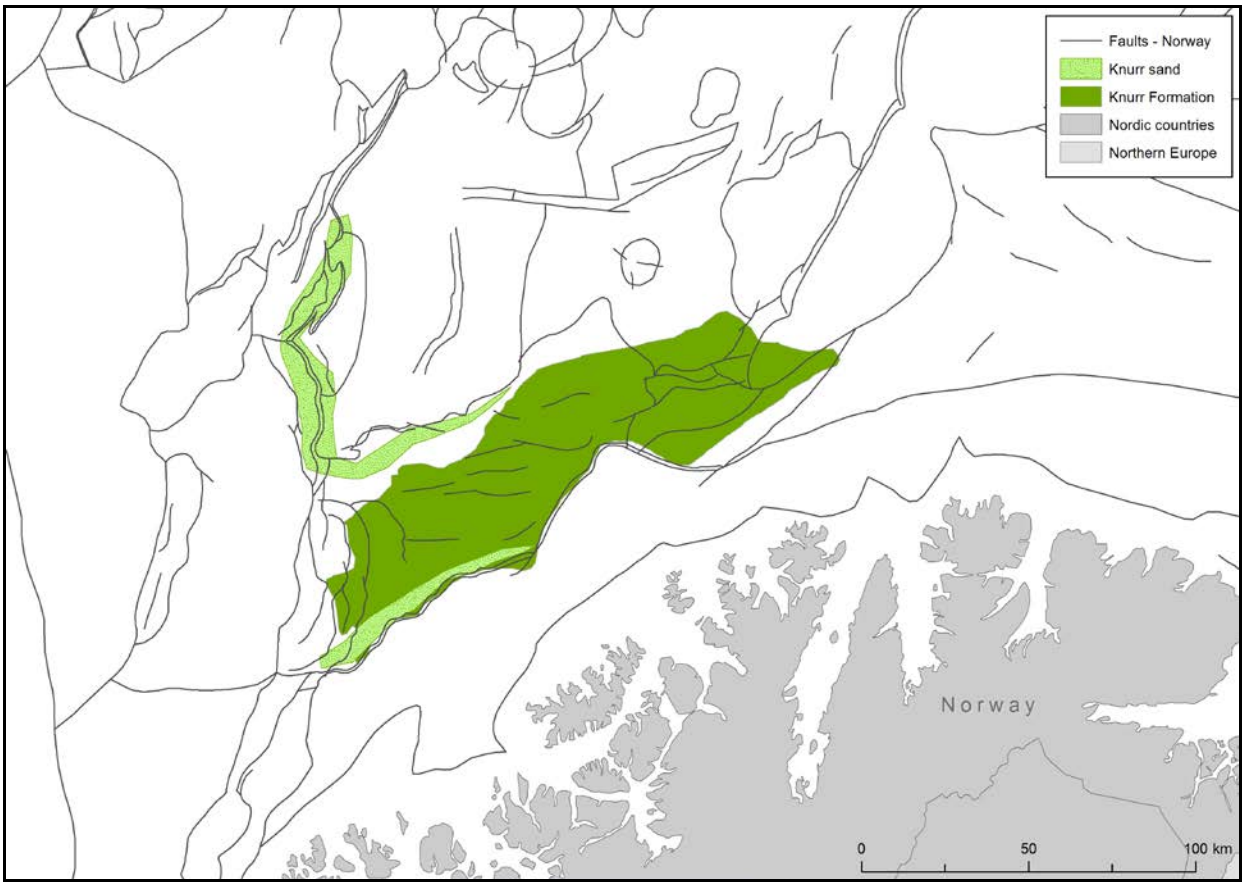

Figure 44. The Cretaceous Knurr Formation and Knurr sand.

8.Caprock formations

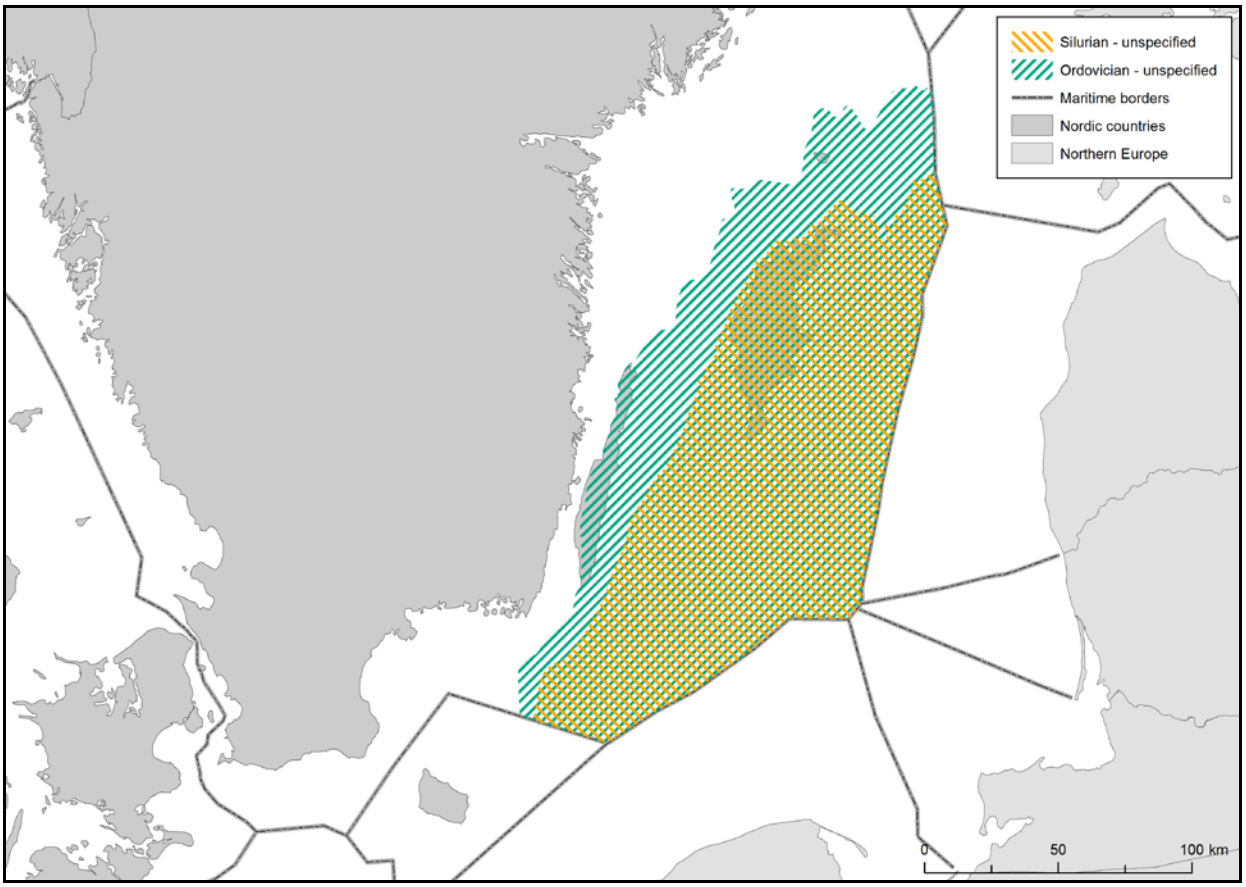

Figure 45. Caprock formations for the Baltic Sea area.

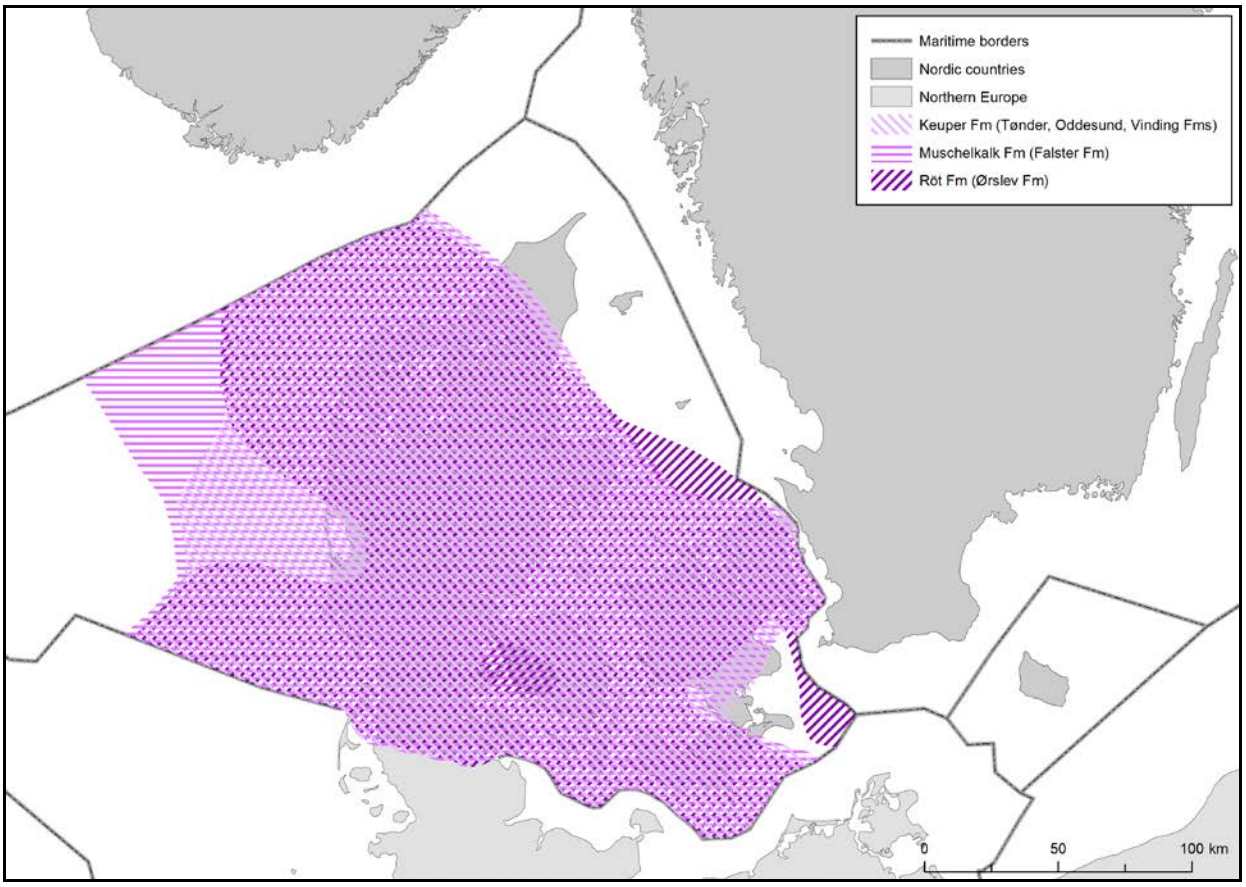

Figure 46. Triassic caprock in the Danish area.

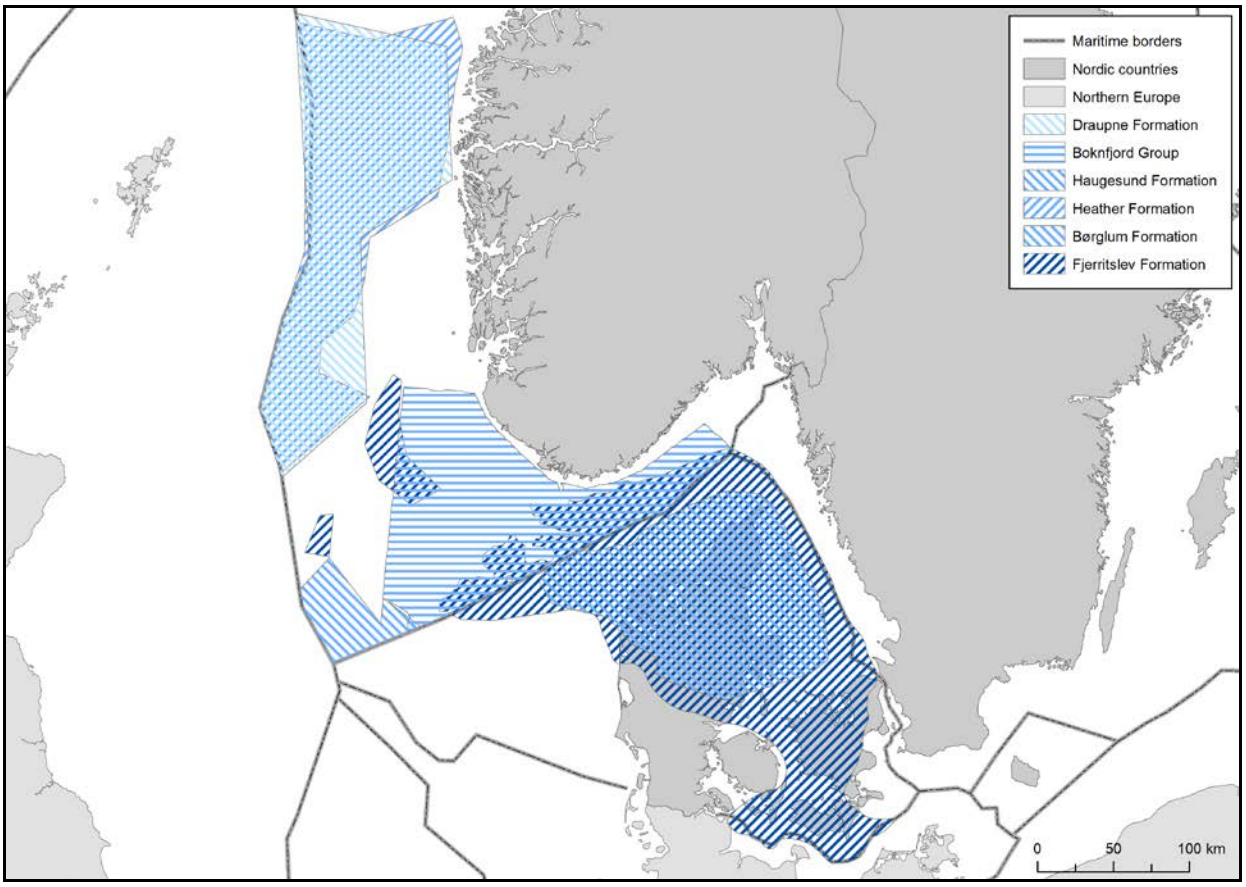

Figure 47. Jurassic caprock in the Danish and Norwegian areas.

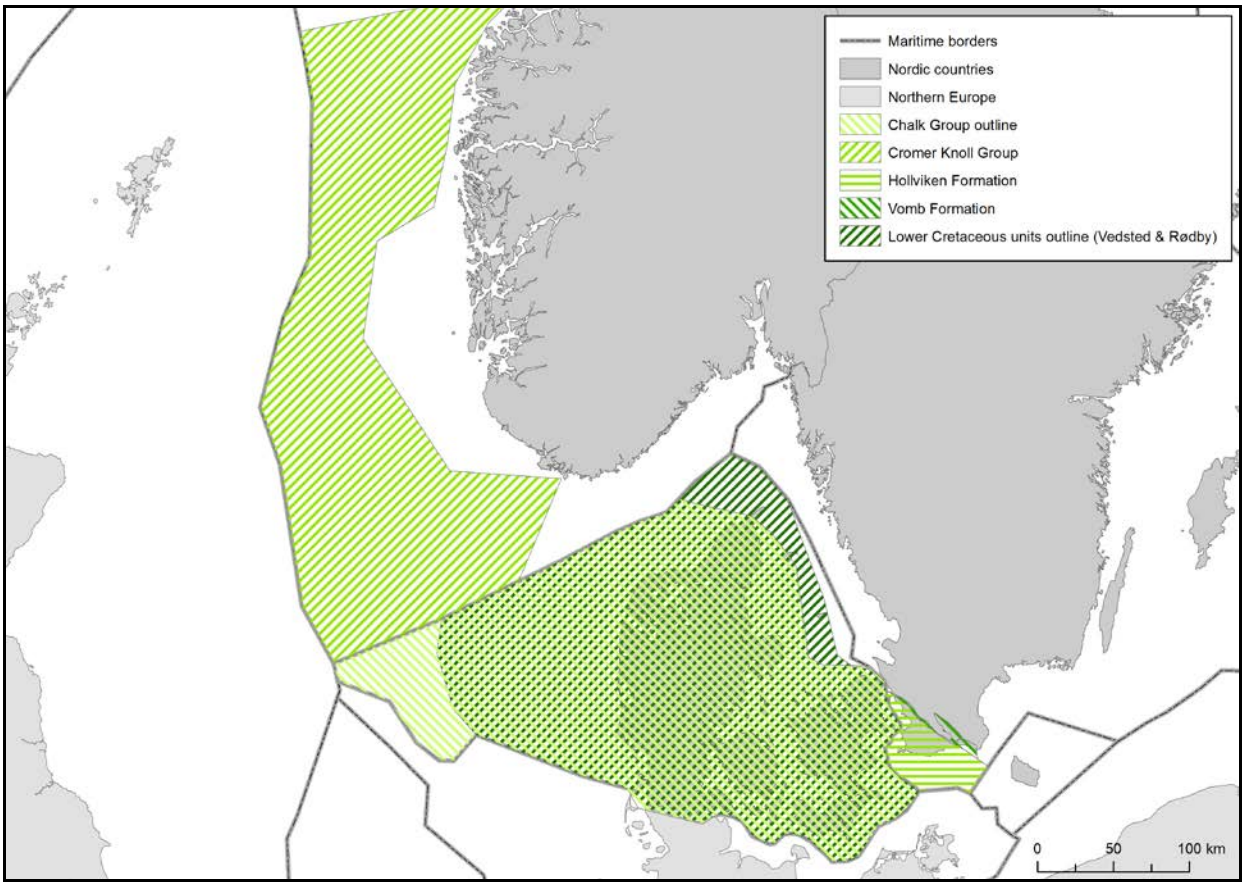

Figure 48. Cretaceous caprock in Danish, Norwegian and Swedish areas.

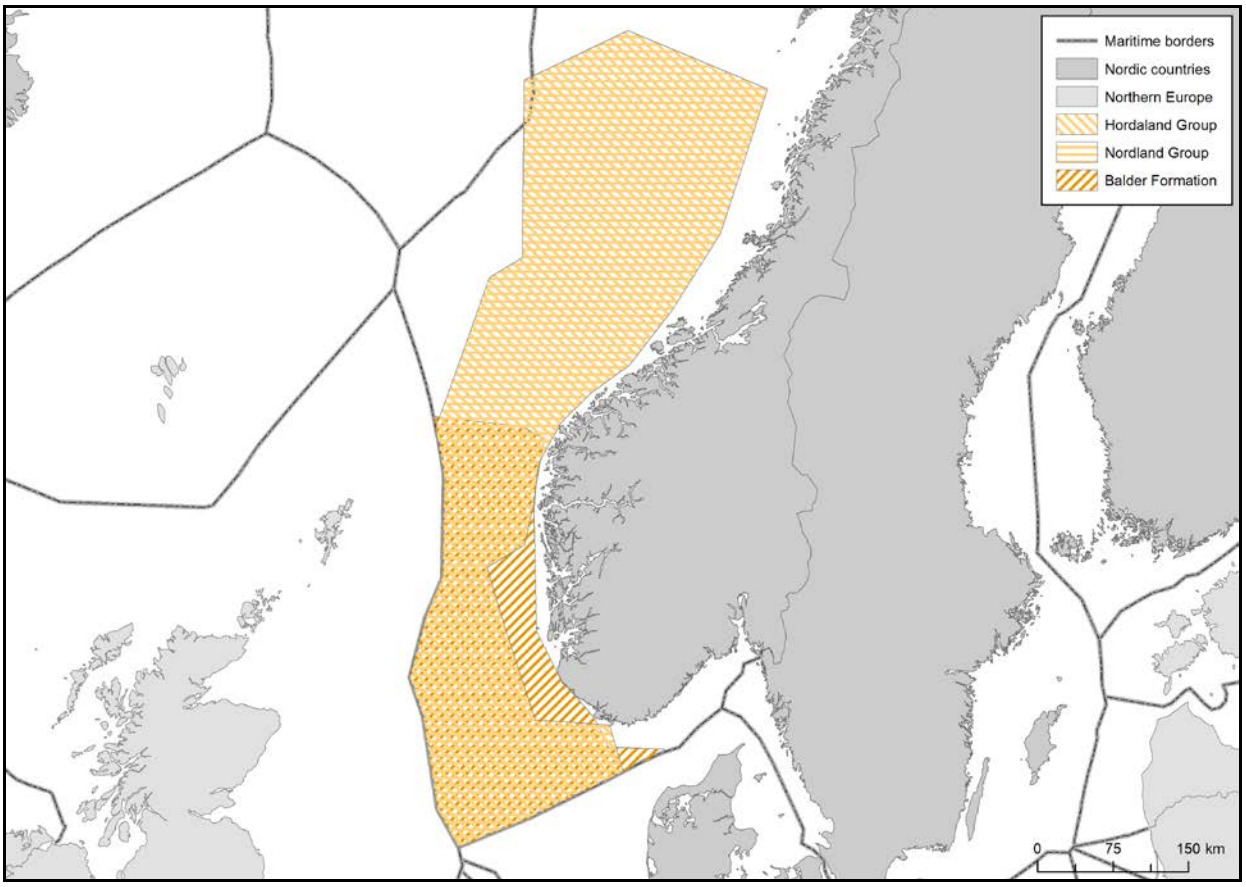

Figure 49. Palergene caprock in Norway.

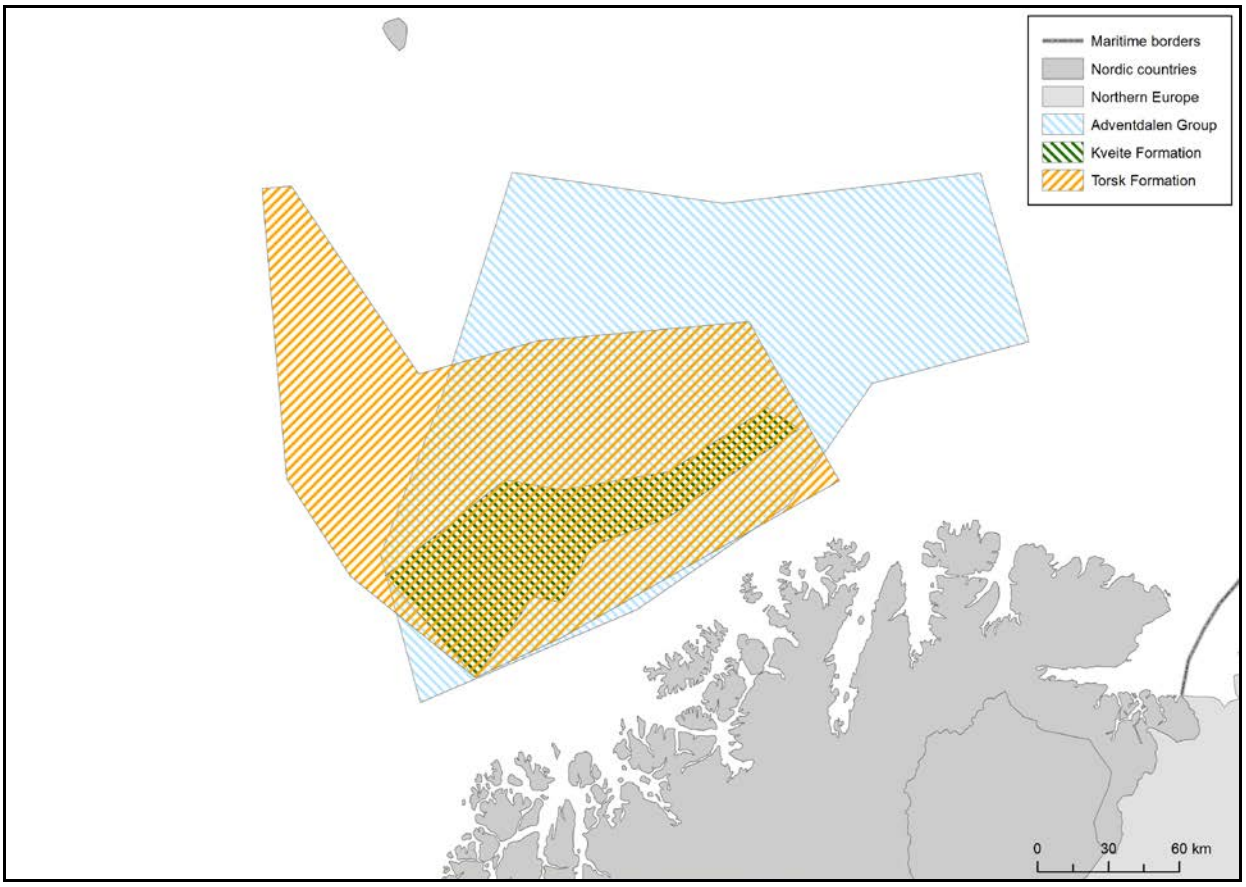

Figure 50. Caprocks in the Barents Sea.

9.Iceland

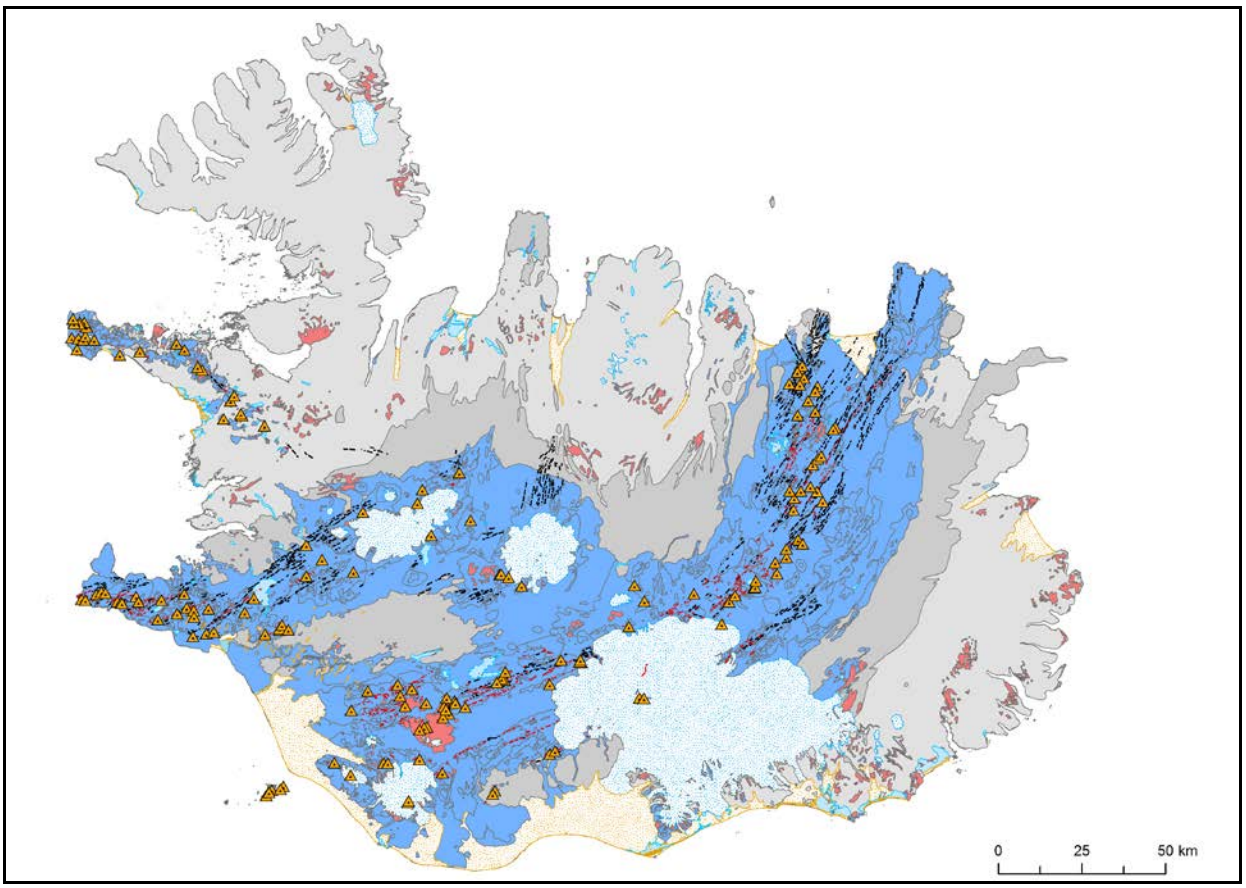

Figure 51. The potential storage areas in porous basaltic rocks in Iceland (blue areas).