



CO₂ Storage Capacity of Saline Aquifers in the Swedish Sector of the Baltic Sea

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Carbon Capture and Storage (CCS) is one of a range of options to reduce CO₂ emissions in order to mitigate climate change in the future. The Intra-cratonic Baltic Sea Basin contains several saline aquifers which could be suitable for CO₂ storage. In this study the CO₂ storage capacity of the Cambrian När and Faludden sandstone members is evaluated within the Swedish sector of the Baltic Sea Basin. A probabilistic approach is adopted to characterise both the most likely storage capacity estimate as well as the associated uncertainty.

The storage capacity within structural closures and stratigraphic traps is considered. Depth structure maps generated using a dense grid of vintage 2D marine seismic data are used to assess the storage potential in structural traps for both potential reservoirs. A regional scale stratigraphic trap is also considered for the Faludden reservoir. Key input properties for the CO₂ storage capacity calculations such as porosity, CO₂ density and storage efficiency factor are characterised based on available well log and core data. CO₂ storage capacities for the structural and stratigraphic traps are then calculated using a Monte Carlo type approach where the input parameters are randomly perturbed within a set range. A statistical analysis of the input parameters is used to define the range within which these properties are allowed to vary, both spatially and at a given point. Finally these results are compared to others for the greater Baltic Sea region.

This approach allows a most likely CO₂ storage capacity estimate as well as low and high estimates to be obtained for the Swedish sector of the Baltic Sea in the investigated formations. Based on these results it appears that the largest storage capacity lies within the regional stratigraphic trap of the Faludden reservoir. The structural traps provide significantly smaller volumes when compared to the Faludden stratigraphic trap. The majority of the structural traps are also less certain than the Faludden stratigraphic trap as they assume a series of sealing faults to be present.