

Investigation of large-scale pressure propagation and monitoring for CO₂ injection using a real site model

KATHARINA BENISCH & SEBASTIAN BAUER

Institute for Geosciences, University of Kiel, Ludewig-Meyn-Str. 10, D-24118 Kiel, Germany

kb@gpi.uni-kiel.de

Abstract This paper presents a study on monitoring of large-scale pressure evolution during and after CO₂ injection on a real site-scale model in the North German Basin. The study is aimed at identifying suitable locations for monitoring and at determining the conditions under which meaningful pressure signals can be measured. A multi-layered reservoir model is used, which contains two potential storage formations separated by a cap rock complex. CO₂ is injected into the lower storage formation. The pressure is monitored in several geological layers at varying distances from the injection well. Simulation results show that pressure increases both in the cap rock and below the storage formation. The pressure increase in the upper storage formation is only faintly detectable, so that no interaction between the two storage formations has to be expected. The type of boundary conditions used yield changes in the pressure signal at larger distances from the injection well, but not close to it. These results show that pressure monitoring and assessment is sensitive to individual site conditions and site geology, and has to be evaluated for each CCS project individually.

Key words CO₂ injection; monitoring; pressure propagation