Application of PET2OGS to CO_2 storage in a saline aquifer of the CO_2CRC Otway project

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PET2OGS, a set of algorithms that integrate the static model (Petrel) with the dynamic model (OpenGeoSys), is applied to model CO_2 storage in a saline aquifer. The Otway Basin is the first demonstration site of the deep geological storage of carbon dioxide as part of carbon capture and storage (CCS) technology in Australia. During Stage 2 of the CO_2CRC Otway project, CO_2 was injected into a saline aquifer along the injection interval of 1435 - 1450 m in a well. Upon conversion and adaption of the geological model into the dynamic model, the simulation of CO_2 injection at 159 tone/day for 5 months is carried out for a hypothetical scenario. CO_2 storage in each facies are analyzed for storage capacities. The discrete nature of CO_2 plume behaviors known in multiphase flow in heterogeneous media is observed in the numerical simulation of CO_2 storage. Sensitivity analysis of the storage capacity with respect to facies, porosity, and permeability is provided.