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Extensions to Early Work on Geologic Carbon Sequestration with Enhanced Gas Recovery (CSEGR)

Monday, 19 May 2025 14:50 (15 minutes)

It has been 25 years since the first numerical simulation studies of Carbon Sequestration with Enhanced Gas Recovery (CSEGR) were carried out in the GEOSEQ project led by Sally M. Benson (Lawrence Berkeley National Laboratory). The early CSEGR simulation paper Oldenburg, Pruess, and Benson (2001) was followed by numerous studies and related publications on the subject by other researchers that continue to this day. Using the search terms “’enhanced gas recovery’co2 carbon dioxide injection”in Google Scholar, one finds approximately 23 papers on the CSEGR topic prior to 2000, 130 papers between 2000-2005, 1101 papers for the decade ending 2015, and then 3400 additional papers for the decade ending in 2025 for a total of 4654 papers for the period 1985 to the present. This growth in publications after the year 2000 reflects both the rise of research in the field of geologic carbon sequestration of which Sally Benson is a respected pioneer and scientific leader, as well as the strong interest by industry in recovering natural gas from depleted reservoirs.

Since 2000, not only has the number of published studies in the area of CSEGR consistently increased, but so has the number of studies in tangential but very relevant topical areas that take advantage of the knowledge gained in CSEGR research and also the computational methods developed for it. For example, topics that have been addressed specifically but that are still of great ongoing interest because of their importance include: (1) effects such as deposition of impurities in CO2 injectate, (2) challenges of CO2 injection into low-pressure gas reservoirs, and (3) effects of gas composition on solubility and leakage attenuation. This talk will discuss these topics through presentation of simulation results and discussion of related implications for geologic carbon sequestration.

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References

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