

Modeling Geological Storage of CO₂: A Workflow Perspective

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The assessment and evaluation of carbon storage systems involve the integration of large datasets and is often conducted by constructing a series of static geological 3-D models which combine all available information. These models provide the capability to query complex interrelated datasets to answer specific questions or highlight areas of interest. Static geological models can be populated with physical and chemical attributes relevant to dynamic simulations allowing the prediction of complex storage system behaviors to CO₂ injection. However, assessment of the economic feasibility of carbon and capture storage (CCS) requires a fully integrated workflow. Here we present several conceptual diagrams that provide generic and straight-forward descriptions of the fundamental steps and functions to be performed in CO₂ geosequestration modeling. Each figure focuses on particular aspects of the modeling workflow. Standardization in the modeling workflow provides project transparency, as well as enabling the models to be evaluated according to common criteria (from outside and within a project team). This will improve the efficiency in determining the feasibility of CO₂ geosequestration projects. Geological CO₂ storage modeling can act as a common workspace for carbon storage management with the potential to improve the organization of interdisciplinary work. Standardized workflows will play an increasingly important role in the evolving regulatory and legal frameworks. Furthermore, a standardized workflow can become an instrument of validation in the process of seeking national and international agreements.