

EPA Workshop on Modeling & Reservoir Simulation for Geologic Carbon Storage

Summary

The U.S. EPA Climate Change Division, Office of Air conducted a Workshop on Modeling and Reservoir Simulation for Geologic Carbon Storage in Houston, Texas on April 6-7, 2005. The workshop venue was the Sheraton North Houston, 15700 John F. Kennedy Blvd., Houston, TX, 77032. Sixty people participated in the workshop as speakers, moderators, panelists, or general attendees.

The objective of the workshop was to assess the potential role and application of reservoir models and reservoir simulation to geologic carbon storage and to provide the U.S. Environmental Protection Agency with information about the 'state of the art' in the development and application of modeling approaches and numerical simulators for geologic CO₂ storage. The workshop informed EPA headquarters and region staff about ways that geologic models and reservoir simulation might be applied during key stages in the life cycle of a CO₂ storage reservoir, from site selection and characterization through injection operations and post-injection verification of CO₂ containment.

The workshop presentations discussed areas of new research and data needs to improve the application of modeling and reservoir simulation for carbon storage. The workshop presentations and discussion also addressed the role of models and reservoir simulation in supporting risk assessment and risk communication for carbon geosequestration sites.

The purpose of modeling geologic reservoirs for CO₂ storage is to predict the long-term movement of CO₂ in the reservoir under various assumptions about future conditions. Geologic models and the simulation of reservoir pressure and fluid flow in response to induced changes such as injection or fluid withdrawal are well-established tools in oil and gas production and ground water management for predicting the behavior of aquifers and oil and natural gas reservoirs. The premise for modeling of carbon storage reservoirs is that simulation of storage reservoir behavior is likewise an important tool for addressing key issues related to the geosequestration of carbon dioxide. These issues include:

- selection and characterization of suitable carbon storage reservoirs
- predicting CO₂ movement in the reservoir during injection and post-injection
- predicting the geochemical reactions of injected CO₂ with reservoir rock and formation water
- verifying the long-term containment of injected CO₂ and assessing risk of CO₂ migration.