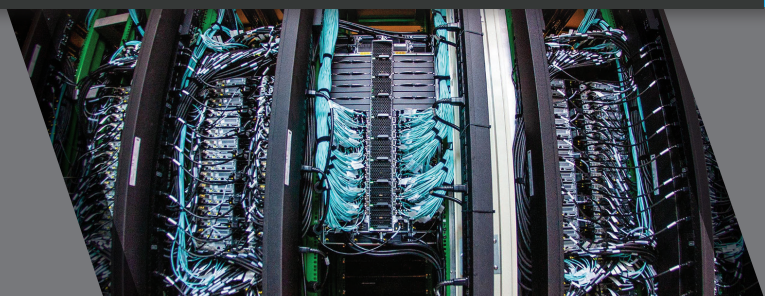




SMART-CS Initiative

Science-informed **M**achine Learning for **A**ccelerating **R**eal-Time
Decisions in **C**arbon **S**torage Applications

The SMART-CS Initiative aims to transform how people interact with subsurface data, improving the efficiency and effectiveness of field-scale carbon storage by application of science-based machine learning and data analytics.



Primary Focus Areas of SMART

REAL-TIME VISUALIZATION

Enable dramatic improvements in the visualization of key subsurface features and flows by exploiting machine learning to improve speed and enhance detail.

REAL-TIME FORECASTING

Transform reservoir management: perform rapid analysis of real-time data to inform operational decisions.

VIRTUAL LEARNING

Develop a computer-based experiential learning environment to improve field development and monitoring strategies.

Collaborative Effort:

The SMART team is engaging with university, national lab, and industry partners, and is building off data collected from field laboratories and regional partnerships, that have been part of the Carbon Transport and Storage Program during the past 15 years. The SMART team will continue to collaborate with other Carbon Storage Program efforts — especially the Regional Initiatives — to collect and analyze data and share insights.

Additionally, SMART-CS will be integrated with SMART-OG, which is focused on research within the Oil and Gas Program to form the overall SMART Initiative, which will transform our understanding of the subsurface through real-time visualization, forecasting, and virtual learning.

Phase I Development Activities



SMART Visualization Platform

Develop an experiential visualization platform through a challenge prize offered to outside developers.



Rock Properties

Identify new ways to illustrate subsurface rock and fluid properties.



Pressure and Stress

Improve subsurface visualization of fluid pressures and rock stresses at the scale of the reservoir and basin.



Optimizing CO₂ Storage

Develop a workflow for informing CO₂ storage operational decisions by forecasting plume migration in response to injection and production strategies.



Active Reservoir Management

Demonstrate an interactive platform for dynamically learning how a CO₂ storage reservoir performs under a variety of operational strategies.



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