

# CMG



How CMOST & GEM  
**accelerated Class VI  
permit readiness** by  
modelling the Area of  
Review under uncertainty —  
**for smarter, faster CCS  
approvals.**

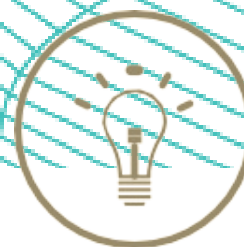


Swipe to see the challenge





# The Challenge:



Permitting delays are holding back CCS, often taking up to 24 months.

A North American carbon storage firm specializing in Class VI projects needed to define the Area of Review (AoR) — where the aerial extent of the CO<sub>2</sub> plume and pressure fronts— across multiple injection sites, under reservoir uncertainty.

The AoR is critical for regulatory compliance — and hard to estimate. CO<sub>2</sub> plume migration and pressure effects are unpredictable across heterogeneous saline aquifers.

Operators need a method to define AoR boundaries fast — and defensibly.



Swipe to see the modeling approach





# The Modelling Approach

The North American carbon storage firm used GEM + CMOST to evaluate plume behavior under uncertainty.

Key inputs:

- Matrix porosity (P10, P50, P90)
- Permeability (defined by power law)
- Capillary pressure
- Hysteresis (i.e residual gas trapping)
- Tracer-based plume tracking

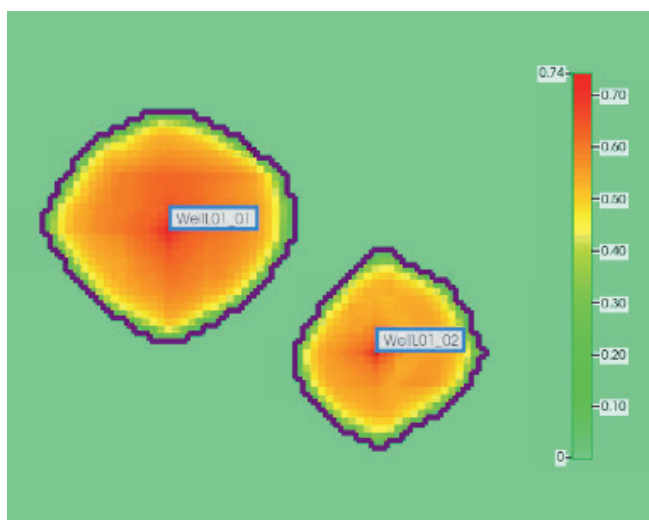


Fig 3b - with vertical layers integration

Swipe to see the results





The Gold Standard in CSS  
Simulation

# The actionable results:

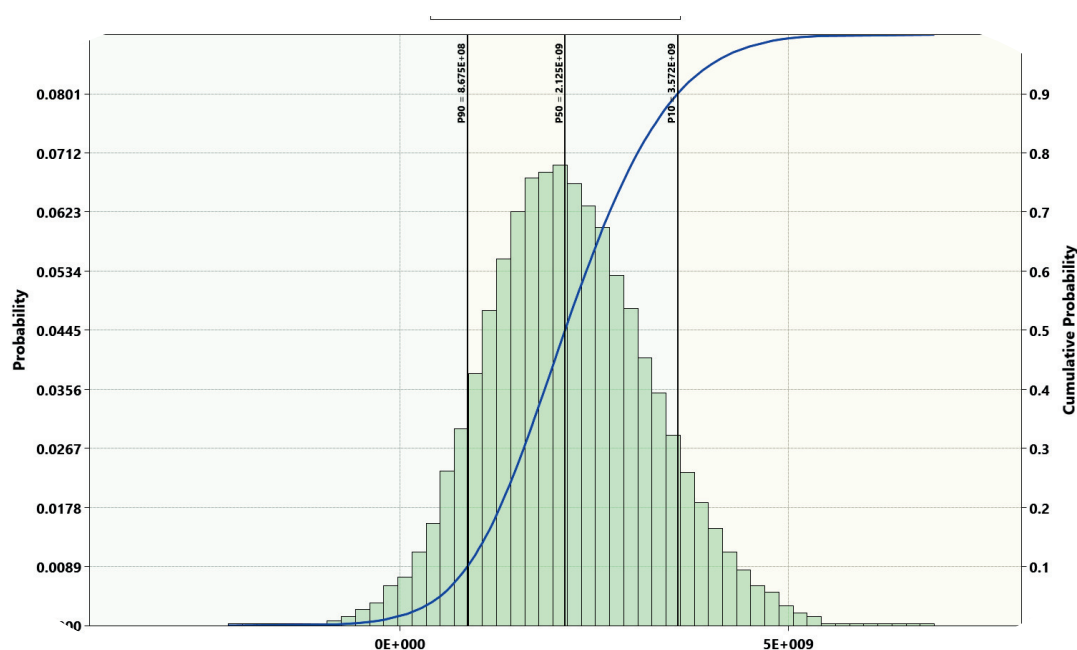
CMOST set up to consider custom regulatory KPIs:

- ✓ Plume volume of mobile, supercritical CO<sub>2</sub>
- ✓ Outlier area for pressure & plume
- ✓ Combined AoR boundaries from the multiple injection sites

Resulting in:

- ✓ Risk curves denoting the possible P10, P50, P90 AoR boundaries
- ✓ Tornado plots comparing the most impactful, uncertain parameters
- ✓ Faster, AI-driven uncertainty analysis
- ✓ Reduced evaluation time for permitting

This workflow is now a blueprint for how to de-risk storage sites, align with regulators, and make better, faster CCS decisions.



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