

PROOF-OF-CONCEPT DEMONSTRATED FOR SCIENCE-INFORMED MACHINE LEARNING TO ACCELERATE REAL-TIME (SMART) SUBSURFACE APPLICATIONS

SMART advances to Phase II Development and Validation after proof-of-concept was demonstrated through machine learning-based workflows and platforms.

PROOF-OF-CONCEPT ADVANCES DEVELOPMENT AND VALIDATION



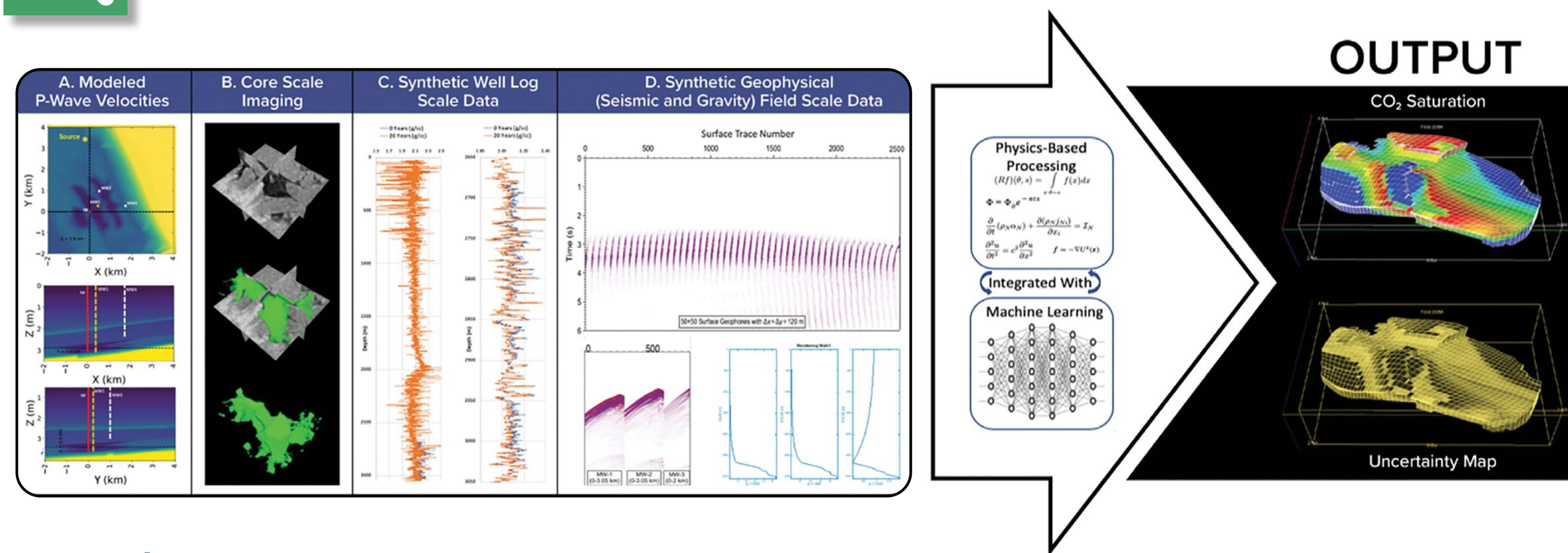
Evaluated existing state-of-the-art technologies for incorporating multiple types of data to provide CO₂ saturation images and quantify uncertainty in real-time.



Developed a prototype, demonstrating that an interactive platform using machine learning (ML)-based models can be built.

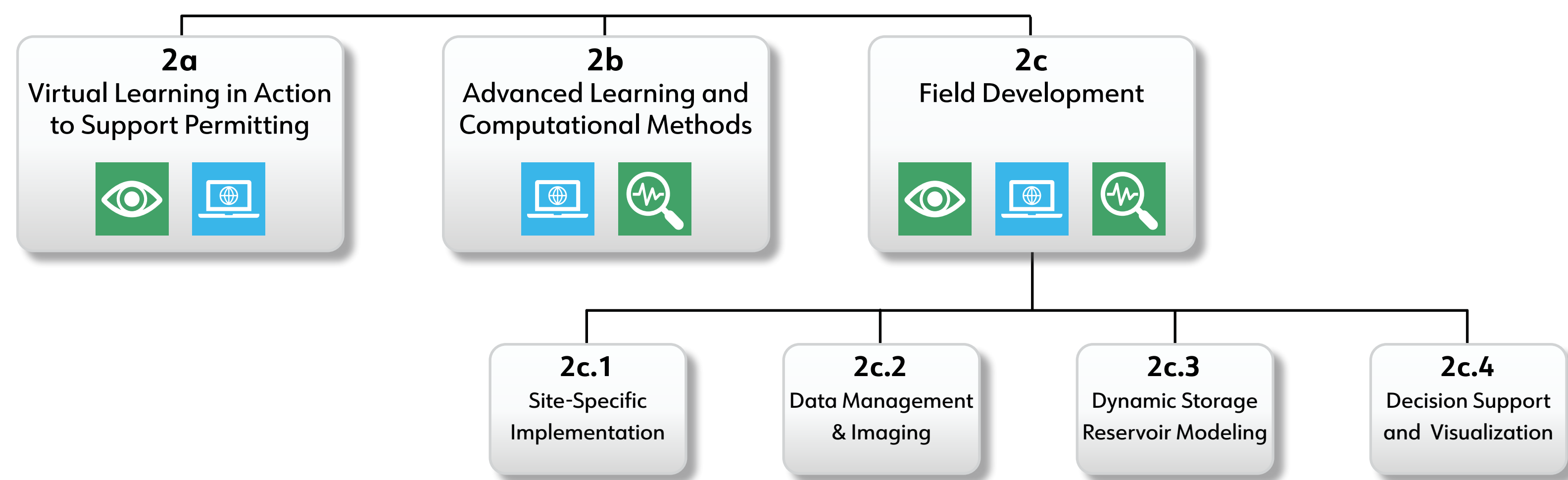


Evaluated existing state-of-the-art machine learning approaches to integrate into a workflow for rapid CO₂ and pressure plume forecasting.



SMART Phase II

- Demonstrate virtual learning in action to support regulators and stakeholders during permitting (Task 2a).
- Develop advanced learning computational methods (Task 2b).
- Apply machine learning assisted workflows from Phase I for field deployment (Task 2c).



TRANSFORMING DECISIONS THROUGH CLEAR VISION OF THE PRESENT AND FUTURE SUBSURFACE

SMART objectives are to provide added value for decision making and to develop tools for rapid deployment of carbon storage projects. Key research areas:



Real-Time Visualization
"CT" for the Subsurface

Real-Time Visualization of Key Subsurface Features and Flows

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



Rapid Prediction
Virtual Learning

Virtual Learning for Rapid Prediction of Reservoir Behavior

Perform rapid analysis of real-time data to inform operational decisions and transform reservoir management.



Real-Time Forecasting
"Advanced Control Room"

Real-Time Forecasting of Actively Managed Carbon Storage Systems

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

AWARD NUMBER
FWP-1025011

PROJECT BUDGET



● DOE \$8,749,999
● PARTNERS \$6,248,767

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FECM RDD&D PRIORITY

