Defining CO₂ Storage Options in the Upper Ohio River Valley:
Advanced Characterization of Geologic Reservoirs and Caprocks

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INTRODUCTION

As part of a collaborative effort to assess potential CO₂ storage targets in the Midwestern U.S., reservoir analysis and regional-scale CO₂ storage resource estimation has been conducted in the eastern Ohio sub-basin of the Appalachian Basin region to facilitate identification, mapping, and resource quantification of the potential reservoir and caprocks in the Cambrian-Ordovician sequence. A comprehensive geologic database has been built using existing well logs and other petrophysical core and formation top data. This database is updated as needed and is used concurrently with injection well test and operational data (2008-2015) available for more than 50 wells in the sub-basin. Geologic data have been analyzed using petrophysical and statistical techniques to help build a regional geologic model study area in eastern Ohio. Log, core, seismic line, and injection operational data indicate a stacked Cambrian-Ordovician storage complex in the eastern Ohio sub-basin may be a viable option for long-term, commercial-scale CO₂ storage in the region.

METHODOLOGY

Data Collection and Database Assembly

- In-house compilation and evaluation of well data, including log and core data
- Assessment of previous research: Appalachian Basin depositional setting and geologic evolution
- Review of previous seismic work and existing seismic data available
- Additional data collection facilitated by collaboration with local well operators, including basic and advanced logs, production/injection logging, injection tests, and operational data
- Comprehensive dataset enhances understanding of regional geologic setting, and can help provide key constraints on local-scale assessments

Regional Mapping of Geologic Reservoir and Caprock

- Maps of key petrophysical properties such as porosity and thickness were generated from well log data
- Porosity-Permeability transforms were calculated from core data for modeling input

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