Neeraj Gupta- Battelle
Christopher Korose- University of Illinois

Midwest Regional Carbon Initiative - MRCI

(Regional Initiative to Accelerate CCUS Deployment in Midwestern and Northeastern USA)

DE-FE0031836

U.S. Department of Energy

National Energy Technology Laboratory

CO_2 Storage Project Review Meeting

August 5-9, 2024

MRCI Midwest Regional Carbon Initiative

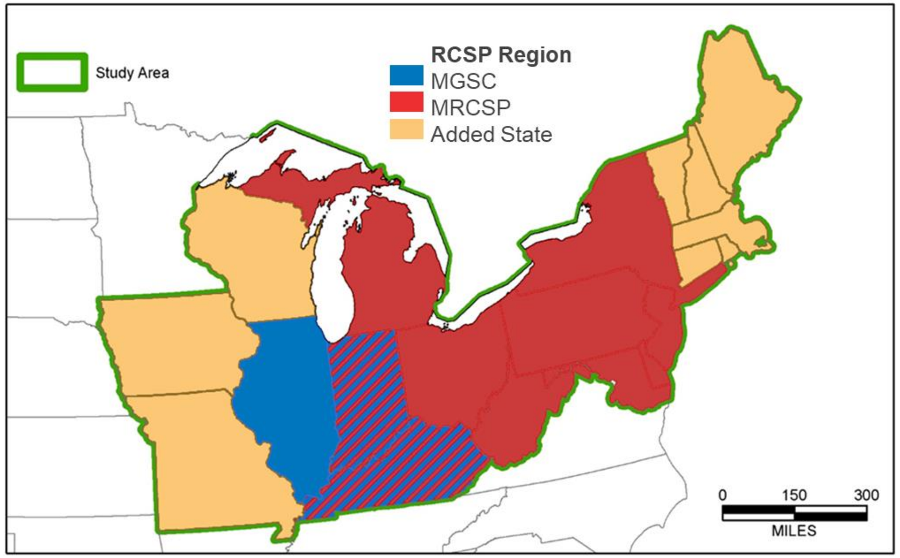
U.S. DEPARTMENT OF ENERGY | NATIONAL ENERGY TECHNOLOGY LABORATORY | BATTELLE | ILLINOIS

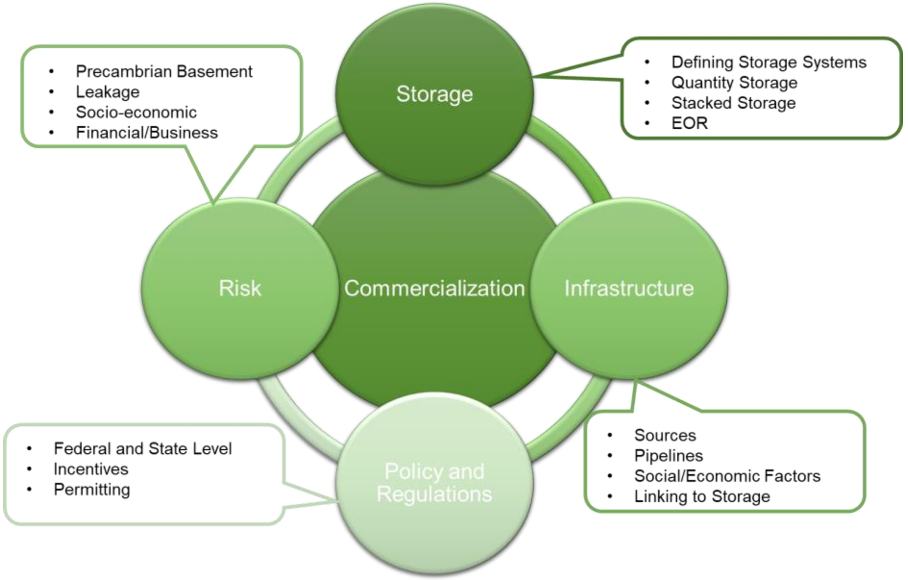
Outline

- Background and Program Goals
- Addressing Key Technical Challenges for CO_2 Storage
- Facilitating Data Collection, Sharing, and Analysis
- Enhancing Infrastructure Development
- Stakeholder Outreach
- The Future of CCS in the MRCI region

MRCI Program Goals

- Implement a collaborative Regional Initiative to accelerate CCUS deployment across Midwestern and Northeastern US.
- Build on more than 20 years of CCUS experience in the region by combining expertise of two RCSPs (MRCSP & MGSC).
- Engage national/international stakeholders, including state geological surveys, universities, industry, fossil fuel production and utilization companies, and NGOs.
- Advanced CCUS research through four tasks:
  - Addressing key technical challenges.
  - Obtaining and sharing data to support CCUS.
  - Facilitating regional infrastructure planning.
  - Performing regional technology transfer.
- Period of Performance – 2019-2024





MRCI Midwest Regional Carbon Initiative

MRCI – Collaboration between Researchers, Industry, and Government, and non-Governmental Organizations

Sponsor

U.S. Department of Energy; National Energy Technology Laboratory (NETL)

Management/ QA

- Don Lamonaca
- Chris Goodman, QA

Industry and Other Stakeholders Examples

Industry

- ADM
- AEP
- B&W
- Consol
- Consumer Energy
- Core Energy
- Denbury
- DTE Energy
- Exxon Mobil
- GeoPetro, LLC
- Marathon
- Marquis
- Honda
- MFFC Drilling
- New Steel
- NRECA Cooperative
- Peabody
- Pilot Water Solutions
- PSPC
- Repsol
- Southern Co.
- Total
- Wabash Valley Resources
- Equinor
- BP
- TC Energy
- TRC
- Navigator CO2
- SageRider
- Chevron

GOs/Academia

- CMU
- DGS
- LANL
- MGS
- MIT
- NGS
- UH
- UW
- WGS
- NYSERDA

NGOs

- C2ES
- CATF
- ClearPath
- CO_2Geonet
- EDF
- ENOS
- Japan CCS
- NARUC

Project Leads

- Neeraj Gupta, Co-PI
- Christopher Korose, Co-PI
- Matt Young, PM

Task 1

Project Management and Reporting

- Matt Young, PM
- Michelle Johnson

Task 2

Addressing Key Research Challenges

- **Mark Kelley**
- Stephen Greb

Task 3

Facilitating Data Collection, Sharing, and Analysis

- **Joel Sminchak**
- Christopher Korose

Task 4

Evaluating Regional Infrastructure

- **Jared Hawkins**
- Carl Carman

Task 5

Promoting Regional Technology Transfer

- **Joy Frank-Collins**
- Ivan Wehner
- Evan Byrnes

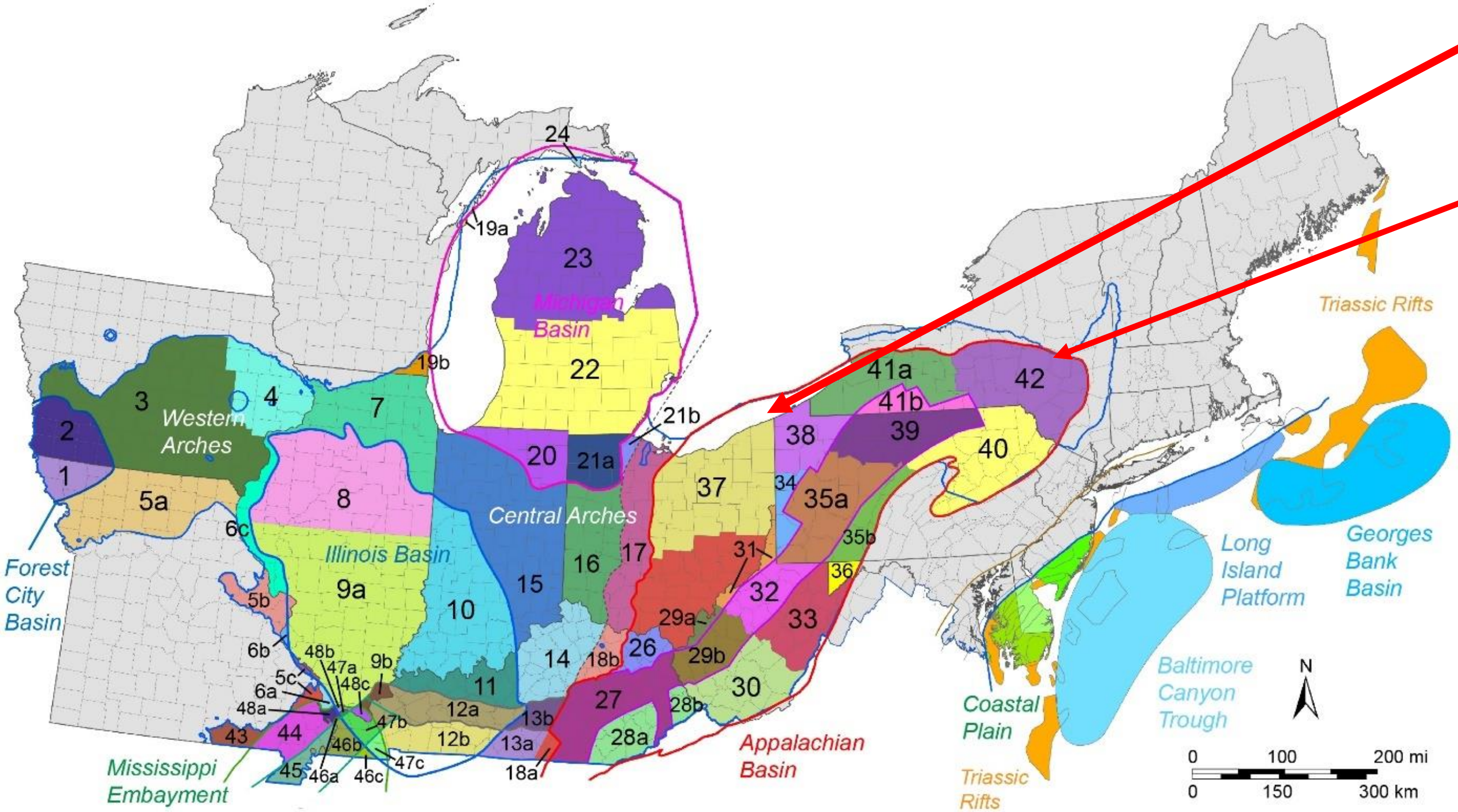
Research Team

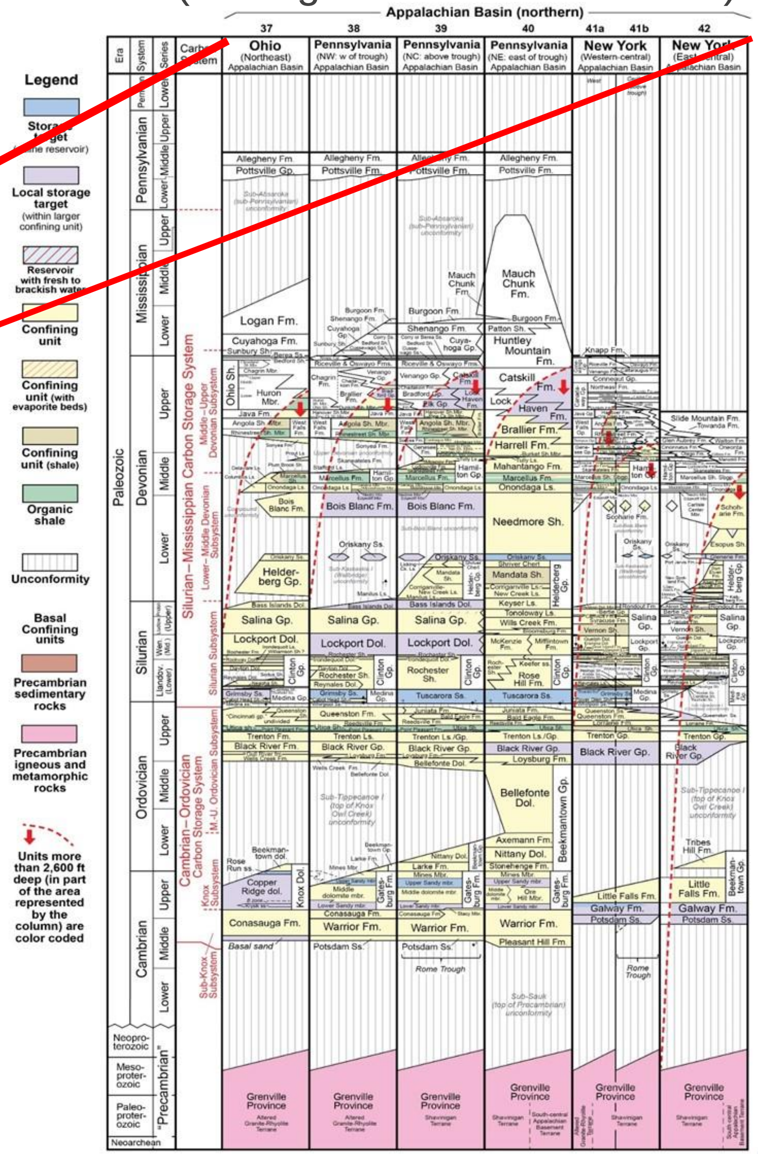
- IGWS: Ashley Douds
- Rutgers: Kenneth Miller
- KGS: Stephen Greb
- MDGS: David Brenzinski
- ODGS: James McDonald
- PAGS: Kristin Carter
- WMU: William Harrison, III
- WVGS: Jessica Moore
- Iowa GS: Ryan Clark
- LANL: Bailian Chen
- PNNL: Christopher Brown
- IEc: Chiara Trabucchi
- Core Energy: Robert Mannes
- CornerPost CO_2: Keith Tracy
- Carbon Solutions: Richard Middleton

Addressing Key Technical Challenges for CO_2 Storage

Defining Carbon Storage Systems

Stratigraphy of Northern Appalachian Basin (subregions numbered 37-42)



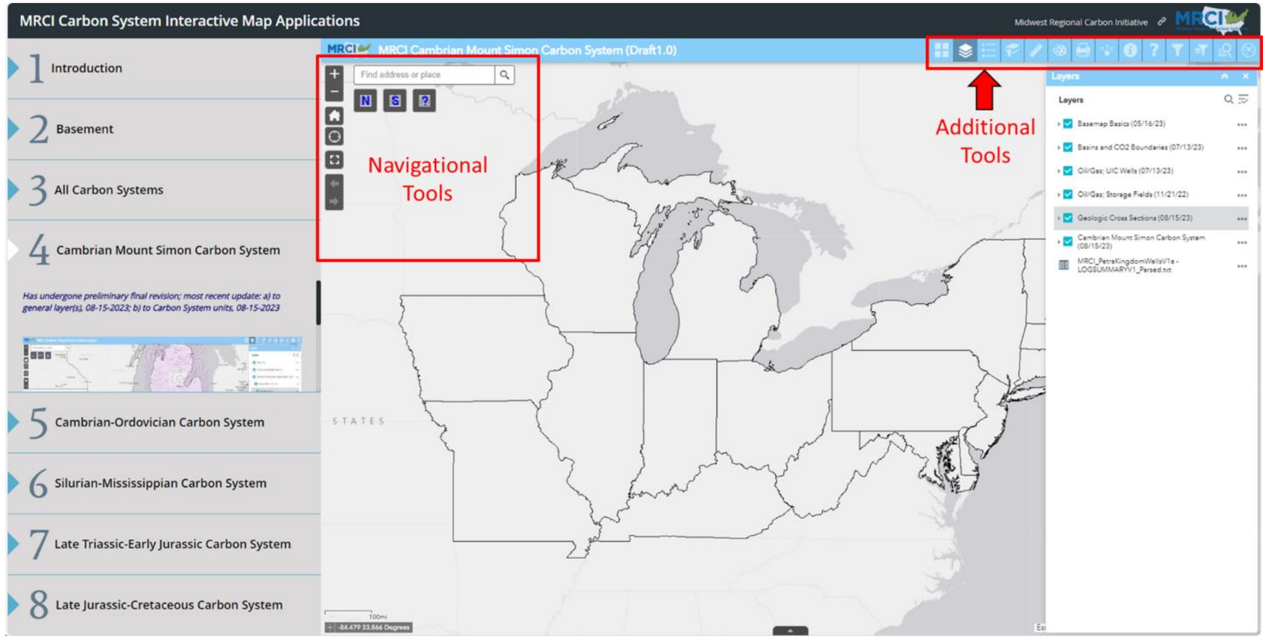


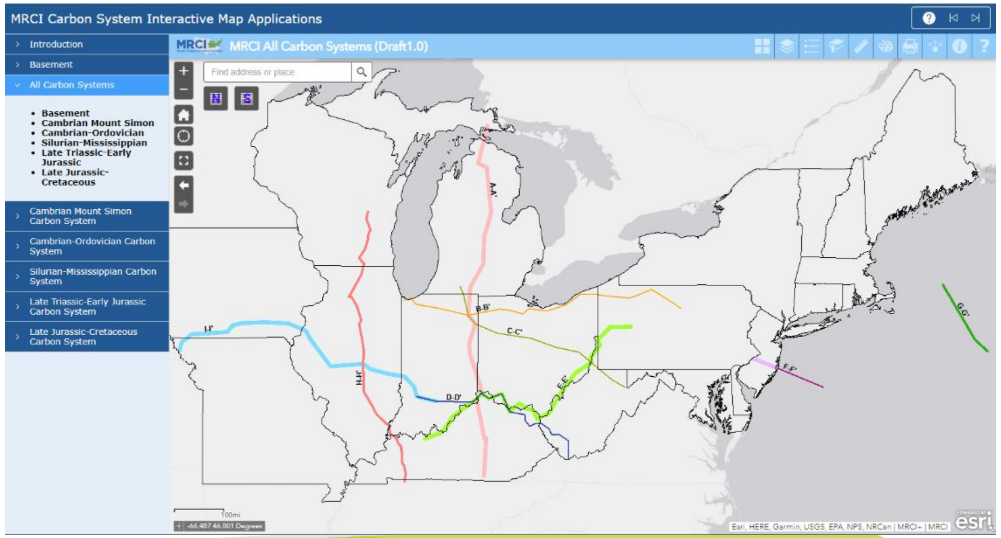
- Stratigraphic columns developed for each onshore and offshore region (example shown for the Northern Appalachian Basin)
- The columns identify potential storage targets and confining layers.

Online Interactive Map (IMap)

MRCI GeoTeam Collaboration

- Total of 818 map layers compiled into a single online ArcMap.
- Central repository for structure, thickness, and property maps for storage and caprock formations throughout the region.
  - *Cross-sections, oil, gas, and storage field locations, and stratigraphic columns among other items accessible through IMap.*
  - *Well data inventory was compiled, which shows data available in wells that penetrate 29 key storage reservoirs in the region.*





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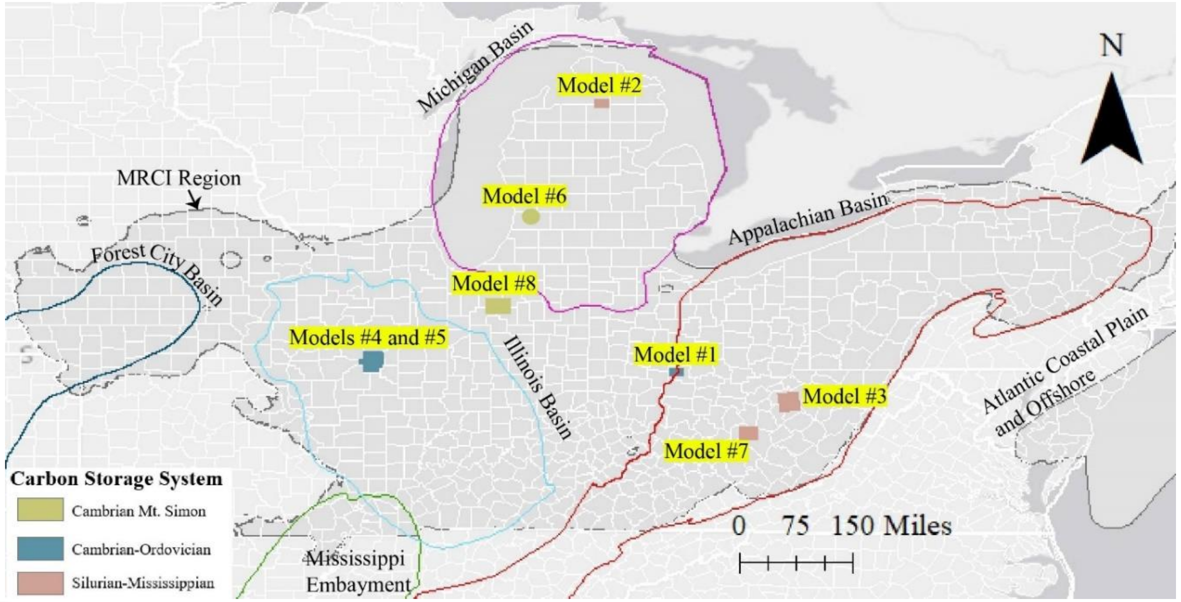
MRCI Sites for CO_2 Injectivity Feasibility Analysis using 3D Site-Scale Models

- Eight site-specific model sites which had static and/or dynamic models developed.
- Models spanning Illinois to West Virginia showcase the variability in reservoir quality throughout the region.



Model #	Model Location	Carbon Storage System	Storage Formations of Interest	Storage Resource Estimate[1] (Tonnes/mi^2)	Previous Model Reference
Model #1	Pickaway County, Ohio	Cambrian-Ordovician	Maryville, Upper Conasauga	90,501 (p10), 298,798 (p50), 713,955 (p90)	Battelle (2017)
Model #2	Antrim and Otsego Counties, Michigan	Silurian-Mississippian	Bass Islands	78,998 (p10), 109,120 (p50), 196,942 (p90)	Battelle (2018)
Model #3	Tri-State Area (Gilmer, Ritchie, Doddridge Counties, WV)	Silurian-Mississippian	Oriskany	30,395 (p10), 121,181 (p50), 355,945 (p90)	N/A [New model]
Model #4	Macon County, Illinois	Cambrian-Ordovician	Potosi	N/A (Only dynamic modeling results)	Adushita et. al., (2013 and 2014)
Model #5	Macon County, Illinois	Cambrian-Ordovician	St. Peter	N/A (Only dynamic modeling results)	Will et al., (2014)
Model #6	Ottawa County, Michigan	Cambrian Mount Simon	Mount Simon	109,792 (1% SEF) 548,964 (5% SEF)	N/A [New model]
Model #7	Kanawha and Putnam Counties, West Virginia	Silurian-Mississippian	Oriskany, Newburg	8,662 (p10), 54,693 (p50), 100,692 (p90)	N/A [New model]
Model #8	Cass, Fulton, Pulaski, and White Counties, Indiana	Cambrian Mount Simon	Mount Simon	544,739 (1% SEF), 2,727,140 (5% SEF),	N/A [New Model]

[1] Storage resource estimates are based on the volumetric storage capacity over the model area.

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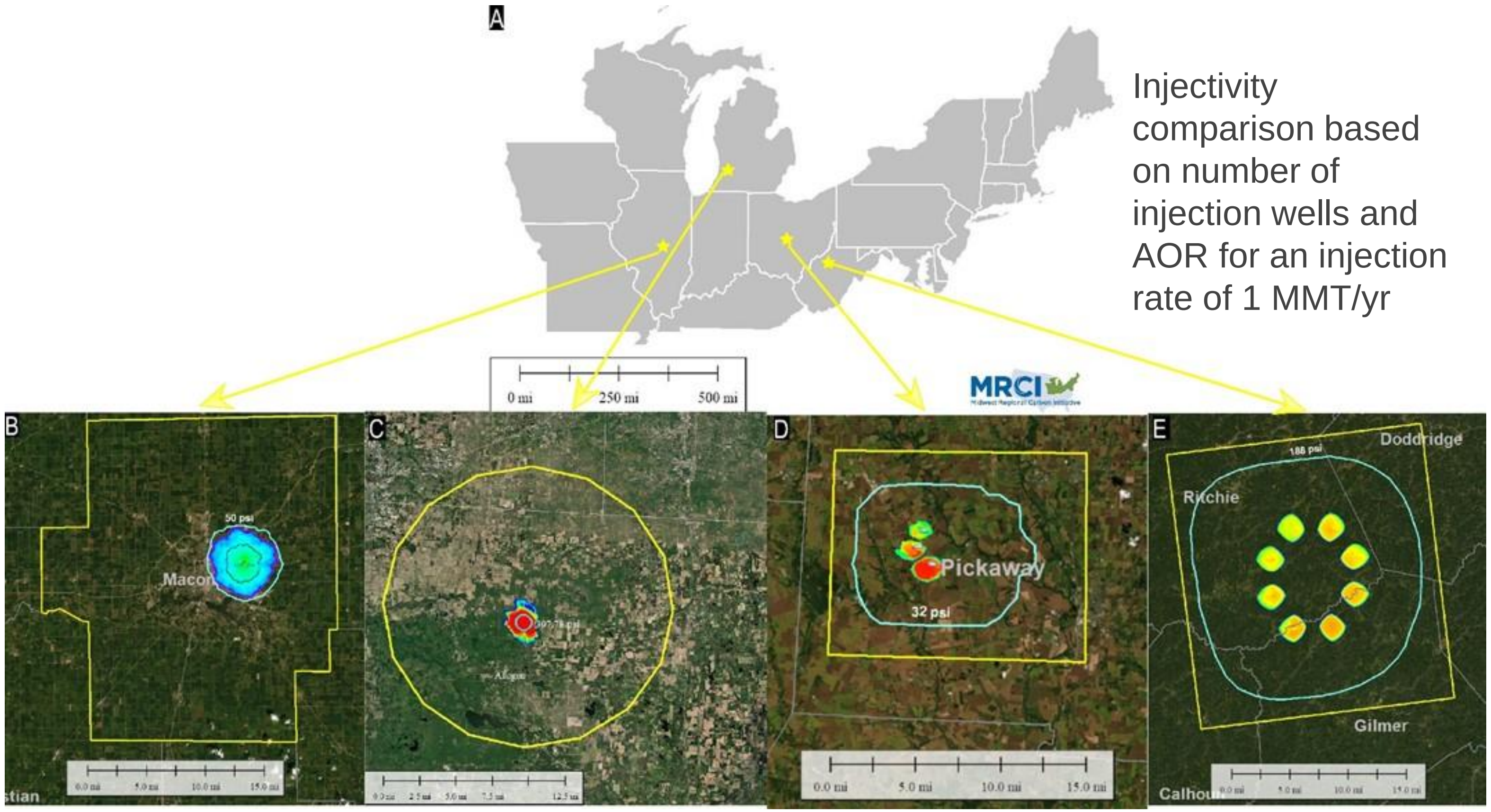
CO_2 Injectivity from Site-Scale Models

- Feasibility of select formations showing number of injection wells and Area of Review (CO_2 plume and pressure) required to accommodate the target injection rate.
- Best sites with sufficient data are in the Illinois Basin and Michigan Basin
- Deeper basins require more wells and exploration



Injectivity comparison based on number of injection wells and AOR for an injection rate of 1 MMT/yr

Potosi Fm Illinois (1 well)

Mt Simon Fm Mich (1 well)

Marysville Fm Ohio (3 wells)

Oriskany Fm only, WV (8 wells)

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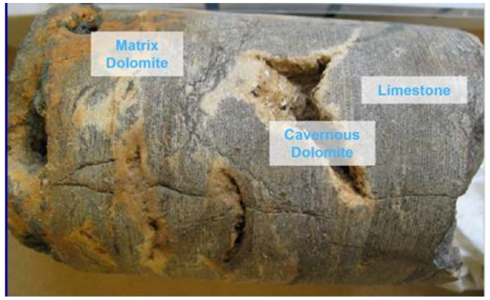
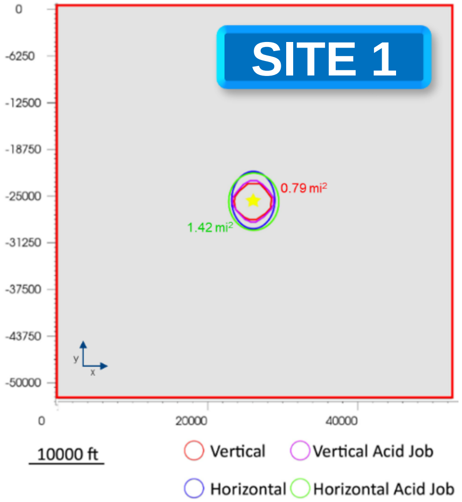
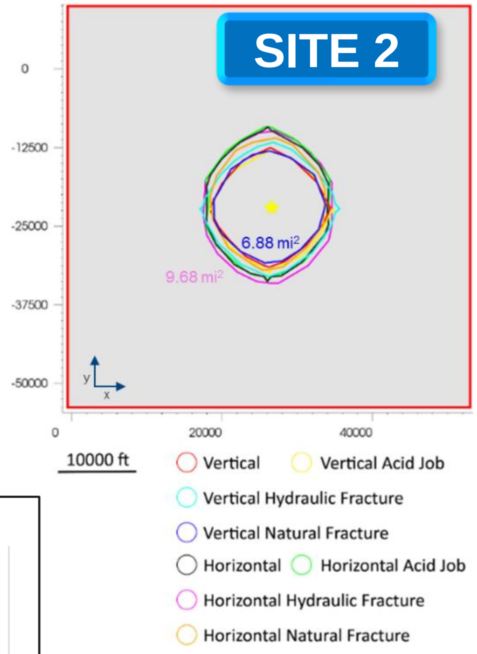
Adapting Oilfield Operational Strategies for Optimizing Injectivity in Complex CCS Systems

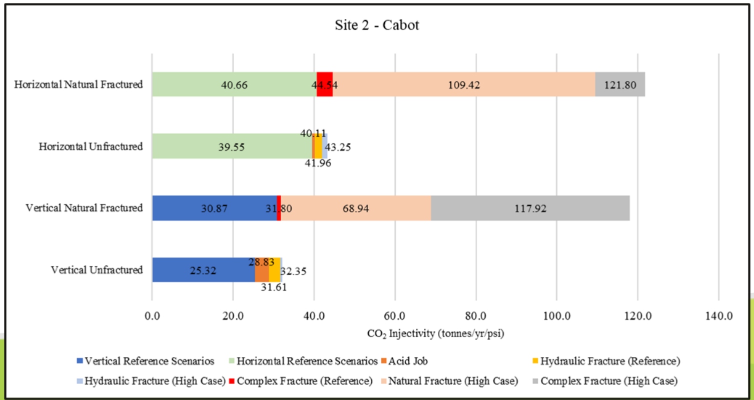
- Many onshore regions of the U.S. comprise complex naturally fractured or 'lower quality' reservoirs that could contain significant additional resource potential for CO_2 to support commercial CCS projects.
  - Matrix permeabilities between 10-30 mD
- Oilfield strategies like horizontal wells and limited hydraulic stimulation for improving CO_2 injectivity and storage efficiency.
  - To inform feasibility, guide optimization of multi-well networks for commercial-scale CCS projects in complex reservoirs.
  - Connected natural fractures in reservoir zone contribute to improve storage efficiency and injection compared to unfractured systems.
  - Evaluate geomechanical impacts of sustained large-scale injection on a site-specific basis.



Trenton Limestone core from Michigan







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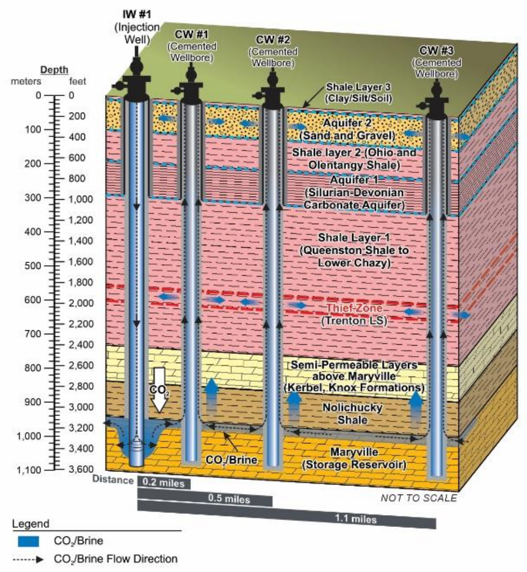
Assessing Containment Risks for Different CS Systems

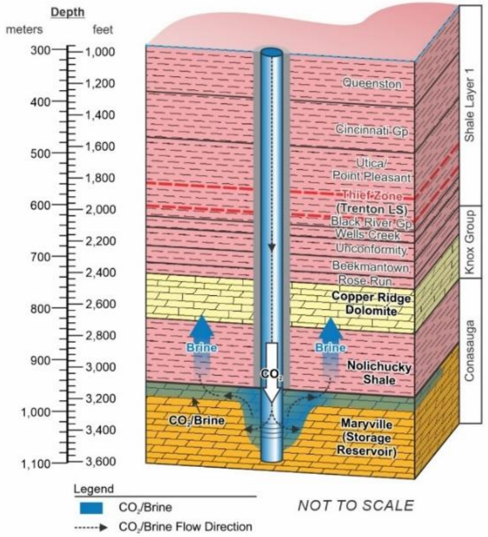


Conceptual diagram for leakage along cemented wells

- Objective – evaluate feasibility of DOE NRAP Reduced Order Models (ROMs) for assessing containment risks at CO_2 storage sites

- Methodology – evaluate two primary leakage pathways:
  - Leakage along cemented wellbore (NRAP-OPEN-IAM)
  - Leakage across unfractured caprock (NRAP OPEN-IAM Seal Horizon component)

Note: The Seal Horizon mode did not produce valid results, so the 3D GEM model(s) were used to evaluate the caprock leakage pathway.



Conceptual diagram for leakage across caprock

Selected MRCI Technical Challenge Publications

Carpenter, N.S., Schmidt, J.P., Kelley, M.E., Greb, S.F., Wang, Z.W., 2022. **Developing a Baseline Seismicity Catalog in the North-Central and Northeastern U.S. to Assist with CCUS Deployment**, *in* 2022 GSA Joint Northcentral – Southeastern Section, April 7-8, 2022, Cincinnati, OH: Geological Society of America Northcentral – Southeastern Section Annual Meeting, vol. 54, no. 4, p. 23. (Presentation)

Collie, A.J., Ravi-Ganesh, P., Haagsma, A., 2023, **CO2 Storage and Injection Modeling of the Mt. Simon-Eau Claire Saline Reservoir System, Southwest Michigan**. AAPG CCUS 2023, Theme 3.

Conner, A., Kelley, M. , Ravi-Ganesh, P., Haagsma, A., Gupta, N. , Greenburg, S., Leetaru, H. , Greb, S., Moore, J., Carter, K., Harrison, W., **Developing a Regional Framework to Define and Assess CO_2 Storage Systems in the Midwestern to Northeastern United States**, Mar. 2022, AAPG CCUS 2022 Conference Houston, Texas (Poster)

Conner, A., Kelley, M., Ravi-Ganesh, P., Haagsma, A., Gupta, N., Greenberg, S., Leetaru, H., Greb, S., Moore, J., Carter, K., Harrison, W., **Assessing Multi-State CO_2 Storage Systems in the Midwestern to Northeastern United States** - Southeastern Section, April 7-8, 2022, Cincinnati, OH: Geological Society of America Northcentral – Southeastern Section Annual Meeting, vol. 54, no. 4, p. 23. (Presentation)

Conner, A., Kelley, M., Haagsma, A., Ravi-Ganesh, P., Gupta, N. , Greenberg, S., Leetaru, H. , Greb, S., Moore, J., Carter, K., Harrison, W., **Assessment of Storage Systems in the Midwest-Northeastern United States for Large-Scale CCUS Projects** - 16th International Conference on Greenhouse Gas Control Technologies GHGT-16. 23-27th October 2022, Lyon, France (Poster)

Haagsma, A., Skopec, S., Conner, A., Ravi Ganesh, P., Kelley, M., **Developing 3D Static Earth Models to Represent CO_2 Storage Systems in the Midwestern United States**, Apr. 2022, GSA 2022 Joint North-Central & Southeastern Section Meeting (Presentation)

Hulett, Samuel, and McDonald, James, 2022, **CO2 solubility in the Silurian "Clinton/Medina" Sandstone – Multi-element modeling and implications for carbon storage**, *in* 2022 GSA Joint Northcentral – Southeastern Section, April 7-8, 2022, Cincinnati, OH: Geological Society of America Northcentral – Southeastern Section Annual Meeting, vol. 54, no. 4, p. 23. (Presentation)

Mawalkar, S., James, D., Skopec, S., Hershberger, J., Kelley, M., Ravi Ganesh, P., Gupta, N., **Evaluation of Wellbore Leaks and Impacts Using the NRAP OPEN-IAM Model**. Jun. 2023, IEAGHG Risk Management Network Meeting, Edinburgh, Scotland.

McDonald, James, Waid, C.B.T., Solis, M.P., Hulett, S.R.W., and Danielsen, E.M., 2022, **Regional characterization of the Utica Shale/Point Pleasant Formation for enhanced oil recovery**, *in* 2022 GSA Joint Northcentral – Southeastern Section, April 7-8, 2022, Cincinnati, OH: Geological Society of America Northcentral – Southeastern Section Annual Meeting, vol. 54, no. 4, p. 16. (Presentation)

Ravi Ganesh, P., Hershberger J., Vance, T., Skopec, S., Chundur, S., Kelley, M., Gupta, N., **Adapting Oilfield Operation Strategies for Optimizing Injectivity in Complex CCS Systems - A Scoping Study**. 2024. SPE-218919-MS.

Skopec, S., Haagsma, A., Ravi Ganesh, P., Kelley, M., Conner, A., Mawalkar, S., **Screening Assessment of the Oriskany Sandstone in Northern West Virginia for Hosting a Commercial-Scale CO_2 Injection Site**, Aug. 2022, AAPG/SEG IMAGE Conference, Houston, TX.

Skopec, S., Mawalkar, S., Vasylkivska, V., Ravi Ganesh, P., Haagsma, A., Kelley, M., **Risk Assessment of Carbon Storage at Potential Midwest Regional Carbon Initiative (MRCI) Sites Using NRAP Open-IAM Component Models**, Aug. 2022, AAPG/SEG IMAGE Conference, Houston, TX.

Skopec, S., Mawalkar, S., Kelley, M., Conner, A., Chundur, S., Pool, S., **Generating a Regional Data Inventory to Accelerate CCUS Deployment in the Midwestern and Eastern United States**, CCUS 2024 Conference, Houston, TX.

Wong, I., Carpenter, S., Kelley, M., Bubeck, A., Schmidt, P., Wu, Q. Wang, Z., Greb, S., Sparks, T. and N. Lewandowski (2022**). Towards large-scale characterization of induced seismicity potential and its impacts for CCUS in the central and eastern U.S.** 16th International Conference on Greenhouse Gas Control Technologies GHGT-16. 23-27th October 2022, Lyon, France

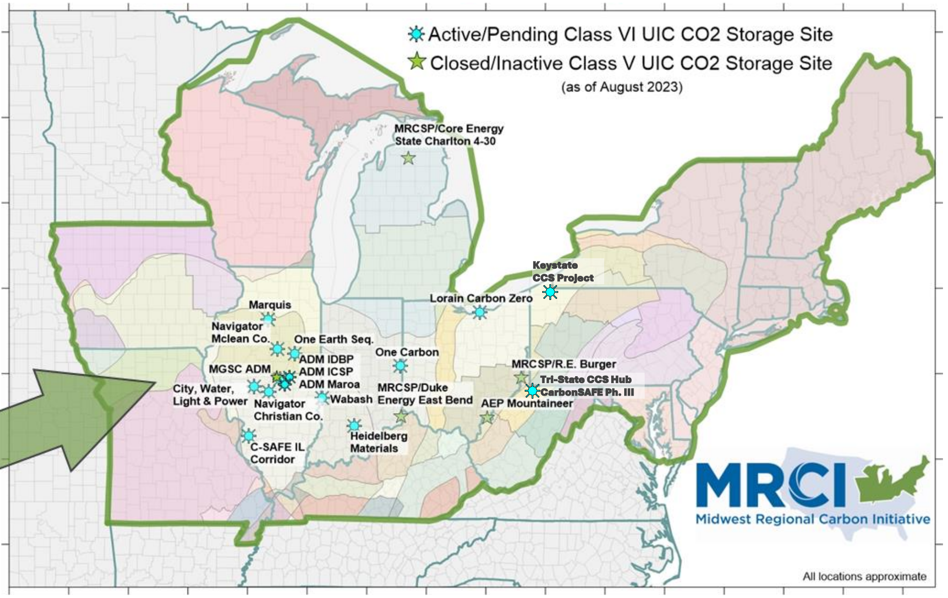
MRCI Midwest Regional Carbon Initiative

Facilitating Data Collection, Sharing, and Analysis

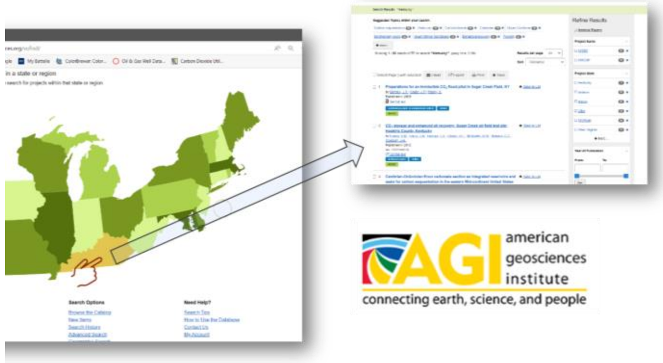
MRCI Task 3 Impact: Previous Testing and Research in the MRCI- *A foundation for CCS Development*

- Providing confidence & practical examples for CCS development from previous DOE/State CCS efforts, legacy seismic, risk analysis, CO_2 injection tests, datasets.
- Providing clarity on key topics (carbonates in Illinois & Appalachian Basin, realistic injectivity rates for CO_2 wells, ethanol & NG CCS)
- Accelerating 10-20 CCS projects in the MRCI
- Supporting feasibility studies at 50+ sites in MRCI

Current/Pending CCS Projects



Sharing Key Research & Datasets



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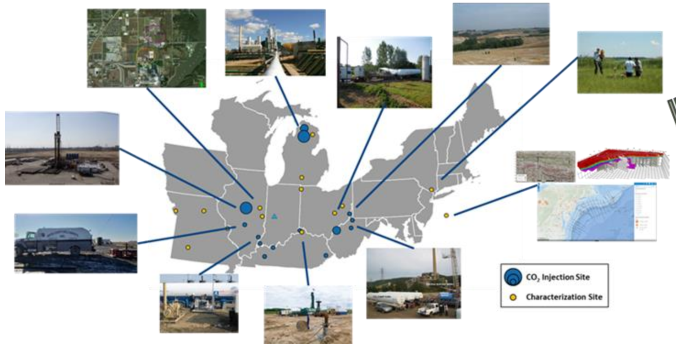
Previous Testing & Research



MRCI- Additional Data Analyses

Additional analysis completed with existing CCS datasets for MRCI:

- *Class I & II Underground Injection Control well injectivity analysis*
- *Central MRCI Ethanol Plant CCS Screening Study*
- *Greenhouse Gas Emissions Life Cycle Analysis for MRCI Sources*
- *ACT collaboration for micro-seismicity*
- *Machine learning for downhole pressure/temperature prediction*
- *CT scan for carbonate porosity zones*
- *NRAP tool validation with field data in MRCI*

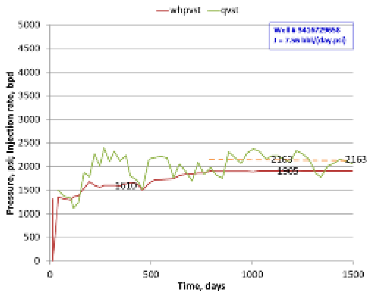
Effective monitoring of long-term site stability for transparent carbon capture and storage hazard assessment (ENSURE)

Description of case study sites

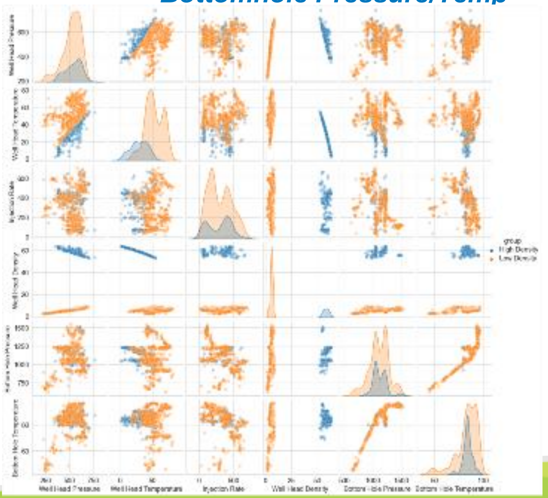
NORSAR

Accelerating CCS Technologies

Class II UIC Well Injectivity Analysis

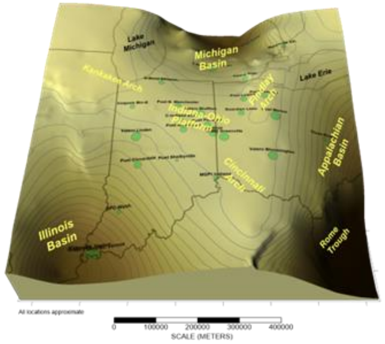


Machine Learning for Bottomhole Pressure/Temp

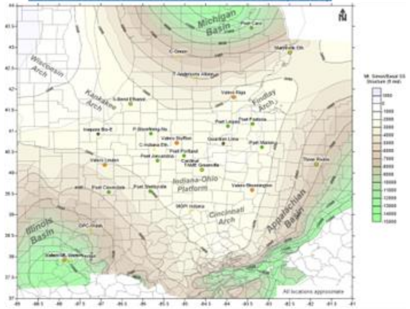


Central MRCI Ethanol Plant CCS Screening

3D Diagram of Regional Basins & Arches

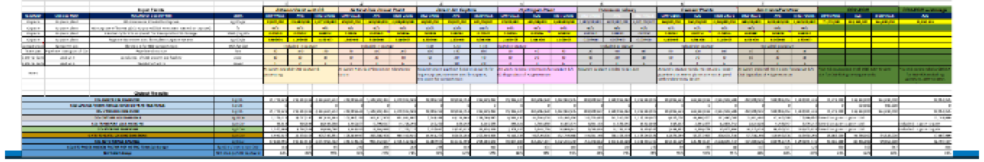


Mt. Simon/Basal Sandstone Structure (ft msl)



GHG LCA Net CO_2 Storage

- Ethanol Plant with CS (82-90%)
- Direct Air Capture Plant (59-90%) (depending on energy source for capture)
- Petroleum refinery (NA)
- Fertilizer/Ammonia Plant (87-88%)
- Natural Gas Power Plant (71-76%) (accounting for displaced electricity)
- Hydrogen Plant (88-90%)
- Cement Plant (90-91%) (new facility)
- CO2-EOR (59-66%) (not including downstream combustion of fuel products)



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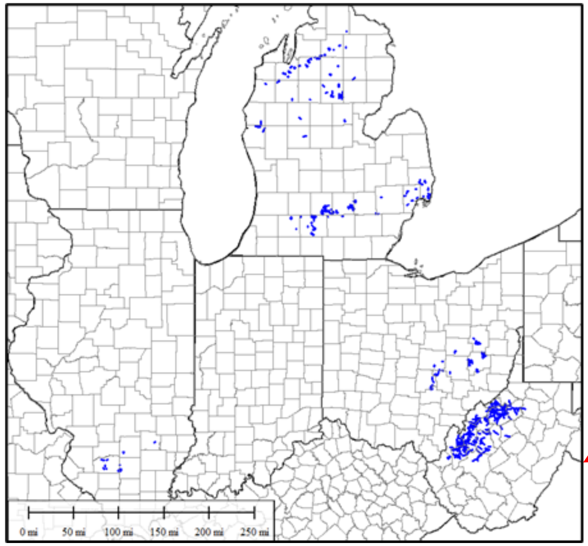
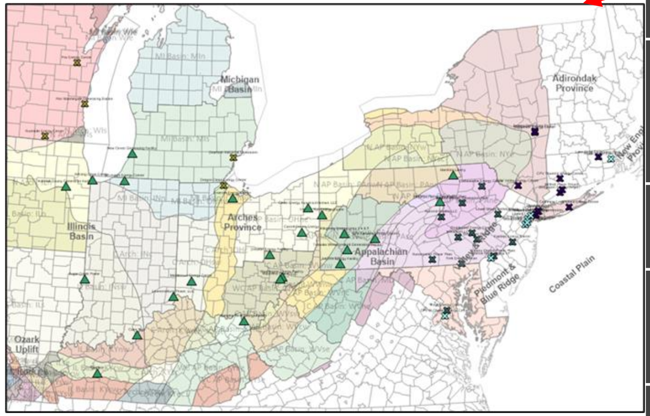
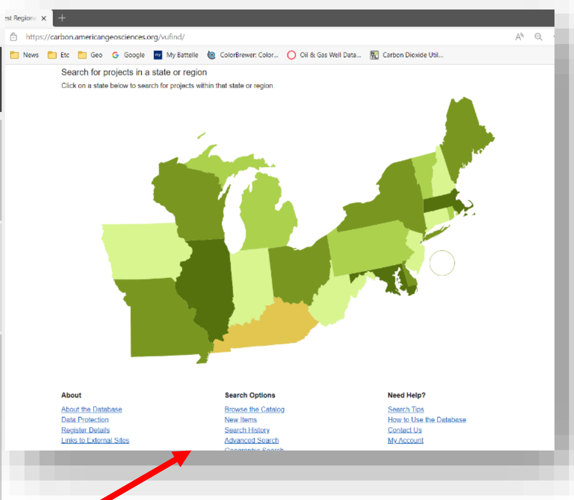
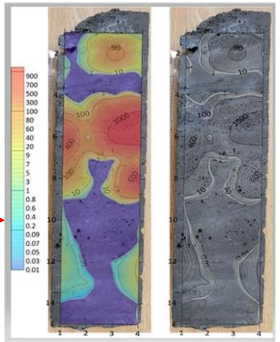
MRCI – Data Compilation/Sharing Accomplishments

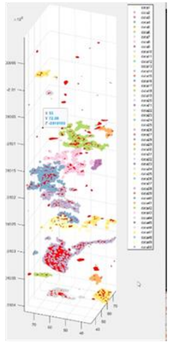




SubTask	Topics	Status
3.1 Inventory Available Data & Analyses	• **Inventory pre-existing datasets, research, reports** • **Prepare Task 3.1 Memo**	• **Complete (Nov 2021)** • **Complete (June 2021)**
3.2 Facilitate Data Collection, Sharing	• Data sharing, survey industrial CCUS progress, engage reg. agencies • Provide data/info for industry CCS development	• Ongoing • Ongoing
3.3 Plan & Execute Additional Analyses	• **Legacy Seismic Data Procurement, Organization, and Evaluation** • **Class I & II Underground Injection Control well injectivity analysis** • **Central MRCI Ethanol Plant CCS Screening Study** • **Greenhouse Gas Emissions Life Cycle Analysis for MRCI Sources** • **AGI database compilation and web portal for key research/datasets** • **Natural Gas Power Plant CCS Screening** • **Appalachian Basin Carbonate Storage Characterization (Hunt)** • MMP testing Oil Samples in MRCI CO2-EOR fields • ACT collaboration for micro-seismicity • Additional Legacy Seismic, Digitizing physical/retro media	• **Complete (Aug 2023)** • **Complete (May 2022)** • **Completed (April 2021)** • **Completed (Aug 2021)** • **Complete (Feb 2023** • **Complete (Aug 2023)** • **Complete (June 2023)** • **Complete (May 2024)** • In progress • **Complete (June 2024)**
3.4 Engage NRAP/NETL	• **NRAP Class VI Rules and Tools support** • **Wabash R. NRAP Open-IAM & SOSAT tool application** • Task 2 risk modeling with NETL & LANL • NRAP workgroups, identify field datasets, review collaboration activities	• **Complete (Jan 2022)** • **Complete (July 2022)** • **Complete (March 2024)** • Ongoing
3.5 Engage Nat. Labs	• NRAP workgroups, identify field datasets, review collaboration activities • Survey/engage other NL CM projects in MRCI	• **Complete (March 2023)** • Ongoing
3.6 Advise Machine Learning for CCUS	• **BHP/BHT Prediction from Wellhead Data Using Machine Learning** • **Carbonate Char. using 2D & 3D Images to Predict Reservoir Props**	• **Complete Sept. 2021** • **Complete (Feb 2022)**
3.7 Participate in SMART Initiative	• **Mawalkar/RaviG- Predictive Analysis of Pres-Temp in Carbonate Res.** • **Kelley/RaviG- Mach. Learning Based Near-Realtime Leakage Detection for Caprock Integrity Monitoring using DAS data from CCS Operations**	• **Complete (Dec 2021)** • **Complete (Dec 2021)**







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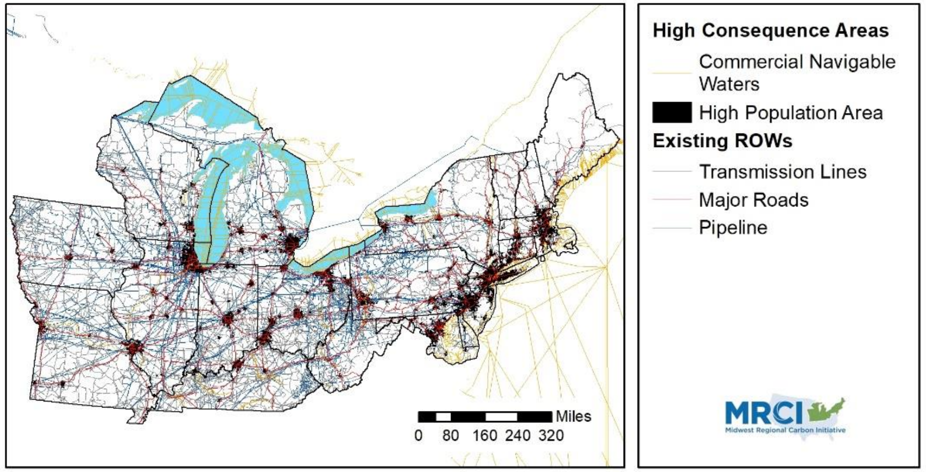
Rethinking infrastructure for Carbon Capture, Utilization, and Storage (CCUS)

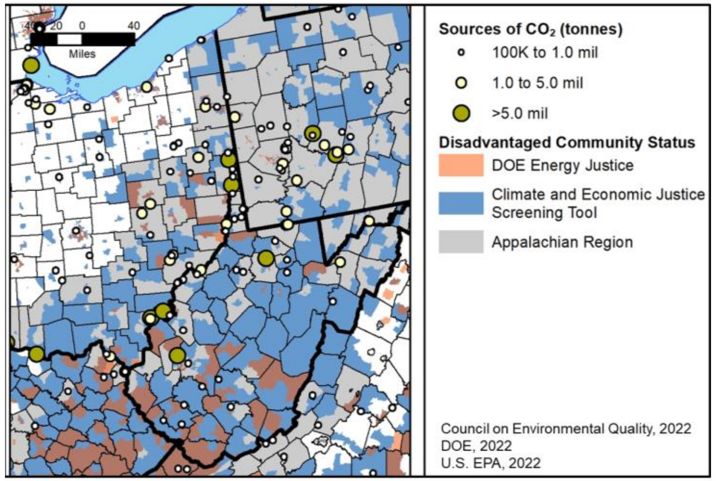
Researching the infrastructure of CCUS is more than just the physical equipment that enables CCUS; it also includes the policy, economics, and people that make CCUS work.

Evaluating Regional Infrastructure

GOAL: Evaluate current infrastructure and future needs to accelerate CCUS deployment

- Conduct a screening level **infrastructure assessment** of surface and subsurface infrastructure
- Assess **site readiness** to rank areas
- Conduct analysis of **social, economic, and workforce development** factors
- Analyze current **regulatory, pore space issues**, gaps, policy, and tax incentives





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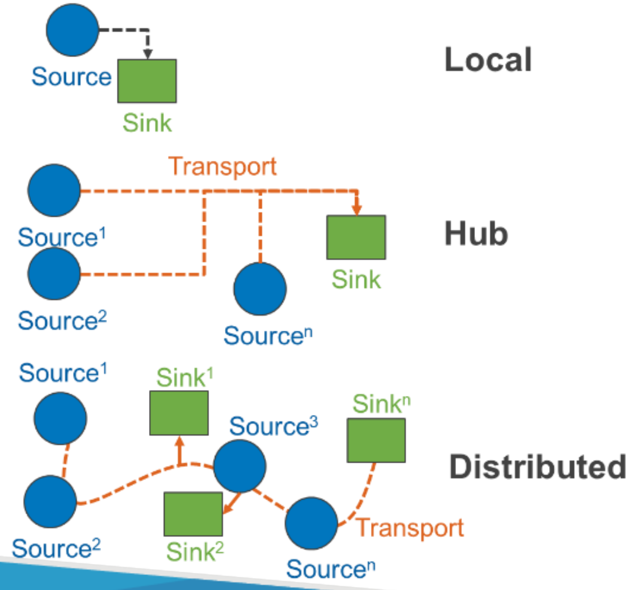
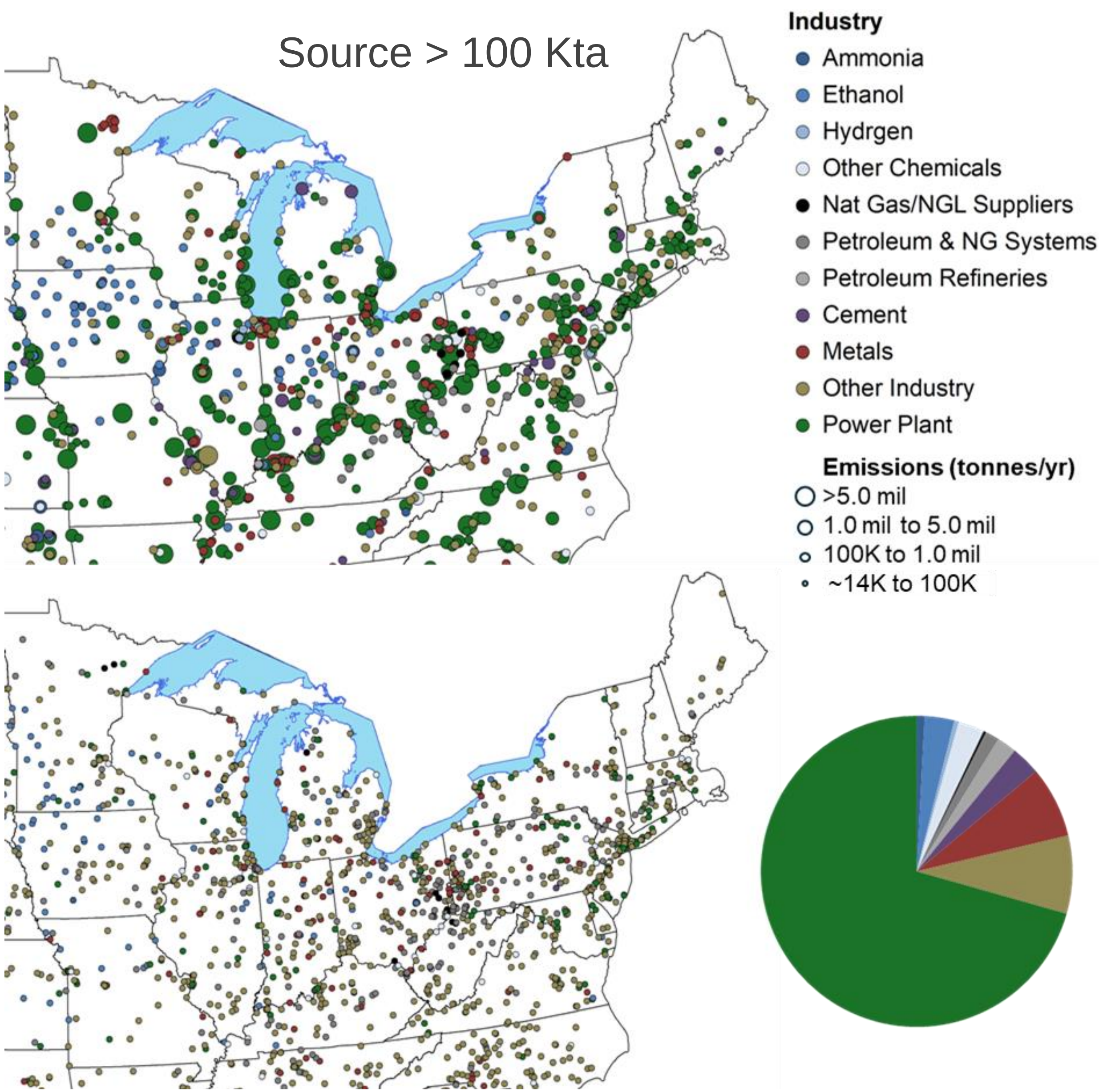
Infrastructure Assessment

- The expansion of the 45Q tax credits have unlocked the potential for capture of an additional 84.1 MMt/yr at 1167 facilities.
- Scenarios have been created to connect these sources with sinks.
- Intermodal transport must be considered next.





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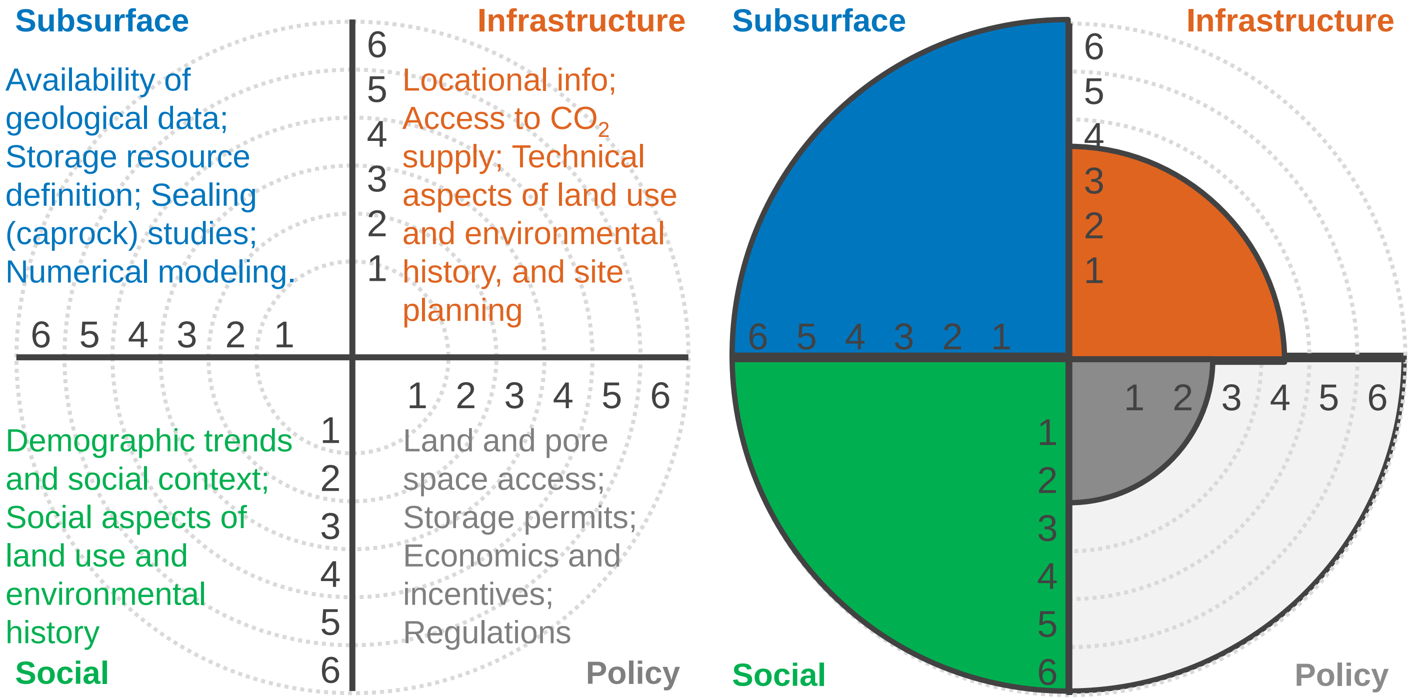
Site Readiness

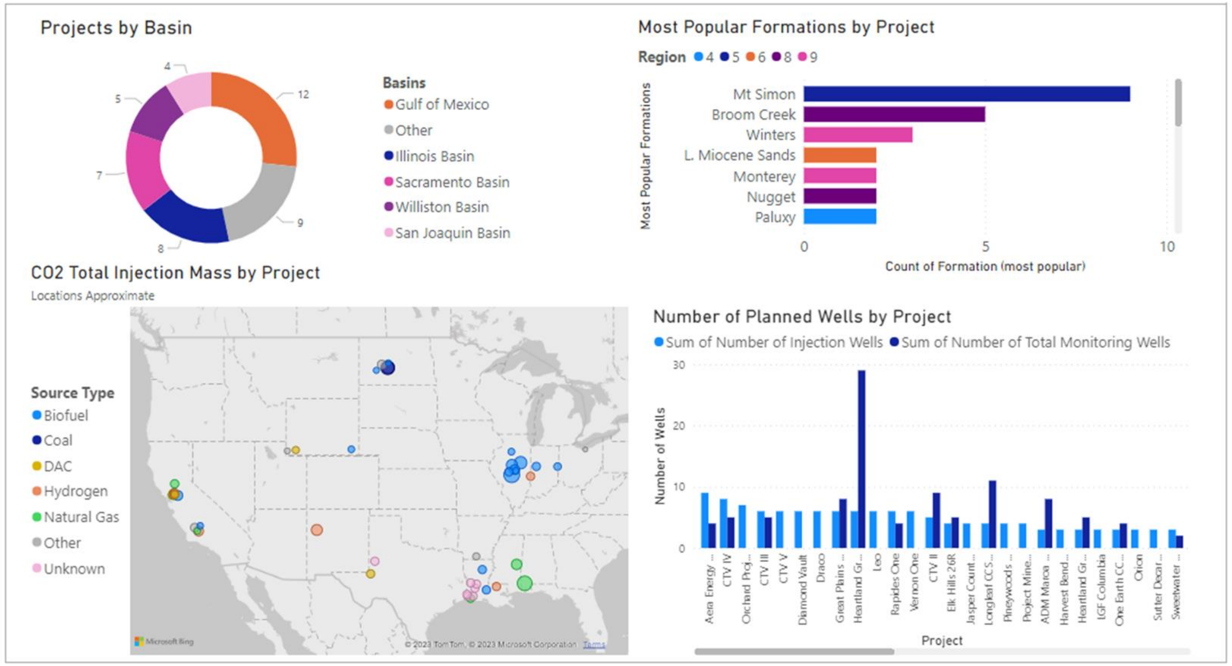
- An assessment of the amount of completed work to advance a project site toward commercial subsurface carbon storage.
- Four categories for integrated projects rated on a six-point scale



Rating	Definition
1	No work has been done in area
2	Screening (regional) assessment
3	Site selection (sub-regional) study
4	Initial site characterization
5	Advanced site characterization
6	Demonstrated commercial viability

Regulations / Permitting – Analyzing Class VI Permits

- **Goal of this analysis:** Assess Class VI submissions to analyze key approaches of the project parameters, subsurface characterization, and monitoring plans.
- In addition, MRCI supporting states in their CCS regulatory (Class VI, pore space, stewardship) development:
  - WV – Primacy in application stage,
  - PA – CCS primacy, pore space bill signed
  - OH – in consideration



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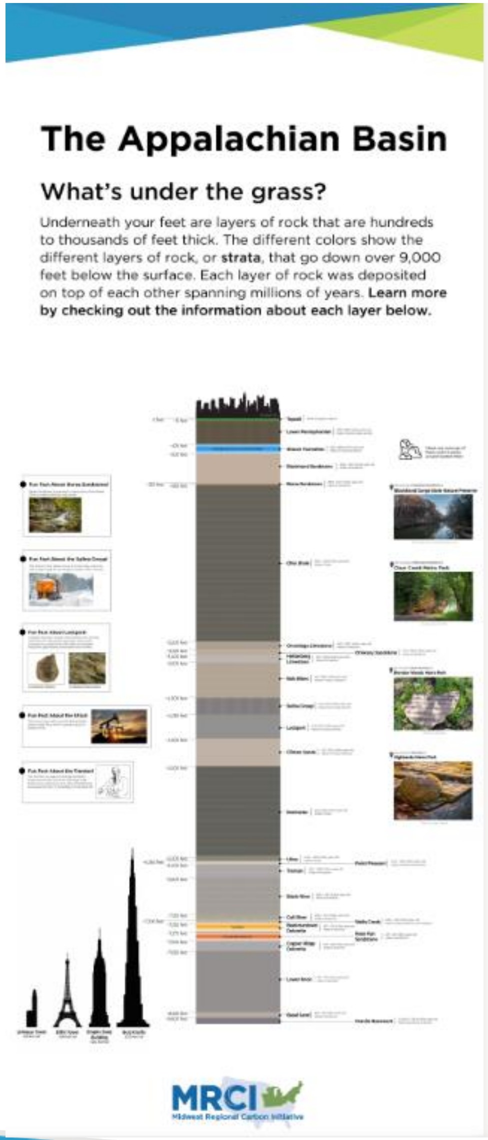
Infrastructure Accomplishments

The task 4 team accomplished several things during the MRCI project.

- Established several *source/sink-transport* case studies and completed routing
- Outlined an *infrastructure security* assessment framework
- Conducted a *stakeholder assessment* using DOE's / WH Council on Environmental Quality's mapping tools
- Completed a *jobs and economic impact* analysis for a realistic hub scenario in the Appalachian Basin
- Demonstrated an in-depth *pipeline routing assessment* for the Michigan Basin, which included identifying sensitive areas, determining impacted communities, and discussing mitigation efforts
- Completed an assessment of publicly available *Class VI permits*

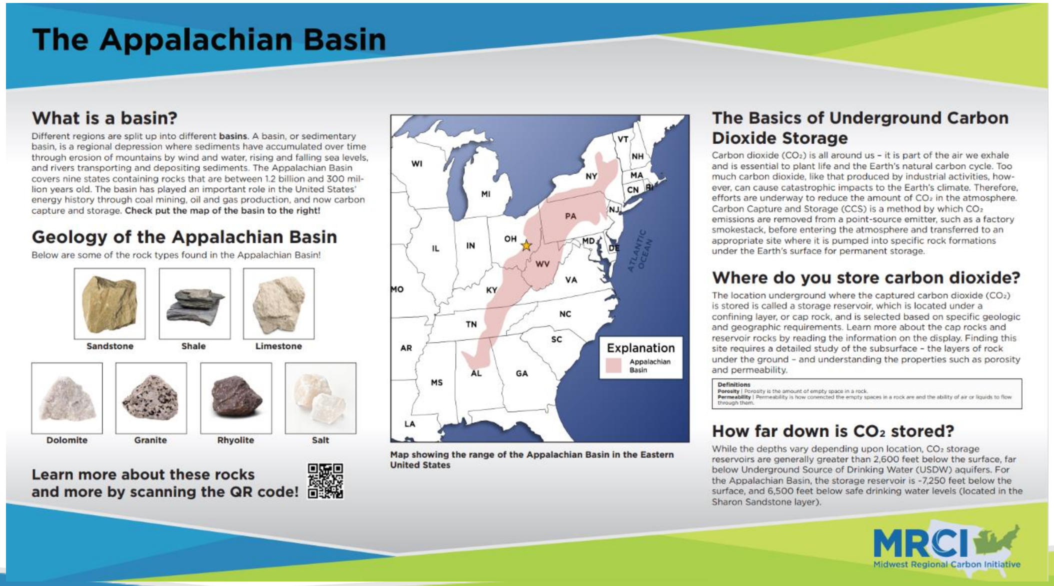
Promoting Regional Technology Transfer

MRCI Outreach and Engagement

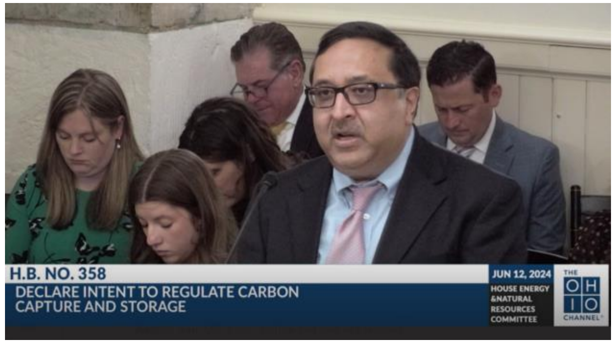


Resource Development

- Fact Sheets
- Hands-on CCS Demonstration Items
- Banner stands and Graphic Displays
- General CCS 101 Slide Decks



MRCI Outreach and Engagement

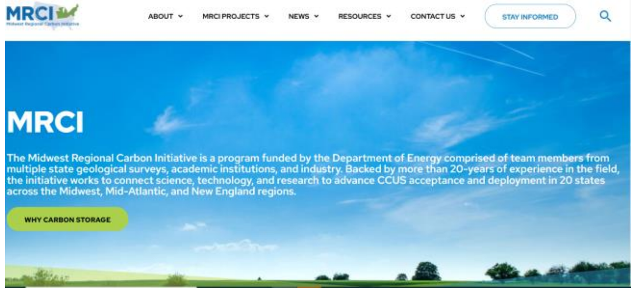


CCS News/Updates

- MRCI Website
- MRCInfo – Bi-monthly Newsletter

General Awareness CCS Examples:

- Neeraj Gupta Testimony, June 2024 Ohio House
- COSI Big Science Festival May 4, 2024
- Community Engagement Support DOE-funded 2799 PA/WV and SE MI CarbonSAFE



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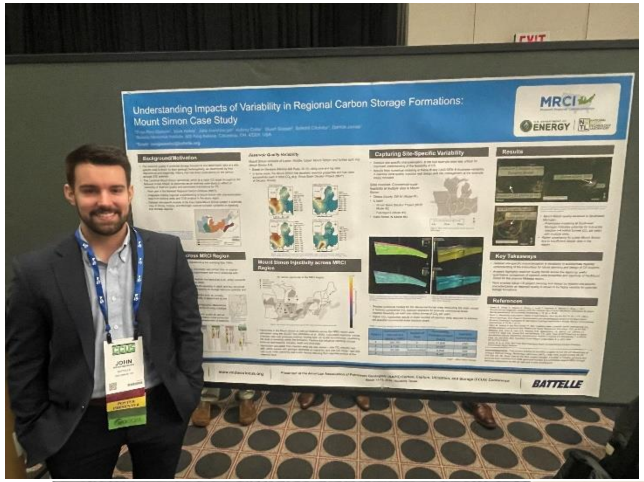
MRCI Outreach and Engagement

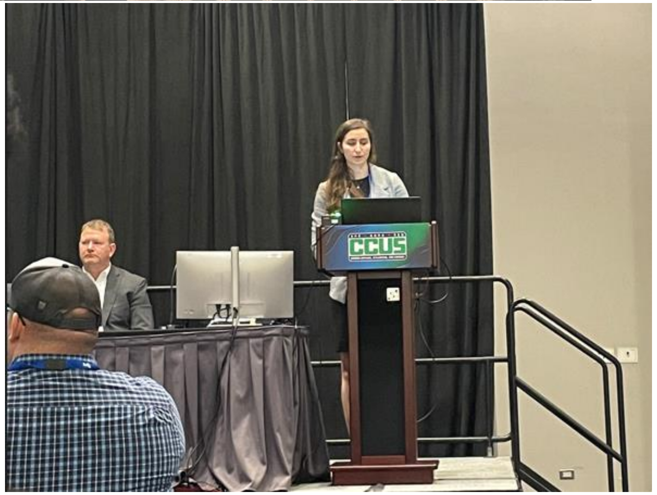
2023 Annual Partners and Stakeholders Meeting, Sept. 2023

2024 Meeting Planned Sept. 23-24, 2024 in Columbus

Additional Technical Transfer/Support

- SPE Western Regional Meeting
- AAPG
- Petro Technology Transfer Consortium
- ENSURE semi-annual meetings
- International Net Zero Workshop
- Illinois Oil and Gas Association (IOGA) 2024 Annual Convention and Trade Show
- Innovations in Climate Resilience





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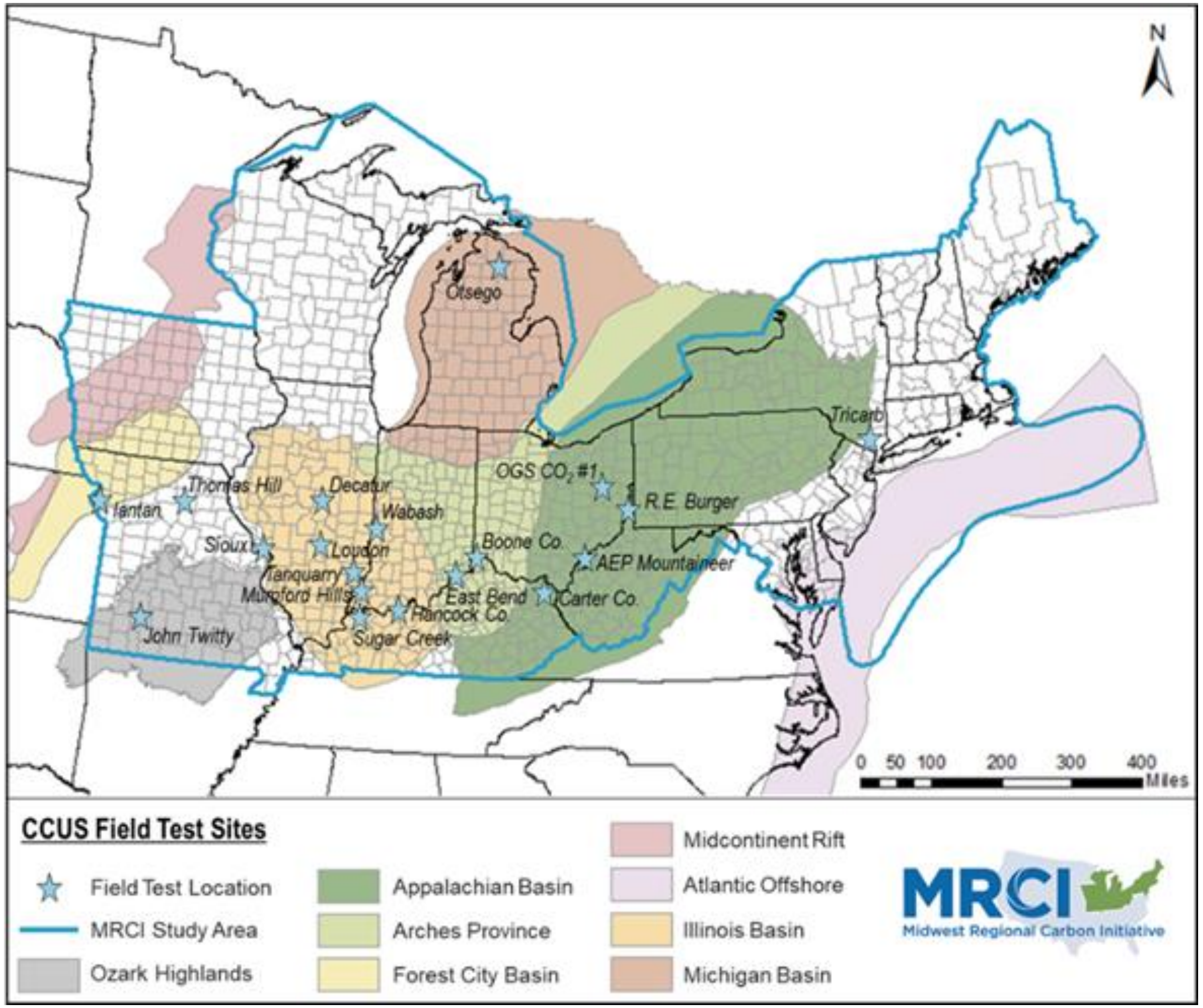
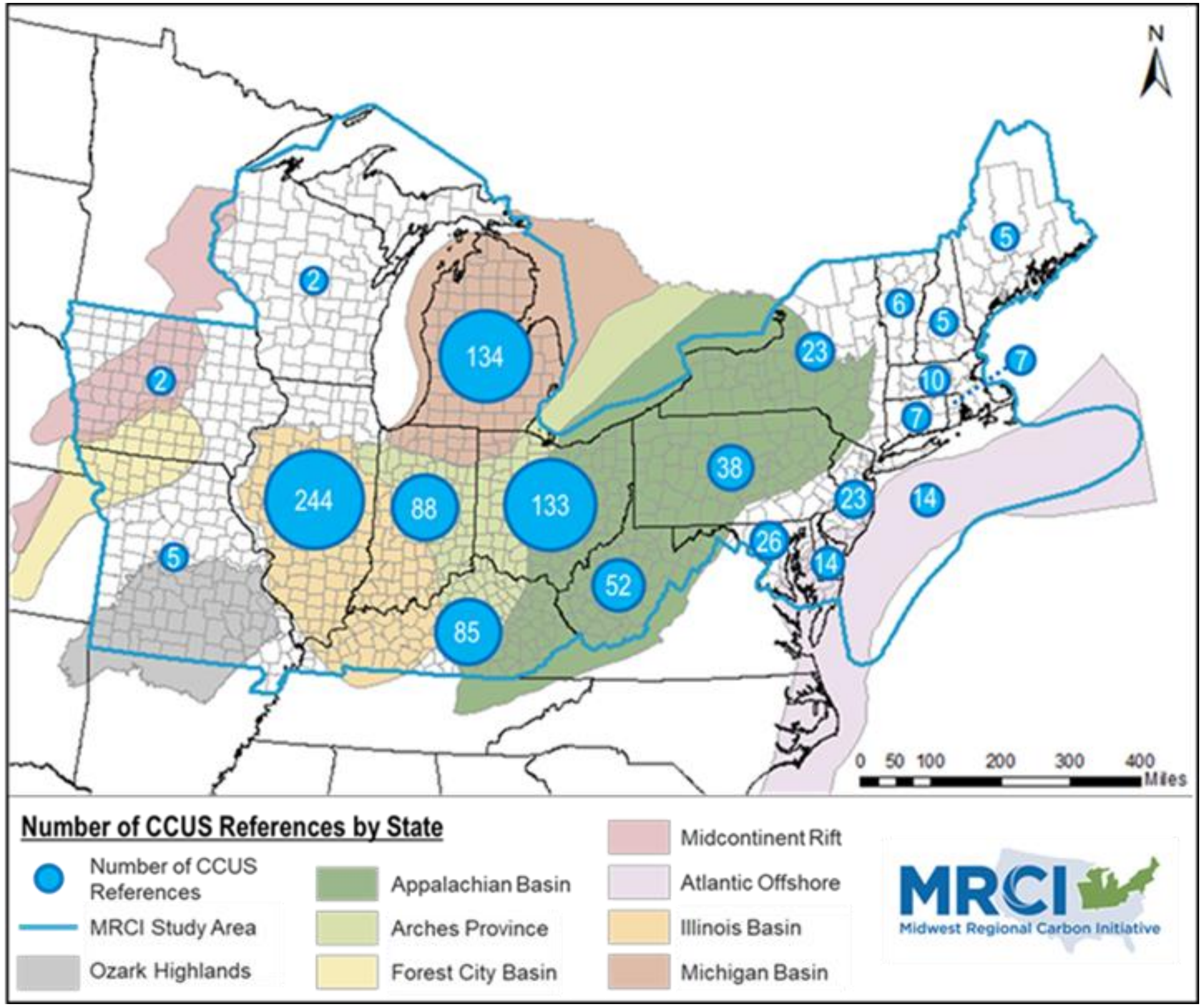
The Future of CCS in the MRCI region

Past Projects and CCUS References in the MRCI





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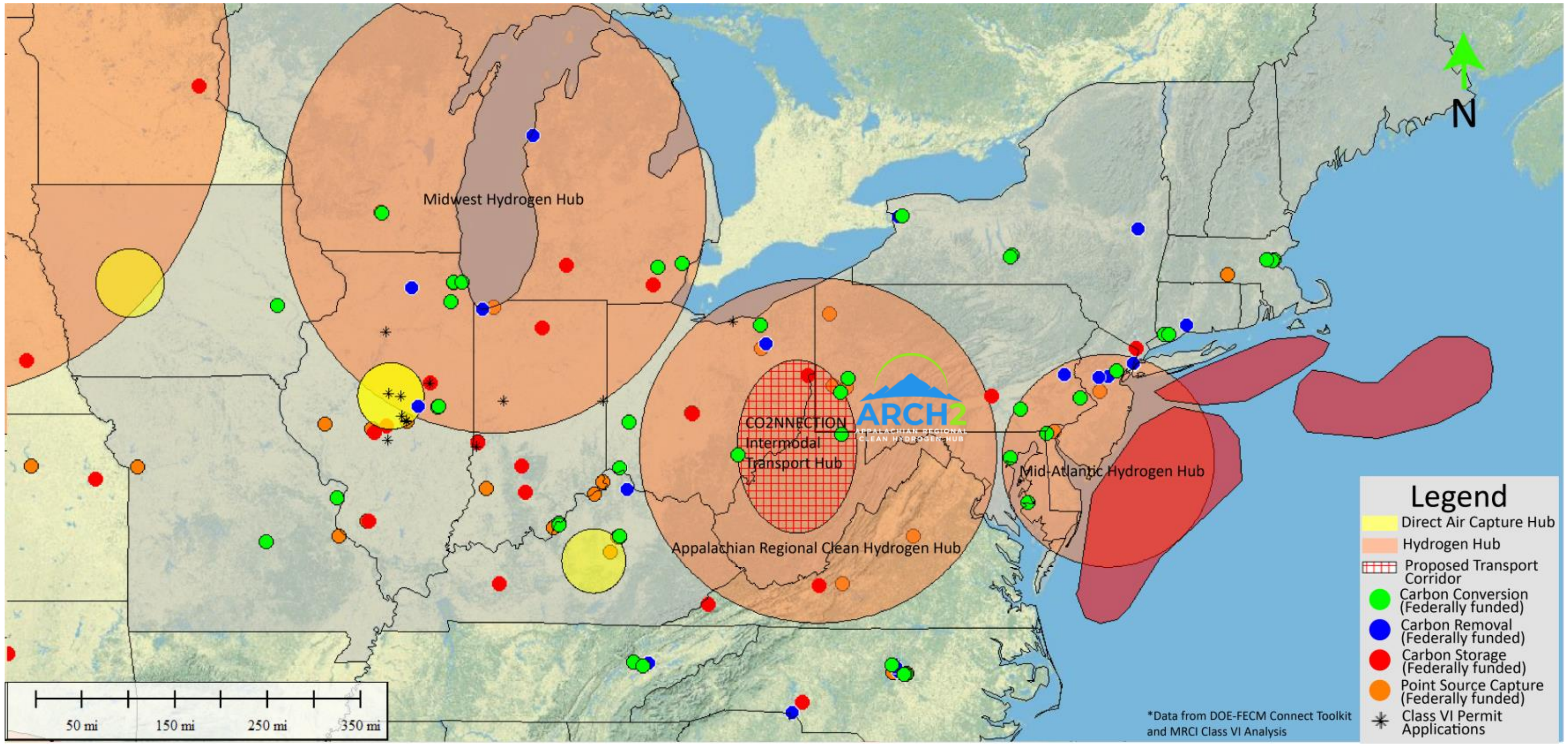
Selected Carbon Reduction Projects in the MRCI

- Numerous private projects
- Regional Initiatives:
  - MRCI
  - FOA2799 – States
  - FOA2799 - Battelle
  - RITAP
- CarbonSAFE
- Industrial Decarbonization
- FEED studies
- Three H_2 hubs
- Three DAC hubs
- Transport – CO_2NECTION



CCS Regulatory Advancement and Legislation In The Region

- CCUS Enabling legislation in PA signed recently
- The Illinois Senate passed a bill which establishes additional requirements for CO_2 pipeline development, permitting for sequestration projects, and protections for pore space owners.
  - In addition to federal Class VI regulations administered by the U. S. EPA, the Illinois EPA, IL-DNR, and Illinois Commerce Commission will develop and enforce the additional carbon storage and CO_2 pipeline permitting requirements and rules for Illinois.
- West Virginia is currently in the application phase for Class VI primacy.
- Several other states considering or developing regulatory roadmap

Pa. hopes to regulate carbon storage wells with new law

Rachel McDevitt

JULY 23, 2024 | 1:25 PM

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NEWS

Senate Energy Committee approves carbon dioxide sequestration bill

ENERGYWIRE

Illinois' Pritzker signs law to regulate CO2 storage, pipelines

By Jeffrey Tomich | 07/19/2024 06:49 AM EDT

The measure includes a moratorium on CO2 pipeline approvals while federal regulators revamp regulations.

Illinois Gov. J.B. Pritzker (D) is pictured last year in Chicago.

Charles Rex Arbogast/AP

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MRCI Summary and Expected Outcome
On Track to Achieve All Technical and Stakeholder Goals

- Established a broad-based consortium of researchers and stakeholders
- Addressed regional storage and infrastructure challenges
- Assessed of policy, economic, and social issues, including knowledge sharing materials and workforce development plans
- Continued education and public advocacy for CCS by respected researchers and agencies
- Provide support/partnership on technical and community engagement efforts for – CarbonSAFE, Hydrogen, DAC, new Initiatives, and RITAP etc. to ensure consistent and public-forward approach
- Continue to address challenges in transport, basin-scale management, scale-up, and advanced deployment needs (hubs, well fields, multilaterals, regulation, etc.)
- MRCI is in final of current funding and will look for DOE's direction in continuing this important program – as we enter the CCS deployment phase!

MRCI

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