Neeraj Gupta- Battelle Sallie Greenberg- 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 **Integrated Project Review Meeting** August 2-3, 2021



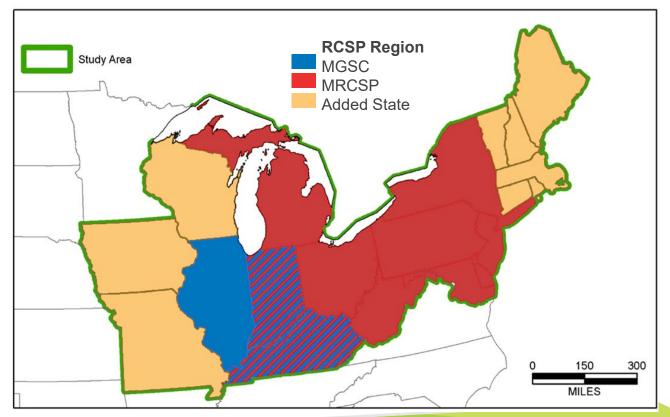






MRCI – Covering 20 States in Midwest and Northeast

- Battelle and Illinois State Geological Survey combine expertise from MRCSP and MGSC
- Working with State Geological Surveys and Universities across the Region to Accelerate deployment of CCUS





Project Aims to Tackle Challenges to Pave Way for CCUS in the Region

Storage

Precambrian Basement

Leakage

Socio-economic

Financial/Business

Defining Storage Systems

Quantity Storage

Stacked Storage

EOR

Risk

Commercialization

Infrastructure

Federal and State Level

Incentives

Permitting

Policy and Regulations

Sources

Pipelines

Social/Economic Factors

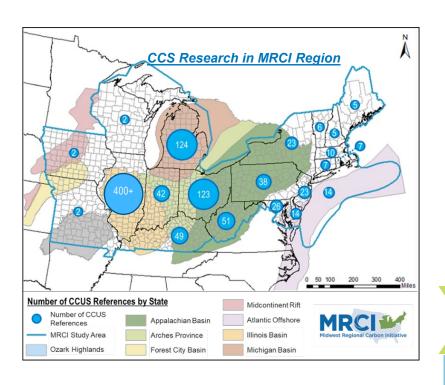
Linking to Storage

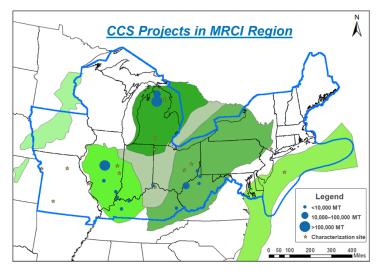


MRCI Research, Projects, Datasets

Facilitating Data Collection, Sharing, and Analysis

Over 930 reports, presentations, posters, technical papers, datasets inventoried from previous research on carbon storage in MRCI region





Technology Development in MRCI Region

Applied Research: TRL 2-4 Proof-of-concept testing Pilot field testing

- · Lab/bench-scale
- Integration of components
- Short duration, low– moderate cost · Simulated conditions
- Characterization &

Feasibility CCS Projects

- MGSC Phase I MRCSP Phase I
- Mid-Atlantic Offshore

Development: TRL 5-6

- Evaluation of performance
- Small-scale CO2 injection
- · Longer duration, higher cost
- In situ operating conditions Relevant to a project lifecycle

- MGSC Phase II Tests
- MRCSP Phase II Tests AEP Mountaineer
- Southern MI Advanced

Demonstration: TRL 7-9

Large-scale CO₂ Injection

Relevant to all phases of a

project's full lifecycle

Extended duration, major costs

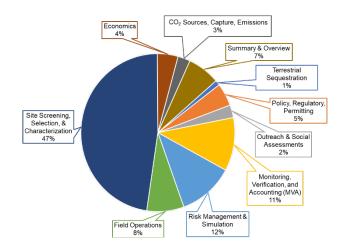
Variable operating conditions

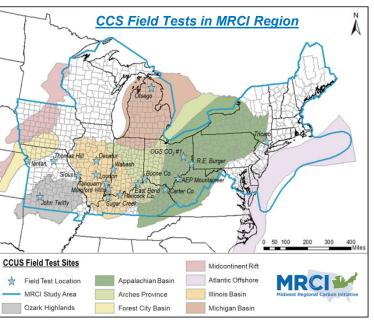
Full-scale commercial

application

- MRCSP Phase III

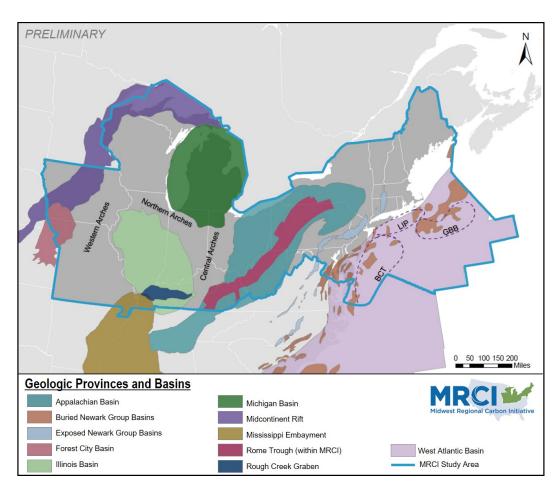
CCS Research Categories in MRCI Region



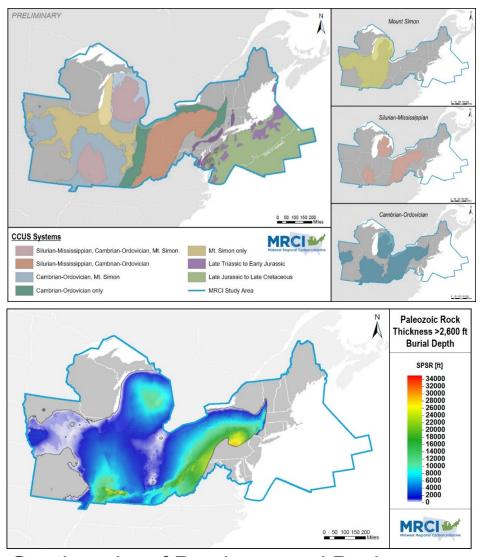




MRCI Systematic Storage Systems Development



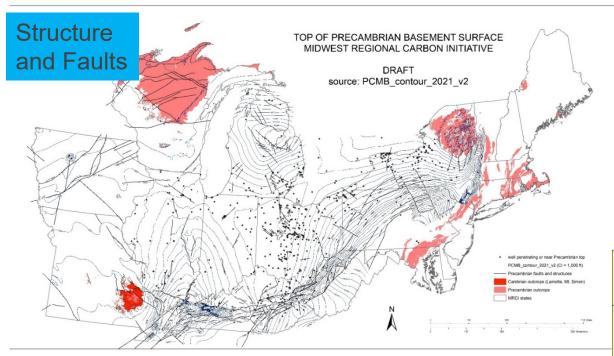
Geologic Provinces and Basins

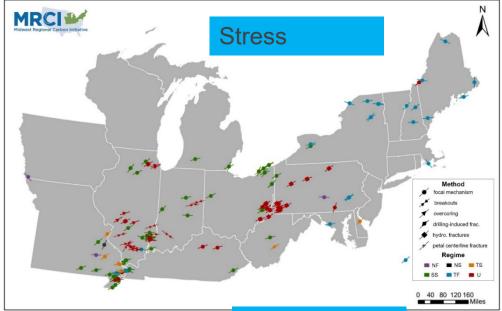


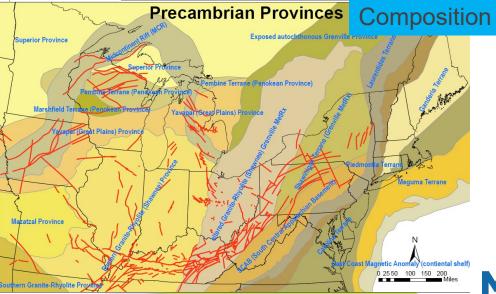
Stratigraphy of Provinces and Basins



Precambrian Structure and Stress – Risk Mitigation





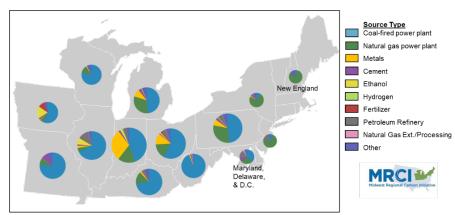




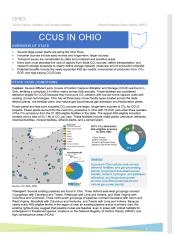


Regional Infrastructure Assessment

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



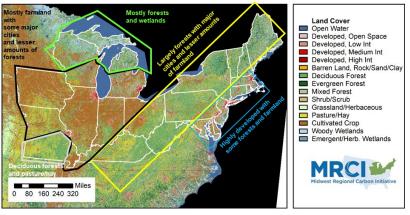
Updated source assessment to existing and future sources and source retirements



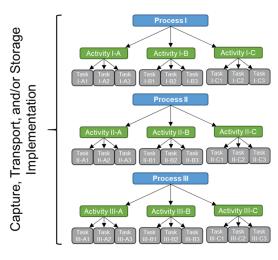


Site Readiness Factsheets
- subsurface readiness;
infrastructure readiness;
regulations, permitting,
and incentives; and social
dynamics

Policymakers, industry, project managers.



Transport study will investigate feasibility and infrastructure needs for realistic project scenarios.

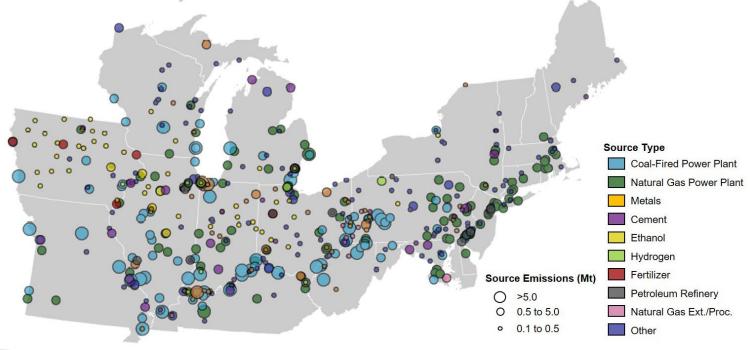


Jobs and economic impact analysis and regulatory analysis will define integrated project benefits and permitting processes.



MRCI Region - Diversity of CO₂ Sources at Play

- More than 1/3 of the nation's CO₂ point sources
- Regional emissions from various industrial sources with power plants accounting for ~3/4
- Concentration along east coast and Ohio River Valley
- Future emissions sources maybe different then present sources, e.g., hydrogen



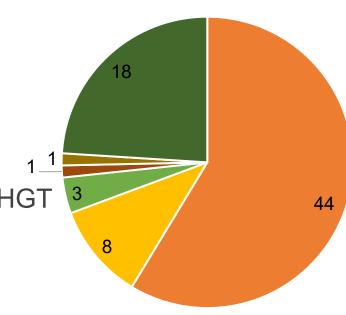
Source Type	2019 Emissions (MMt)	%
Hydrogen	4.2	<1%
Fertilizer	6.9	1%
Coal Fired Power Plant	501.2	52%
Ethanol	23.2	2%
Metals	75.0	8%
Cement	24.2	3%
Natural Gas Power Plant	209.6	22%
NGL/LNG/NG Ext.	3.2	<1%
Other	77.9	8%
Petroleum Refinery	35.9	4%
TOTAL	961	-



Communicating CCUS Advancements in the MRCI Region

- Website development
 - www.midwestccus.org
 - Project background, partners, research, resources, announcements, and blogs
- Numerous outreach activities
 - Technical presentations and panels e.g., AAPG, SPE, GHGT
 - Workshops e.g., NARUC
 - Event participation
 - Information sharing and educational
- Planning future activities
 - Outreach strategy and plan



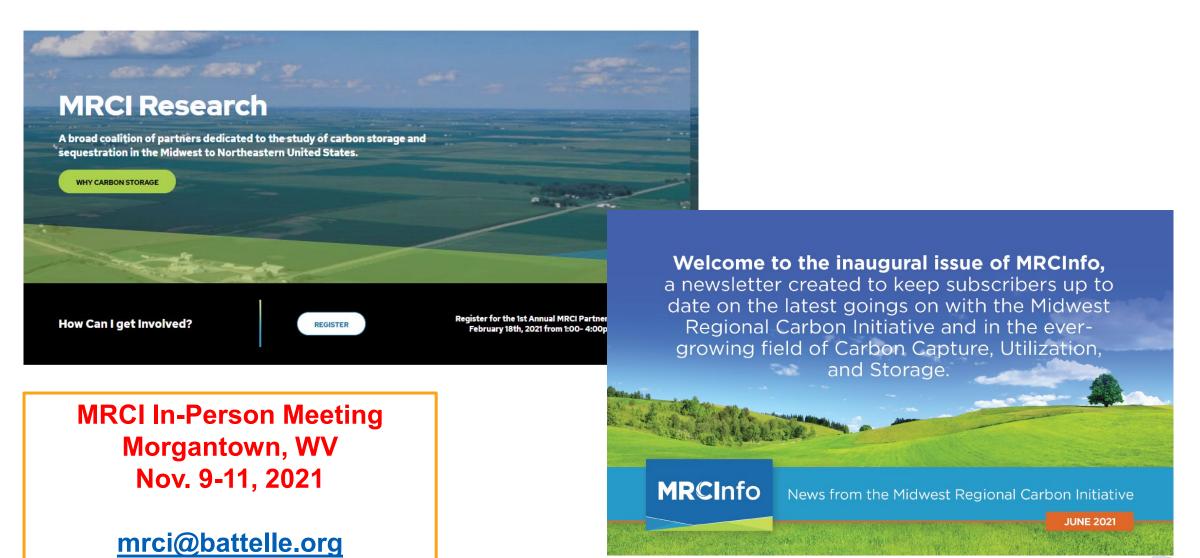


- Presentations and Panels
- Workshops
- Materials

- Participation
- Papers
- Information Sharing/Discussions

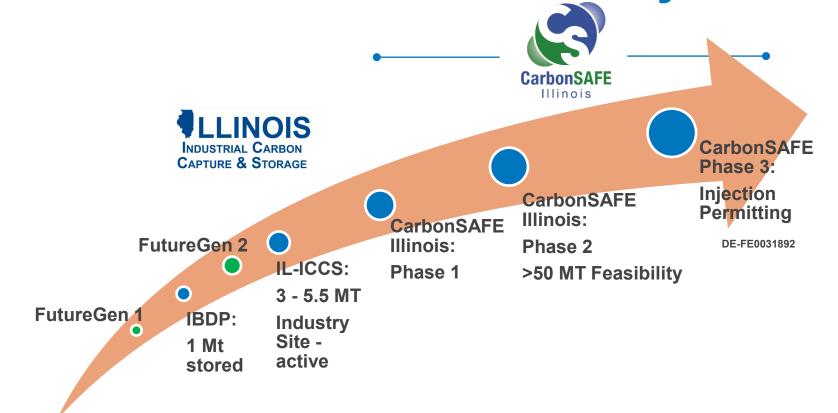


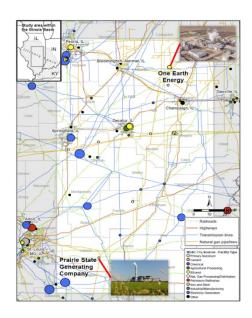
Website and Newsletter





Illinois Basin CCUS Growth – A Preview of What's Possible in MRCI and Nationally





Illinois Storage Corridor













Illinois Basin and MRCI Region Projects

