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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 28-September 1, 2023

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

Outline

- Background and Program Goals
- Previous Efforts in the Region and Data Collaboration
- Addressing Key Technical Challenges for CO_2 Storage
- Enhancing Infrastructure Development
- Stakeholder Outreach
- Summary

MRCI Program Goals

- Implement a collaborative Regional Initiative to accelerate CCUS deployment across the 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 and international stakeholders, including state geological surveys, universities, industrial partners and advisors, 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.

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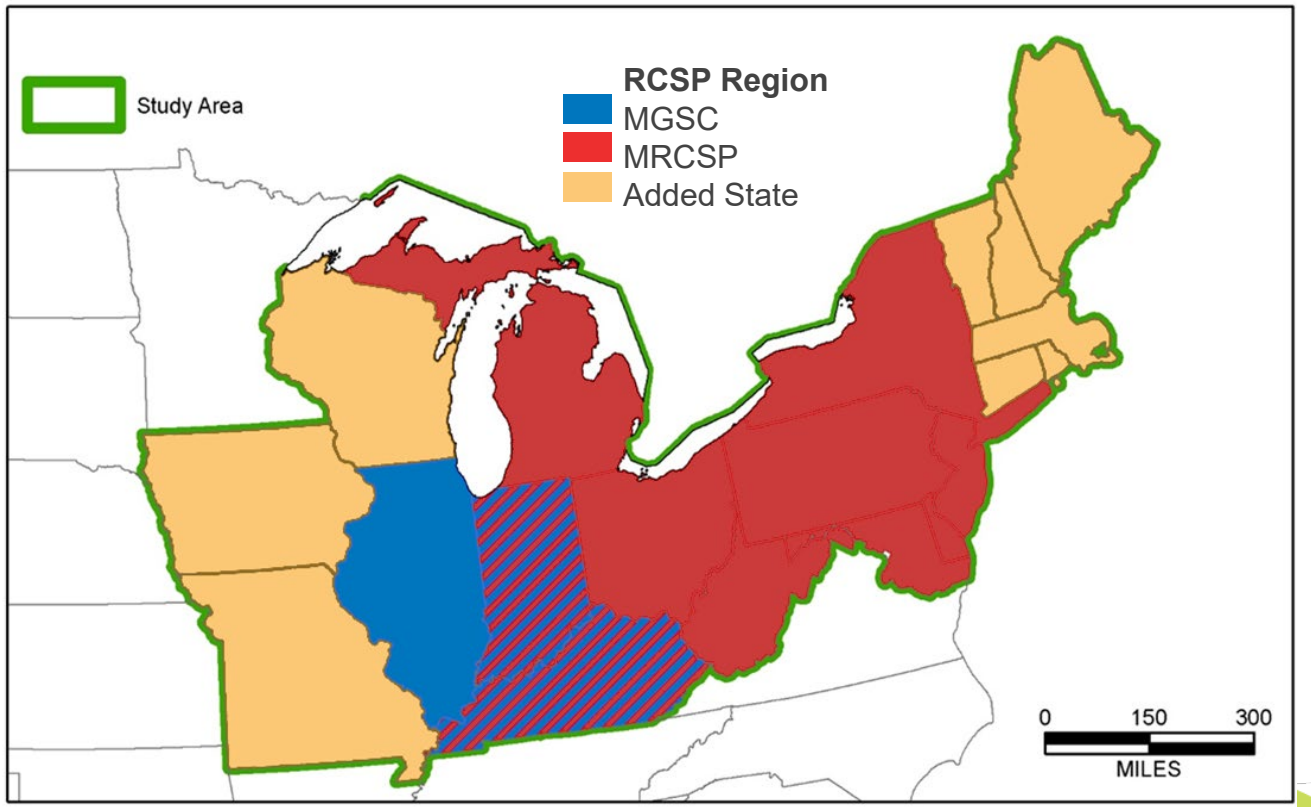
MRCI – Covering 20 States in Midwest and Northeast

- 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



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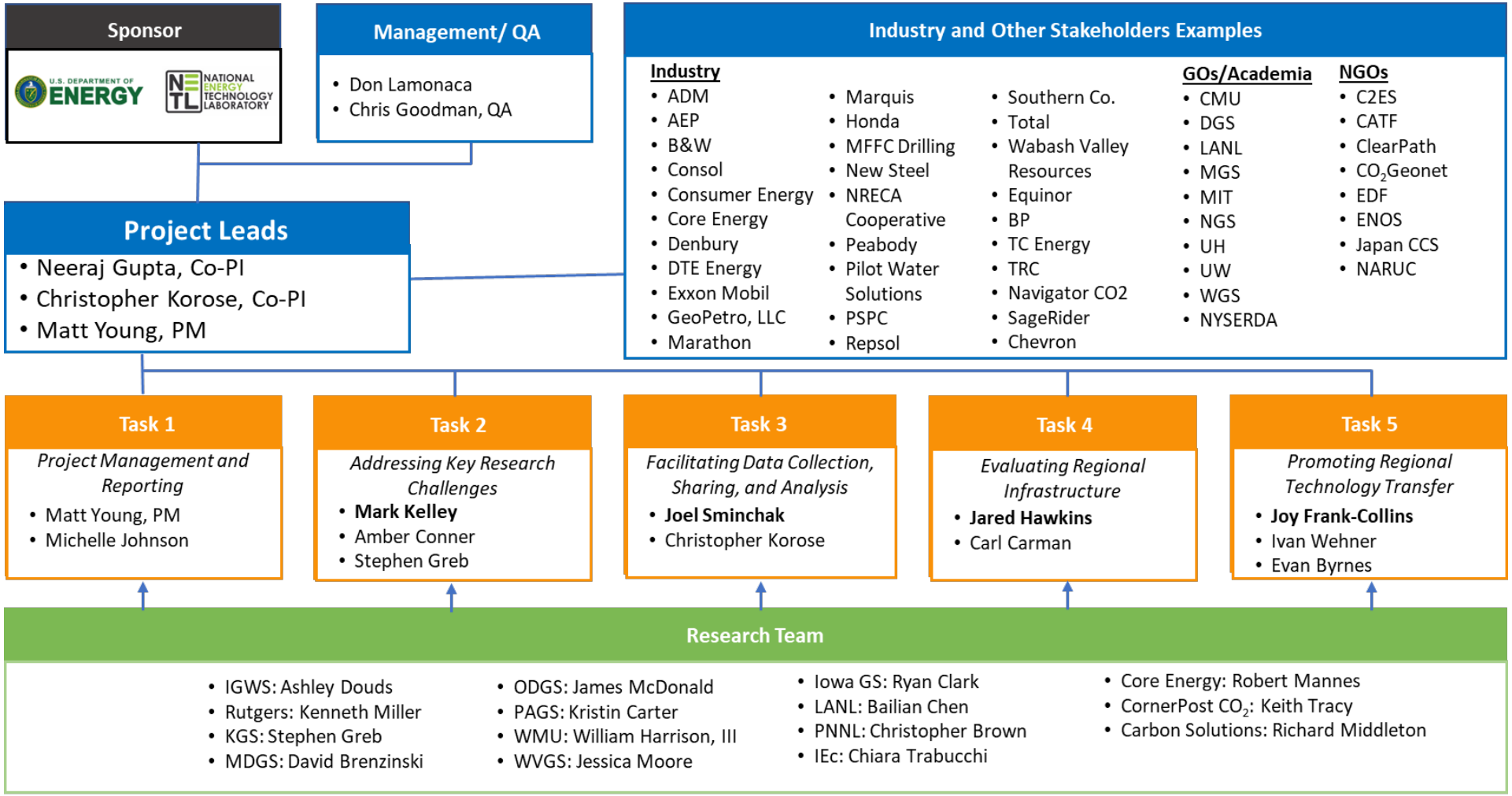
MRCI – Collaboration between Researchers, Industry, and Government, and non-Governmental Organizations



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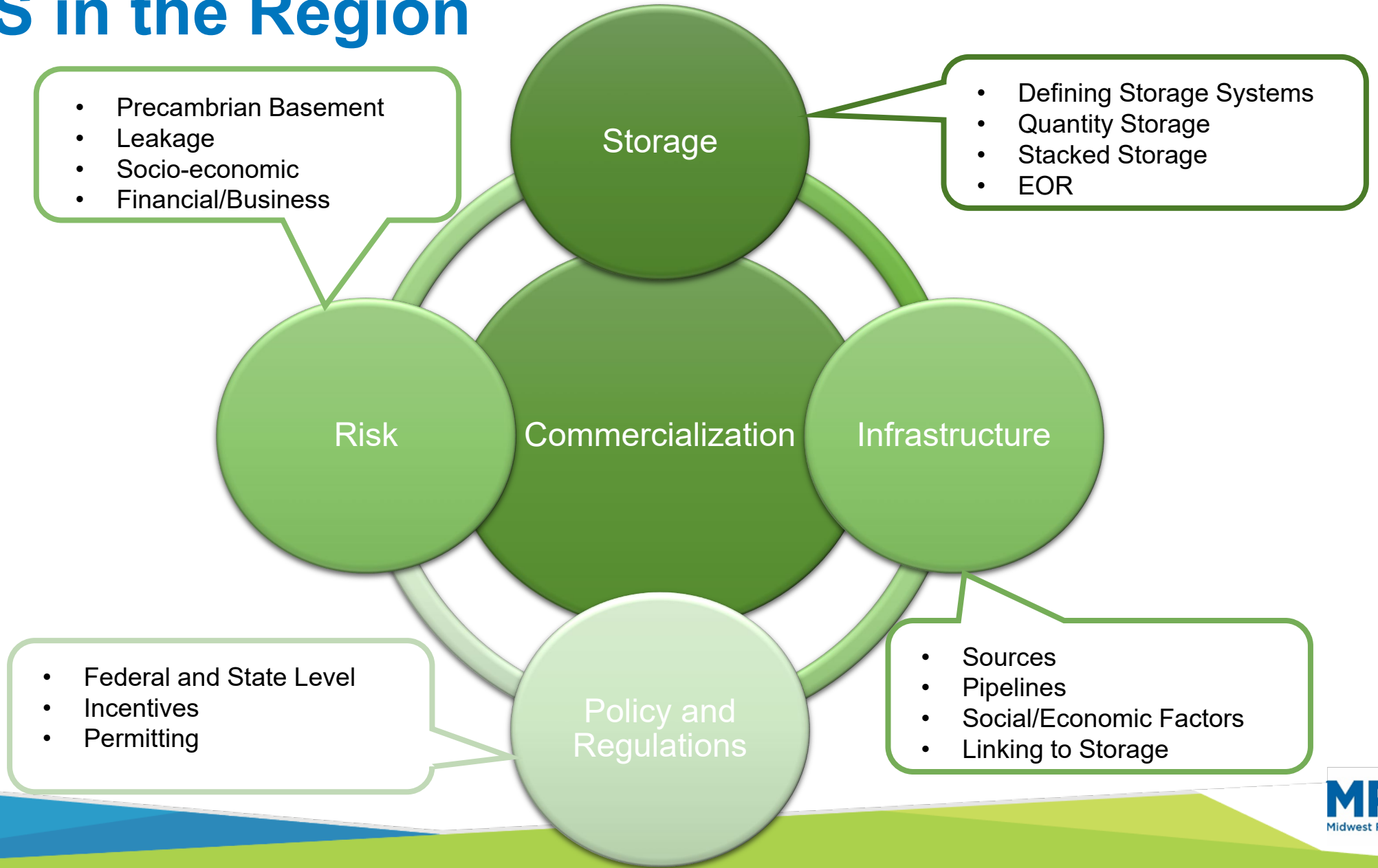
Project Aims to Tackle Challenges to Pave Way for CCUS in the Region



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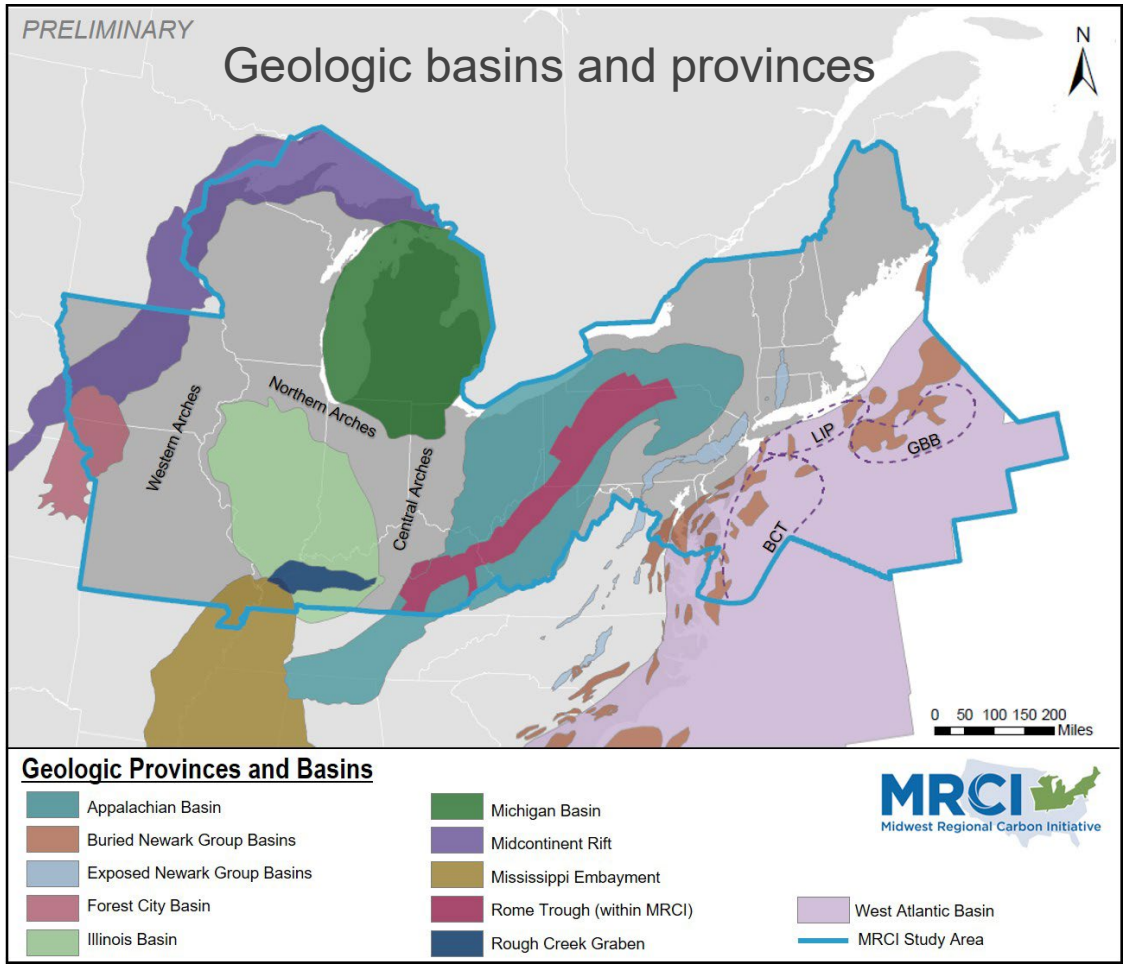
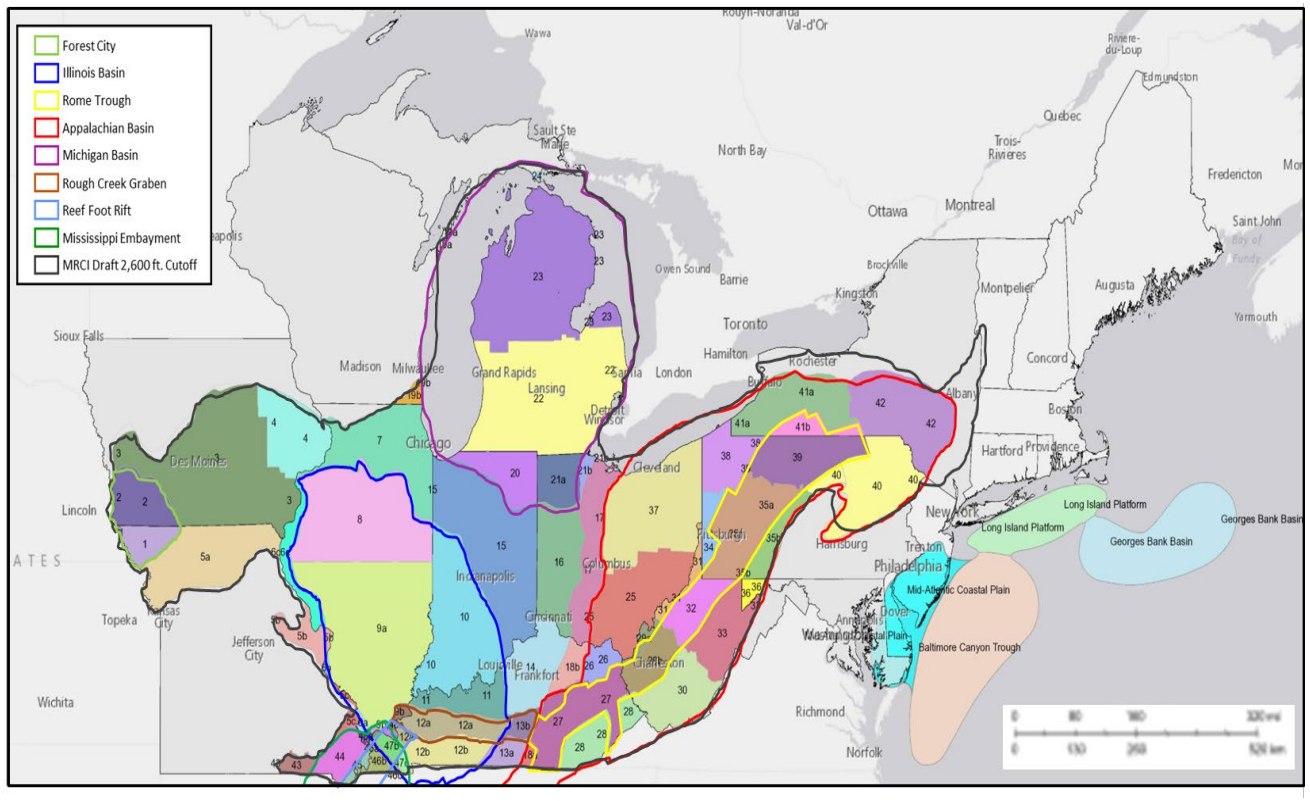
Geologic Framework - Defining Carbon Storage Systems





Geologic basins and provinces were subdivided into 48 continental sub-regions and 4 off-shore sub-regions on the basis of stratigraphy.

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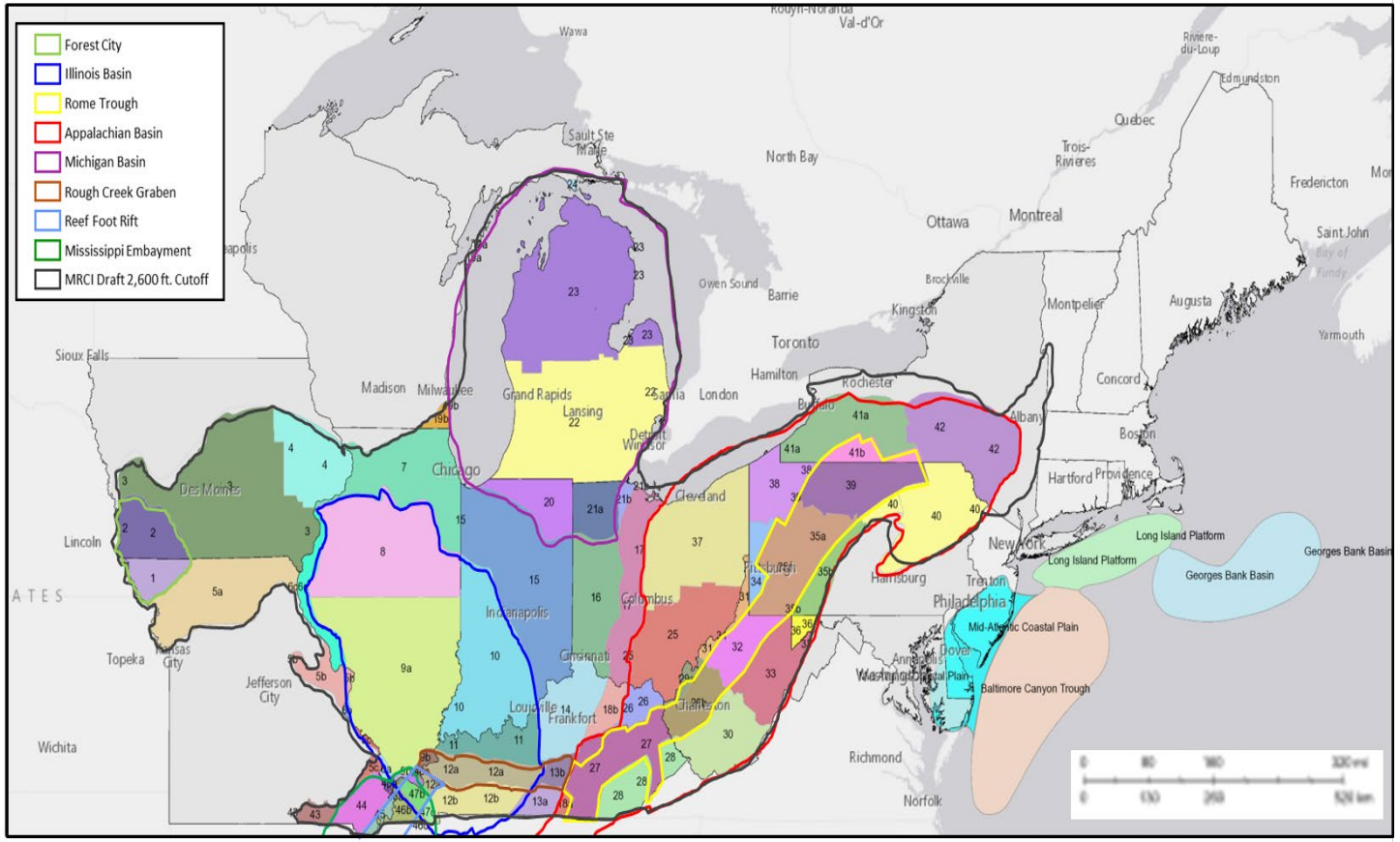
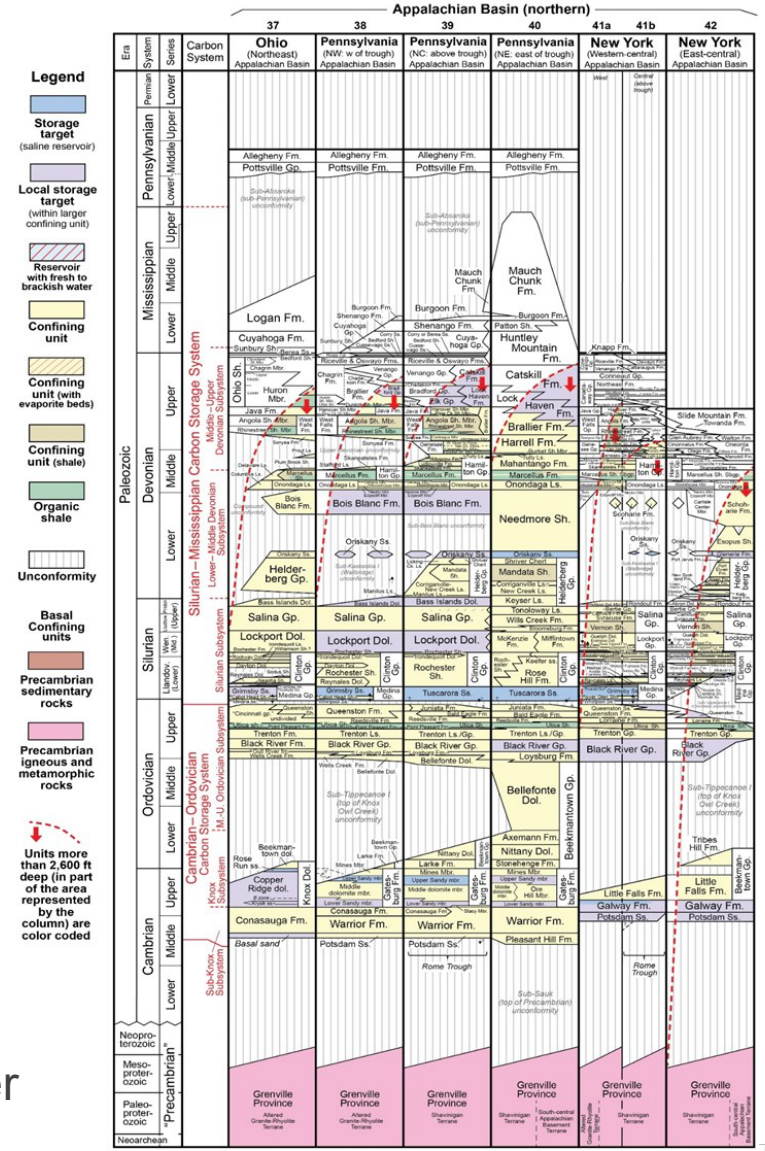
Defining Carbon Storage Systems



Stratigraphic columns were developed for each on-shore and off-shore region (example shown here for the Northern App Basin)

The columns identify potential storage targets and confining layers deeper than 2,600 ft deep.

Stratigraphy of Northern Appalachian Basin



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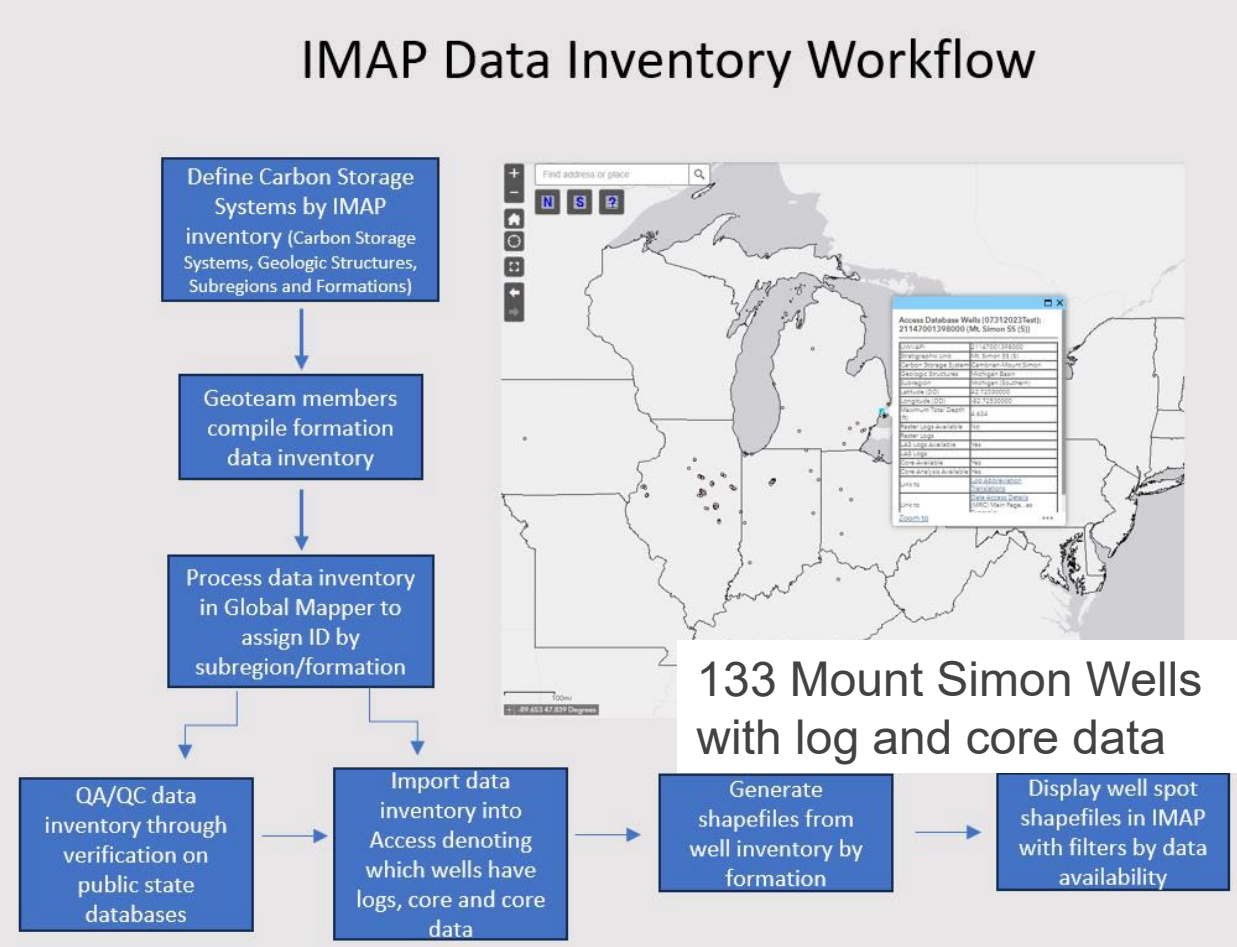
Data Inventory Workflow
MRCI GeoTeam Collaboration



Formation	Count of Wells	Wells with Logs	Wells with Core Analysis
Basal Sand	186	184	3
Bass Islands	1,891	1,889	1
Beekmantown Dol.	36	32	1
Bois Blanc	1,481	1,481	
Bradford Gp.	4	4	
Clinton SS	1,983	1,982	1
Copper Ridge Dol.	2,306	2,233	18
Dundee LS	284	284	11
Elk Gp.	6	6	
Gatesburg Fm.	100	100	
Grimsby SS	5,179	5,179	
Lock Haven Fm.	22	22	
Lockport Dol.	4,389	4,389	
Lower Cretaceous 1	44	40	5
Lower Cretaceous 2	44	39	7
Medina SS	3,633	3,633	1
Middle Cretaceous 1	44	40	
Middle Cretaceous 2	44	40	3
Middle Cretaceous 3	44	40	1
Middle Jurassic	44	31	
Mt. Simon SS	1,360	1,116	143
Oriskany SS	8,105	6,868	6
Potosi Dol.	1,004	851	3
Rose Run SS	2,431	2,347	18
Salina Gp.	271	271	3
St. Peter SS	8,282	3,500	222
Tuscarora SS	249	201	2
Upper Jurassic	44	40	12
Total	43,510	36,842	461

Across the MRCI region - identified that are potential storage targets with log, 28 formations and core data.

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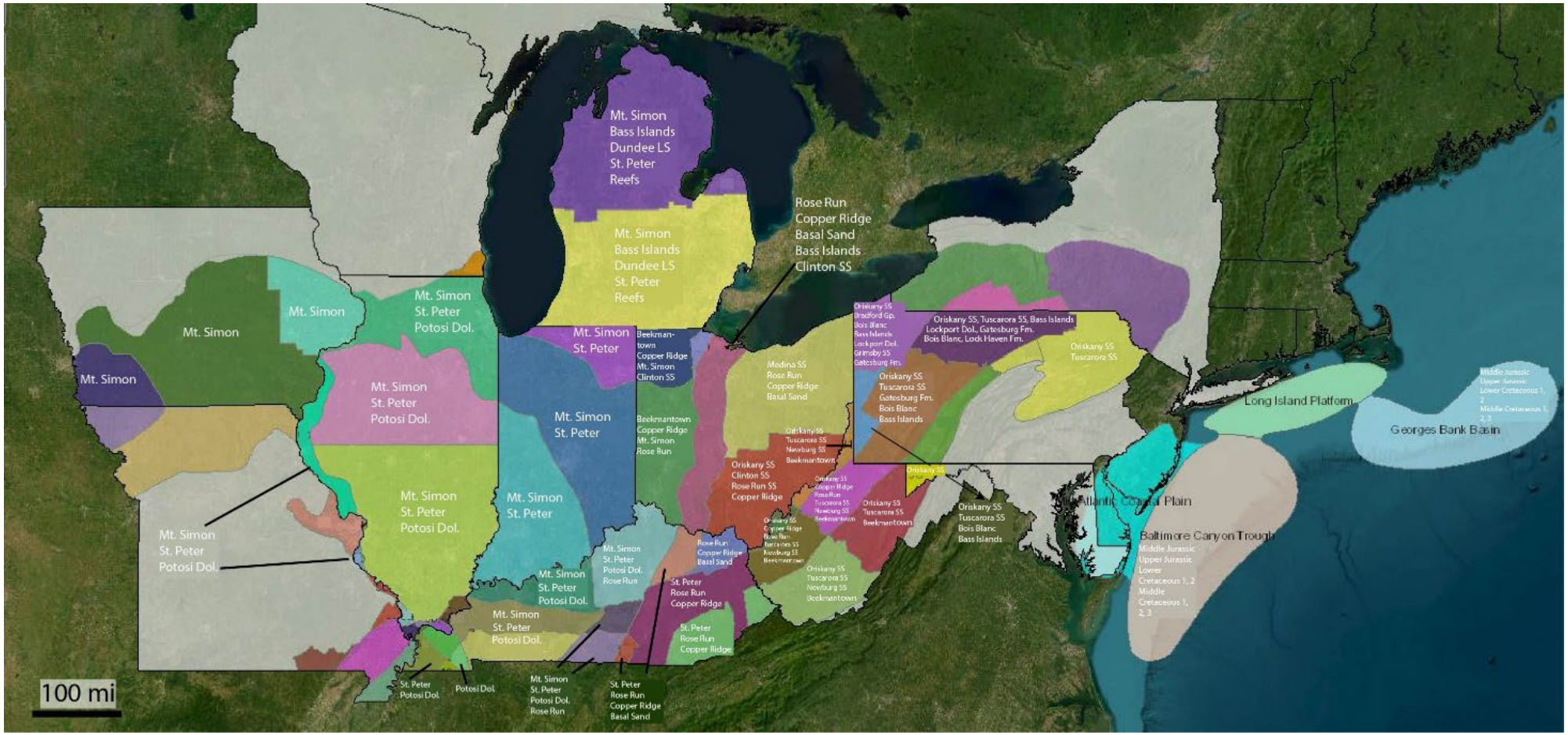
CO_2 Storage Reservoirs in the MRCI Region

This map identifies the 28 key storage formations within each of the 48 onshore sub-regions and the 4 off-shore sub-regions.



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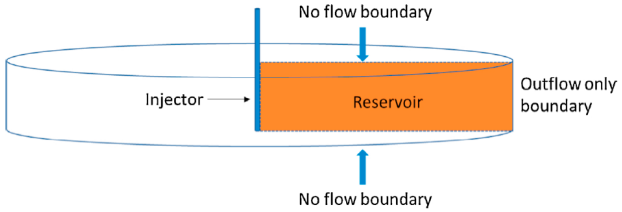
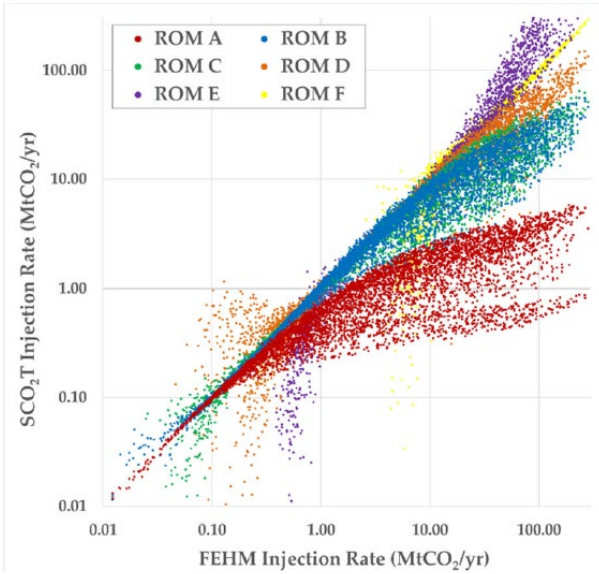
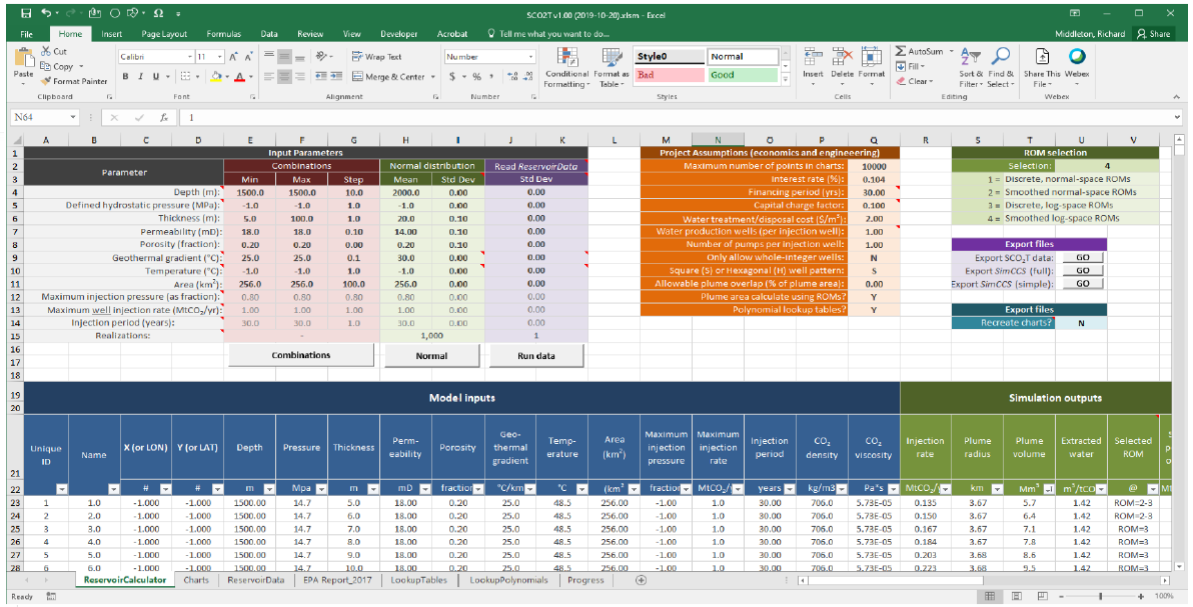
CO_2 Injectivity Assessment

- BP-1 - Evaluated the feasibility of commercial-scale CO_2 injection ($\geq$1 MMT for 30 yrs) in 5 storage systems region using 3D models to simulate CO_2 injection
- BP-2 - Expanded the feasibility to additional formations using:
  - Reduced order injectivity model (ROM) trained to synthetic data from a 3-D models; and
  - Site-scale 3-D numerical flow models.



Example simulation from training dataset (from Chen et al (2020))





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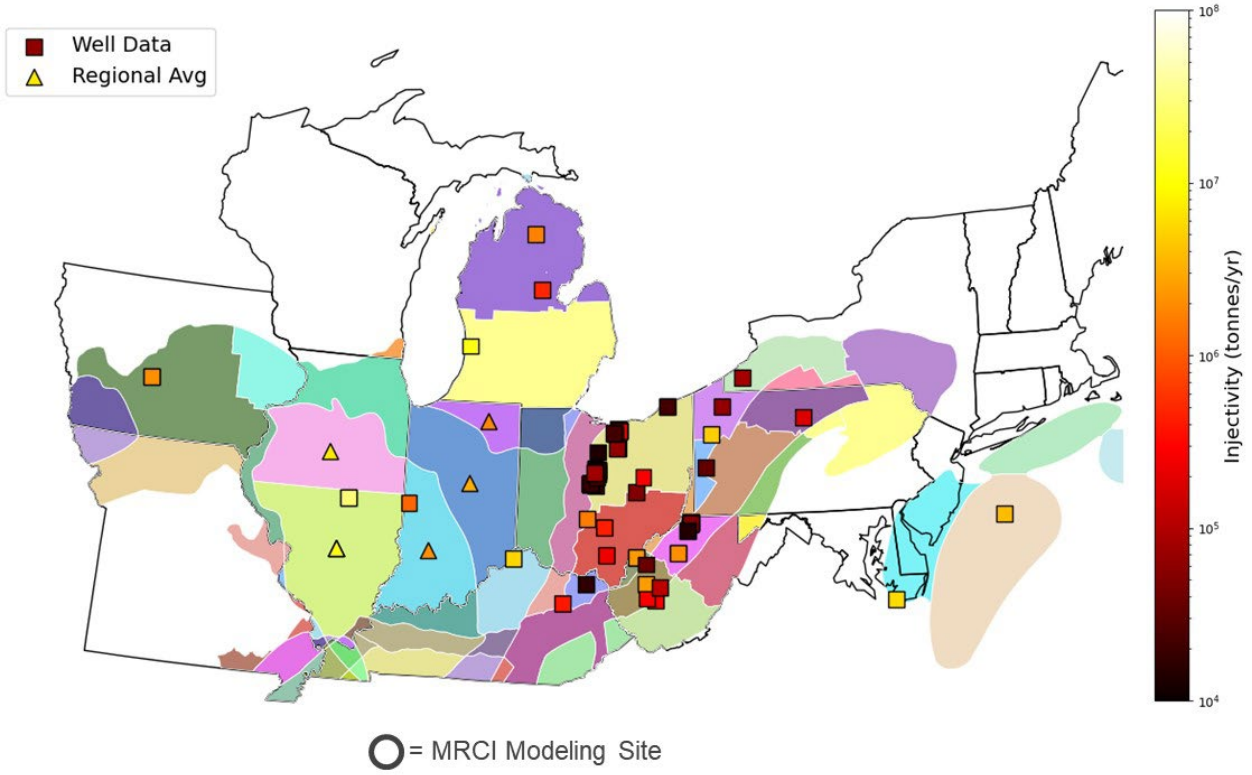
CO_2 Injectivity from Reduced Order Model (ROM)

- The map shows the injectivity as tonnes of CO_2 injected per year for a single well as predicted by the ROM.
- Yellow-orange areas have injectivity > 1 million tonnes per year.
- Injectivity is highly variable across the region.
- *Not all sub-regions/formations have necessary data to estimate injectivity with the ROM – especially in deeper basins.*



ROM Injectivity Tool description in Chen et al (2020) and Middleton et al (2020)

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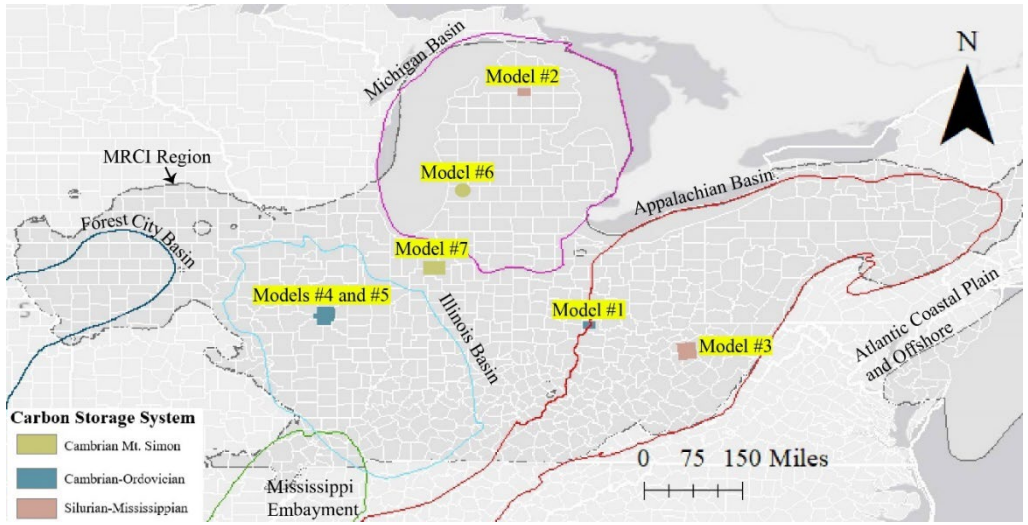
MRCI Sites for CO_2 Injectivity Feasibility Analysis using 3D Site-Scale Models



Model #	Model Location	Carbon Storage System	Formations of Interest
Model #1	Pickaway County, OH	Cambrian-Ordovician	Maryville
Model #2	Antrim and Otsego Counties, MI	Silurian-Mississippian	Bass Islands Dolomite, Bois Blanc
Model #3	Tri-State Area (Gilmer, Ritchie, Doddridge Counties, WV)	Silurian-Mississippian	Oriskany Sandstone
Model #4 (Will et al., 2014)	Macon County, IL	Cambrian-Ordovician	St. Peter Sandstone
Model #5 (Smith and Adushita, 2014)	Macon County, IL	Cambrian-Ordovician	Potosi
Model #6	Ottawa County, MI	Cambrian Mount-Simon	Mt. Simon Sandstone
Model #7	Cass, Fulton, and Pulaski Counties, IN	Cambrian Mount-Simon	Mt. Simon Sandstone

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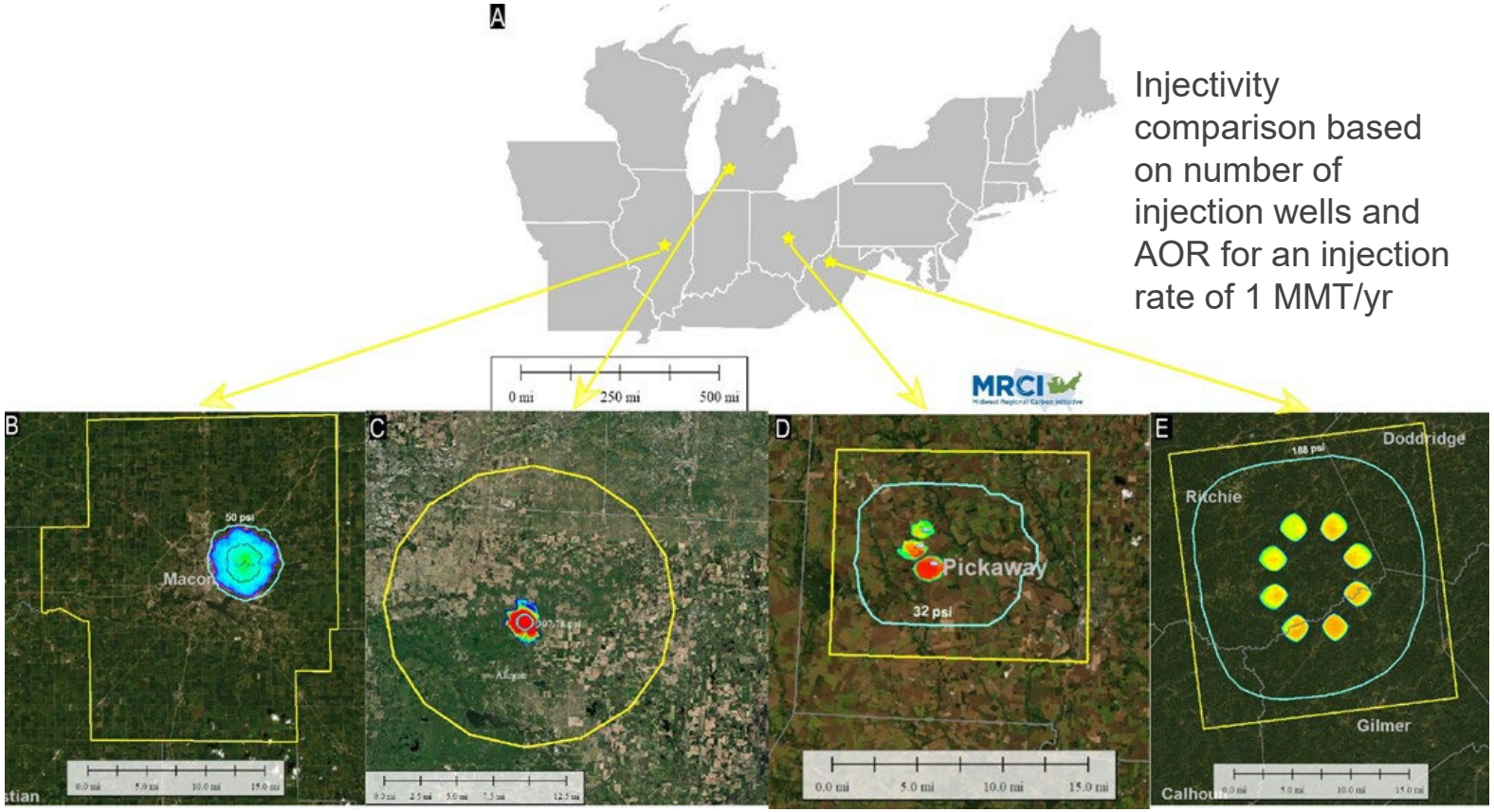
CO_2 Injectivity Examples from Site-Scale Models

- 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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CCS Projects are Taking off in MRCI Region – Building on Past Pilots and Demos

CO_2 Storage Projects in MRCI

(not including CO2-EOR)

- **1 Active Class VI Well.**
- **~9 CCS project sites pending.**
- **~20 Class VI UIC permits** with EPA Region 5
- **~10-15 additional CCS projects** under development in MRCI.
- **4 post injection or closed out projects**

State	County	Permittee/Permit Applicant	Proposed CO2 Injection Rate	Maximum Total CO2 Injection Volume	Current Status	Current Project Phase
IL	Christian	Heartlnd Grnway Navigator	N/A	N/A	Pending (6 permits)	Pre-construction
IL	Ford	One Earth Sequestration, LLC	N/A	N/A	Pending (3 permits)	Pre-construction
IL	Sangamon	City, Water, Light, & Power	N/A	N/A	(FEED)	(CarbonSAFE)
IL	Macon	ADM (IBDP)	**1.0-1.2 Mt/year**	**6.0 Mt**	**Active**	**Injection**
IL	Macon	ADM (IL ICSP)	N/A	N/A	Pending	Pre-Construction
IL	Macon	ADM (Maroa Campus)	N/A	N/A	Pending (3 permits)	Pre-Construction
IL	Mclean	Heartlnd Grnway Navigator	N/A	N/A	Pending (2 permits)	Pre-Construction
IL	Putnam	Marquis Carbon Injection, LLC	N/A	N/A	Pending	Pre-Construction
IL	St. Clair	Carbon SAFE IL Corridor	NA	NA	Class VI prepared	Pre-Construction
IN	Randolph	One Carbon Partnership, LP	N/A	N/A	Pending	Pre-Construction
IN	Vigo	Wabash Carbon Services, LLC	0.834 Mt/year	10 Mt	Pending	Pre-Construction
			0.834 Mt/year	10 Mt	Pending	Pre-Construction
IN	Lawrence	Heidelberg Materials	N/A	N/A	(FEED)	(CarbonSAFE)
OH	Lorain	Lorain Carbon Zero Solutions	N/A	N/A	Pending	Pre-Construction
KY	Boone	Duke East Bend	0.001 Mt/yr	0.001 Mt	Class V	Closed
IL	Macon	ADM	0.3 Mt	1.0 Mt	Class V	Post-Injection
MI	Otsego	Core Energy	0.5 Mt/year	0.06 Mt	Class V	Closed
WV	Mason	AEP Mountaineer	0.12 million metric tons/year	0.037 million metric tons total	Class V	Closed

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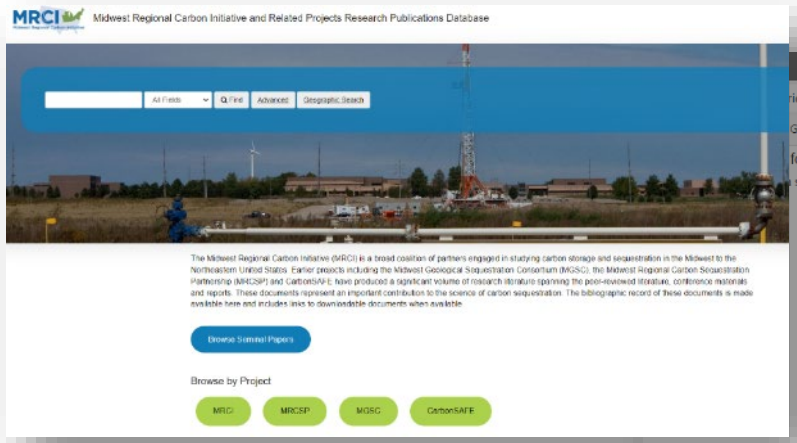
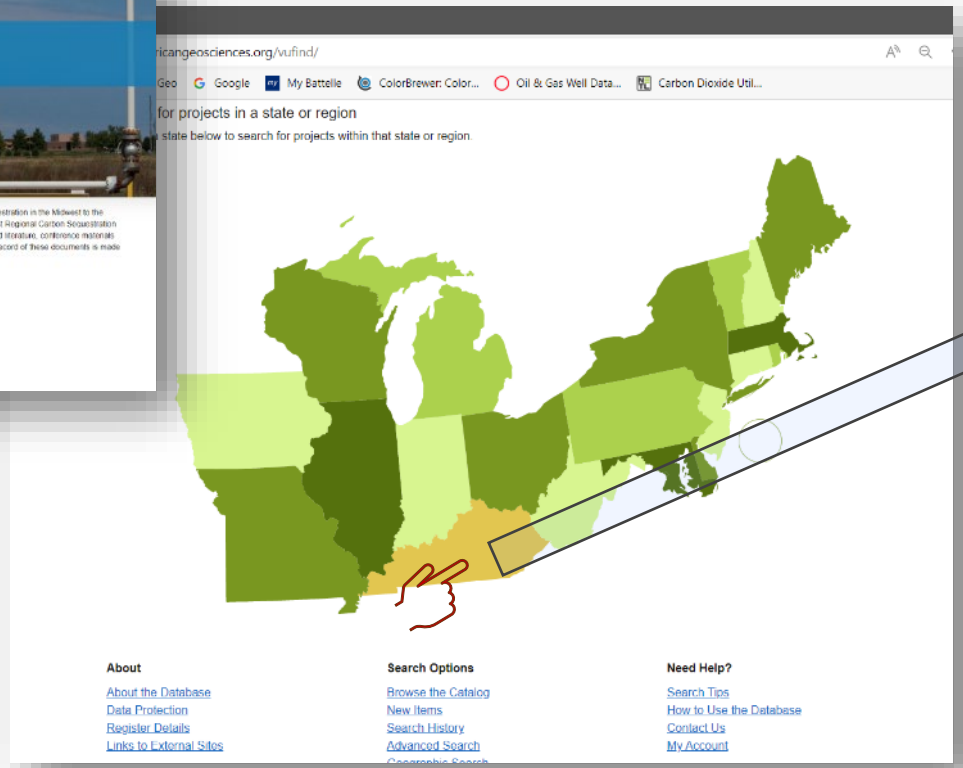
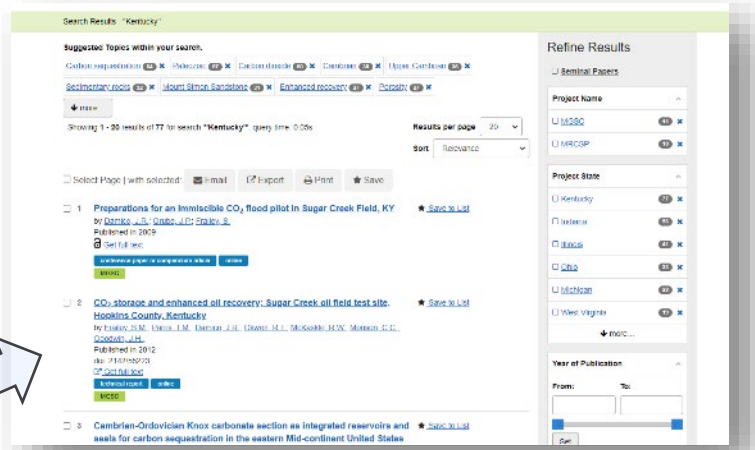
MRCI Data Sharing

- Information on geological storage provided to project developers in Illinois, Indiana, Ohio, Maryland, Michigan, Pennsylvania, West Virginia, & Ontario, CAN.
- Online database developed by American Geosciences Institute for MRCI website.







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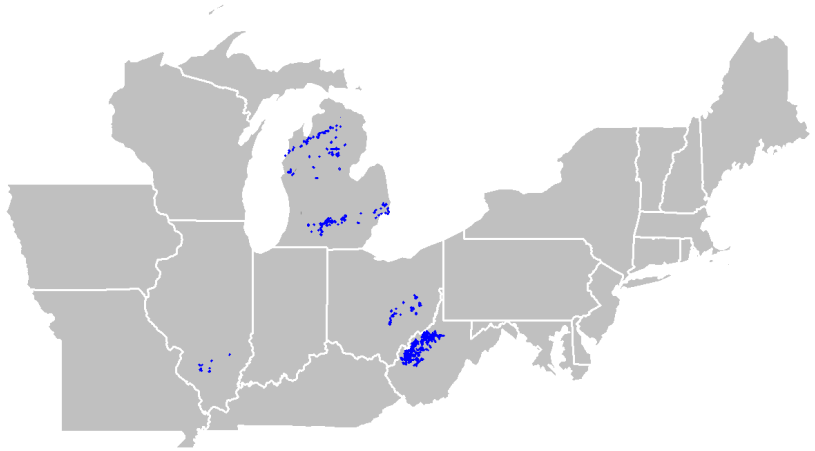
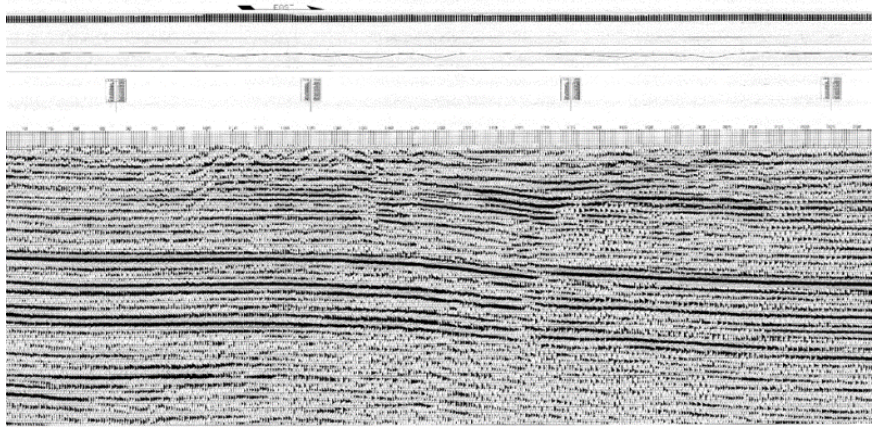
Rescuing Legacy Seismic Datasets

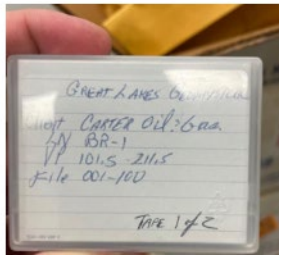
Legacy seismic data was organized, summarized, and digitized so that it may support CCS in the MRCI region:

- 986 seismic surveys - 1,892 linear miles of 2D seismic data
- 43 square miles of 3D seismic data
- 61 boxes with CD's, DVD's, tape cartridges, floppy disks, reels, mylars, paper plots
- 8 oil and gas operating companies with data from Illinois, Michigan, Ohio, West Virginia

Seismic surveys cataloged in terms of location, acquisition parameters, data type, format.







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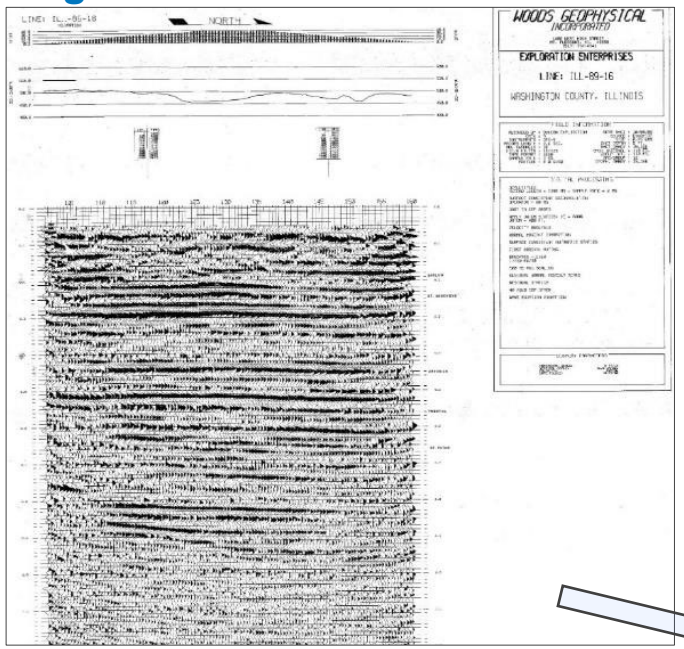
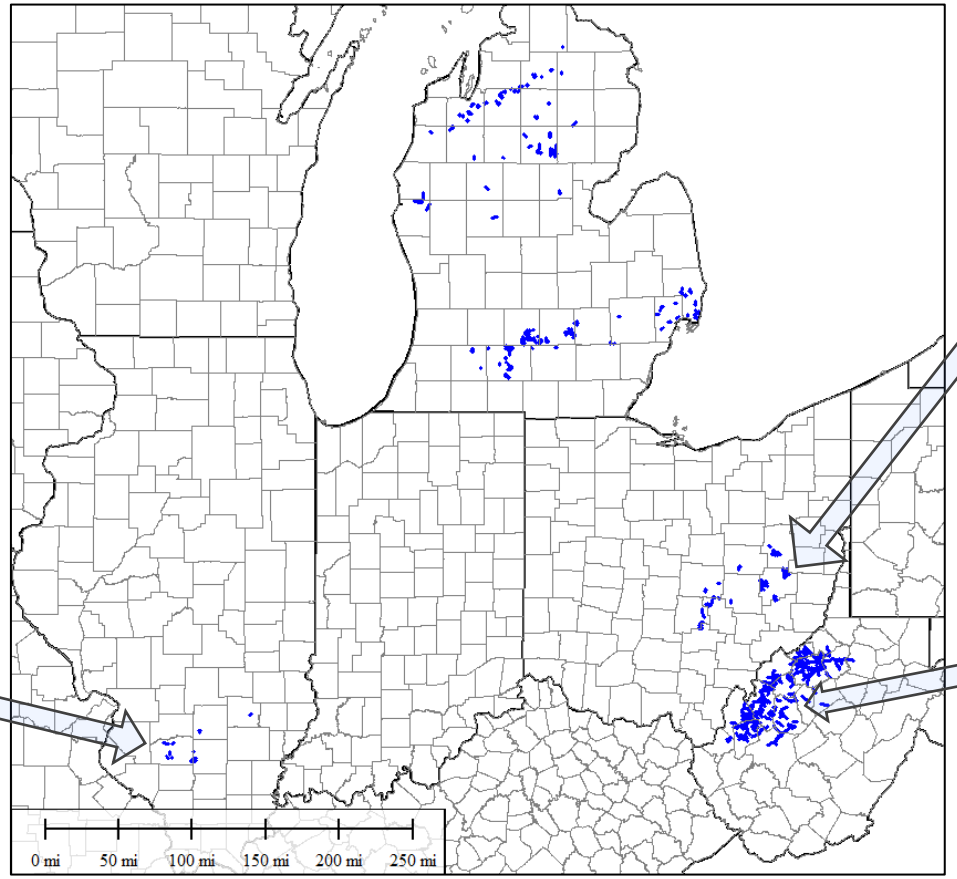
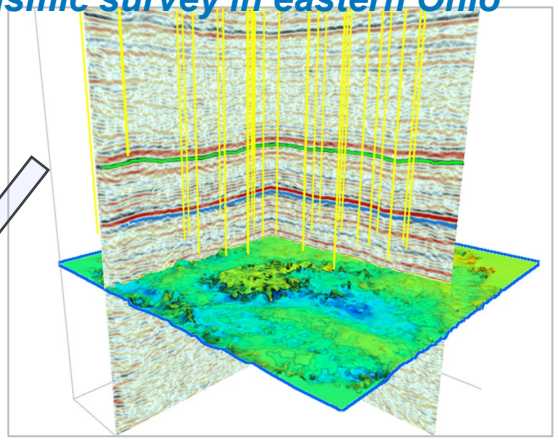
Leveraging Legacy 2D and 3D Seismic Datasets

2D seismic line in southern Illinois scanned from mylar to digital format

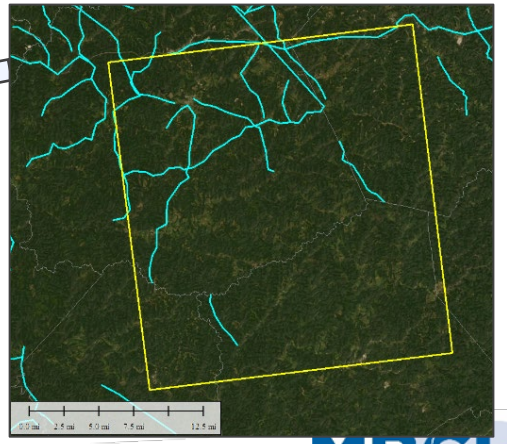




Mount Simon horizon on a 3D seismic survey in eastern Ohio



Legacy seismic lines (blue) in relation to the model area in West Virginia



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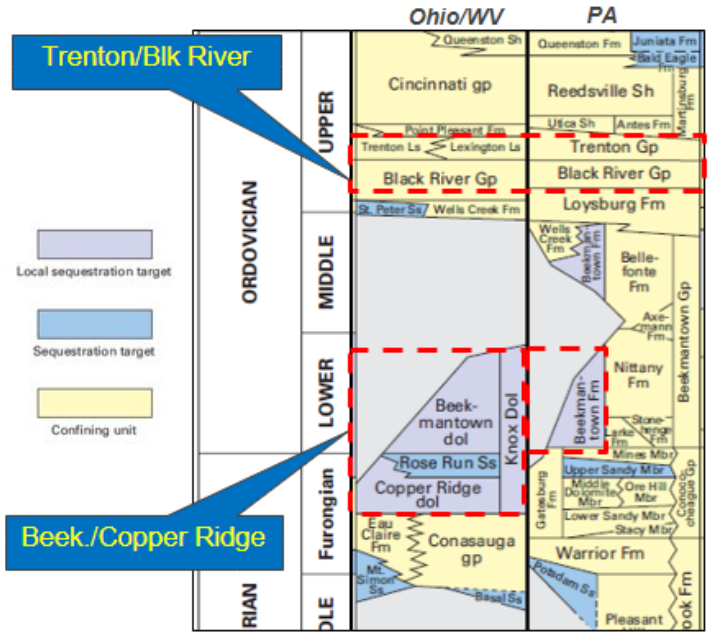
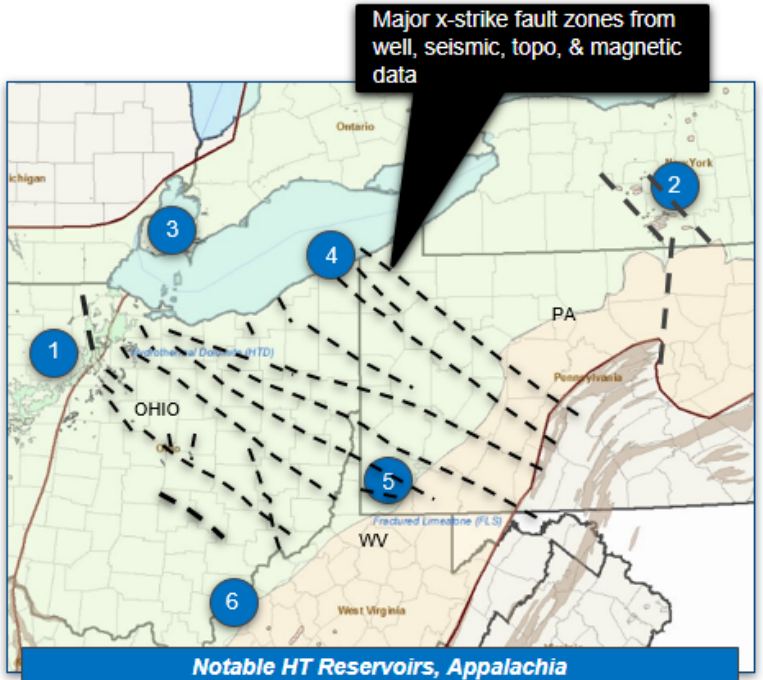
Exploring CO_2 Storage in Carbonates

Hydrothermal Dolomite for CO_2 Storage in Appalachian Basin



- PreC crustal zones of weakness and three subsequent orogenies
- Resulted in development of a vast, long-lasting system of wrench/strike-slip faults
- A thick section of Ordovician carbonates were exposed to deep, hot brines via the extensive wrench system

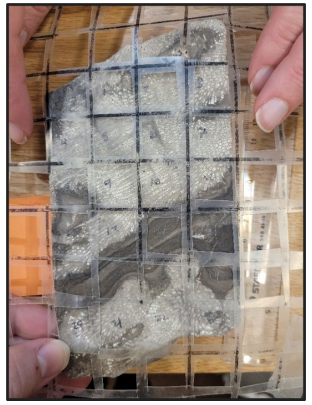


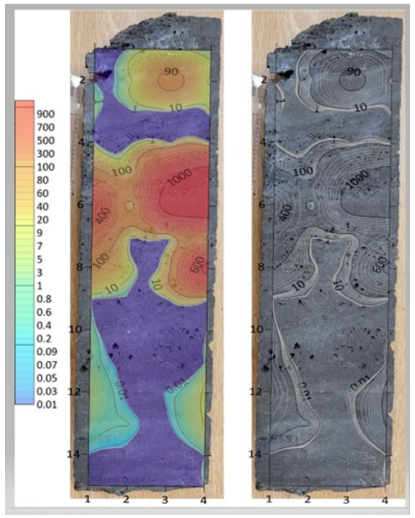
Notable HT Reservoirs, Appalachia

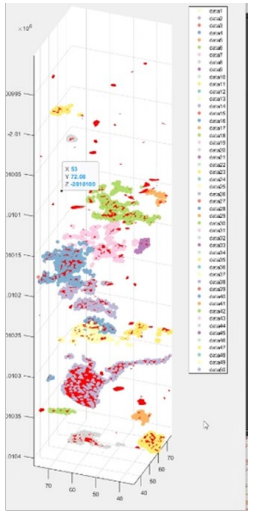
1. Lima-Indiana: World's first giant oil field
2. Prolific HT gas fields of S. NY
3. Rochester oil field, Ontario
4. Saybrook HT oil/gas, OH
5. Scotts Run: biggest "shale gas" well.
6. **Copper Ridge Fm** vuggy zones

Trenton/Blk River Fm

Mapping Vugular Porosity in Carbonates via Rock Core CT Scans







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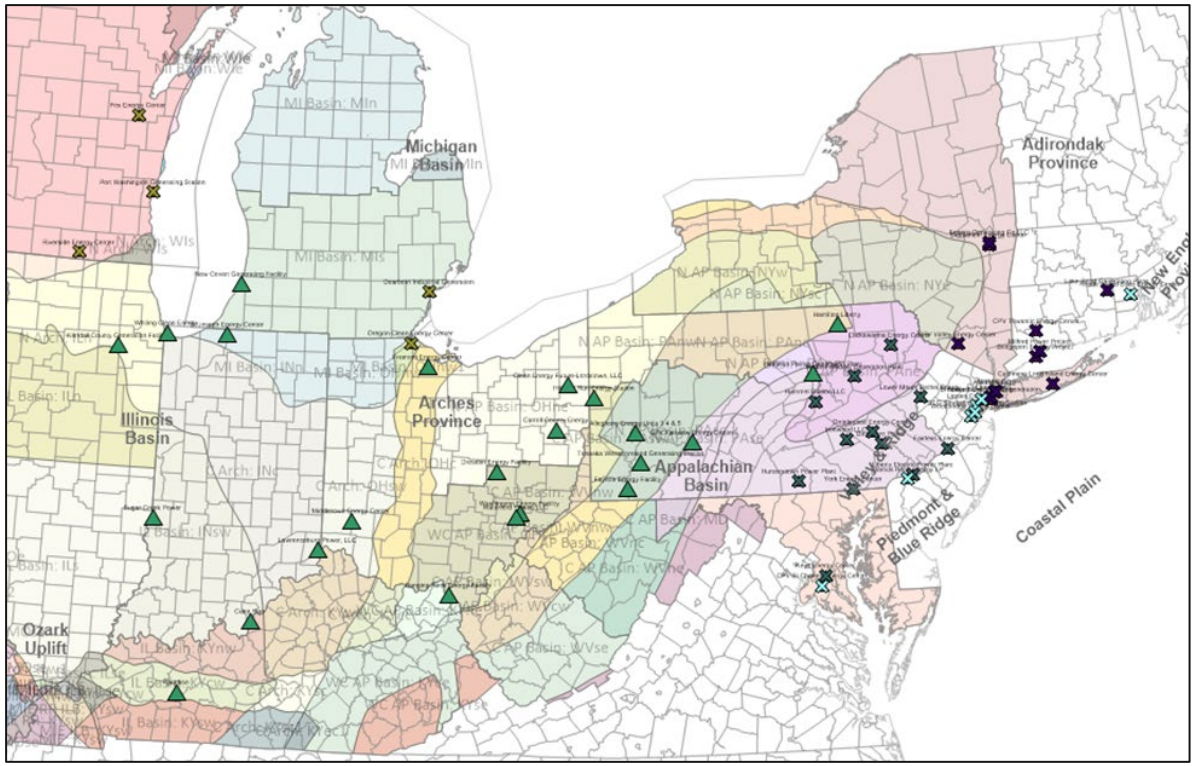
Existing Natural Gas Power Plant CCS Screening

- 781 Natural Gas Power Plants in the MRCI were evaluated for CCS feasibility.
- 59/781 NG plants meet proposed EPA rules (>300MW & 50% Capacity Factor).
- Screening results for engineering specifications, geologic setting, and surface factors for CCS:
  - 15 fair/favorable plants
  - 8 marginal plants
  - 36 unfavorable plants
- Favorable plants located in deeper portions of sedimentary basins, undeveloped lands.
- Many marginal plants, unfavorable plants along east coast, eastern Appalachian Basin.



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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*

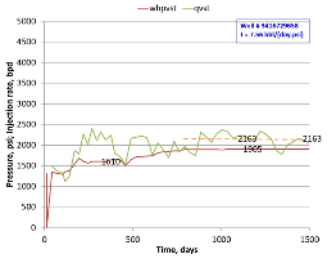
Effective mo**n**itoring of long-term site **s**tability for transparent carbon captu**r**e and storage hazar**d** ass**e**ssment (ENSURE)

NORSAR

Accelerating CCS Technologies

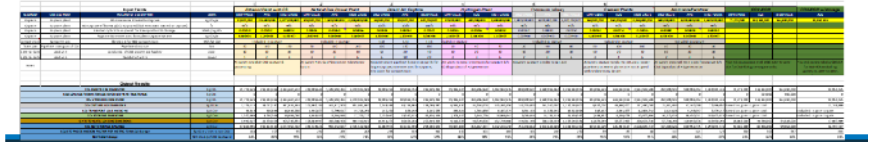
Description of case study sites

Class II UIC Well Injectivity Analysis

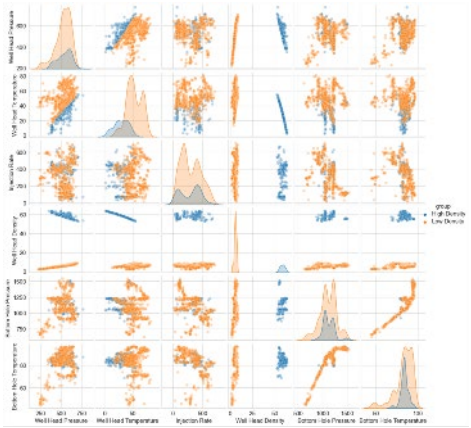


GHG LCA Net CO_2 Storage

- 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)

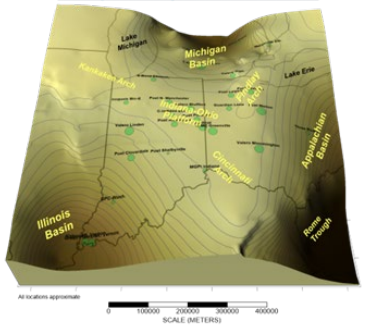


Machine Learning for Bottomhole Pressure/Temp

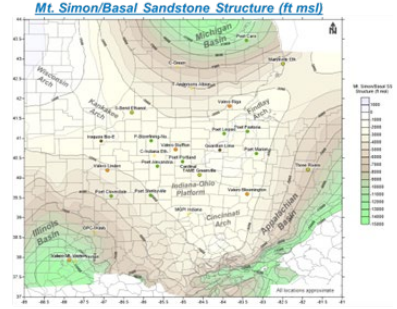


Central MRCI Ethanol Plant CCS Screening

3D Diagram of Regional Basins & Arches



Mt. Simon/Basal Sandstone Structure (ft msl)



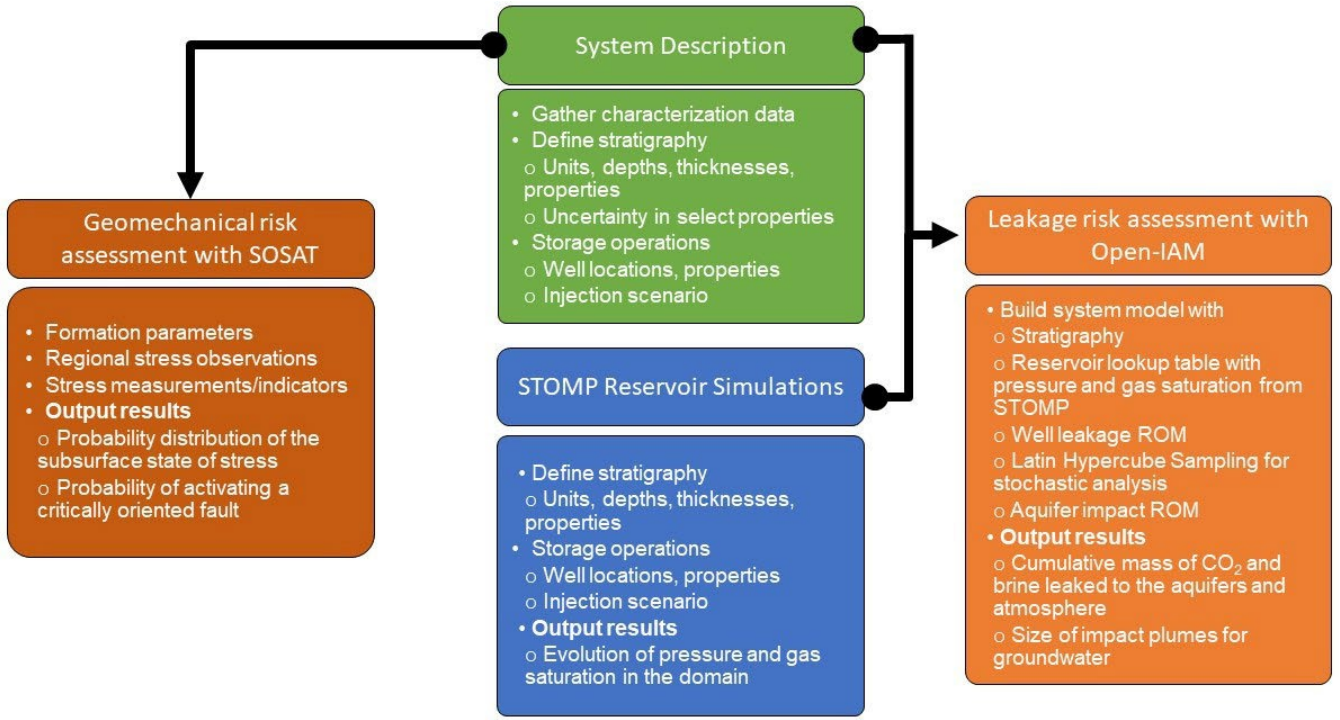
MRCI Midwest Regional Carbon Initiative

Working with NETL National Risk Assessment Partnership

- The Illinois State Geological Survey worked with PNNL in support of the Wabash CarbonSAFE project, including STOMP reservoir simulations for the Potosi Dolomite, and assessments of well leakage risk and subsurface stresses using the NRAP-Open-IAM (Integrated Assessment Model) and a new version of the SOSAT (State-of-Stress Analysis Tool).

- The CarbonSAFE Illinois Storage Corridor project is currently in progress and leveraging NRAP tools (SOSAT, NRAP-Open-IAM and Designs for Risk Evaluation and Management [DREAM]) for site characterization and to support UIC Class VI permit applications for the project's two site hosts.

General workflow for assessing leakage and geomechanical risks associated with the injection of carbon dioxide using two NRAP tools



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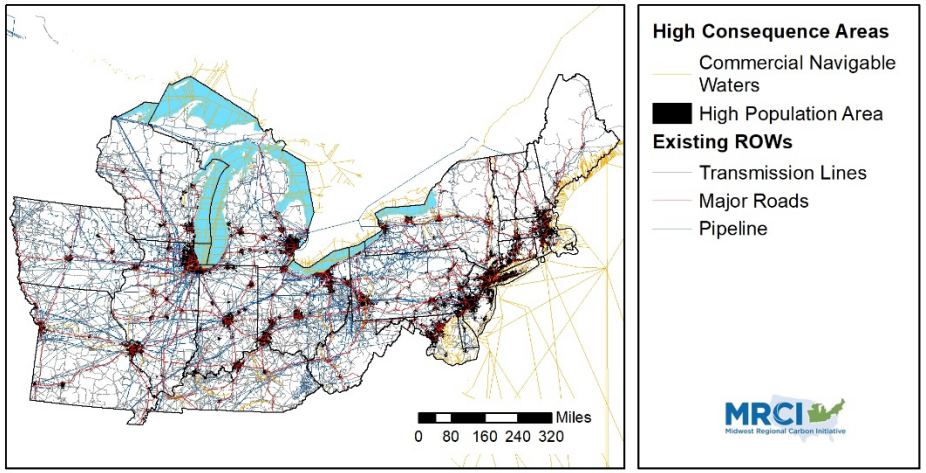
Rethinking infrastructure for Carbon Capture, Utilization, and Storage (CCUS)

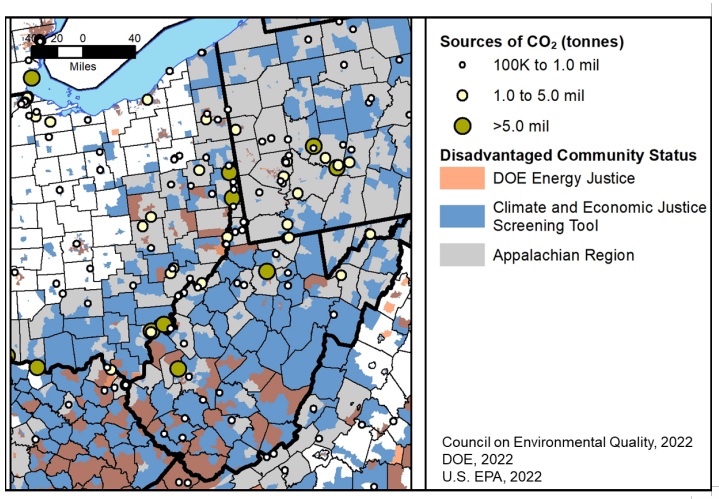
Researching the infrastructure of CCUS is more than just the physical equipment that enables CCUS; it also includes the policy, economics, and people that make CCUS work.

Evaluating Regional Infrastructure

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

- Conduct a screening level 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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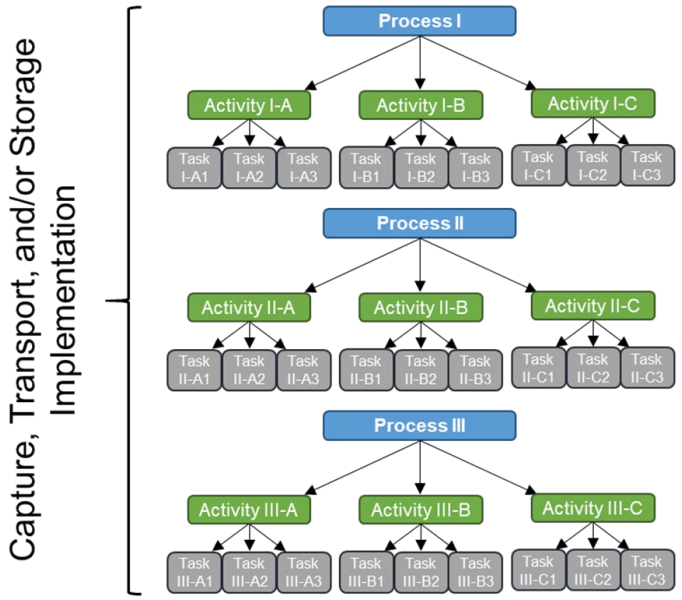
Evaluating Regional Infrastructure Progress



United States® Census Bureau

2020 Census Results

United States® Census Bureau

Quarterly Workforce Indicators

EPA United States Environmental Protection Agency

EJScreen

NCES National Center for Education Statistics

CIP THE CLASSIFICATION OF INSTRUCTIONAL PROGRAMS

-Evaluating jobs using input-output models.
-Calculating projects expenses, benefits, and tax.

Jobs and Economic Impact

-Conducting community characterization.
-Researching environmental justice and sustainability.
-Working with outreach task.

Social Characteristics

-Determining workforce characteristics.
-Outlining workforce needs.
-Identifying training institutions.

Workforce Development

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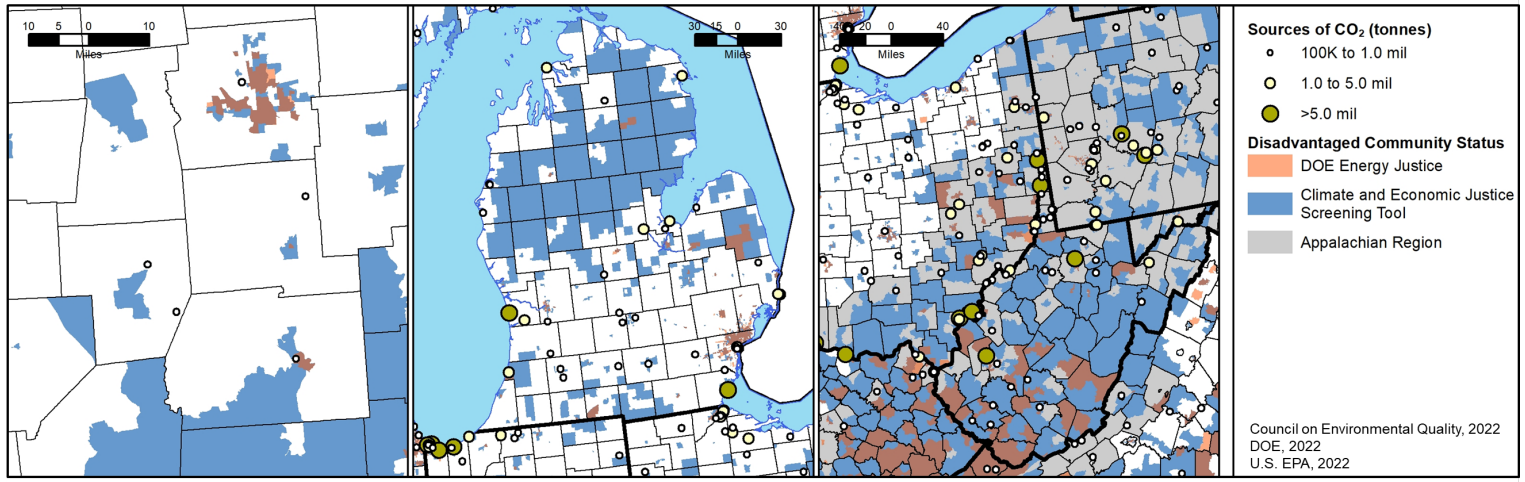
Disadvantaged Communities– Using the tools



Local (Central Ohio) Hub (Michigan Basin) Distributed (Central Appalachian Basin)

Scenario	No. Tract	Underserved		Climate Change		Energy		Health	
Local	321	123	38%	5	1.6%	19	5.9%	99	31%
Hub	3,060	1,106	36%	49	1.6%	575	19%	843	28%
Distributed	2,581	1,013	39%	327	13%	359	14%	703	27%
All MRCI	30,671	9,856	32%	1,783	5.8%	3,128	10%	5,515	18%

Scenario	Legacy Pollution		Transportation		Water		Workforce Dev.		Housing	
Local	32	10%	31	10%	10	3.1%	72	22%	61	19%
Hub	313	10%	397	13%	529	17%	585	19%	656	21%
Distributed	374	14%	287	11%	145	5.6%	348	13%	422	16%
All MRCI	4,169	14%	3,421	11%	2,903	9.5%	5,835	19%	5,654	18%

Projects offer benefits to these categories. Well-designed projects are unlikely to negatively impact them.

Project could offer benefits to these categories. Poorly designed projects may negatively impact them.

Projects may negatively impact these categories. Well-designed projects will mitigate impacts and/or add benefits.

From identifying the communities to understanding their issues, the tools provide a way to find opportunities for sharing community benefits and mitigating possible impacts.

The MRCI project is demonstrating this with case studies.

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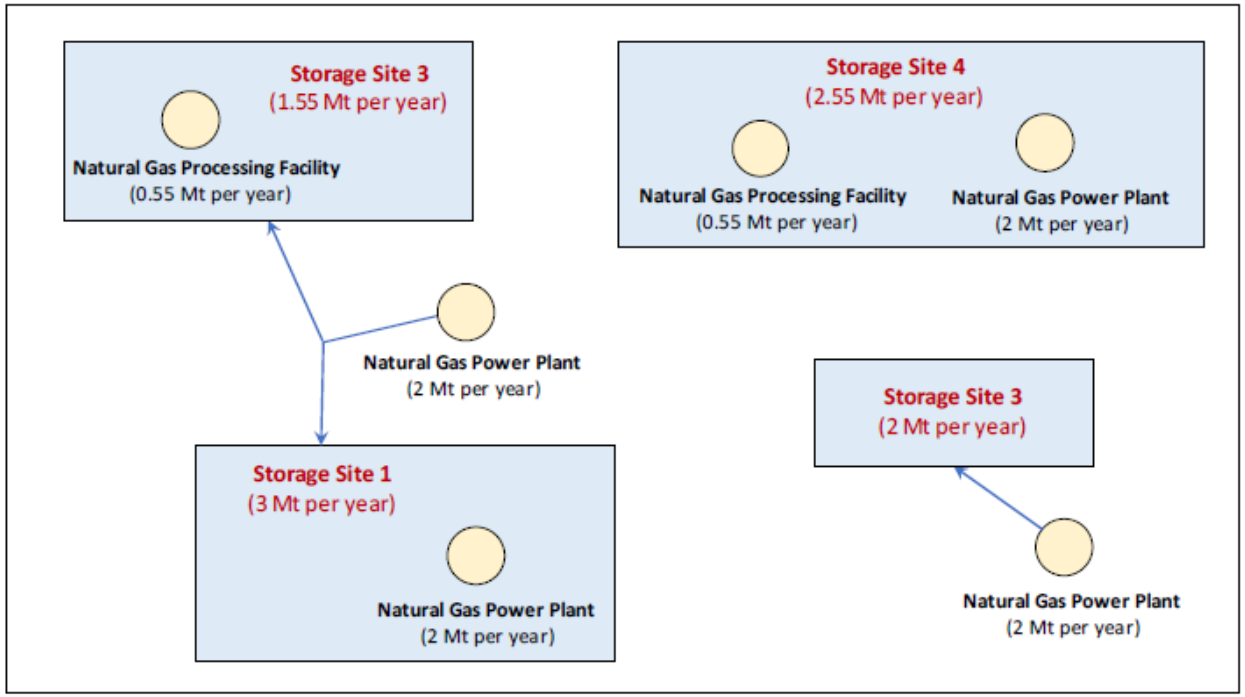
Jobs and Economic Revitalization – A hypothetical case study from the Appalachian Region



The economic revitalization of an integrated multi-source project in Pennsylvania:

- 6 sources (9.1 Mt/yr)
  - -Natural gas processing (x2)
  - -Natural gas power plant (x4)
- Pipeline transport
- 4 storage sites

Direct, indirect, and induced employment and economic impact ($million)

Phase	Employment		Labor Income		Value Added		Output	
	Avg. Annual	Total	Avg. Annual	Total	Avg. Annual	Total	Avg. Annual	Total
Pre-Injection phase (3 years)	8,600	25,800	$676	$2,000	$1,000	$3,100	$1,700	$5,200
Injection phase (25 years)	800	20,000	$55	$1,400	$76.1	$1,900	$142	$3,500
Post-Injection phase (25 years)	20	600	$2	$49	$2.8	$70	$5	$120
Total (53 years)	900	46,400	$65	$3,500	$95	$5,000	$166	$8,800

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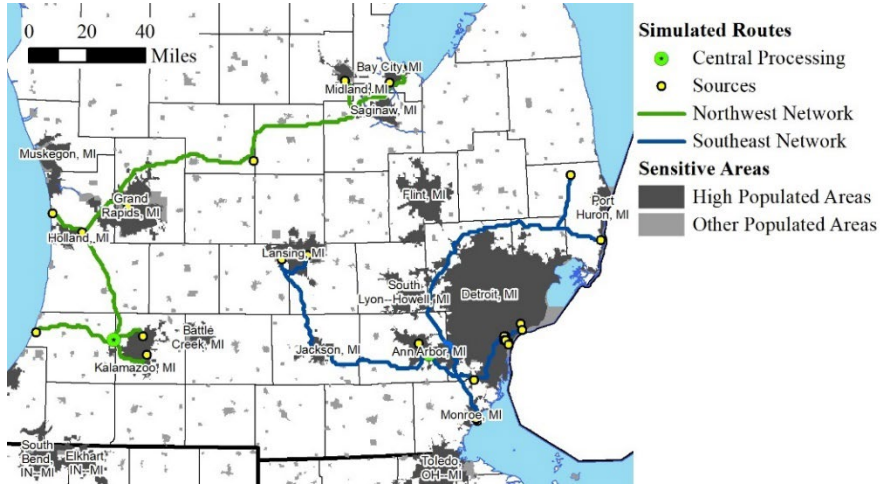
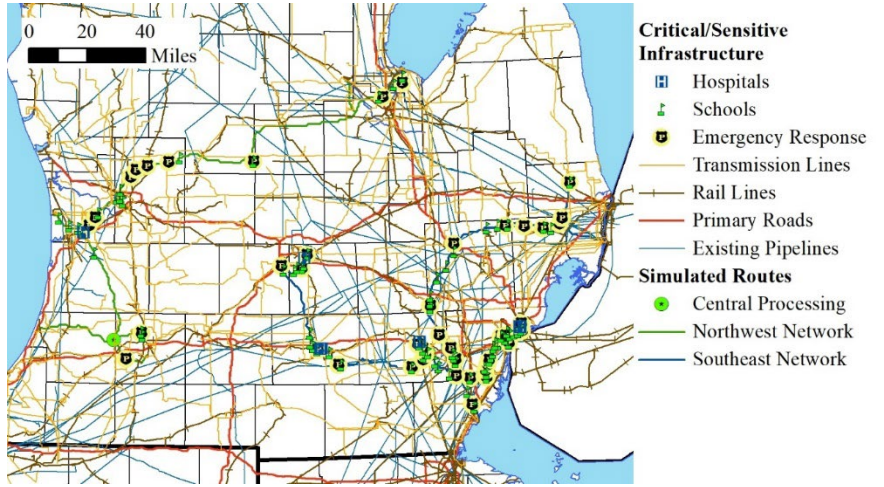
Accounting for Sensitive Areas – Michigan Basin Example

Analyzing simulated network for how it impacts sensitive areas and environmental justice

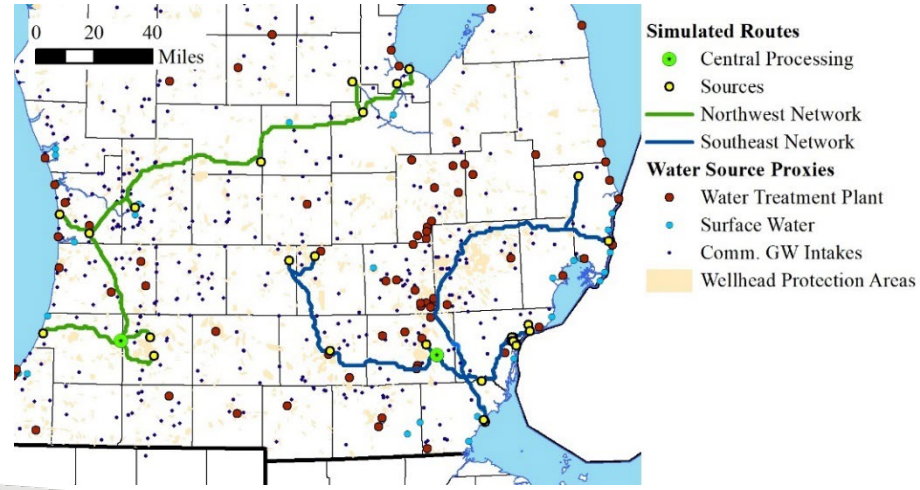
Populated Areas



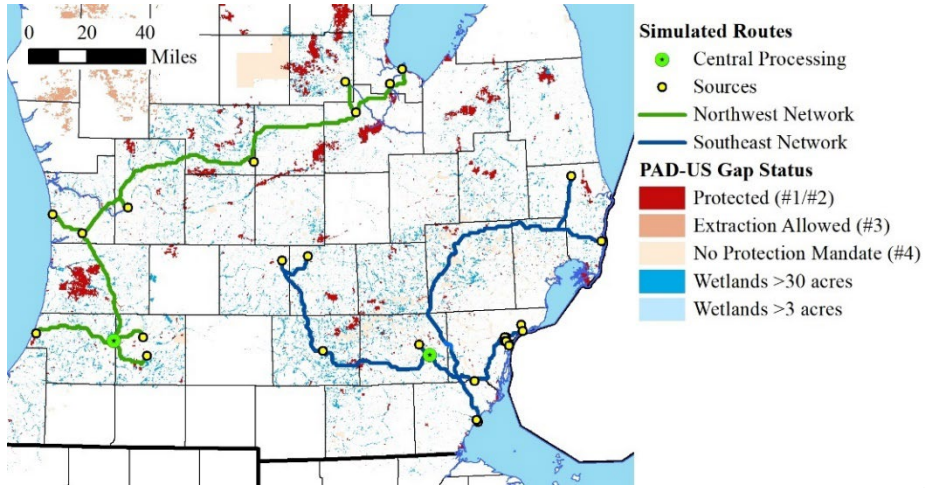
Critical Infrastructure



Water



Environmental



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Thinking to the Future – How Infrastructure Security is an emerging issue for CCS

Infrastructure security is important for CCS because of digital and physical proximity and interconnections to critical infrastructure and varying risk receptors.

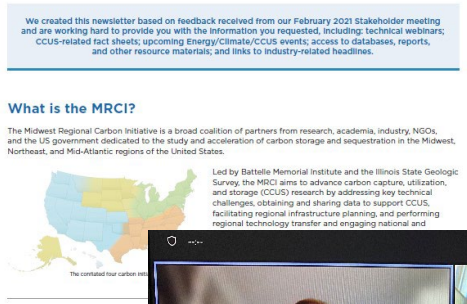
The process used to access physical security and cybersecurity:

Threat Assessment	What could go wrong?
Vulnerability Assessment	When, where, and how?
Consequence Identification	What will it impact?
Protection Assessment	How can it be prevented?

Promoting Regional Technology Transfer

GOAL: Leverage existing and new relationships with critical CCUS stakeholders within the RI and globally and become a key resource for CCUS development.

- Promote acceleration of CCUS deployment by providing general support for commercialization and technology transfer
- Compile and communicate information from previous tasks to interested stakeholders
- Engage with federal and state governments, industry consortia and NGOs
- Engage with global institutions



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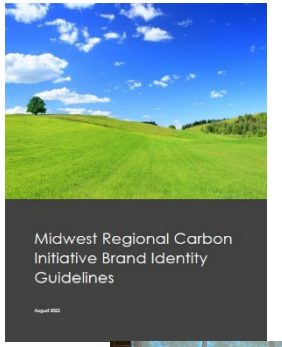
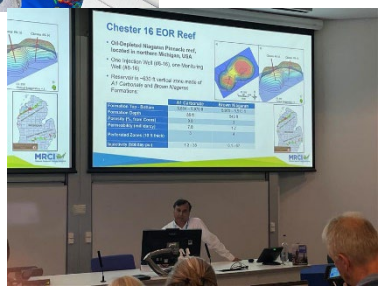
Aligning Outreach Strategy with Targeted Audiences

General Public	Technical	Academic/Educators/ Students	Industry	Policy/Regulators
• Annual Meetings • Website • Newsletter • Fact sheets • Educational Videos • Podcast • Story Maps	• Annual Meetings • Newsletter • Website • Webinars • Podcast • Story Maps • Conferences and papers • Short courses	• Annual Meetings • Newsletter • Website • Fact Sheets • Educational Videos • Story Maps • Short courses • Hands-on learning opportunities	• Annual Meetings • Newsletter • Website • Fact Sheets • Podcast • Story Maps	• Annual Meetings • Newsletter • Website • Fact Sheets • Informational meetings • Story Maps • CURC engagement

Outreach Status

- Full branding package created
- Support platforms - website, podcast, social media presence, newsletter
- Three Stakeholders and Partners meetings hosted, with attendance tripling in three years
- Presentations and panel appearances supporting published research at conferences across the country and globe
- Community outreach at science festivals (COSI) and community meetings about CCS and related projects



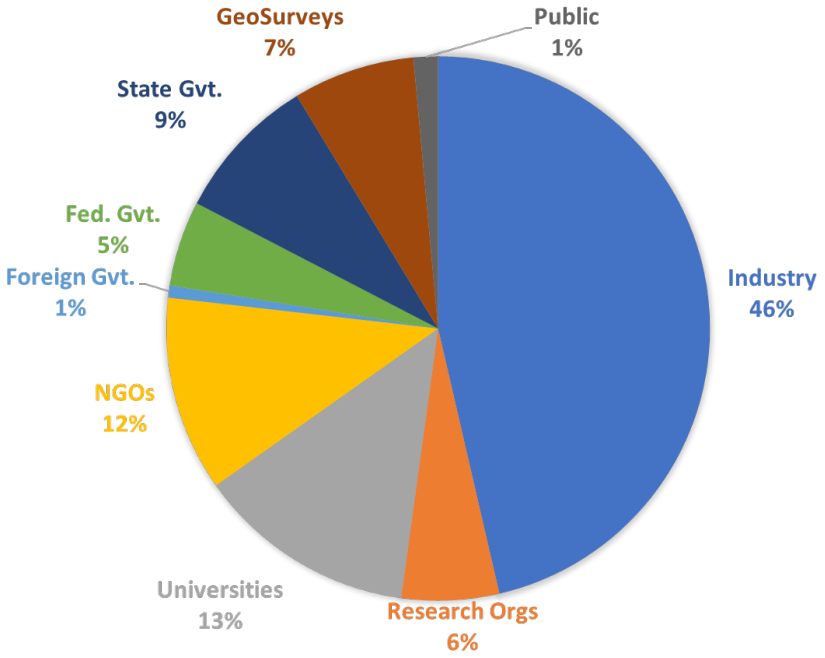


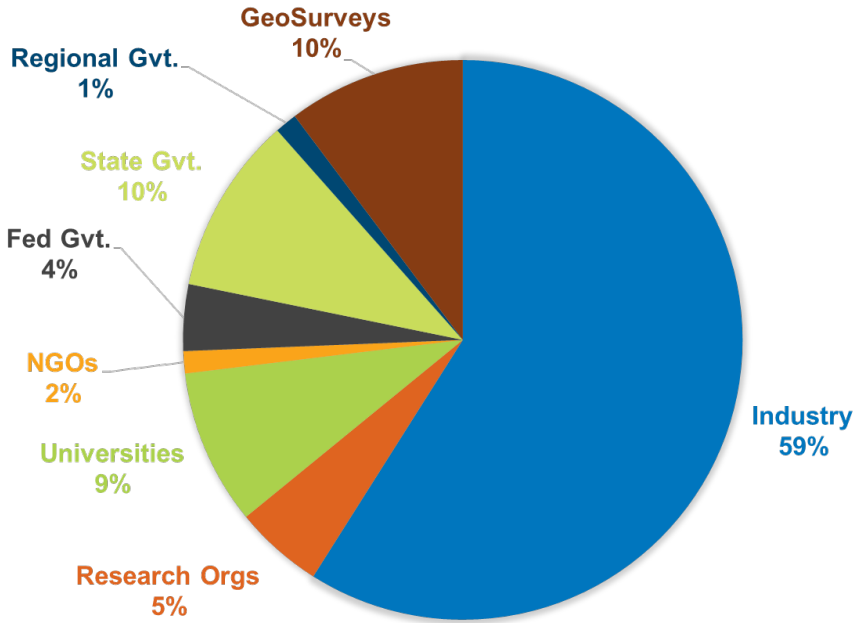
MRCI Midwest Regional Carbon Initiative

Growth of Program in Region

First Stakeholder Meeting February 2021, virtual

245 attendees, including: AEP, Duke Energy, BP, Shell, Tuscaloosa Chamber of Commerce, NORSAR, Univ. Wyoming EORI, CATF, EDF, SSEB, Norwegian Petroleum Directorate, DOE-NETL, EPA





Third Stakeholder Meeting September 2022, in-person
Columbus, OH, Over 175 attendees, including: ADM, Navigator CO_2, Global CCS Institute, International Brotherhood of Boilermakers, SARTA, Muskingum Watershed Conservancy District

Two pre-conference sessions:

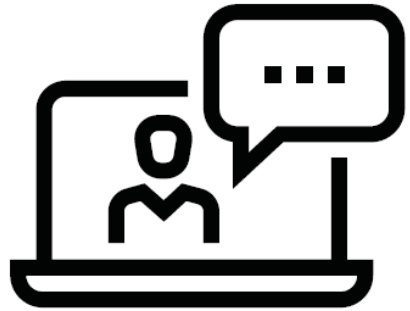
- Machine Learning = 25 attendees
- Stakeholder Engagement and Environmental Justice = 70 attendees

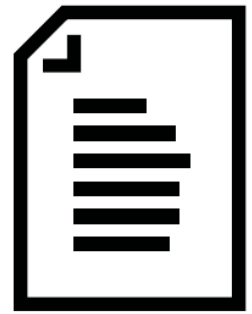
MRCI Midwest Regional Carbon Initiative

Focus on Environmental Justice

Learning, Connecting, and Informing

- Formed MRCI EJ Working Group to explore the topic, learn about its roots, and how it intersects with CCUS
- Compile and communicate information about Justice40 Initiative, Energy Communities, etc. with stakeholders
- Hosting EJ Workshop at Annual Stakeholders Meeting Sept. 27-28, 2022
- Engaging with other Initiatives on EJ in late 2022, early 2023





Steps Forward for Outreach

- Stakeholders and Partners Meeting - October 3-5, 2023, Morgantown, WV
  - Workshops on **Storage Resources Management System (SRMS), Community Benefits, and Hydrogen/CCS**
- Bi-monthly webinars and YouTube Channel
- Beta testing CCS teacher kits with geo survey partners in up to 5 states
- Joining/Continuing conversations worldwide to promote acceptance and deployment of CCS in region with big potential
- Continued one-on-one support to stakeholders with education and advice on community engagement – which is crucial for successful deployment

Summary and Expected Outcome

- 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 is vital for acceptance
- Provide support/partnership on community engagement efforts for DOE-funded projects – CarbonSAFE, Hydrogen, DAC, etc. to ensure consistent and public-forward approach
- Collaborate with newly selected projects – offshore storage, State Geological Surveys, and industry under FOA2799
- MRCI is entering final year of current funding and will look for DOE's direction in continuing this important program – as we enter the CCS deployment phase!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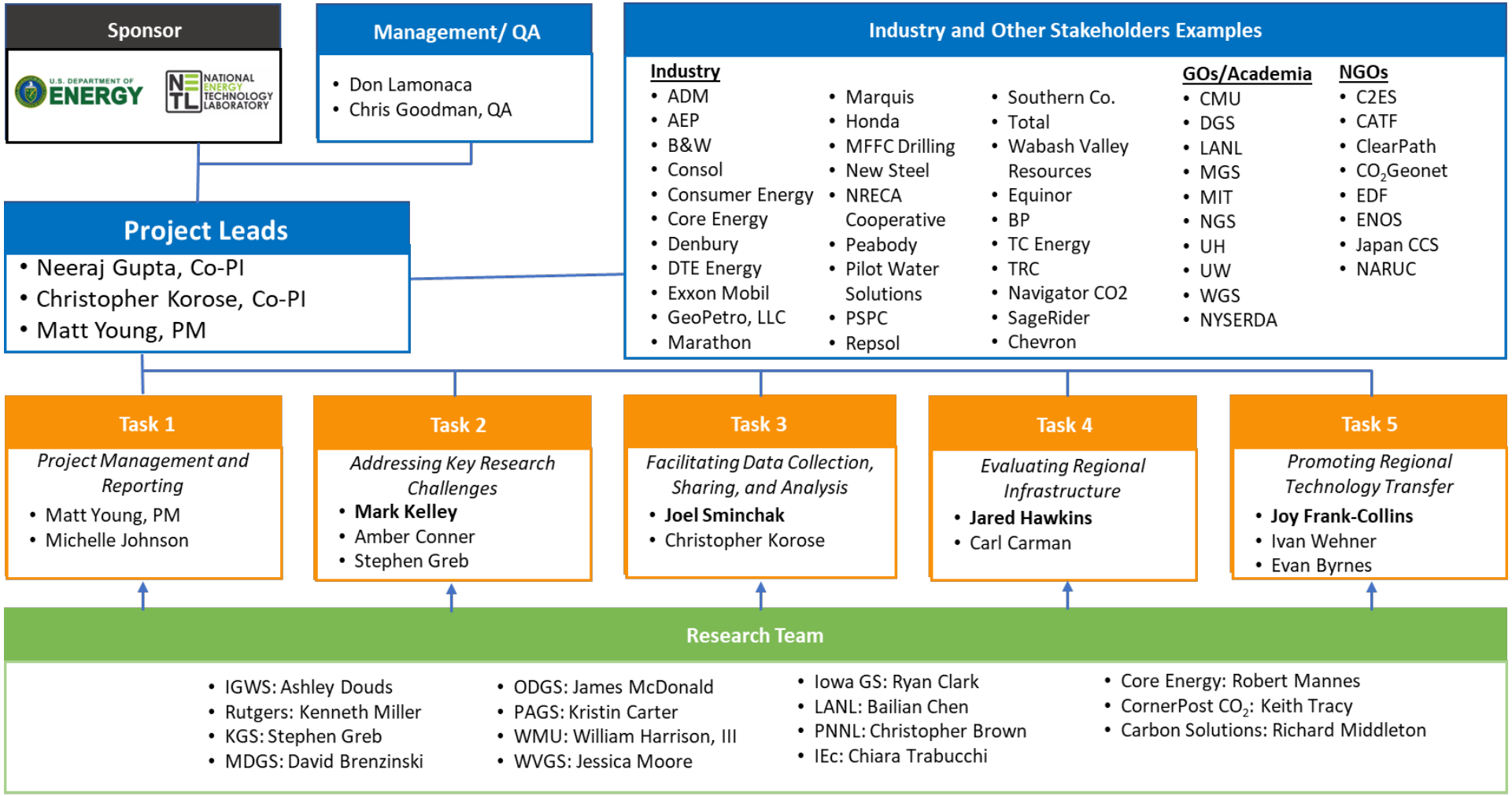
MRCI – Collaboration between Researchers, Industry, and Government, and non-Governmental Organizations



MRCI Midwest Regional Carbon Initiative

Gantt Chart

Task	Description	FY2020				FY2021				FY2022				FY2023				FY2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.0	**Task Management and Planning**	1	2																		12
2.0	**Addressing Key Technical Challenges**							5		6							10				
2.1	Assessing regional/subregional framework and expanding CO_2 stacked storage characterization																				
2.2	Analyzing Precambrian Basement faulting/stress																				
2.3	Developing industrial partnership and regional technical collaboration																				
2.4	Conducting regional/subregional analysis																				
2.5	Assessing and managing risks																				
3.0	**Facilitating data collection, sharing, analysis**															9					
3.1	Inventorying of available data and analyses																				
3.2	Facilitating data sharing																				
3.3	Planning and executing additional data analyses																				
3.4	Engaging the National Laboratories' efforts																				
3.5	Engaging NRAP																				
3.6	Advising machine learning for CCUS efforts																				
3.7	Participation in DOE SMART Initiative																				
4.0	**Evaluating Regional Infrastructure**												8								
4.1	Evaluating infrastructure																				
4.2	Assessing site readiness																				
4.3	Conducting social, economic, and jobs analysis																				
4.4	Promoting commercialization and policy																				
4.5	Convening regional stakeholders for infra-structure evaluation																				
5.0	**Promoting Regional Technology Transfer**					3	4			7							11				
5.1	Facilitating regional efforts to address non-technical, permitting, and infrastructure																				
5.2	Engaging global efforts																				
5.3	Supporting policy, incentives, and business cases																				
5.4	Engaging CCUS stakeholders																				

Task POP Subtask POP Deliverable Milestone* Subtask Dependence

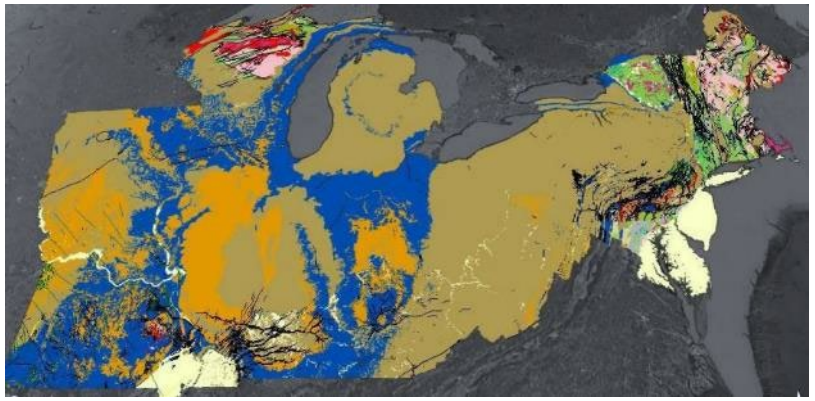
*Values correspond to Table 2.

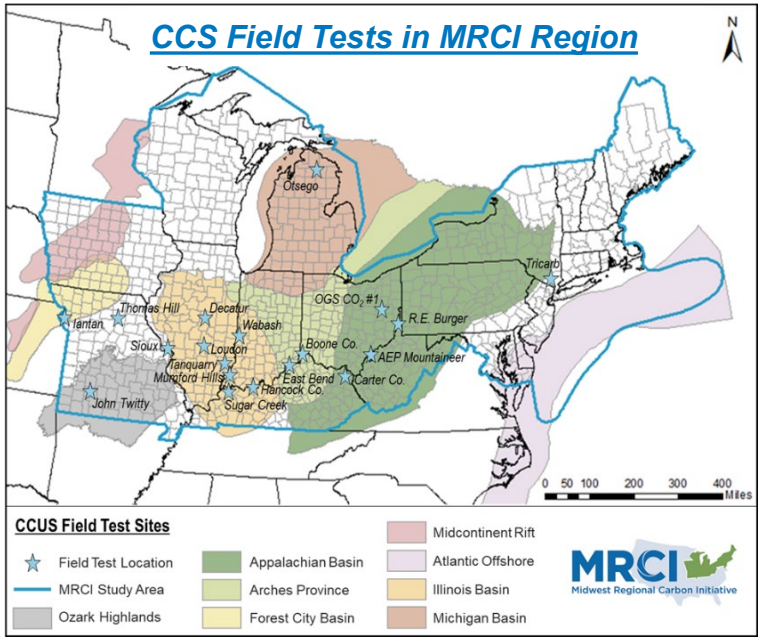
MRCI Midwest Regional Carbon Initiative

MRCI Research, Projects, Datasets

Objective: facilitate CCUS development through collection and sharing of existing and new technical data from CCUS projects for further analysis and assessment of tools by the project team and other DOE research programs.

- Inventory & Compile Data from MGSC, MRCSP, State initiatives: completed summarizing 1000+ reports, datasets, projects completed in MRCI over the past 20+ years!
- Additional Data Analysis: completed topical studies for key CCS challenges in MRCI region.
- Collaborate with DOE-NETL, NRAP, Nat. Labs.





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