Welcome to MRCInfo, a newsletter created to share the latest news from the Midwest Regional Carbon Initiative and the ever-growing field of Carbon Capture, Utilization, and Storage.

MRCInfo

News from the Midwest Regional Carbon Initiative

SEPTEMBER 2021

In this issue, read about...The research available from the Midwest Geological Sequestration Consortium (MGSC) program, one of the two pre-cursors to the MRCI; a completed drilling project on the Illinois Storage Corridor Project; West Virginia's steps towards Class VI primacy, the latest on the US Infrastructure Plan; and more!

MGSC Reports Available – Sharing Results from 17 Years of CCUS Research in the Illinois Basin

In April 2021, the Midwest Geological Sequestration Consortium (MGSC) concluded a 17-year deep dive into CCUS in the Illinois Basin, producing a vast amount of research and data that has advanced CCUS science and technology across the US.

Its flagship three-phase project, The Illinois Basin – Decatur Project (IBDP), successfully stored one million tonnes of CO_2 in a deep saline reservoir at an industrial site owned by Archer Daniels Midland (ADM) in Decatur, Illinois. Initiated in 2007, the project stages included the pre-injection period (2007-2011), injection period (2011-2014), and post-injection monitoring period (2014-2021). In addition, the IBDP also provided monitoring for an industrial-scale CCS project, the Illinois Industrial Sources CCS Project, led by Archer Daniels Midland, which is currently injecting CO_2 at the site.

These two projects hold the first Underground Injection Control (UIC) Class VI storage permits for CCS issued in the country.

MRCI Midwest Regional Carbon Initiative

The IBDP ended earlier this year as the MGSC wrapped up its work and merged with the MRSCP (Midwest Regional Carbon Sequestration Partnership) to form the MRCI. The IBDP also concluded environmental monitoring through the Monitoring Verification and Accounting (MVA) program earlier this spring, transitioning monitoring equipment to the Illinois Industrial Sources CCS project for continued use.

Publications dating back to the project's inception are now available at the Midwest Geological Sequestration Consortium Research Publications Database. Designed by the American Geosciences Institute (AGI), this searchable bibliographic database contains about 600 references and features publications including peer-reviewed literature, conference materials, and reports, and represents important contributions to the science of carbon sequestration.

The MRCI plans to partner with AGI in 2022 to produce a similarly searchable database of publications created throughout this project.

Progress Report: Illinois Storage Corridor Project

Completes test well drilling for CarbonSAFE project

The Illinois State Geological Survey (ISGS) recently finished drilling Lively Grove #1 in Washington County, Ill., to evaluate storage reservoirs and seals. The activity is part of the Illinois Storage Corridor project, which involves characterizing and constructing two carbon storage sites: one near the One Earth Energy ethanol facility in Gibson City and a second at the Prairie State Generating Company in Marissa. The Illinois Storage Corridor project itself is a component of the survey's CarbonSAFE project.

According to Principal Investigator and ISGS Director of Energy & Minerals Dr. Steve Whittaker, the well was drilled to a depth of about 5880-feet and reached the Precambrian basement. A full suite of geophysical logs, cores, side wall cores, a drill stem test, and cuttings were collected and are being analyzed. A number of potential storage intervals and confining beds are being evaluated and a vertical seismic profile and *in-situ* well tests are slated to take place soon.

The data collected from this project will be used for development of static geocellular models and dynamic simulations of injection, which will better help researchers understand the site's suitability for CO_2 injection and storage.

In addition to the well, the ISGS is currently in the process of conducting a 2D seismic survey campaign to image the subsurface in Washington and McLean counties in the state.

MRCI Fall 2021 Stakeholders Meeting Postponed

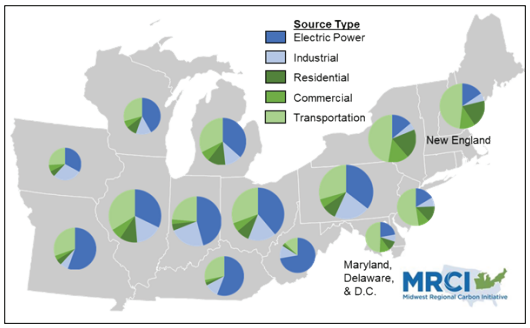
Due to continued uncertainty related to rising COVID-19 cases caused by the Delta variant, we have made the difficult decision to postpone the in-person Fall 2021 MRCI Stakeholders meeting originally scheduled for Nov. 8-10 in Morgantown, WV. It is our hope that we can reschedule this event to meet in-person in early 2022.

That doesn't mean that we still don't have lots of research and discoveries related to CCUS to share. Therefore, we are putting together a series of shorter, virtual meetings to keep you up-to-date and in-the-loop. Look for more information about these meetings, tentatively slated for October and November 2021, in your inbox and on our website at midwestccus.org soon.

PROJECT SPOTLIGHT

Where is CO_2 Coming From?

Infrastructure research update from Battelle Geologist Jared Hawkins



State-wide CO_2 emissions, by sector, for point sources (blue) and non-point sources (green). The pie charts are sized by total CO_2 emissions in the state. Pennsylvania point and non-point sources emitted the most CO_2 in the MRCI region (216.7 MMT of CO_2). The Maryland area point- and non-point source emitted the least amount of CO_2 in the MRCI region (66.9 MMT of CO_2). Data are from the Energy Information Administration (EIA, 2020).

The MRCI area is a unique blend of large urban centers, industrial hubs, rural areas, and undeveloped natural areas. The states with the largest emissions in the MRCI area are in the industrialized Midwest (Pennsylvania, Ohio, Michigan, Indiana, and Illinois). The impact of these states is even greater when considering only point sources. However, the states in the MRCI area with the most aggressive climate targets are along the Eastern Seaboard, where two-thirds or more CO_2 emitted is from non-point sources. Because of these distinctions, tailor-made solutions are required to effectively address CO_2 emissions across the entire study area.

In addition to traditional carbon capture, utilization, and storage (CCUS) methods at electric power and industrial point sources, the MRCI project team is evaluating new technologies like direct air capture (DAC) with CCUS to offset difficult to capture point- and non-point sources, BioEnergy with CCUS (BECCUS) to provide potentially carbon neutral or carbon negative power sources, and hydrogen production with CCUS (blue hydrogen) to provide a less carbon intensive power source and transportation fuel.

MRCI Completes Annual Review with Department of Energy

On August 4, Dr. Neeraj Gupta, co-principal investigator for the Midwest Regional Carbon Initiative and technical director for Battelle's Carbon Management Program, presented an overview of the work recently completed on the project at the DOE's Carbon Management Review Meeting.

View Dr. Gupta's presentation

Neeraj Gupta, Ph.D.

LEARNING OPPORTUNITIES

The Indiana University Environmental Resilience Institute is hosting the webinar, Addressing Community Climate Vulnerability, from noon - 1pm (EST) on November 10, 2021. The course is directed at ways, using mitigation and adaptation strategies, local governments can create community-specific policies to reduce vulnerability and increase resilience of their residents to climate impacts.

Register Here

COMING SOON!

The MRCI will host a technical webinar outlining preliminary findings related to the current infrastructure within the region and the future needs to accelerate CCUS deployment. Slated to last an hour, the webinar will include a presentation by Battelle Geologist Jared Hawkins as well as a panel discussion.

Registration information will be posted to the MRCI website soon.

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The Center for Climate and Energy Solutions is hosting the webinar, Scaling Carbon Dioxide Removal (CDR): Limitations and Potential, from 1 p.m. – 2:30 p.m. Tuesday, September 21. In this webinar, which is being conducted in conjunction with Climate Week, experts will discuss the potential role of nature-based and technological CDR solutions in future comprehensive decarbonization strategies, overcoming barriers for large-scale deployment of CDR, and how environmental justice can be embedded in CDR frameworks.


Sallie Greenberg, Ph.D.

Dr. Sallie Greenberg, co-principal investigator for the MRCI and principal scientist – energy & minerals for the Illinois State Geological Society, is a member of the panel entitled: Public perception of CDR and environmental justice as part of the CDR agenda.

Register Here

FACT SHEETS

This Fact Sheet from the EDA sums up the $300 million Coal Communities Commitment program and includes contact information for interested applicants.

Find it hard to track all of the federal legislation relating to CCUS? The Clear Air Task Force has you covered with this handy Fact Sheet.

The Carbon Capture Coalition, a nonpartisan collaboration of more than 80 businesses and organizations building federal policy support to enable economywide, commercial scale deployment of carbon capture technologies, created this Fact Sheet on Permitting and Primacy for Class VI Wells.

WATCH THIS SPACE!

The MRCI is working on a series of our own Fact Sheets featuring graphics and content that will make even the most complex aspects of CCUS easy to understand.

IN THE NEWS

In late June, Equinor signed a memorandum of understanding (MOU) with US Steel to examine the potential for hydrogen and carbon capture and storage (CCS) development in the tri-state region of Ohio, Pennsylvania, and West Virginia. **Read about it**

Researchers at the MIT Joint Program on the Science and Policy of Global Change, MIT Energy Initiative, and ExxonMobil asked the question: Might CCS alone enable hard-to-abate industries to continue growing while eliminating nearly all of the CO_2 emissions they generate from the atmosphere?
And the answer was: YES. **Read about it**

The $410 million KeyState to Zero project, slated for construction Clinton County in central Pennsylvania, could include hydrogen and chemical production, carbon capture and storage, shale drilling, and maybe even a few solar opportunities. **Read about it**

Summit Carbon Solutions recently awarded contracts on the $4.5 billion Midwest Carbon Express CCUS project, slated to begin in 2024. The project proposes connecting more than 30 ethanol facilities in Iowa, Minnesota, North Dakota, South Dakota, and Nebraska, and claims it will be capable of safely capturing and permanently storing 12 million tons of carbon dioxide a year. **Read about it**

LEGISLATIVE ACTIVITY

West Virginia Takes Key Steps Toward Class VI Primacy

The West Virginia Department of Environmental Protection (WVDEP) has taken the first steps to obtain primacy for the regulation of Class VI Underground Injection Control (UIC) wells, making West Virginia the first state in the MRCI region to initiate the primacy process. If approved by the U.S. Environmental Protection Agency (EPA), the Class VI program would be administered by the WVDEP Office of Water and Waste Management, which is responsible for regulation of Class I, III, and V UIC wells in the state. West Virginia also holds primacy for Class II UIC wells; that program is administered by the WVDEP Office of Oil and Gas.

Draft rules for the West Virginia Class VI UIC program were compiled with assistance from the EPA and presented for public comment in June 2021. A public hearing was held on July 23, 2021, public comments were addressed, and agency approval of the proposed rule followed on July 30. The rule has now been filed with the Legislative Rule-Making Review Committee and will be considered during the 2022 Regular Session of the West Virginia Legislature, which begins on January 12, 2022.

The MRCSP and MRCI research programs have been integral to the understanding of CCUS systems and operations in the Appalachian basin, particularly through the work performed onsite at the American Electric Power (AEP) Mountaineer Plant in New Haven, W.Va. and the FirstEnergy R.E. Burger Plant in Belmont County, Ohio. This work ensures that decision-making related to Class VI wells in West Virginia can be data driven and informed by decades of research into the state's carbon storage systems.

US Infrastructure Bill(s) Update

On August 24, the US House of Representatives agreed to vote by Sept. 27 on a $1 trillion "Infrastructure Investment and Jobs Act" (IIJA) that has already been passed by the Senate and approved the budget framework on a larger $3.5 trillion referred to by the Biden Administration as the "Human Infrastructure Package."

According to the Carbon Utilization Research Council, the $1 trillion bi-partisan IIJA includes direct appropriations for the following programs (over five years):

Fossil Energy and Carbon Management

- The SCALE Act, including $2.1 billion for CO_2 Transportation Infrastructure Finance and Innovation; $310 for a Carbon Utilization Program; $100 million for FEED studies for CO_2 Transport; and $2.5 billion for Carbon Storage Validation and Testing
- $3.5 billion to develop four regional Direct Air Capture Hubs between fiscal years 2022 – 2026
- Initiating a $15 million pre-commercial Direct Air Capture Technology Prize Competition and a $100 million commercial Direct Air Capture Technology Prize Competition

Office of Clean Energy Demonstrations

- $937 million for Carbon Capture Pilots
- $2.537 billion for Carbon Capture Demonstrations
- $500 million dedicated to Industrial Emission Demonstration Projects
- $8 billion for regional Clean Hydrogen Hubs

The bill also includes an enhanced Section 48C investment tax credit originally introduced by US Senators Joe Manchin (D-WV) and Debbie Stabenow (D-MI) in their American Jobs in Energy Manufacturing Act of 2021.

Read what David Hart, a science policy expert at George Mason University who has been closely following the bill, has to say about its research-related provisions, specifically related to CCUS, in *Science Insider* magazine.

Government Funding Available for Coal Communities

The US Economic Development Administration recently launched its "Coal Communities Commitment," part of the American Rescue Plan, which provides $300 million to support coal communities as they recover from the pandemic and helps them create new jobs and opportunities, including through the creation or expansion of a new industry sector.

For more information visit the EDA Coal Communities Commitment online.

RELATED UPCOMING EVENTS

International Pittsburgh Coal Conference
Virtual, Sept. 20–23, 2021
https://www.engineering.pitt.edu/pcc/

Joint annual meetings of the American Association of Petroleum Geologists (AAPG) and the Society of Exploration Geophysicists (SEG)
Denver, CO, Sept. 26-Oct. 1, 2021
https://ace.aapg.org/2021

Eastern Section of the American Association of Petroleum Geologists (ES AAPG) 50th Annual Meeting
Pittsburgh, PA, Oct. 2-6, 2021
https://www.esaapg.org/event/2020-eastern-section-annual-meeting-pittsburgh/

Geological Society of America (GSA) Connects 2021 Annual Meeting
Portland, OR, Oct. 10-13, 2021
https://community.geosociety.org/gsa2021/home

The International Energy Agency Greenhouse Gas (IEAGHG) R&D Program's 6th Annual Post-Combustion Capture Conference
Virtual, Oct. 19–21, 2021
https://ieaghg.org/conferences/2-uncategorised/1042-pccc-6

Carbon Capture, Utilization and Storage, Gordon Research Conference "Permanently Removing CO2 from Our Emissions and Atmosphere"
Newry, ME, Oct. 24–29, 2021
https://www.grc.org/carbon-capture-utilization-and-storage-conference/2021/

Appalachian Hydrogen & Carbon Capture Conference
Pittsburgh, PA., Nov. 4, 2021
https://www.appahydrogencarbon.com/

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The Midwest Regional Carbon Initiative is a structured five-year program funded by the Department of Energy. The MRCI is co-led by Battelle and the Illinois State Geological Survey and is comprised of team members from multiple state geological surveys, academic institutions, and industry. Backed by more than 20-years of experience in the field, the initiative works to connect science, technology, and research to advance CCUS in 20 states across the Midwest, Mid-Atlantic and New England regions.

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