Outlook

[egeonews-l] E-Geo News | April-June 2025

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on behalf of
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INDIANA UNIVERSITY BLOOMINGTON

READ ONLINE

News from the Indiana Geological and Water Survey
April-June 2025

IGWS move from Geology Building imminent

Over the next six months, Indiana Geological and Water Survey staff will be preparing to move from the Survey's longtime home in the Geology Building on the Indiana University Bloomington campus to a different IU-owned building.

IGWS Director and State Geologist **Dr. Todd Thompson** announced the news in an all-staff meeting on May 5. Many logistical and financial details are not yet known, but Survey administrators have been told that the second, third, and fourth floors need to be vacated by the end of this calendar year, with the remaining three floors and basement to follow. Research labs and staff offices are on the floors to be moved first; IGWS administrative offices, the Learning Lab, and the in-progress IGWS Records Center are on the ground floor and basement.

The Learning Lab will be closed for the entirety of July but will reopen in its current location Wednesday, Aug. 6 with limited hours.

Survey staff aim to continue our research and other commitments throughout the transition as best we can. More information will be shared when available.

IGWS Learning Lab hours changing

As a result of the plan to move the IGWS out of the Geology Building, as well as budget cuts, open hours at the popular **Learning Lab** are changing.

The Learning Lab remains open for walk-in visitors through June, but it will be closed the entirety of July. The **IGWS store** will be open for online orders only in July.

The Learning Lab will reopen in the fall at the current location starting Wednesday, Aug. 6, and will be open for walk-in visitors between 10 a.m. and 4 p.m. Wednesdays, Thursdays, and Fridays. Occasional Saturday events will be scheduled, but there will be no regular Saturday hours.

Requests for fall field trips can be made for Mondays-Fridays. **More field trip information is posted here.**

Survey research aligns with governor's executive orders

Five IGWS staff members met with state officials in Indianapolis in May to discuss the Survey's capabilities related to executive orders by Gov. Mike Braun.

Executive Order 25-62 targets the recovery of rare earth metals and critical minerals from Indiana coal waste disposal and mining sites--a topic the IGWS has been studying since 1994.

Executive Order 25-63 directs the development of a statewide water inventory and a water management plan. Water quantity and chemistry are other long-running areas of **Survey research**; water studies date back to the 1980s.

Suzanne Jaworowski, newly appointed Indiana Secretary of Energy and Natural Resources, met with IGWS Director and State Geologist **Dr. Todd Thompson,** lead energy researcher **Dr. Maria**

Mastalerz, Research Scientists **Ashley Douds** and **Ginger Davis,** and Assistant Director for Information Services **Matt Johnson.** Jon Ford, executive director of the Office of Energy Development, also was briefed on the Survey's studies and capabilities.

Established in 1837, the IGWS is tasked under state statute with discovering, developing, and preserving the water, mineral, and energy resources of Indiana.

"We appreciated the opportunity to provide an overview of the critical minerals and rare-earth elements research that the Survey has completed during the past several years," Thompson said. "This work directly aligns with Governor Braun's Executive Order 25-62, and we hope to work closely with the Secretary's Office of Energy Development to fulfill the executive order. We look forward to collaborating on other executive orders and future state needs."

UPPER RIGHT: IGWS geochemist Tracy Branam collects a water sample from an acid mine seep in Pike State Forest. An IGWS team is evaluating waste sites for evidence of rare earth elements--minerals which are necessary to produce electronics, medical and defense technologies, electric vehicles, and many other items.

Looking ahead: IGWS addresses critical geologic issues

The IGWS, as a state-supported research institution, continually publishes freely accessible regional and statewide maps, data sets, research papers, and earth science education materials that are centered on geologic knowledge critical to the sustainability of our state and nation's natural resources. Our publicly funded science research forms a basis for the private and public sectors to invest in Indiana.

Click the "read more" link below to read overviews of recent research into **rare earth elements, carbon sequestration,** and **landslides.**

Did you know?

A 2018 study conservatively estimated that the Survey has an annual economic impact of $110.4 million on the state of Indiana. The Survey's online tools are worth nearly $25 million alone. The value of projects that would never be completed without the IGWS's freely available or low-cost data is listed at more than $56 million annually.

Read more...

New research papers, maps published

The *Indiana Journal of Earth Sciences* is on track to publish a record number of research products this year in Vol. 7. The four projects published since mid-March are:

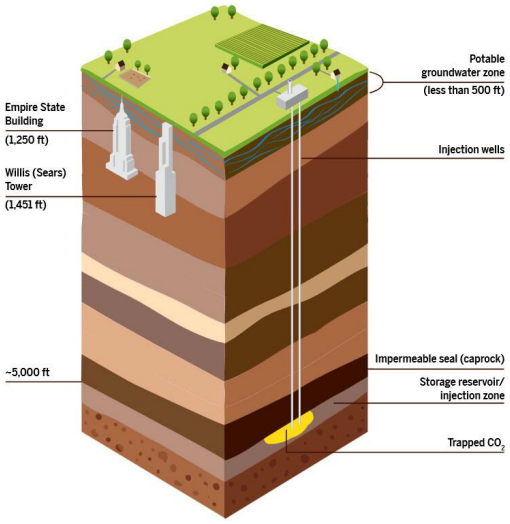
Characterization of Coal Tailings from Indiana--Implications for Their Potential Utilization as Sources of Critical Elements and Carbon

This study investigated coal tailing deposits from Greene and Pike Counties as potential sources of critical elements and carbon. Thirty-three samples were obtained from two former coal

preparation plants: one that processed the Tradewater Formation (mostly former Brazil Formation) coals and the other that processed exclusively the Springfield Coal of the Petersburg Formation. Tests characterized the presence of arsenic, carbon, cobalt, gallium, germanium, vanadium, and zinc, as well as rare earth elements, yttrium, and scandium, on whole-rock basis and on ash basis. "Properties of coal tailings suggest that they should be further investigated toward their potential utilization," the study concluded. Co-authors were **Dr. Maria Mastalerz, Tracy Branam, Ashley Douds, Valerie Beckham-Feller, Victoria Leffel, LaBraun Hampton,** and **Garrett Marietta**. This study was funded by the U.S. Department of Energy-sponsored CORE-CM project administered by the Illinois State Geological Survey. **Read the study here.**

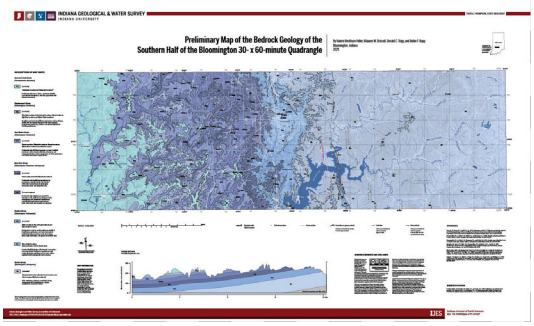
Carbon Sequestration in Indiana--a Brief Overview

This paper, written for the benefit of non-scientists, provides an overview of geologic carbon sequestration, including its history, regulatory oversight, U.S. Environmental Protection Agency Class VI permitting, and the potential risks associated with the practice. Rock units found in Indiana and why they are being explored as potential reservoirs for geologic sequestration projects are also discussed. More information on frequently used scientific terms and a list of acronyms used throughout the paper are provided. Co-authors were **Valerie Beckham-Feller, Rachel Culver, Ashley Douds,** and **Dr. Maria Mastalerz.** This work was funded by the U.S. Department of Energy as part of a larger project to investigate the feasibility of carbon management technologies in Indiana. **Read the paper here.**



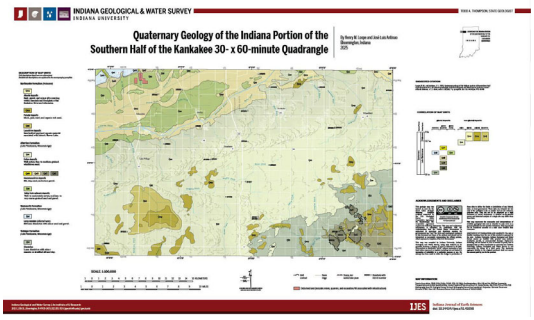
Preliminary Map of the Bedrock Geology of the Southern Half of the Bloomington 30- x 60-minute Quadrangle

This map shows Pennsylvanian and Mississippian bedrock units distributed over six counties and includes six physiographic provinces within the Southern Hills and Lowlands Region in south-central Indiana. The map contains brief summaries of all mapped bedrock units, drill hole data points, field observation data points, and a cross section. Co-authors were **Valerie Beckham-Feller, Kilauren Driscoll, Don Tripp,** and **Robin Rupp.** This project was funded through the STATEMAP program supported by the U.S. Geological Survey. **Download the map here.**



Quaternary Geology of the Indiana Portion of the Southern Half of the 30- x 60-minute Kankakee Quadrangle

This map shows unconsolidated Pleistocene glacial sediments associated with the Lake Michigan Lobe and Huron-Erie Lobe of the Laurentide Ice Sheet and other post-glacial sediments in northwestern Indiana. A map pamphlet and geodatabase are also included. Co-authors were **Dr. Henry Loope** and **Dr. Jose Luis Antinao**. This project was funded through the U.S. Geological Survey Great Lakes Geologic Mapping Coalition program. **A related**



map, covering the northern half of this region, was published in IJES Vol. 7 earlier in the year. **Download the most recent map, pamphlet, and geodatabase here.**

Grant received to expand landslide studies

The IGWS has been awarded a $51,187 grant to continue and expand research into landslide risks and mitigation through the National Landslide Preparedness Act. This time, the focus will be on south-central Indiana.

This is the second grant the Survey has received in two years to support research into this topic. The IGWS was one of 12 state agencies to receive funding for FY25 through the program, sponsored by the U.S. Geological Survey. For FY24, the IGWS's application, for $45,439, was one of 10 funded nationwide.

AT RIGHT: Nick Angelos and Victoria Leffel take measurements of a landslide on public land in Perry County, Ind., in March 2024. | Sara Clifford, IGWS

Work to be undertaken with the new award will center on the Bedford, Jasper, and Tell City 1:100,000-scale USGS quadrangles, which include parts of 13 south-central Indiana counties: Crawford, Daviess, Dubois, Floyd, Greene, Jackson, Lawrence, Martin, Monroe, Orange, Perry, Spencer, and Washington.

Research Geologist **Victoria Leffel** will examine statewide LiDAR data to identify likely landslides based on their appearance in aerial imagery; field-verify a limited number of sites on public lands; and pull in other information sources, such as highway- and mining-related landslide records. Underground coal mines and karst sinkholes are prevalent in the quadrangles to be studied, and research published in 2024 showed that those factors can contribute to landslide development.

"Landslides in Indiana can be triggered by events like flooding or earthquakes, and they often occur in areas with a history of past slides," Leffel said. "Having a detailed landslide inventory helps emergency managers and engineers strengthen infrastructure and better prepare for potential disasters."

The IGWS's National Landslide Preparedness Act project for FY24 focused on mapping landslides in southwest Indiana, including in area state parks. A report, maps, database, and a photo gallery are expected to be published in 2026.

The most recently completed project on Indiana landslides, which centered on the Hoosier National Forest, was published in late 2024. **Read it here.**

Staff news

• IGWS Research Scientist **Kilauren Driscoll** has resigned to take a new job in environmental consulting in Colorado. She started at the IGWS as a Potter Intern in 2022 and returned as a full-time research geologist in August 2023. Her last day will be June 20.

• Starting in August, **Dr. Ben Dattilo,** an associate professor of geology at Purdue University Fort Wayne, will join IGWS researchers during his sabbatical to work on bedrock mapping in southeast Indiana. Dattilo also participated in IGWS mapping projects during his winter break in 2022-2023.

• Kacper Lis, a researcher from Wroclaw University, Poland, visited the IGWS Energy Research Laboratory from March 26 to April 9. Lis collaborates with IGWS Research Scientist **Dr. Maria Mastalerz** on characterization of Ordovician gas shales. The primary purpose of his visit was to use Micro-Fourier Transform Infrared Spectroscopy (micro-FTIR) techniques to study functional group distribution in organic matter components of shales with increasing maturation.

• Mastalerz is a co-author of two studies recently published in the *International Journal of Coal Geology*: **"Component identification of solid biomass fuels using reflected light microscopy: Interlaboratory study 2"** (with IGWS Research Affiliate **Dr. Agnieszka Drobniak** and 63 others); and **"The impact of domestic combustion of biomass pellets on the environment and human health: Example from Poland"** (with Drobniak and four others). The microscopy study brought together an unprecedented 65 scientists from 25 countries. "This large-scale collaboration explored the capabilities and reproducibility of using reflected light microscopy (RLM) to identify components of solid biomass fuels, making it one of the most extensive exercises of its kind to date," Drobniak said. "The interlaboratory study not only showcased scientific excellence and global cooperation but also elevated the visibility and credibility of this innovative methodology on sustainable energy solutions."

• Mastalerz and IGWS Research Scientist **Dr. Bei Liu** are co-authors of two more studies recently published in the *International Journal of Coal Geology*: **"Reflectance as an indicator of biochar permanence"** (with Drobniak and one other); and **"Application of image analysis to quantify maceral composition of source rocks"** (with two others).

Outreach efforts

• More than 200 visitors descended upon the IGWS Learning Lab May 23 and 24 for Minecraft Mania. Kids and adults engaged in real-life exploration of the rocks, minerals, and ores that inspired the game; matched resources to state biomes; and learned about mining activity in the Hoosier state. ***Photo at right:*** *IGWS Learning Lab facilitator Lucas Porter (right) works with Minecraft Mania visitors on a scavenger hunt. | Polly Sturgeon, IGWS*

â€¢ IU Limestone Campus Tours have restarted for the season; the next two will be from 10 a.m. to noon Saturday, July 12, and Tuesday, July 15, both starting from the Sample Gates. Tours are free and no registration is needed. **Preview the tour route here.**

• Research Geologist **Victoria Leffel**, a member of the IGWS earthquake response plan committee, will participate in a full-scale simulated earthquake response exercise, organized by the Indiana Department of Homeland Security, June 17-18 at the Indiana State Fairgrounds in Indianapolis. Other IGWS staff members will be simulating setting up a local clearinghouse to collect, analyze, and share geological information to provide decision makers with relevant information regarding the nature and extent of an earthquake.

• Leffel also will assist with the Lake Monroe Watershed Tour on Saturday, June 21. It is free and open to the public; **see the event posting here.**

• IGWS Director and State Geologist **Dr. Todd Thompson** attended the 117th annual meeting of the Association of American State Geologists in Baton Rouge, La., in early June. The meeting was hosted by the Louisiana Geological Survey, and besides state geologists it included administrators from federal and partner agencies. Discussions centered on critical minerals, hazards, energy, and workforce development. Thompson is president of the AASG Foundation and represents the concerns of more than 80 honorary members of the association.

• Thompson and others met with the IGWS Advisory Council on April 9. The IGWS budget was discussed, and council members were updated on publications, outreach, service, and other activities. The council was provided quarterly reports from the energy and water centers. New council member Eli Eckart was introduced. He represents the Indiana Economic Development Corporation, replacing Matt Jaworowski, who stepped down earlier in the year.

• Thompson gave a presentation on the geologic framework of Indiana to the Earth Science Club of Northern Illinois in early April and led a fieldtrip to an Indiana limestone quarry with IGWS Volunteer Affiliate **Dr. Brian Keith** for the Illinois Geographic Society in late April.

• Thompson is leading two fieldtrips in the Indiana Dunes at the end of June for the Illinois and Indiana section of the American Institute of Professional Geologists (19th) and the Environmental Humanities Congress (20th). Both trips will focus on the geological history of the area, shoreline behavior, and hazards.

• Former IGWS intern and graduate student **Alec Siurek** spoke at the Indiana Geologists April meeting about "The Indian Creek Member: A New Unit in the Mississippian (Chesterian) Ste. Genevieve Limestone, Indiana."

UPCOMING EVENTS

IGWS EVENTS

GEOLOGY HIGHLIGHTS

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