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E-GeoNews

News from the Indiana Geological Survey

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New Mapping in Morgan County



Morgan County residents: You may begin seeing drill rigs and IGS

vehicles on your roads as our geologists begin a new multiyear mapping project. This cooperatively funded project between the IGS and USGS continues mapping efforts northward from Lawrence and Monroe Counties to join completed mapping in Marion County (Indianapolis). The decision to map this area was, in part, prompted by the construction of U.S. Interstate 69. Detailed surficial and bedrock geology mapping was last conducted by the IGS in the area during the 1970s.

Up-To-Date Equipment Necessary for Geologic Research

The IGS recently acquired several new pieces of equipment, including a Malvern Mastersizer 3000 laser diffraction particle-size analysis machine, which can measure particles from less than 1 micrometer to 2 millimeters in diameter (from clay to coarse sand). The machine measures the angle of diffraction of light as it passes through a mixture of sediment and water, which is constantly circulated through the detector. This equipment allows IGS scientists to quickly and accurately determine particle-size distributions for use in facies analysis and hydrogeologic properties in unconsolidated sediments.

A seed grant from IU's Office of the Vice Provost for Research made it possible for the IGS to buy a ThermoNiton XL3t GOLDD+ portable X-ray fluorescence (pXRF) analyzer. It will be used primarily to quantify the composition of bedrock and unconsolidated map units; the pXRF can also prospect for a range of elements that degrade drinking water sources (namely, groundwater) under a range of hydrologic conditions.

IGS coal geologists are now using the Survey's new LECO total organic carbon and sulfur analyzer to determine the amounts of carbon and sulfur in rocks, including coal and shale. In addition to total carbon, it can analyze total organic carbon after carbonate removal. It evaluates the quality of the source rock in terms of hydrocarbon generation, and also help determine the origin of the rock.



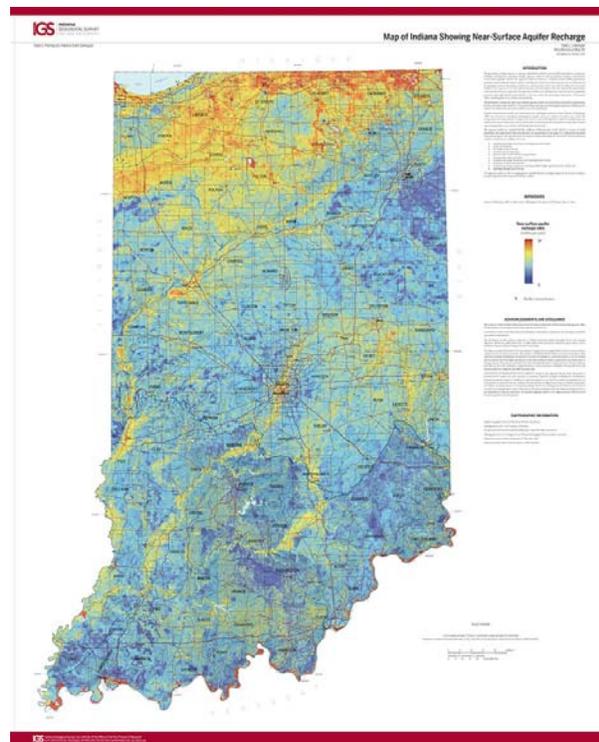
IGS geologist Pat McLaughlin demonstrates the portable X-ray fluorescence analyzer.

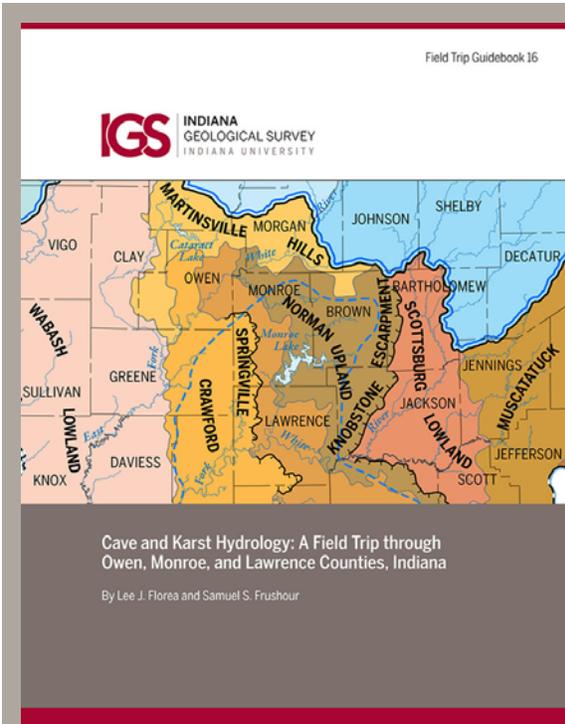
New Aquifer Maps

Two new maps by IGS hydrogeologist Sally Letsinger show the relative risk of Indiana's aquifers to contamination. She and other IGS researchers have been working to understand the factors that control the rate of infiltration, or groundwater recharge, into the subsurface. Most groundwater contaminants are transported along with water from the surface to the water table, and so recharge is a significant control on aquifer sensitivity to contamination. These maps identify the locations where water, and therefore, potential contaminants applied at or near the ground surface, are expected to rapidly infiltrate into the subsurface.

[Letsinger, S. L., 2015, Map of Indiana showing near-surface aquifer recharge: Indiana Geological Survey Miscellaneous Map 92, scale 1:500,000.](#)

[Letsinger, S. L., 2015, Map of Indiana showing near-surface aquifer sensitivity: Indiana Geological Survey Miscellaneous Map 93, scale 1:500,000.](#)





New IGS Publications

A new guidebook, [Cave and Karst Hydrology--A Field Trip through Owen, Monroe, and Lawrence Counties, Indiana](#), IGS Field Trip Guidebook 16, by L.J. Florea and S.S. Frushour, details a self-guided field trip that explains some of the interesting features of south-central Indiana's karst hydrology, with an emphasis on karst aquifers.

[Corebook of Carbonate and Associated Rocks in Indiana](#), IGS Occasional Paper 74, by T.A. Thompson and B.D. Keith, features 384 photos of cores and a coding terminology of commonly quarried and mined carbonate lithologies in Indiana. This corebook will assist those working in the field or lab to quickly make systematic and reproducible descriptions of carbonate rocks.

[Rotosonic Cores of the Lagro Formation in Huntington and Allen Counties, Indiana](#), IGS Report of Progress 43, by M.L. Prentice, P.W. Ducey, and R.F. Rupp, focuses on the deposition

of the clay-rich Lagro Formation in northeastern Indiana. The report presents initial depositional models for this formation within a segment of the Wabash moraine and two segments of the Salamonie moraine. The models are based on initial descriptions of three rotosonic cores drilled by the IGS.

What does Coldplay have to do with Indiana geology?



One of our geologists recently saw the band Coldplay live on the Today Show, filmed in New York City, and immediately thought of Indiana geology. Can you find the connection in this photo?

Check out the buildings in the background. Yes, that Indiana's Salem Limestone surrounding lead singer Chris Martin. This premium building stone comes from a 30-mile-long, 15-mile-wide area

called the "Stone Belt" in south-central Indiana, which contains the largest accessible deposit in the United States.

Go [here](#) to read a short article about Indiana limestone on the IGS website.

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