

Fracking in Michigan: Researchers study potential impact on health, environment, economy

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University of Michigan researchers are conducting a detailed study of the potential environmental and societal effects of hydraulic fracturing, the controversial natural gas drilling process known as fracking.

In [hydraulic fracturing](#), large amounts of water, sand and chemicals are injected deep underground to break apart rock and free trapped natural gas. Though the process has been used for decades, recent technical advances have helped unlock vast stores of previously inaccessible natural gas, resulting in a fracking boom.

Now U-M researchers are working with [government regulators](#), oil and gas industry representatives and environmental groups to explore seven critical areas related to the use of hydraulic fracturing in Michigan: human health, the environment and ecology, economics, technology, public perception, law and policy, and geology/hydrodynamics.

Detailed technical reports on the seven subject areas are to be released early next year for public comment.

"While there have been numerous scientific studies about hydraulic fracturing in the United States, none have been conducted with a focus on Michigan," said John Callewaert, director of integrated assessment at U-M's Graham Sustainability Institute, which is overseeing the study.

The research teams kicked off the first phase of their two-year research project last month with support from four university units: the Graham Sustainability Institute, the Erb Institute for Global Sustainable Enterprise, the Energy Institute and the Risk Science Center. Industry representatives, nongovernmental organizations, state government officials, [academic experts](#) and other stakeholders are providing input.

During a policy address on energy and the environment today at Michigan State University's W.K. Kellogg Biological Station, Gov. Rick Snyder noted that the state will be a partner in the U-M-led fracking study.

"We're going to be a partner with the University of Michigan's Graham Sustainability Institute on doing a study on where fracking's going," Snyder said. "Fracking is something that is very serious and it needs to be done the right way.

"Let's be at the forefront of being environmentally responsible when we look at these energy issues. And let's do this in a way where we're working together."

The U-M-led research teams will draw on their findings for the second phase of the project, which will outline a range of environmental, economic, social and technological approaches to assist stakeholders in shaping hydraulic fracturing policies and practices in Michigan. The researchers will present their overall findings and policy recommendations in 2014.

Of particular interest is the increasing use of horizontal drilling, whereby drilling is conducted horizontally to expose the drill bore to more shale rock formation. In those cases where shale fracturing is required, water with added chemicals is injected into the reservoir rock at high pressure to cause the rock to fracture and open up for gas extraction.

"Hydraulic fracturing has been around for decades, but with horizontal drilling now coming into play, people are increasingly questioning and scrutinizing the risks involved," said Andrew Maynard, professor of environmental health sciences and director of U-M's Risk Science Center.

"Areas of concern include perceived lack of transparency, potential chemical contamination, water availability, waste water disposal, and impacts on ecosystems, human health and surrounding areas."

Callewaert said there are currently only a small number of active drilling sites in Michigan that use high-volume horizontal drilling in conjunction with hydraulic fracturing.

"There's a lot of interest, but there really isn't that much activity at the moment in Michigan," he said. "That's why this is a good time to do the assessment."

One of the stakeholders engaged in the project is Tip of the Mitt Watershed Council, an environmental nonprofit organization in northern Michigan near the Antrim Shale Formation, which stretches through six counties across the top of Michigan's Lower Peninsula, from Lake Michigan on the west to Lake Huron on the east.

"What concerns us is the application of horizontal hydraulic fracturing," said Tip of the Mitt Program Director Grenetta Thomassey, who sits on the project steering committee. "We are very glad to be working with the University of Michigan and the Graham Institute in taking a proactive, multidisciplinary look at the impacts and implications of this practice, and what to do about them, both now and in the long run."

The two-year study uses a collaborative research methodology called integrated assessment, which, according to Callewaert, is ideally suited

for addressing complex sustainability challenges.

"There are many different perspectives on hydraulic fracturing," Callewaert said. "But, fortunately, we've been able to draw together some exceptional researchers across multiple disciplines at U-M, as well as several key stakeholders, in order to conduct a thorough, unbiased assessment to help determine what new approaches might be needed for Michigan."

Greg Fogle, a 40-year oil and gas industry veteran, is a representative of the Michigan Oil and Gas Association, a stakeholder in the project.

"MOGA is proud of the industry's record of conducting hydraulic fracturing safely and without environmental incident since 1948," Fogle said. "We believe this project will demonstrate how Michigan is a national model when it comes to regulating hydraulic fracturing and ensuring proper safeguards for keeping water, air and land protected."

John DeVries, a U-M Law School graduate and a steering committee member specializing in oil and gas law, emphasized the importance of a multifaceted investigation.

"This unbiased, science-based study will investigate not only the potential environmental risks of hydraulic fracturing but also the potential air quality and economic benefits of using the domestic, low-cost natural gas produced by hydraulic fracturing for electrical generation and manufacturing," DeVries said.

Erb Institute Director Andrew Hoffman is one of the researchers working on the social issues and [public perception](#) report.

"Hydraulic fracturing has the potential to touch issues that virtually all Michigan residents care about: drinking water, air quality, Great Lakes

health, water supply, local land use, energy security, economic growth, tourism and natural resource protection," Hoffman said. "In the end, our goal is to provide valuable insights and information to help address these important and legitimate concerns here in the Great Lakes State."

Provided by University of Michigan

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