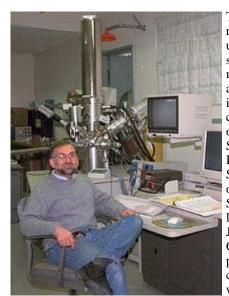


and mobilize it? Will uranium then show up in <u>Delaware Valley College Hosts</u> groundwater?" <u>Sustainability Symposium</u>

To find out, Bank and her colleagues scanned the scanned the scanned to the scanned the sc

surfaces of Marcellus shale samples from Western New York and Pennsylvania. Using sensitive chemical verse Coastal Interests Release instruments, they created a chemical map of the Recommendations To Sustain Gulf surfaces to determine the precise location in the shale of the hydrocarbons, the organic compounds constrained to the New About Its Ties natural gas.



Professor Joseph Gardella with the ToF-SIMS machine in his lab at the State University of New York at Buffalo. (Photo courtesy UB)

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research is the first to map samples using this technique, which identified the precise locatio uranium.

"We found that the uranium and the hydrocarbons are in the same physical space," says Bank. "We found that they are not just physically - but also chemically bound.

"That led me to believe that uranium in solution could be more of an issue because the process of drilling to extract the hydrocarbons could start mobilizing the metals as well," said Bank, "forcing them into the soluble phase and causing them to move around."

When Bank and her colleagues reacted samples in the lab with surrogate drilling fluids, they found that the uranium was indeed, being forced into the soluble phase.

When the water used in hydraulic fracturing comes back to the surface, it could contain uranium contaminants, potentially polluting streams and other ecosystems and generating hazardous waste, warned Bank. "Even though at these levels, uranium is not a radioactive risk, it is still a toxic, deadly metal," Bank said. "We need a fundamental understanding of how uranium exists in shale. The more we understand about how it exists, the more we can better predict how it will react to fracking."

State and federal regulators have reported that fracking has already have polluted drinking water sources in Wyoming, Colorado, Texas, Arkansas, Pennsylvania and New York.

Bank's research will be presented at the annual meeting of the Geological Society of America in Denver on November 2.

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