Abstract:
All communities must guard the quality of their water, but all communities also need access to energy. If drilling and developing oil and gas wells pollutes drinking water, human health can be impacted deleteriously now or in the future.

To address this issue, rivers and groundwaters are monitored worldwide, but it is often difficult to assess water quality impacts at the spatial scale needed, especially for regions drilled for oil and gas. In such basins, oil and gas wells are now often developed across many watersheds with the use of modern techniques of “fracking”.

In this talk I will discuss the fracking boom that changed the worldwide energy economy and the environmental issues around water that created worldwide public pushback. I will emphasize the basin with some of the oldest commercial oil, gas, and coal exploitation in the world (Appalachian Basin). In our work, we endeavor to foster dialogue about water quality among scientists and nonscientists as well as within and outside the industry. With more than a decade of this research, we can now use data to address the question -- how does fracking affect our water?
About Dr. Brantley:
Susan Brantley is Distinguished Professor of Geosciences in the College of Earth and Mineral Sciences at the Pennsylvania State University. She also serves as director of the Earth and Environmental Systems Institute (EESI). Dr. Brantley’s career as a geochemist focuses on the chemistry of natural waters both at the surface of the earth and deeper in the crust. Much of her research is an attempt to understand what controls the chemistry of natural water, and how water interacts with the rocks through which it flows. Investigations incorporate field and laboratory work, and theoretical modelling of observations. Recent work has focused on measuring and modeling how rock turns into regolith and water quality issues in areas with hydraulic fracturing.

Brantley is a member of the National Academy of Sciences and Fellow of the American Geophysical Union, the Geological Society of America, the Geochemical Society, the European Association for Geochemistry, and the International Association of GeoChemistry. She is a recipient of the Robert Garrels Award from the Geobiology Society, the Urey Award from the European Association of Geochemistry, the Geochemistry Division Medal from the American Chemical Society, the Wollaston Medal of the Geological Society, the Arthur L. Day Medal of the Geological Society of America, and the Presidential Award of the Soil Science Society of America. She holds honorary doctorates from the Paul Sabatier University (Toulouse III) in France and the University of Lausanne in Switzerland.

Brantley earned her B.A. in chemistry (magna cum laude) and her M.A. and Ph.D. degrees in Geological and Geophysical Sciences, all from Princeton University.