

# Scientist uses geological observatories to monitor the health of soils

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Humans need plants to survive, and plants need soil. But what happens when human, geological and climatic activity alters soil composition and structure and diminishes the amount of fertile land available?

Erosion and weathering can hinder the soil's ability to maintain a nutritional balance -- a process crucial to maintaining life around the globe.

"Our sustenance is all based on the soil, and yet we lose soil every day to erosion," said Susan Brantley, a professor of [geosciences](#) at Pennsylvania State University. "It's important for us to understand how the soil is formed in the first place."

Brantley's research was featured today at the Goldschmidt Conference hosted by the University of Tennessee, Knoxville, and Oak Ridge National Laboratory.

A worldwide network of field research sites takes an interdisciplinary approach to studying Earth's "critical zone," the multi-layered region from groundwater to vegetation canopy. Understanding how the soil interacts with its environment and changes over both a short-term and geological time scale offers insight into the potential renewability of soil.

Funding for United States observatories in this "Critical Zone Exploration Network" is granted by the National Science Foundation. Brantley was a pioneer in setting up the network and conducts research

at one of the first observatories to receive a grant, the Susquehanna Shale Hills observatory in Pennsylvania.

Here, Brantley and her team are investigating why the soil contains an unusually high amount of manganese. Using data gathered from other critical zone observatories across the states, she and her colleagues are discovering a correlation between nearby industrial facilities and this excess manganese in the [soil](#).

Provided by University of Tennessee at Knoxville

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