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Molecular "canaries" Warn When Soil Ecosystems Are Imperiled

An interview with Professor Myrna Simpson
Environmental Chemist, University of Toronto

How do we help protect environments through research?

Right now we lack a rapid and sensitive method to detect whether or not an environment is healthy. Part of my research is to develop better methods. Methods that can detect environmental deterioration long before it happens on a wide-spread scale. It's a little bit like the canary in the coal mine. We don't have a canary in the coal mine at the molecular level to tell us how healthy the environment is, so we're developing tools where we can sense the health of environment using different molecules that exist in the environment.

How does your research work?

In soil environments, soils currently hold twice the amount of carbon than we currently have in the atmosphere and there's a very intricate carbon exchange between the atmosphere and soil carbon. And with some of the modern threats like global warming and urbanization, this intricate balance is going to shift, and we could potentially create a scenario where that soil carbon is then transformed into atmospheric CO_2, and CO_2 is a greenhouse gas and it may actually accelerate global warming as we know it.

What are the specific applications of your research?

So the reality of our research is that we are trying to give this information to government scientists and policy makers both at the provincial and federal level. We want our research to transform how we monitor environments so that we can act quickly and ensure the long-term sustainability of our resources for generations to come.