

Researchers study plants sprouting from century-old seeds after excavation

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Forestry PhD candidate Melanie Sifton examines soil recovered from the Port Lands construction site. Credit: Geoffrey Vendeville, University of Toronto

At a Toronto Port Lands construction site on the city's waterfront, keen-eyed workers recently spotted plants that had sprouted from soil recently

exposed by the removal of tons of earth. The plants were hard stem bulrush and cattails, which are commonly found in freshwater marshes.

Because the plants grew from a patch of ground that had been seven meters below the surface for a century, conservationists concluded that they had grown from seeds buried when Ashbridges Bay Marsh at the mouth of the Don River was covered with landfill in the early 1900s.

Now, a team of University of Toronto researchers including Sarah Finkelstein and Shelby Riskin is studying the [soil](#) removed from the site for a better understanding of the long-lost natural habitat.

Finkelstein, a paleontologist and associate professor who is chair of the Faculty of Arts & Science's department of Earth sciences, studies paleoenvironmental records to better understand past climates and how ecosystems respond to [environmental change](#). Mrinmayee Sengupta, an undergraduate geography student and University College member, will be helping her analyze the Port Lands soil.

"Our first goal is to understand what the marsh looked like back then," Finkelstein says. "We'll try to answer questions like: What was the plant community like? What were the food webs like? What role did this marsh play ecologically on a local and regional scale?"

Meanwhile, Riskin, an assistant professor, teaching stream, in the department of ecology and [evolutionary biology](#) in the Faculty of Arts & Science, will study how changes in land use impact ecosystems and how those ecosystems can continue to function in the face of change. Stuart Ralston, an undergraduate student studying environmental science and a member of Victoria College, will be working with Riskin on the project.

"We'll look for evidence of the life in the marsh—shells, seeds, pollen—and hopefully get an idea of the biodiversity of those soils from

100 years ago and compare it to what we find in the wetland soils in the area today," Riskin says.

"I'm quite curious as to what we will find. If there is going to be a viable seed bank of native plants in those soils, or if there's evidence that it was already a degraded ecosystem 100 years ago."

Ashbridges Bay Marsh was once a thriving natural ecosystem. But by the end of the 1800s it was suffering from sewage and pollution from Toronto's waterfront cattle yards, among other sources. As the city grew in the early 20th century, it was covered over and more industry moved onto the new land.

Today, the Port Lands is undergoing major redevelopment to reduce flooding at the mouth of the Don River and to create parks and new wetlands. As workers dig, they are uncovering the city's recent history like urban archeologists.

The researchers will also measure the carbon content of the soil to understand whether it came from a natural source or human activity, and how well the marsh served to absorb and store carbon.

"Right now, my research group is working a lot on carbon uptake and sequestration in wetlands, which is an important research focus in Ontario given our abundance of wetlands and their potential role in mitigating climate change," Finkelstein says. "This work could tell us how well this wetland functioned as a carbon sink. It will also help us learn more about wetland restoration and what we may be able to recreate on the Toronto waterfront."

Provided by University of Toronto

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