

RESEARCH CONNECTION

Peatland restoration in South Eastern Manitoba

By Leon Kirschner, Pete Whittington, PhD, & Maria Strack, PhD



The Elma West peatland restoration site, mid-restoration, October 2023. The slope between the natural peatland (forest, left side) and the restoration area (brown, middle/right side) is clearly visible. Restoration will continue in fall 2023 and spring 2024.

Why this research is important

Peat is extracted for horticultural use in South Eastern Manitoba; this represents a large reduction in the ecosystem's carbon storage capacity. The project aims to restore the area to a fen so that it can function as a carbon sink again. However, there is little knowledge of how to restore a fen, as well as linking the restoration area with the surrounding landscape. Therefore, the research provides fundamental knowledge. In addition, the peat extraction processes expose dry, inflammable soil that can easily lead to wildfires or dust clouds during strong winds. The restoration contributes to preventing these hazards.

What you need to know

Peatlands are important stores of carbon, storing twice as much carbon as the world's forests combined despite covering only 3% of the Earth's surface. Thus, they function as a carbon sink, mitigating the increased concentration of carbon dioxide in the atmosphere. Peatlands are usually broken into two groups: bogs and fens. Bog peatlands get their water only from rain, whereas fens can get their water from streams, groundwater, as well as rain.

How the research was conducted

In order to fit the best restoration strategy, different approaches to try and retain as much water on the site as possible were used. Furthermore, a gentle slope between the natural ecosystem and the restored site was created, hoping to encourage the flow of water and nutrients to the restoration area. To see how effective these approaches were, a combination of water level monitoring and carbon cycle measurements were taken. Additional data was taken from a weather station installed on the site for calculating evapotranspiration.

What the researchers found

Spending a whole summer at the field site showed that due to a hot and dry climate, the water level of the fen dropped dramatically. Where there was a big waterbody at the beginning of summer, there was only bare soil left at the end. The absence of rain combined with a strong evapotranspiration dried the fen. However, it still kept more water than the non-restored sites.

How this research can be used

This research delivers fundamental knowledge of fen restoration that can be used in the future for a more effective approach to restoring and protecting wetlands in Canada and worldwide. Thus, it provides solutions for strong, natural ecosystems after human use being part of mitigating climate change.

About the researchers

This five-year research project is carried out by a team of Brandon University students, research assistants and Mitacs students under the supervision of **Dr. Pete Whittington** (Brandon University) and **Dr. Maria Strack** (University of Waterloo). Both this year and last year, the project was assisted by the Mitacs Globalink Scholarship, which is awarded to students from Germany. This year's student, **Leon Kirschner**, is an undergrad student from Germany studying geocology at Technische Universität Bergakademie Freiberg, Germany.

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Mitacs Globalink program from a professor's perspective

The program is very easy to access and apply to—it also requires NO funds. It begins in the spring with a faculty application where you describe the project that the international intern would be involved with. If your project is approved, then students (from many different countries) can apply (in early fall) to work on your project. Mitacs will provide a shortlist of student candidates for your project in

mid-fall; professors are then asked to review student applications, conduct interviews, and rank the applicants in order of suitability. In early winter, a matching process occurs, with results announced in February. You then work with the student to identify the 12-week period that they will come to Canada to conduct the research.

Mitacs Globalink program from a student's perspective

After a successful application and matching process, Mitacs students get the opportunity to participate in a 12-week internship in Canada. Mitacs provides the funding so that there are barely any personal costs for the duration of the student's stay. "During my time in Canada, I experienced a really close connection to nature. Doing a lot of outdoor activities such as camping, climbing or hiking has shaped my adventure here. The internship supported me with new knowledge, contacts and experiences. It was a great time, and I can highly recommend participating in the program." (Leon)

Keywords

Peatlands, restoration, ecotone, hydrology, climate change

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