

## RAISING AWARENESS ABOUT THE IMPORTANCE OF SOIL



Charlotte Norris

Research has shown that soil disturbance associated with some forestry practices can lead to soil degradation and affect long-term forest productivity. Further, these effects are often slow to manifest, taking several decades to measure and understand — demonstrating the value of long-term research efforts that federal science can provide to the sector. Charlotte Norris, is a soil biogeochemist at the Pacific Forestry Centre in Victoria, British Columbia where her research is focused on forest soil health.

“My hope is to raise the awareness of the importance of soils,” Norris explains. “Healthy soils are an important component of healthy forest ecosystems and vital to maintaining the many benefits that Canadians derive from their forests.” From soil reclamation in the oil sands, through post-doctoral work in agriculture, Norris brought her skills in data collection and analysis to the Pacific Forestry Centre in 2019 where she continues Doug Maynard’s research legacy in long-term productivity trials in the BC interior.

The Long-Term Soil Productivity study (LTSP) is an international project designed to investigate effects of soil compaction and organic matter retention on forest productivity over the long term.

Norris expects the results to confirm the original study’s hypothesis that organic matter removal would have negative effects on tree survival and growth, and soil compaction would adversely affect tree survival and growth. The knowledge gained from such research will inform the federal government’s environmental policy and leads to improvements in forest management practices.

The BC Ministry of Forests established the series of LTSP studies in the 1990s. Currently there are 14 installations in BC covering four biogeoclimatic zones. The LTSP study sites focus on core questions related to forest resource management: how much

**SOIL** is the naturally occurring, unconsolidated organic and mineral material that serves as a medium for plant growth. Soils are critical for the production of food, fibre (including the wood fibre vital to the forest industry) and, more recently, fuel made from biomass. Research by the federal government and others on the role that soils play in forest ecosystems is helping address three current issues tied to forest soil health: clean water; biomass harvesting; and the impact of climate change.

compaction and how much organic matter removal will affect long-term soil and site productivity?

From 1999 to 2003, Maynard set satellite trials in five of the Long-Term Soil Productivity (LTSP) sites in southeast BC. The objective was to determine the

effects of soil compaction and displacement on tree growth on smaller plots than those in the LTSP. Eight treatments of various combinations of compaction and displacement were included at each of the five LTSP sites. Using international Long-Term Soil Productivity (LTSP) trial protocols, data collection will assist researchers in providing recommendations to reduce human impacts on soil health.

Building on Maynard's work, this past field season Norris collected data from the 20-year old treatment sites. She is looking specifically at two human caused effects on the soil, compaction and organic

matter removals resulting from harvesting practices. Over the winter she will examine the data on tree heights and diameters, foliar nutrients from the two dominant tree types in the plots as well as soil samples from beneath the canopy of selected plots. From this she expects to learn more about growth rates and survival in the various plot types.

The driving question for Norris is how humans effect soil health. More specifically, the capacity of soil to be able to function as an ecosystem that can support plants, animals and humans.

*"The bird's nest in the soil is one of my favourite images. To me, it encompasses the idea of soil health — that soils are important to sustain plants, animals, and humans."*

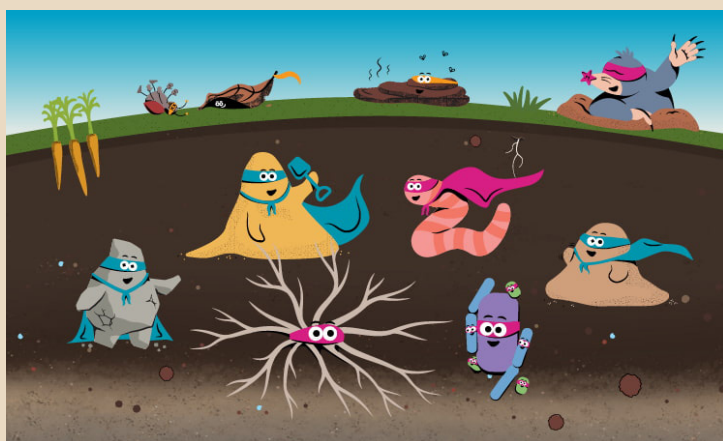
Charlotte Norris



Interior research plots



Charlotte Norris sees soil as a one of the earth's creatures always changing and evolving. She embraces any chance to further educate and excite the public about the importance of soil health, and as such was delighted when the Canada Agriculture and Food Museum in Ottawa launched their Soil Superheroes exhibit. "I think it's a wonderful and yet rigorous project," said Norris, adding, "I had hoped to get to Ottawa to see it, but current conditions restricted my travel. However, their plan is to bring the exhibit across Canada, so I look forward to attending when it reaches British Columbia".



## SOIL SUPERHEROES

This exhibit provides visitors with an underground perspective on the importance of soil science and conservation. Meet the star players such as Captain Clay, The Mole, and Wonder Worm and learn how their superpowers not only provide humans with food and medicine, but also clean the water we drink and protect our climate!



## WORLD SOIL DAY - DECEMBER 5

December 5, 2021 is recognized by the United Nations as World Soil Day. FAO, through its World Soil Day website, is raising the profile of healthy soil by encouraging governments, organizations, communities and individuals around the world to engage in proactively improving soil health.

### For additional information:

World Soil Day [www.un.org/en/observances/world-soil-day](http://www.un.org/en/observances/world-soil-day)

Soil Superheroes [ingeniumcanada.org/agriculture/exhibitions/soil-superheroes](http://ingeniumcanada.org/agriculture/exhibitions/soil-superheroes)

Soil displacement and compaction effects on conifer seedlings in Southeast British Columbia: Study establishment, D.G. Maynard, K. E. Hogg<sup>1</sup>, E.F. Wass, and M.P. Curran (2014)

Fifteen-year tree growth on standard long-term soil productivity trials and various adjacent amelioration treatments at Interior Cedar-Hemlock sites insoutheastern British Columbia and northern Idaho, Mike P. Curran, Charlotte E. Norris, Karen E. Hogg, Michael Murray, Deborah S. Page-Dumroese

<https://www.nrcan.gc.ca/our-natural-resources/forests-forestry/sustainable-forest-management/conservation-protection-canadas/soil/13205>