

Soil Hydrology

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Starting out in beautiful Québec City, I developed a love for the outdoors which lead me to do a degree in natural resource management (1992), and later a M.Sc. in soil hydrology (1994), both at Université Laval. Following graduation, I accepted an offer to join the Forest Service in Mackenzie, BC. In 2001 I decided to get back into research. As a Soil Scientist, my area of expertise is soil physics, wetland soils, soil conservation and rehabilitation. My recent work includes development of innovative tools for soil resource stewardship monitoring, testing new soil rehabilitation techniques on waterlogged soils, and assessing hydrological risk within MPB areas.



Predicting Where Wet Soils Will Create Problems

Identifying sites with saturated soils prior to harvesting enables foresters to plan their operations to avoid soil rutting and compaction. The need for predictive tools becomes especially apparent in areas affected by MPB, where saturated soils are being encountered more frequently during summer harvesting. John Rex and I have initiated a research project to produce an operational tool for predicting sites most vulnerable to soil damage.

We have concluded that the most effective indicators for predicting the risk of wet ground occurring are lodgepole pine content, understory, drainage density, sensitive soils, and the topographic index. The wet conditions could become exacerbated by wet weather and by salvage logging.

Testing a New Technique for Rehabilitating Drainage

After lodgepole pine is salvaged, the natural drainage patterns of a site can be disrupted enough to create an elevated water table and excessive water pooling. To address this dilemma, a research project was initiated in 2006 to evaluate the effectiveness of digging ditches as a treatment for restoring a cutblock's water drainage patterns. By reducing standing water, remedial ditching improves access to sites, stimulates forest regeneration, and enhances tree productivity. The research will produce guidelines that foresters can use to identify where, when and how to use remedial ditching to manage excess moisture pooling on harvested sites.

Creating methods using digital imagery to monitor soil resources A protocol for data collection has been developed by the Soils Team of the BC Ministry of Forests and Range for evaluation of the soil value at the cutblock-level under the Forest and Range Evaluation Program (PDF available on SharePoint). The protocol consists of ground and image based methods that consider soil disturbance observable on the ground as a proxy for longer-term effects. As operation manager, over the last few years I have been responsible for developing new methods for digital imagery analysis and interpretation that make use of GPS mapping applications and real-time field data collection (e.g., OziExplorer Manual - available on SharePoint). I am also in charge of delivering a province-wide training program for staff in C&E and Stewardship who are involved in protecting soils.

Soils - Extension Activities

* Trained C&E and BSTS staff on soil conservation, rehabilitation and the impacts of forestry practices on soils. The course consists of both office and field sessions that pass along new information gained from FSP soils research on identifying problem sites and preventing soil damage. Course was filmed and is available for staff on DVD.