

Forest Watershed Research Centre, UNB



Visualizing the implications of mapping unmapped flow channels and adjacent depth-to-water index, at the Acadia Forest Research Station

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Shown below is a sample of the 5-m resolution flow channels and cartographic depth-to-water index (DTW) map for the Acadia Forest Research Station, in reference to a forest operations research project dealing with determining relationships between soil condition, tree growth, carbon sequestration, commercial thinning, and wood quality, one tree at a time. The high resolution mapping of the depth-to-water table delineates the extent to which each tree is influenced by the proximity of its root system to the water table in the ground. This proximity has several consequences: trees on soils next to flow channels subject to regular flooding may be subject to flood-induced root mortality and dieback; in contrast, soils that are fed by capillary water from a water table location beneath the normal rooting zone potentially promote root development and tree growth; if the water table is far below the rooting zone, root development is reduced on account of lack of water, and root mortality would increase during times of severe draught. Overall, a well-functioning root system promotes tree growth, increases overall wood production, and leads to fast-growing trees that have a tendency to produce tall, slender stems ideal for wood processing and marketing. The map sample on the right highlights the details of the flow-channel and cartographic DTW conditions within and adjacent to the cut-block area where mechanical forest harvesting has been conducted, to generate pertinent information about the physical dimensions of each tree in terms of stem size and quality, and geographic location in reference to the DTW interpreted soil moisture conditions underneath each tree.

Flow-channels (blue) and depth-to-water map (0 to 1 m from pink to red) overlying the forest operations treatment block within the Acadia Forest Research Station between Road 9 and Bridges Brook (south central location).

