

## Modeling the impact of peatland drainage on a superficial aquifer

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Peat harvesting for horticultural purposes requires the lowering of the water table within the peatland. This is usually done with a peripheral drain all around the peatland and secondary drains to maintain low water levels within the peat. Recent studies have focused on the effect of peat drainage on the organic deposit within the peatland. However, only limited research has studied whether or not and in which conditions peatland drainage has an impact on an adjacent superficial aquifer. This issue is addressed in this presentation. Available data have been used to build conceptual models of peatlands located in two regions of southern Québec (Canada). These models represent two hydrogeological environments where peatlands are used for peat harvesting in the Côte Nord and Centre-du-Québec regions. The models are built to simulate the effect of actual peat harvesting conditions on water table drawdowns in the two regions. Other models are tested to understand how different hydraulic properties, changing the position of the peripheral drain, or modeling for agricultural drains in the vicinity of the peat production area impacts the results. Other models are also tested to understand how the presence of a low hydraulic conductivity layer below the peatland or the presence of agricultural drains in the vicinity of the exploitation influence water table levels. Results show that peatland drainage generates drawdowns in the superficial aquifer that are smaller than 0.5 m. The distance between the peripheral drain and the peatland border has limited impact on the drawdowns. In the Côte Nord region, the presence of a low-K horizon below the peatland reduces the effect of peat drainage on aquifer drawdown. In the Centre-du-Québec region, the presence of agricultural drainage limits significantly the spatial extension of water table drawdowns. This study provides new insights into the effects of peat harvesting on groundwater resources that will help the peat industry to maintain responsible management.