



## **Characterization of the efficiency of sedimentation basins downstream of harvested peat bogs**

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Peat harvesting is a very lucrative industry in the provinces of Quebec and New-Brunswick (Canada). Peat enters in many potting mix used for horticulture. However, harvesting this resource has some impacts on the environment. First, industries need to drain the peat bog to dry the superficial layer. Then, it is harvested with industrial vacuums and the underlying layer is allowed to dry. The drained water is laden with suspended sediments (mostly organic peat fibers) that may affect biota of the stream where it is discharged. To counter the problem, this water does not go directly on the stream but first flows through a sedimentation basin, built to reduce suspended sediment loads. This work focuses on characterizing and eventually modeling the efficiency of those sedimentation basins.

Seven basins were studied in Rivière-du-Loup, St-Valère and Escoumins (Quebec, Canada). They each have a different ratio basin area/drained area ( $4.7 \cdot 10^{-4}$  to  $20.3 \cdot 10^{-4}$ ). To continuously monitor the sediment loads (calculated from sediment concentrations and discharge) entering and leaving basins, a nephelometer and a level logger were installed in the water column upstream and downstream of sedimentation basins. Their trapping efficiency was measured during the ice-free period (May to October) and for each significant rain event, since it is known that the rain and subsequent runoff induce most of the peat transport in and out of the basin. Results show that the event efficiency decreases as the basin is filled up with trapped sediments. For one basin, the efficiency was 85% on a June rain event, 67% on a July event and it was negative in August. Trapping efficiency can be used as a tool to estimate basin dimensions. This has been done for municipal sedimentation ponds that trap minerals and will be adapted to the current context, where the dominant sediment is organic.