



## **An easy, field-based approach to approximate the terrestrial water inputs of boreal first order streams**

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The biogeochemical inputs into boreal stream ecosystems depend on terrestrial cycles and catchment hydrology. The near-stream area, or riparian zone, controls the quantity and quality of terrestrial water that becomes stream water. It has been traditionally assumed that diffuse flow is the major pathway for groundwater to reach a stream. However, these diffuse flows are a challenge to detect and quantify, and are often based on debatable assumptions of homogeneity across space and constant rates. This is a problem for closing water, nutrient and energy balances on reach scales. Is there an easy, field-based way to approximate the terrestrial water inputs into a stream reach? Topographic maps allow to easily identify locations across the riparian zone where terrestrial water accumulates before it transitions to the aquatic system. The majority of the catchment's groundwater and event-water (or a combination) routes towards these focal points in the riparian zone from where it is ultimately delivered to the stream. Such points in the landscape provide an opportunity to monitor the dynamics of terrestrial inputs into streams. We refer to these areas as discrete riparian inflow points (DRIPs). We were able show the hydrological and thermal effect of DRIPs on a stream reach over different seasons. Furthermore, we have found that DRIP water has a unique biogeochemistry that stands out from the rest of the riparian zone. We combined biogeochemical data with GIS metrics and field-based measurements to understand the role of DRIPs in a boreal landscape. Using mixed effect models we identified landscape characteristics that explain the biogeochemistry of DRIPs across space and time. Ultimately, we aim to be able to explain the majority of biogeochemical and hydrological dynamics in the low order branches of a stream network, by considering the spatial extend and behaviour of the DRIPs.