



## **Hydrological Flow Paths during the Spring Flood: Linking Small-Scale Process Understanding to Landscape Patterns**

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Stream flow generation in boreal catchments remains poorly understood, especially associated with spring flood episodes which is the dominant hydrological event in many seasonally snow covered regions. We examined the spatial and temporal aspects of flow pathways by linking detailed oxygen-18 analyses of soil, snow melt and stream water with hydrometric measurements across 11 nested catchments in northern Sweden during the snow melt period. The investigated catchments ranged over three orders of magnitude in size, from 3 ha to over 6780 ha . Separating the catchments into the main landscape units, forested and wetland areas, explained most of the variation in event/pre-event water during the spring flood. Whereas the spring flood in forested catchments was dominated by pre-event water (80%-90%), the proportion of event water in wetland-dominated catchments had a significant proportion (40%-60%). One plausible explanation to this large variability between catchment types, as explained by soil isotopic and hydrometric data, was an extensive and homogenous soil frost layer preventing melt water to infiltrate into the soil during the spring flood. Catchment size did not influence the proportion of pre-event water during the spring flood.