

## **Streamflow responses and trends between permafrost and glacierized regimes in northwestern Canada**

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**Abstract** An assessment of the streamflow response of glacierized basins in southwestern Yukon was carried out to determine if there are apparent trends associated with climate warming. The study area includes portions of the sporadic and discontinuous permafrost zones. Annual mean, maximum and minimum flows, as well as the timing of the maximum and minimum annual discharge, were assessed using the Mann-Kendall test. A slight positive trend in annual mean discharge was generally observed throughout the study region, likely a result of combined precipitation increases and glacier melt contributions. Annual maximum flow trends are more variable with the majority of station records exhibiting a positive trend. Permafrost likely has a significant role in controlling annual peak discharge trends. Basins with little permafrost exhibited positive trends in response to additional meltwater contributions, while basins with significant permafrost exhibited negative trends, likely a result of the degrading permafrost enhancing subsurface flow processes. Positive trends in annual minimum flows were generally obtained, presumably due to greater groundwater contributions to baseflow.

**Key words** glacierized; discontinuous; sporadic permafrost; Mann-Kendall; trend analysis; streamflow response; Yukon Territory, Canada