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Particulate organic carbon composition and landscape characteristics in the Peel River Watershed, Canada

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Rapid warming of the Arctic is accelerating thaw of permafrost, which mobilizes organic carbon (OC). Remineralization of this carbon can contribute to further climate warming. The Peel River watershed is underlain by continuous and discontinuous permafrost and covers a diverse set of landscapes from wetlands to barren mountainous areas. Part of the watershed undergoes abrupt permafrost thaw that releases particulate OC (POC) to the fluvial system. In this study, we couple landscape characteristics to river POC to better understand its spatial variability and the changes imposed on the watershed by permafrost thaw. We sampled POC in July-August 2019 in the Peel River main stem and its tributaries (total $n \sim 120$) and used carbon isotopes and lipid biomarkers to characterize its composition and trace its sources. Our first results indicate a compositional diversity within the watershed as POC ranges between <0.1 and 2.1 mg L^{-1} , $\delta^{13}\text{C-POC}$ from -36.7 to -26.5% and $\Delta^{14}\text{C-POC}$ from -906.4 to -43.5% . Ongoing changes in the watershed can be traced within its waters, and may help us to decipher how it is changing and may change in the future.