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Northern peatlands play an important role in permafrost regions as they are one of the largest carbon pools in northern ecosystems. Following permafrost thaw, changes to carbon cycling in peatlands could cause a positive or negative feedback to the climate system. This is of particular interest in the discontinuous permafrost zone as permafrost is susceptible to complete disappearance and could thus permanently alter the magnitude of carbon losses. One pathway through which carbon is lost from these sensitive ecosystems is as dissolved organic carbon (DOC). We characterize seasonal variations in DOC export from three catchments (0.02-0.05 km<sup>2</sup>) at Scotty Creek, a 152 km<sup>2</sup>-watershed underlain by discontinuous permafrost near Fort Simpson, Northwest Territories, Canada. The goal of our research is to understand the impact of changing hydrological conditions and their effects on DOC export rates and DOC contributions from different land cover types. We compare DOC export rates from 2014 and 2015 for two climatological extreme years, relatively dry and relatively wet compared to climate normals. Our preliminary data shows higher export rates for 2015 due to higher runoff generation and no noticeable weakening dilution effect on DOC concentrations. This increases considerably DOC export and directly impacts the regional carbon budget.