

“Groundwater on ice: hydrogeology and the fate of permafrost carbon in Arctic watersheds”

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Abstract

The rapid warming of the Arctic where permafrost is prevalent is threatening to release carbon which would accelerate global warming if it reaches the atmosphere. There are many unknowns regarding carbon cycling and budgets in Arctic watersheds. This presentation shows that active layer soil above permafrost functions as a thin but extensive unconfined aquifer made up of mostly of peat. The supra-permafrost aquifer has relatively high porosity and permeability, creating efficient subsurface flow paths above otherwise impermeable permafrost. Observations and modeling reveal that much of the water and carbon going through Innavait Creek, a headwater river in the North Slope of Alaska, has passed through the supra-permafrost aquifer. Remote sensing showed that supra-permafrost groundwater is prevalent during summer while extensive sampling showed that there is substantial carbon within the supra-permafrost aquifers, as much as those estimated for permafrost. The crucial task of predicting the fate of carbon in Arctic watersheds depends on knowing the subsurface flow properties and processes.

Mehr Informationen zur Birdsall-Dreiss-Lecture und Prof. Bayani Cardenas finden Sie auf der Webseite der Geological Society of America: <https://community.geosociety.org/hydrodivision/home>



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