

H04: Recent advances in peatland hydrology, Part 2: Flow and transport of water, solute, and energy in organic soils

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Session Description

With increasing northern developmental pressure, the need to understand the processes governing the flow of water, solutes, and energy in organic soils, which are prevalent in northern Canada, is increasing. Unlocking the underlying processes is a major scientific challenge to improve our understanding and our ability to predict water fluxes, nutrient and contaminant transport, peatland development, and ecosystem services under a changing climate and developmental pressures. The physical structure of organic soils controls the movement of water, solutes and energy and results in non-linear unsaturated hydrology, an abundance of macropores and inactive porosity, and are subject to shrinkage and swelling. Thus, describing water, solute, and energy transport in organic soils is complicated due to these complex physical soil properties, in addition to the relatively unknown transport processes (i.e., dispersion, diffusion, sorption, and local non-equilibrium), high moisture and organic content, and abrupt temporal/spatial changes in geochemical conditions (e.g., anoxia). Recently, there has been a push to understand how advection, dispersion, diffusion, sorption, and biogeochemical processes govern the flow and transport of water, solutes, and energy in organic soils from the pore to regional scale. Thus, the goal of this session aims at providing a platform for hydrologists, hydrochemists, wetland scientists, and soil physicists to discuss the recent advances in our understanding of the processes governing the transport of water, nutrients, contaminants, and energy in organic soils. Our scale of interest ranges from the laboratory to the regional scale. In particular, contributions will be welcome that cover hydrological fluxes, soil physics, sorption and desorption processes, contaminant and nutrient fluxes, thermal transport and hydrological models that illuminate these processes in organic soils and organic horticultural substrates. Additionally, we welcome the presentation of new, developing, or novel methodologies and experiments that highlight these complex processes.

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